

CRITICAL FACTORS

in Selecting a Course Management System for Higher Education in Ghana

Close consideration of key issues involved in choosing a CMS helps universities avoid the typical barriers to successful implementation and adoption

By **Isaiah T. Awidi**

Successful technologies for higher education provide integrated software applications that support both instructors and students. As educational delivery has shifted from traditional face-to-face to more blended learning and to online learning, student enrollment in developed countries has increased. At higher education institutions in Ghana, however, the limited infrastructure has not been fully integrated to support collaboration, assessment, feedback, student learning, and lecture preparation and presentation. These weaknesses in the infrastructure have hampered support of students both on campus and through alternative modes of instruction.

Course management systems (CMSs) currently drive educational delivery in most developed countries. Their absence in higher education in most developing countries creates a digital divide between first- and third-world students. Meeting the needs of higher education in Ghana therefore depends on identifying the factors that should inform the choice of such a system. To determine the factors crucial to choosing a CMS for Ghanaian higher edu-



cation institutions, I studied the three main universities in Ghana through a survey and workshops.

Background of the Study

Providing quality education requires that university administrations manage enrollment to maintain institutional integrity, while faculty must ensure effective and efficient delivery of instruction, effective communication with students, and collaboration between students and lecturers. Most Ghanaian public universities have seen increases of more than 90 percent in faculty, departments, and programs over the



past 10 years to accommodate increased student enrollments. This growth has not been accompanied by a corresponding increase in technological infrastructure, however. Between 1990 and 2000, for example, three public universities in Ghana selected management information systems for implementation. The first MIS chosen was abandoned by all three universities; the second was abandoned by two of them.

In most Ghanaian institutions, students get feedback only from year-end exam grades. This happens for various reasons, such as high lecturer-to-student ratios due to increased stu-

dent numbers, cancellation of tutorial sessions because of lack of space. Some programs give students one assignment for the whole academic year, while other programs do not give assignments. Moreover, a few institutions have experienced widespread cheating on exams, bringing into question the integrity of the exam results and of the institutional managers.

Given these challenges, what factors must university management and faculty consider in selecting a system to support teaching and learning? And how can they choose a CMS that will be accepted by all?

My study aimed to identify critical factors to consider in selecting a CMS. A secondary goal was to identify management's role in selecting a CMS.

Approach to the Research

The study was conducted between April 16 and August 3, 2006, at the University of Ghana (UG), the Kwame Nkrumah University of Science and Technology (KNUST), and the University of Cape Coast (UCC). The sample population covered students, lecturers, and technical and administrative managers at these universities. The data-collection process employed purposive

and simple random sampling methods. Table 1 shows the population that received questionnaires and the response rate.

For each university, in addition to the questionnaires distributed, interviews were conducted. The questionnaires were distributed to 5 members of management, 2 instructors from each department sampled, 20 students from each academic level, and 5 information and communications technology (ICT) support staff members. In addition, 5 senior members (management) from each university were interviewed face-to-face using a semi-structured questionnaire as a guide. Efforts were made to obtain a representative sample of the target population in order to achieve content validity. Further effort was made to ensure that items in the survey used were designed to contain, in a balanced way, almost all issues relating to the subject of the study. Since content validity is a matter of judgment, these items were peer reviewed and subjected to thorough scrutiny and reorganization. Analysis of the quantitative and qualitative data relied on SPSS, the statistical package commonly used for social sciences research.

Technology in Ghana and Literature Review

The following explanation of the context of higher education technology in Ghana and accompanying literature review cover ICT and public universities, definitions of a CMS, management's role in choosing a CMS, and the financial implications of using a CMS.

ICT and Public Universities

ICT combines hardware, software, and multimedia. Its influence on higher education cannot be overstated. ICT development in Ghanaian universities started in the mid 1990s, but growth has been slow and difficult due to unreliable power supplies, poor infrastructure, inadequate funding, lack of institutional support,¹ and lack of appropriate skills for implementation. Even when donor funding is available, breaking away from tradition has been a challenge to growth.

Table 1			
Survey Response Rate			
Target Population	Sample Size	Actual Responses	Response Rate
Managers	15	10	66.7%
Lecturers	90	57	63.3%
Students	300	258	86.0%
ICT support staff	15	12	80.0%

In public universities in Ghana today, using computers to promote active learning and collaboration is considered important. Nonetheless, the prevailing notion of technology intervention focuses on building ICT infrastructure and acquiring basic technical skills, and technology is still embedded in traditional pedagogy. ICT units are understaffed and poorly motivated. Departmental computer laboratories are used to train students in word processing.

