University of California
Application for 2007 Larry L. Sautter Award for Innovation in Information Technology

Advising @ UCR – A Comprehensive Approach to Student Advising

Project Team

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Project Summary:

The University of California, Riverside’s (UCR) Student Success Task Force (SSTF) was appointed in October 2005 by Executive Vice Chancellor and Provost Ellen Wartella, and was charged with providing recommendations on improving undergraduate retention, academic success, and the overall undergraduate experience at UCR through the support students receive outside the classroom. The charge was clearly aligned with Chancellor Córdova's goals of “Increasing UCR’s reputational rankings and to expand the opportunities for learning and personal growth for all students, undergraduate and graduate.”

The SSTF believes that academic advising is an important contributor to student success and student persistence and endorses the 2005-06 Undergraduate Council report on undergraduate advising and mentorship. The primary recommendation is to establish an academic advising system for undergraduate students that delivers timely, effective, and accurate advising services to all students; reflects developmental and demographic profiles of the student population; responds to the needs of individuals, communities, and special populations; is accountable for results; and is supported at the level necessary to attain these results.

In order to support UCR’s strategic goals and short term objectives relating to student success, Computing and Communications (C&C) has built a suite of complementary, web based advising tools that capitalize on existing technical infrastructures - data stores, business applications and rules, etc. These tools are designed as “self service” applications that leverage the web and other electronic resources to place data, reports, query & planning capabilities, and various communications mechanisms directly into the hands of faculty and staff engaged in advising. The resources are designed to build on one another and provide a complete end-to-end support environment for campus advising efforts. This suite of tools is as follows:

- Student Academic Information System (SAIS) data warehouse
- GROWL SIS (Student Information System) Advising / Enrollment Management System.
- GROWL SIS (Student Information System) Advising / Messaging System.
- Student Academic Advising System (SAAS) Took Kit.
- Student Advising/Mentoring Resources @ UCR.
Advising @ UCR – Overview of Resources, Tools, and Applications

1. **Student Academic Information System (SAIS) data warehouse.**

   This web tool allows detailed, ad hoc queries of discreet data elements that are predictors / indicators of student success. Using this tool, the Division of Biomedical Sciences (for example) might create the following query: create a list of all students in the Medical Scholars Program that took at least 16 units the previous quarter and had one course that he/she received less than a C. This tool is a powerful, easy to use, self service application that is capable of automatically e-mailing list of students resulting from ad hoc queries.

2. **GROWL SIS (Student Information System) Advising / Enrollment Management System.** Based on output from the SAIS data warehouse (and other systems), academic departments and colleges may utilize the GROWL SIS Advising / Enrollment Management System to control registration and initiate a face-to-face or electronic dialog relating to student performance, registration, class scheduling, etc.

   The GROWL SIS Advising / Enrollment Management System provides colleges and departments the following flexibility when managing quarterly registration:

   - Departments and/or colleges can require the submission and approval of a course plan prior to allowing a student to enroll.
   - Departments and/or colleges can require students to answer a question (that is department / student group specific) prior to enrolling in classes.
   - Departments and/or colleges can require a face-to-face meeting with an advisor prior to permitting a student to enroll.
   - And finally, departments and/or colleges can simply post a message to students (again, that is department / student group specific) that simply provides advice / guidance relating to that quarter’s enrollment processes.

   Using the GROWL SIS Advising / Enrollment Management System, the Division of Biomedical Sciences (for example) might require all students with a prior term GPA of less than 2.0 to submit a course plan for the following quarter and/or answer a question relating to academic performance.

3. **GROWL SIS (Student Information System) Advising / Messaging System.**

   Based on output from the (SAIS) data warehouse (and other systems), academic departments, colleges, or other campus organizations (most notably the Vice Provost of Undergraduate Education) can utilize the GROWL SIS Advising / Messaging System to provide detailed GROWL messages that are specific to groups of students (based on a wide variety of student attributes).
The Vice Provost of Undergraduate Education has (for two years) used this system to provide information on Supplemental Instructional Support to all freshman and sophomores. Thus, typically during 5th or 6th week (upon logging into GROWL) students are presented with all Supplemental Instructional Support available to them on a course by course basis (e.g. Learning Center support, T.A. office hours, Learning Community support, etc. for each and every course he / she is enrolled in).

4. **Student Academic Advising System (SAAS) Took Kit.**

As a result of using one of the several tools outlined above, a face-to-face interaction with a student often results. This interaction might include a faculty mentor, a professional departmental advisor, or a college advisor / resource. The Student Academic Advising System (SAAS) is a web “tool kit” designed to facilitate these face-to-face interactions. The SAAS provides the advisor with easy access to a student’s current enrollment, prior term units earned and GPA, all units earned and cumulative GPA, any holds, Dean’s list status, expected graduation, an unofficial transcript, and the ability to run a degree audit. The SAAS also allows the advisor to enter “advising notes” that are date and time stamped and are viewable to other advisors interacting with the student.

