Computer-Assisted Advising: The Next Agenda Item for Computer Development

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Computer-assisted advising has for many years been a popular topic at national conferences on admissions, records and advising. In the past, people attending computer-assisted advising sessions expressed a desire to have computer-assisted advising systems on their campuses, but had reservations about costs, technological capabilities, programming priorities, administrative support, etc. Most returned to their campuses resigned to continue with traditional advising practices.

Today, because of ever-present concern to provide students with accurate, up-to-date academic information, college and university administrators have intensified their efforts to make computer-assisted advising a top item on the agenda for computer development. A number of administrators are in the position to pursue such a development, because they have met other computer goals that opened the way to programming a comprehensive student record system. For many institutions, the next item in computer development *is* computer-assisted advising.

Before the 1980s only a handful of institutions had developed a computerized degree audit system, but in a 1982 survey (by the American Association of Collegiate Registrars and Admissions Officers [AACRAO]), 132 institutions had reported operational computer degree audit systems. Because of the interest in computer-assisted advising during this decade, the focus of this article is in two parts: to review the state of art of computer-assisted advising; and to analyze the characteristics of leading programs in the country.

Part I
A REVIEW OF COMPUTER-ASSISTED ADVISING

The First Agenda Item for Computer Development

The principal computer-related academic goal of institutions during the 1970s was to

systematize academic records, mainly the transcript. The computer development objective of the past decade has been to establish registration and records systems. However, institutions were delayed in developing computer-assisted advising because of their dependence on computer stored student record systems. For example, in order to print a comprehensive degree audit report, a computer program had to reveal the following:

- general student profile information;
- general education requirements;
- completed education courses;
- major requirements;
- completed major requirements;
- currently enrolled courses;
- transfer classes and credits;
- waived or substituted major courses; and,
- individual student additional major requirements.

Therefore, institutions that have operationalized computer-assisted academic advising have effectively solved the problem by establishing and integrating student academic information files. The student and advisor should know all the important facts that constitute the academic record. They should know which completed courses apply toward academic requirements, and also know how current enrollment applies toward academic requirements. Thus, the key to generating a comprehensive student progress report is to have in place integrated registration, records and curriculum files.

The Second Agenda Item for Computer Development

At many institutions, student information processing has been automated for several years. This processing has included current and historical data about the student. Academic advising data (curriculum files) are a later addition to the student information system. Curriculum computer files contain catalog and monitoring information necessary for curriculum management. The curriculum computer files also include information on currently approved courses; historical course information; and basic catalog information (e.g. college, department, major, degree requirements). As noted earlier, the success and efficiency of a computer-assisted advising system depends on careful system planning and properly developed computer files. In its simplest form, computer-assisted advising is a computer program that stores and matches the degree requirements with the student's academic record. The computer produces an evaluation report that shows the graduation requirements and the student's progress in completing those requirements. The progress report may be printed in any format the university or college desires.

Computer-assisted advising has been involved with a number of campus advising problems. For example:

- too much faculty time spent on clerical-type functions;
- complexity of degree requirements;
- higher frequency of changes in degree requirements and curriculum;
- increased student major changes and "stop-outs";

- extended time between student entry and graduation;
- greater number of advising errors; and
- petitions for waiver(s)/substitution(s) of requirements

Most computer-assisted systems have met and solved these problems. However, a summary from follow-up questionnaires sent to institutions that reported having computer-assisted advising programs (or in the process of developing them) identified several design objectives that not only addressed the above problems but others as well (79 out of 132 surveys were received, for a return rate of 59 percent). Those institutions recognized that identifying objectives was critical to system development. According to questionnaire responses, those persons designing a computer-assisted advising system should include the following objectives:

1. Develop a programmatic comparison of a student's academic record and the degree requirements for that student.
2. Provide an accurate and up-to-date advising information file.
3. Provide a consistent format between catalog, CRT terminal screen, and printed degree audit report.
4. Include all credit: institutional, transfer, Advanced Placement, CLEP, Military, etc.
5. Provide the flexibility of indexed degree programs, individually modified programs, and totally individualized degree programs.
6. Include a means to insert and track waivers and substitutions.
7. Provide capability to track multiple and dual majors.
8. Track university and general education requirements from date of entry; and track department major requirements from date of official entry into the major.
9. Provide a mini-transcript on the printed degree audit report.
10. Provide flexibility for narrative information.
11. Show prerequisites and qualifying information.
12. Provide instant update capability.
13. Allow student major shopping.
14. Insure simplified data entry procedures.
15. Provide curriculum management information to academic departments.