Some partnerships through the African Virtual University have attempted to address the use of technology in higher education, but technology still has not been integrated into universities' delivery of education. Some universities have attempted to use an open source CMS such as KEWL, but the complete implementations have failed because some staff did not appreciate the relevance of the program or lacked the necessary skills to use it. Those systems still in limited use are saddled with multiple problems. In some institutions, faculty attributed the failure to system incompatibility, while others described the CMS as not being intuitive. Analyzing the implementations, I observed that those championing the products expected instructors to come to them for tutoring and guidance following the launch. This approach clearly contributed to the implementations' failure.

Current trends in educational delivery suggest that characteristics of the institutions, students, and lecturers have changed. Institutions are becoming more independent from the government and self-supporting, and student populations have become diversified

and more demanding. Mainstream students now include those who want some level of training specifically for their jobs. For most corporations, this suggests job-specific courses. Learners thus demand some flexibility in the use of ICT-enabled systems² so that work can be combined with learning and individuals can determine when, where, and what to study.³ Research from institutions that have used a CMS extensively suggests the technology can support both lecturers and students in meeting multiple goals.⁴

Defining Course Management Systems

In describing technology support for flexible learning, Boer⁵ observed that the CMS evolved as an integrated combination of web-based tools focused on distributing content and enabling communication and organizational and pedagogical support within courses. Various attempts to define the CMS highlight aspects of its functions. Some definitions describe it as a support tool for instructors. For the purpose of this article, I follow Collis and Moonen, who described the CMS as a

...World Wide Web-based system [of] comprehensive software packages that support some or all aspects of course preparation, delivery and interaction, and allows these aspects to be accessible via a network.⁶

Considering the definition in light of enrollment and space problems faced by universities in Ghana, the CMS is a tool that can support teaching and learning.

Once students and lecturers have access to the web, using a CMS would minimize the challenges in preparing lectures and the problems associated with students' physical presence in lecture halls. Problems with late submission of student grades by faculty, collaboration, and feedback on assignments would be minimized if not solved. The CMS can be proprietary or open source. Common CMSs include WebCT, Blackboard, Edu-Price, KEWL, TeleTOP, and Moody.

The openness of some systems allows instructors and IT professionals to control the capabilities that the CMS delivers to its users and to add the learning content, resources, and technologies that best fit users' needs. Leslie⁷ observed that CMS tools can be grouped into two main categories: learning tools and support tools. My analysis of 60 CMSs used in both corporate and academic settings revealed that the learner tools include communication, productivity, and student involvement tools, while the support tools assist administration, course delivery, and curriculum design. Any attempt to select a CMS must therefore take these tools into consideration.

Management's Role in Selecting a CMS

The management structure in universities is hierarchical, with top management responsible for strategic decisions and mid-level managers (normally referred to as senior members) and senior staff responsible for the implementation of such decisions. Most universities operate by committee, which normally involves senior members and faculty who submit findings to top management. Management therefore has the responsibility for performing all due diligence in selecting a CMS. In consultation with educational experts, they must evaluate all systems to ensure well-informed decisions that support the missions and vision statements of their universities.

Normally the universities' planning units take the lead in these evaluations. They ensure that the system has the capability to support e-learning,⁸ is appropriate for the planned uses, and fits within the cultural and environ-

mental context of the institution. Well-defined, well-structured institutional policies guide the selection and implementation of a CMS. For example, if students do not have personal laptops (estimated to be 99.6 percent), residence halls are not networked, no wireless service is available on campus, and students' only means for accessing the web and Internet is through the university's computer labs, institutional policies might encourage blended learning made possible by a CMS.

Critical elements of management's role include:

- Ensuring support for pedagogy, collaboration, and operational functioning of the CMS, including adequate training for technical staff to fix problems that come up during use of the system
- Ensuring effective and efficient evaluation and quality control of the CMS throughout its life cycle

Financial Implications of Using a CMS

The cost of acquiring a CMS normally depends on the features required. In analyzing the available systems in EDUTOOL, a resource for higher education that aids decisions about CMSs, I observed that the systems are developed as modules having specific features. The number of integrated modules that an institution requires determines the price of the system. Typically the initial cost is high, including the cost of the product, implementation, and training. Other common costs include hardware (servers, personal computers, air conditioners), maintenance, and upgrades.

Performing a return on investment (ROI) analysis would inform management about a system's viability. Management could determine if the benefits to be accrued from use of a system outweigh the cost of investing in it.