Using the SAAS, an advisor within the Division of Biomedical Sciences (during a face-to-face meeting with a student) might use the SAAS to review a student’s academic performance during the prior quarter and record a note that he/she recommended the student visit the Learning Center for help with a calculus course.

5. **Student Advising/Mentoring @ UCR.**

The University of California, Riverside provides students a wide variety of resources supporting their academic and career goals and objectives. Mentoring Resources @ UCR provides an electronic gateway to many of these resources and simplifies the search for meaningful materials.
Project Description:

Background

UCR has developed a suite of integrated advising and mentoring tools aimed at improving retention, persistence, time to graduation, and student performance. The tools were developed in integrated, complementary ways that allow the students themselves, central offices, professional advisors, and faculty to leverage each other’s efforts so as to maximize the collective benefit in support of student success. The various tools leverage a several technologies and are used in college offices, departmental settings, and one-on-one faculty/student interactions.

Importantly, UCR developed these systems with virtually no incremental resources. Rather, through combining the strengths of various technical systems, this integrated effort has been deployed campus-wide.

At the core of the various tools is the Student Information System (SIS), a transaction processing system running on an IBM mainframe, using CICS and VSAM. SIS contains billions of pieces of data that result from standard and tailored processes supporting admissions, registration, business services, financial aid, enrollment, and more. SIS feeds a subset of data to an Oracle data warehouse (SAIS) designed for easy access to data for report and analysis purposes. SAIS includes data mining tools, the ability to save queries, a standard report capability, and a tool to export output Excel.

SIS and SAIS have been leverages to create UCR’s suite of end-to-end academic advising tools. The diagram below illustrates how the various systems are combined to produce UCR’s suite of advising systems:
I. **Introduction to SIS -- Student Information System**

UCR contains a single official repository of student as well as a code base the provides UCR an on-line Enrollment/Advising system, Degree Audit system, and an Official and Unofficial Transcript generation system. All academic history including transfer coursework, advanced placement, UCR coursework, and test scores, etc. are housed in a single location for use in many business processes.

“Table based” advising criteria are set up in SIS to be used when the enrollment advising process runs, allowing for flexibility by college, department, GPA, etc. Once the process starts for an enrollment term, the process runs daily for adjustments to restrictions as well as automatically clearing when a condition changes on a student’s record and the student no longer meets criteria.

Messaging flags can be set up on individual student records, either in batch or online. These flags cause alert messages to display to students upon login to GROWL (see GROWL Messaging below). Since the flags can be updated in batch, messages can be assigned “in mass” to students, using any criteria available (e.g. class, GPA, units earned, etc.).
II. Student Academic Information System (SAIS) data warehouse.

The SAIS data warehouse is an Oracle system that contains a subset of SIS data (biographical, academic status, attributes, enrollment, history, etc.) that is updated on a daily basis keeping the information current. The data is structured in a manner that is conducive to queries and reporting. Colleges and departments run analyses that provide *Summary Mode* functionality to retrieve an initial set of aggregated data, and users may then “drilldown” and display detailed records. Display data is comprised of various student information (e.g. class enrollment, grades, class information, original cohort information, major, etc.). With one click, the results can be downloaded to MS-Excel format for further evaluation. Student lists resulting from queries may be sent e-mail directly from the system.

**Scenario:**

- Target students in difficulty (ex: show me all Poli Sci majors with < 2.2 Cumulative GPA).
- Students sent email notifying them to meet with their advisors.
- Students signs on to GROWL and receives a message that their enrollment is being held until they meet with their advisors.
- Upon meeting with the advisor, the advisor clears the enrollment hold.
II. **GROWL SIS (Student Information System) Advising / Enrollment Management System.**

This tool allows the departments to establish advising restrictions and holds based on pre-defined criteria within individual student records. Students’ registrations may be held until all advising restrictions are satisfied and cleared by their advisors. Departments may require course plans to be submitted, text responses, or external requirements such as attendance at seminars or in-person meetings with faculty or staff advisors.

Advisors may communicate with the student by placing individualized holds on students with either standardized or freeform messages. After the student submits his response or course plan, the advisor may also respond back to the student in text form to the student to further explain requirements or respond to a student’s questions.

Web reports are produced which list, by advisor, students who have submitted responses and are awaiting approval clearance, or the placement of new holds and restrictions. Advisors monitor these reports for quick response to student submissions. As the advising requirements are satisfied, the advisor clears the holds. When all advising restrictions are cleared, the student is free to enroll at his predetermined enrollment time.
IV. **GROWL SIS (Student Information System) Advising / Messaging System.**

Colleges, departments, and campus units can utilize the GROWL SIS Advising / Messaging System to provide detailed GROWL messages that are specific to groups of students (based on a wide variety of student attributes).

The Vice Provost of Undergraduate Education has (for two years) used this system to provide information on Supplemental Instructional Support to all freshman and sophomores. Thus, typically during 5th or 6th week (upon logging into GROWL) students are presented with all Supplemental Instructional Support available to them on a course by course basis (e.g. Learning Center support, T.A. office hours, Learning Community support, etc. for each and every course he / she is enrolled in).