The Third Agenda for Computer Development

Before setting up a computer-assisted advising system, it is necessary to define program specifications. Fortunately, university and college personnel who are interested in developing a degree audit system can profit from the study of existing computer-assisted advising programs, particularly their ratio of successes and failures.

In addition to studying existing systems, institutions also should study all degree requirements (regular and irregular) within the university or college. Department heads and deans can help in this process by identifying special needs and changes that are not well known. In fact, the computer-assisted advising concept should be discussed with college and department leaders to gain their support before the project begins. Proper expectations

should be identified, and a representative from each college should be assigned 1) to advise the project team, 2) to critique plans at each stage of development, and 3) to ensure full administrative and faculty support.

Once an institution is ready to implement a program, it should consider doing so in phases, even though all academic programs will eventually be included. Planners should start with a department where success is likely, and rely primarily on students to debug the system, because they are very effective in identifying problems and errors.

Finally, programming success does not always come from the traditional full-time programmer on campus. Most universities attribute their programming success to a dedicated and creative person that perseveres, though the computer problems seem insurmountable. Often the key people are intelligent computer science students that are not restricted by traditional programming methods.

The main concern for institutions should be to make the advising by computer program as useful at the beginning, and during a student's academic life, as it is at the end. For example, most students graduate in the semester they are currently enrolled; therefore graduation evaluation can be conducted by automatically evaluating current enrollment and all courses completed as they apply to graduation requirements. Thus, by incorporating the first agenda for computer development and by methodically outlining and following design procedures, institutions can develop a computerized academic advising report that:

- has the capability to display graduation requirements;
- will match courses completed with those required;
- provides a deficiency/completion analysis of requirements;
- could be used as a tool to certify graduation requirements; and
- automatically generates a posting of the degree to the transcript.

PART 2
CHARACTERISTICS OF LEADING PROGRAMS: A NATIONAL FOCUS

The Maricopa Conference

Evidence of institutional readiness to move to this next agenda item for computer development was supported by a strong interest in two national conferences (held in 1984) that focused on computer-assisted academic advising. Early in the year, the Maricopa Community College District in Phoenix, Arizona sponsored "A Working Conference on Student Information Systems." The central themes of the conference were review of user needs, exploration of benefits, costs, and priorities of a comprehensive computerized advising system. Participants at the conference numbered 175, from large and small colleges and universities. The conference's agenda included presentations by representatives from several institutions and collective group participation in specifying the design characteristics of an ideal degree audit system. An interesting result of the conference was the formation of a national task force sponsored by the League for Innovation, to continue the investigation and design of computerized advising systems. The principal goal of this task force is to develop a national model, which will be useful for colleges that are creating a degree audit system.

The Brigham Young Conference

Later in the year another conference on computer-assisted advising took place at Brigham Young University. In attendance were over two hundred and fifty participants from diverse areas in the academic community, representing major universities and colleges from thirty-one states and three Canadian provinces. They included academic vice-presidents, deans of academic colleges, department chairmen, faculty, directors of academic advising, and registrars, all responsible to some degree for academic advising. The conference program featured six nationally recognized computer systems from those institutions that had pioneered computer-assisted advising. The specific features of each system are described in Tables I and II. An exciting aspect of the conference was to learn about institutions that have recently developed and are now operating computerized academic advising systems. They are: Tulane University, Miami University of Ohio, Southern Methodist University, Houston Baptist University, and the University of Delaware.

The conference participants heightened their awareness of the procedures involved in establishing a computer-assisted advising program, and after seeing what is possible and what is being done elsewhere, many expressed confidence in implementing a computerized advising system on their campuses. A logical result of these two national conferences is that many institutions are now ready for the next step in academic computer development: computer-assisted advising.

Summary

This article has described computer-assisted academic advising, one of the most recent and useful advances in computer technology at the academic institution. By improving administrative records, providing timely and accurate data, reporting students' progress toward graduation, and identifying possible obstacles, this new mode of advising has greatly improved the quality of assistance on many campuses.