Analysis of Data

The data obtained from the workshops and survey covered student enrollment, familiarity with and use of CMSs in higher education, and expectations of the CMS selection process.

Student Enrollments

Enrollment trends at the major public universities in Ghana indicate that student populations more than doubled between 1999 and 2006. Registration for some courses exceeds 1,000 students, especially at the lower levels. For instance, some courses in the humanities have between 800 and 1,480 students registered for a single class.

Asked to indicate how they participate in lectures, 85.3 percent of students explained that they had to rush to arrive early enough to secure a good place to sit in the lecture hall; otherwise, they were forced to stand the entire time. Teaching and learning suffer because the instructor cannot address all students' specific needs and challenges. For this reason, collaborative and communication tools are very important in any CMS selected.

The effective use of a CMS depends greatly on access to the web or Internet and a level of computer literacy that enables users to easily access information posted on the system and to search the web. Responses from the ICT support staff queried about the computer literacy level of new students suggested that about 65 percent of the students who enroll each year are not computer literate, where computer literacy was defined as the ability to use the computer to manipulate or access information. Of 210 valid responses from the 258 students surveyed at the three universities, 90 percent responded that they were computer literate. A cross-tabulation of computer literacy and where they learned how to use computers revealed that about half of the students who indicated having computer skills (49 percent) learned them when they came to the university. This means 56 percent of students are not computer literate when they enroll, so faculty and management need to structure programs to teach computer literacy. Currently, students are charged ICT fees for literacy training and use of university resources.

The public universities surveyed have central computer laboratories in addition to the various faculty and departmental labs. One of the challenges is

that not all faculties and departments are networked. Though some infrastructure exists, ICT resources are underutilized. Students normally are not taught how or required by instructors to use the computers and Internet facilities for their academic work, whether assignments or research. When asked to indicate their main uses of the Internet facilities, 37 percent indicated checking e-mail and browsing, 32 percent used them for learning purposes, and 27 percent used them for assignments. A summary of computer use suggests that 57 percent of students at all three universities use the Internet for learning-related activities. This implies that if students were required to use ICT facilities for learning purposes, they would embrace the opportunity. At the universities I visited, it is common to see students queuing for a turn to use the computers provided in the common pool. None of the universities had more than 400 computers with full Internet capabilities for students to use, although each has a student population of well over 15,000 students.

The most widely used ICT application for learning is the Microsoft Office Suite (named by 33 percent of students surveyed). Internet browsing was 31 percent. These results suggest that while waiting for selection and implementation of a CMS, faculties or departments could assist students by acquiring discipline-specific software packages and SPSS, or contracting with software companies to use their discipline-specific products.

Students asked whether their instructors use any form of ICT applications or tools in teaching responded in the negative (72 percent). Those who indicated the use of some form of ICT tools for teaching and learning (28 percent) cited projectors and PowerPoint as the main tools used by their instructors. The use of ICT facilities to support pedagogy is very limited or nonexistent.

The data suggest that student participation must be considered when selecting any ICT-enabled system for the institution. Computer literacy programs must be integrated in the universities' curricula to ensure that all students know how to use the systems acquired.

Table 2	
Lecturers' Expectations of a CMS	
Expectations	Percentage
No response	26.3
Supports IT intervention that enhances what we do	7.0
Provides uninterrupted access to online material	8.8
Provides easy access to information	5.3
Enhances and facilitates teaching and learning	15.8
Provides both lecturers and students with the curriculum	5.3
Helps students maximize their use of computers and the Internet	3.5
Gives up-to-date knowledge about our carrier/ISP	3.5
Enables courses to be covered more efficiently	3.5
Lets lecturers integrate ICT in teaching and learning	5.3
Promotes research; helps lecturers keep up with trends in the discipline and participate in the global forum of scholars	5.3
Reduces delays in accessing information	3.5
Provides access to current literature on a wide range of topics, lecture notes, and assignments	3.5
Avoids repetition and enables better research	3.5
Total*	100.1

* The total does not equal 100% due to rounding.

Knowledge and Use of the CMS in Higher Education

Lecturers' responses to the question of whether their universities use ICT-enabled tools or a CMS to support their teaching and learning processes revealed that their institutions have not done much to support them: 81 percent indicated they knew of no support tools, while only 19 percent knew of some ICT-enabled tools in use. A cross-tabulation of faculty revealed that those who indicated knowledge of ICT-enabled tools were connected with the African Virtual University on their various campuses. At one university, lecturers from the faculty of science were experimenting with a CMS launched by the institution more than three years earlier. In addition to not being integrated into delivery of teaching and learning, the system prompted instructor complaints about its usability.