V. **Student Academic Advising System (SAAS) Took Kit.**

The SAAS tool kit was designed to place important information at faculty members' and advisors' fingertips, without using cumbersome interfaces associated with the campus transaction processing systems. This information, in turn, facilitates faculty and advisory advising interactions with students.

SAAS includes the ability to view current enrollment, grades, earned units and other academic information for individual students. The system also allows advisors to run a degree audit against the student's major or a prospective major, unofficial transcripts, and record notes for future use.

Access to the student’s complete academic history is also available with the capability to sort coursework by term, course id (subject area and course), with options to display all coursework or only graded courses.
Scenario:

- Student meets with Faculty or Staff Advisor
- Using SAAS, advisor pulls data to better provide mentoring support & robust advising.

SAAS Includes:

- Current Enrollment Data
- Term Specific Attributes (Dean’s List, Academic Action, etc.)
- Historical Enrollment Data
- Unofficial Transcript
- Degree Audit
- Previously Recorded Advisor Notes

- Advisor records notes
- After meeting, advisor clears Enrollment advising hold.
VI. **Student Advising/Mentoring Resources @ UCR.**

The University of California, Riverside provides students a wide variety of resources supporting their academic and career goals and objectives. **Mentoring Resources @ UCR** provides an electronic gateway to many of these resources and simplifies the search for meaningful materials. The resources are categorized by "Academic", "Career" or "Student Life", with highlights of three campus resources and a link to a broad array of support organizations and services.
Technology Utilized in the Project:

Technology

IBM mainframe CICS transaction processing system
IBM mainframe web services
Oracle database
Oracle Internet Application Server (IAS) Development environment
In-house developed middleware integrating the systems

Tools

Timeframe of Implementation:

The various software applications contained in this document have been under development for several years (beginning in late 2004). C&C has deployed and upgraded the tools throughout the past 2.5 years. The SAAS is the most recently deployed tool; it was piloted in Spring 2006 and went into production during Fall 2006.
Objective Customer Satisfaction Data:

"I have worked in academic advising for 13 years, at two public research universities, and I can say, without hesitation, that the SIS Data Warehouse is the most powerful and sophisticated advising tool I have encountered. It provides academic advisors (and advising administrators) with an unprecedented ability to do everything from analyzing retention patterns to sending targeted communications. It’s very difficult now to imagine an academic advising environment without the SIS Data Warehouse. I eagerly anticipate the roll-out of version II."

-- José Beruvides
Student Academic Affairs Manager
College of Humanities, Arts and Social Sciences

“The CNAS Student Academic Affairs Office uses the expanded [SAIS] multiple times each week... During winter quarter alone we have already used the system to pull the following data for my office:

- At the end of Fall 2006, we were able to quickly and efficiently pull raw data from the new data mart including quality points and quality hours and through a simple Excel formula within 5 minutes determine the cumulative variance of all CNAS undergraduates, a real time saver.

- At the end of Fall 2006 CNAS, as well as the other two undergraduate colleges, noticed a large spike in the percentage of our first quarter students on probation. With a little reasoning and data pulled from the new [SAIS] (class enrollment with final grades along with the academic action and quarter GPA) we were able to narrow down the possible causes which enabled us to better advise our students regarding changes they needed to make in their Winter quarter enrollment during our CNAS Focus on Academic Success Workshops held last week.

- Several years ago CNAS instituted a Learning Community program called CNAS Scholars where students volunteered to take a 1 unit discussion and workshop to support their CHEM 1A class. Statistical analysis of the students who took the voluntary support activities had markedly higher grades in CHEM 1A than those who did not. Since many majors already have highly impacted curricula it is important for Chemistry and CNAS to be able to justify the addition of the extra unit as important to the success of the CHEM 1A students. My office is currently working on generating this data since we were able to very quickly pull the grades from all sections of CHEM 1A, CHEM 1HA and CHEM 1LA (the newly separated laboratory section) to compare them to the grades students received in CHEM 1A last year without the extra discussion section.

“... I'd like to commend you and your team for an outstanding job on a product that delivers timesaving and invaluable assistance to Associate Deans of Student Affairs and their academic advising staff on campus.”

--Barbra J. Wallace, Manager
Student Academic Affairs Office
College of Natural and Agricultural Sciences
“By combining the use of the degree audit and our suggest course plans per major, we can advise a student at any given time about where they stand within the major and then make appropriate recommendations. It also improves advisor ability to develop atypical plans specific to each individual students situation, especially students who have deviated from suggested course plans. On one hand it empowers advisors to offer more “person-specific” service while at the same time increasing student accountability. We know more, so now we can expect more from students as we support and facilitate their academic and personal growth.”

--Roderick Smith, Director
Student Academic Affairs
Bourns College of Engineering
University of California, Riverside

“BTW it is a very well done program, congratulations!”

--Jose Wudka, Professor of Physics
Physics and Astronomy
College of Natural and Agricultural Sciences
University of California, Riverside