Computer-assisted advising has been successful where it has been implemented. The demonstrated benefits are: freeing faculty from clerical tasks; improved advising information and accuracy; decreased costs; integrated advising and information systems; and curriculum management information. Computer-assisted advising is the best solution to the most fundamental advising problem: getting accurate academic information to advisors and students. It appears that many institutions have progressed from fulfilling basic computer priorities to understanding the potential help an automated degree audit system could be to their students, faculty and university.

TABLE I

Characteristics of Established Computer-Assisted Programs

	Georgia	Purdue	B.Y.U	U. Denver	N. Carolina	U. Florida
Year Established	1968	1969	1975	1975	1978	1978
Institution Size	22,000	32,500	26,000	8,300	22,000	34,300
Report Name	Programmed Academic Curriculum Evaluation (PACE)	Academic Progress Report	Advising by Computer (ABC)	Academic Progress Report (APR)	Automated Degree Audit System	Florida Academic Counseling Tool (FACT)
Hardware	Univac 90/80	IBM 3033	IBM 4341	Burroughs 6800	IBM 3083	IBM 3033
Development Costs	30,000	15,600	16,000	4,000	20,000	———
Unit Cost/Printout-Batch	.02	.04	.01	.02	.15	.025
Individual	.85	———	.35	———	———	.025
Original Development Time (Person months)	06	24	06	06	12	———
Majors Tracked	285	510	350	———	260	95
On-line Terminal Access	Yes	No	Yes	No	No	Yes
Frequency Report Distributed	Each Session	Once each Quarter/ individual request	Semester/ Term	3 times a Year Prior to advance registration	Each Semester	
Dissemination of Report	All Professional	Academic unit	Mailed to Students or Academic Units upon request	Academic Departments & individual schools	Academic Departments	Academic Colleges
Input/Insert Process Centralized/Decentralized	C	D	C	C	D	C
Tracking Methods*						

*Each of the above institutions tracks requirements by class, credit, or a combination of the two. Also, each institutional report includes the following information: General Education, University, and Major Requirements: Credit from your own institution, Transfer Credit, AP Credit, CLEP Credit, and Military Credit; Current Enrollment; Text Messages; Class Prerequisites; Substitutions; Waivers; Mini Transcript; and Individual Programs.

TABLE II

TRACKING FORMATS

Georgia State (Over/Under Format)

1. Humanities (20 hours)
   A. Courses taken in this area
      English III A- 5.0 TRN (Transfer)
      English 112 A 5.0 FA83

[illegible]

Purdue (Matrix Format)

E	ENGL 101	[illegible]	PSY 2[illegible]
R 1		CEEB AP	
E	A F84		A SS84
S	2 CR HR	3 CR HR	3 CR HR
H			

Brigham Young University (Class/credit hour combination Format)

COMPLETE THESE 5 CLASSES
Math 110 TRANS MATH 101 ..... 3.0 B+
Math 111 WAIVED ..... 0.0 WV
Math 112 SUBSTITUTE Math 114 ..... 3.0 A
Math 121 ..... 3.0 A
Math 122 ..... 3.0 A
THIS REQUIREMENT IS COMPLETE

Univ. of Denver (Side-by-side format)

	courses taken		**courses to be taken**
Social Sci (15 hrs, 3 fields)	Gen Anthro	5.0 A	complete
	U S History	5.0 A	
	Prin of Soc	5.0 A	

North Carolina State Univ. (Group Masking Format)

Course	CR
Group B (24 HRS)	
01 ACC 260 ACCT I-CONC FIN RE	3
02 GRP 009 EB 303 OR 523 OR 551	3
03 GRP 010 EB 311 OR 3B 521	3
04 GRP 011 EB 415 OR EB 420	3
05 GRP 012 EB 326 OR 332 OR 431	3
06 EB 307 BUSINESS LAW I	3
07 GRP 020 GROUP B ELECTIVES	6
	24

Univ. of Florida (Grouping by Discipline)

Mathematics
821 MAC 1122 ALGEBRA & TRIG 4.0 C
818 MGF 1113 FUNDAMENTAL MATH 3.0 C
831 STA3023 INTRO TO STATIST. 1 3.0 B
TOTAL CRED(S) REQ = 3 CRED EARNED = 10.0
CRED(S) NEEDED 0