When asked to indicate the critical factors considered in selecting the CMS used in their university, 65 percent responded "no idea" or "do not know";

4 percent said management decided, and they were informed about the product by their heads of departments. This offers a clear indication not all stakeholders were involved in the decision.

Expectations in CMS Selection

Lecturers were asked to indicate their expectations for the future design or selection of any CMS in their universities. Various responses from the survey appear in Table 2. The results revealed that the most prominent requirement is the system's ability to enhance or facilitate their teaching (15.8 percent). Although the instructors did not explicitly mention support for collaboration, assignments, and feedback, their responses nonetheless suggest the importance of these capabilities.

In one university where a CMS was being used, 85 percent of the students said they did not know about the system, and 64 percent of the instructors said they did not. Instructors who indicated knowledge of the CMS were mainly in the faculties of science and

engineering. Asked to indicate if they knew about the system before its selection and implementation, 92 percent of instructors responded “no,” and the rest abstained. Once again, these results suggest the importance of involving all stakeholders in the initial selection and implementation processes.

Discussion and Recommendations

Appropriate stakeholders and criteria should influence selection of a CMS in higher education, including organizational considerations.

Preliminary Selection Criteria

Due to the internal and external challenges facing universities in Ghana, selection and implementation of a CMS require careful evaluation. Foremost among the challenges is the unreliability of the country’s power supply. To ensure full use of the system selected, the university should acquire a high-capacity power generator.

Stakeholders’ motives for “owning” the system are also important. According to Preece, Rogers, and Sharp,⁹ all stakeholders at an institution that plans to introduce the system must be identified, along with their operational requirements or usability needs and goals. This means the process must begin with a thorough analysis of the institution’s operational needs.

Explaining why they thought two major student MIS projects failed in the public universities, some survey respondents pointed to poor leadership for the projects, lack of technical support, and the absence of stakeholder involvement as main factors. Some management staff argued that the preliminary investigations involved some end users and that staff turnover created the problems, which they also attributed to lack of motivation. Others believed that the MIS product was selected without due regard to the end users, who learned about it during training sessions.

Analyzing the responses revealed that the major problems had to do with change management, technical support, and cost. The biggest contributing factor, however, was attitude and commit-

ment to the projects. In using the MIS system, the challenge was changing the institutional processes—not from manual operation to digital but changing operational procedures. Implementation and change management were not professionally handled, and the users did not thoroughly understand the new system. Moreover, technical support was remote to the end users.

These observations suggest shortfalls in management’s handling of change processes and in providing strong leadership based on thorough evaluation before committing to a system. It is therefore critical for management to show commitment by analyzing the system carefully and involving all stakeholders in the selection and introduction of any new system.

The preliminary assessment of a CMS requires answers to issues I consider critical. (See the sidebar for the important issues to address.) These issues are

consistent with what Glover¹⁰ described as *diagnostic assessment* in his work on e-learning maturity models. He observed that whatever choice you make, the diagnostic assessment process must fit the purpose; that is, it must enable a university to respond to each learner’s skills and individual development needs. This could be done by providing a checklist with evidence gathered through a survey of all stakeholders.

Done properly, these checks can identify flaws that would otherwise hinder the implementation process. A task inventory could guide selection and ensure that nothing is left out.

Institutions might decide to purchase an off-the-shelf CMS or design and develop their own system. Collis and Moonen¹¹ suggested that the selected product must support course content, course delivery, discussions, collaborative work, assignments, self-assessment, and tests associated with courses. This

Checklist of Critical Issues

- **Fairness of the system to all users:** No users would experience a disadvantage from using the system. All stakeholders must assess and approve the system’s acceptability to users and user friendliness.
- **Reliability of the system:** Management must certify that the results of the initial assessment are right the first time and all the time. They can do this by checking the system for accuracy.
- **Validity of the system:** The university must ensure that users can access what they want to access and what the system claims to provide. This could be done through exposing users to trial versions to determine if a system meets the university’s expectations.
- **Suitable system scope:** Management must find out whether the system includes key features necessary for learners to acquire the skills they expect from using the system, at the level required and in sufficient depth.
- **Proper documentation:** Management must be satisfied with the user manuals and that the system generates key records that are simple to use, easy to understand, and easily accessible.
- **Support for individual learning plans:** The system should provide tools for developing individual learning plans that can be continually reviewed and updated.
- **Practicability in all situations:** Determine the extent of training required for all users of the system, the availability of hardware, and staff expertise, time, and other resources required to use the system properly.

makes the selection an all-inclusive process involving instructors, students, technical staff, and administrators. These characteristics are important because they form the core of higher education teaching and learning.

Some temptations must be avoided, for example, management's tendency to base decisions on information provided by vendors and some educational experts without due regard to the operational users of the system. The problem is that some vendors and educational experts might not be conversant with the university's operations and unique problems. A bottom-up approach would be most appropriate, with information from stakeholders informing management decisions.

Critical Criteria in Selecting a CMS

Participants of a workshop organized at the three primary public universities of Ghana addressed the factors they considered critical in choosing a CMS. They expressed strong opinions that universities need to develop their own systems and provide support in terms of resources to the computer science and MIS departments. They felt even more strongly that first the base infrastructure must be improved, training stepped up, and lecturers and ICT supporting staff exposed to the workings of CMS systems. They suggested this could be done by organizing accelerated programs to reorient faculty and staff. On the issue of selection, however, they generally agreed that the criteria to consider in selecting any CMS for the universities in Ghana should be based on a system's flexibility, adaptability, expandability, and suitability. EDUTOOL provides a list of CMS products (currently 21) and the bases for comparing them.

Collis and Moonen¹² identified five possibly critical issues in the selection of any CMS that exceed the functionalities outlined by EDUTOOL. I have classified the issues they noted under four main groups: organizational, technical support, pedagogy, and change management.

Organizational Criteria

Categories of organizational criteria

include the system's cost and the social and political climate.

Cost of the System. The first factor to assess is the cost of the product, including the financial implications of system maintenance and upgrades. The public universities reportedly dumped the MIS projects partly because of their inability to sustain the cost of running the system after sponsorship lapsed. A university would not find it worth buying a system if maintenance cost estimates exceeded the expected benefits. It is therefore very important to do a cost-benefit analysis of digitizing campus procedures, starting with costs of the purchase, training, and implementation.

Cost elements that directly or indirectly affect teaching and learning in using the system also must be evaluated. For example, the university should investigate if implementing a CMS would require restructuring or redesigning existing courses and determine the associated cost. Answering these questions may help: How demanding is the redesign process if needed? How steep is the adaptation curve?

These managerial decisions must be carefully considered. Analyzing the costs during project initiation, product selection, and system integration provides management with the quality information needed to decide whether the benefits will outweigh the cost and to determine that there are no hidden costs.

Social and Political Climate of the Institutions. Collis and Moonen¹³ noted the effect of influential people—those who have the ability to influence major decisions as well as the social and political climate within, and sometimes outside, the institution. It is important that top management and influential stakeholders in the institution be committed, in principle and in practice, to the system chosen. They must be fully committed to the entire process for it to succeed. Management will naturally be interested in products that give the institution maximum returns and a competitive advantage.

Software vendors employ various means of winning over top manage-

ment or influential people. Some offers might have hidden implications, however, both for the future and for smooth running of the system. Management must guard against situations where vendors offer kickbacks and trips abroad to influence negotiations when operational users' concerns are such important factors in the selection. Any system considered must be carefully and objectively evaluated according to the institution's statutes.

Technical Support

Technical support is critical in selecting a CMS. One reason given for the failure of the MIS projects was that support services were not readily available. Some technical staff explained that at times they had to travel to Accra, a two-to five-hour drive, to get assistance. On other occasions, directions received by phone were not helpful.

Where the CMS is designed and developed locally, a detailed and comprehensive manual should be available for technical staff. Thus, even when the developers leave the institution, the manual can guide future users. Such homegrown systems must be formally registered in the name of the institution, and the developers should be well compensated and recognized for their contributions.

In selecting a commercial or in-house CMS, the institution must evaluate technical support carefully. Management must be satisfied that technical support will always be available for technical staff.

Support for an off-the-shelf CMS and subsequent upgrades is critical. Issues to consider include the warranty and the type of support available for users and for the institution as a whole. One reason given for the failure of one of the MIS products at UCC and KNUST was that in critical situations, phone calls had to be made to the home country of the system developers.

Sometimes the vendors provide online instructions; other times the developers log in remotely. Both methods are subject to good Internet connections, of course. The delays in fixing problems are sometimes very frustrating. Nevertheless, the commitment and support



of technical staff and management are key to the success of any system. As some workshop participants suggested, other factors contributed to the failure of the MIS, including a lack of sufficient supporting staff and product experts to consult in difficult times, while others attributed the failure to lack of commitment from management.

Pedagogical Criteria

Considering the CMS as mainly an educational tool requires careful evaluation of the system's general focus. The general and operational functions must meet the institution's needs for teaching and learning; if the CMS emphasizes information or content management, it does not merit acquisition. As Collis and Moonen described it, "the extent to which the background orientation of the system fits the culture of the institutions will determine how best it will fit in with the environment."¹⁴ The

system's flexibility in adapting to the cultural environment is very important. Acceptance of the system must be carefully considered in light of the university's expectations and needs.

In choosing an open source product, it is important to discover whether the source code is familiar to the institutions and available to customize the CMS for the institution's use. Critical issues specific to teaching and learning and course integration must be addressed, including "publication, information dissemination, communication, collaboration, information, and resource handling."¹⁵

Another reason advanced for the failure of the two MIS products was their incompatibility with the systems already in use and the institutions' operational procedures. One of the public universities had to abandon its homegrown student information system (SIS) in order to adopt the new MIS. Though the in-house SIS supported the institution's

operational procedures better, the new system integrated better with other systems the university wanted to explore. The finance unit of the same university, however, strongly opposed adoption of the new system and maintained its in-house system. The finance unit still uses the in-house system because staff found it more convenient and appropriate to their needs than the new product.

Usability is also very important for acceptance of a new system. The institution should ensure that training and use are not technical but accessible to beginners among all categories of stakeholders. Comparing products to ensure user-friendliness of systems that otherwise meet the institution's needs must not be ignored or taken for granted; for example, EDUTOOL provides a checklist to guide the selection of a system while taking usability into account.

Change Management

Users' preparedness to accept and use a product depends largely on how management handles the transition. Evaluating change management processes for all stakeholders should ensure that the various changes required following selection of a new CMS are acceptable to users and accommodate uninterrupted educational delivery. This evaluation would help management strategize implementation and adoption of the new system.

Students and faculty worry whether the hardware, software, services, and documentation will support their work. Faculty might worry about potential job loss. The change process should minimize the initial disruption caused by introducing the CMS. Effective planning could prevent incidents and problems that might prompt negative attitudes among students and lecturers toward the new system. A thorough assessment of the change management process provides a bird's-eye view of challenges to expect. Management inability to handle the change process appropriately could lead to rejection or failure of the system; therefore, identifying the change processes associated with selection and implementation of a CMS is critical.

In 1995, while initiating automation of the admissions process, some staff

asked, "Will learning how to use the computer for data processing benefit me?" They believed they could deliver the necessary performance without the new system and thus were not motivated to change. This attitude was typical of people accustomed to manual processes on campus. At the time, however, submission numbers were small; not anticipating increasing student numbers, staff preferred to stay in their operational comfort zone. This preference indicates the differing mindsets among users and the strong possibility that some will resist the change process. Young lecturers already familiar with computers will probably be ready to explore ICT applications in educational delivery, while lecturers accustomed to more traditional teaching methods sometimes resist change.

Conclusion

Emphasizing an institutional approach rather than a faculty approach would yield many benefits in selecting and adopting a CMS. Selecting or designing a system that will support a university's operational processes requires campus-wide acceptance of the system. It is therefore important to involve all stakeholders at every stage of the decision-making process because the success or failure of the end product depends on them. For higher education, stakeholders include instructors or lecturers, students, management, systems administrators, and technical staff. Change efforts must encompass staff with political influence on campus because they can frustrate the implementation process.

In selecting a CMS, university management must examine all costs to ensure that there are no hidden costs and that the institution will derive the full benefits of the system. Management and all stakeholders must accept the system, and it must meet standards of effectiveness, efficiency, ease of use, and environmental considerations. The stakeholders must agree that the system chosen satisfies their basic and critical requirements. They might provide a checklist to indicate their expectations, such as:



It is important to involve all stakeholders at every stage of the decision-making process because the success or failure of the end product depends on them

- User friendliness
- Replication of classroom or teaching environments
- No HTML coding required of faculty
- Update and reuse of courses possible
- Logical organization of course content and activities
- All-inclusive functions
- Automated assignment submission
- Security (restricted access)
- Reliability and stability
- Scalability, since student numbers will continue to grow

Finally, management must compare various products before making the final decision to ensure the best choice for the institution and the likelihood of acceptance by the campus community. *e*

Endnotes

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