Making a Smart Campus in Saudi Arabia

A smart campus depends on an overarching strategy involving people, facilities, and ongoing faculty support as well as effective use of technology

By **Eltayeb Salih Abuelyaman**

Prince Sultan University (PSU) in Riyadh, Saudi Arabia, has conceptualized what it means to be a smart campus after surveying similar notions worldwide. A *smart* campus, according to our definition, requires smart teachers, smart technology, and smart pedagogical centers. This basic definition raises some questions:

- What makes a teacher smart?
- What makes a classroom smart?
- Since colleges, departments, and individual courses have diverse missions, goals, and objectives, should smart classrooms be clones of each other?
- Should we make all classrooms on a campus smart?
- Are teachers ready to adapt to a new, smart environment?
- How can we help teachers take advantage of a smart environment?

Three of these questions are easily answered with a "No." We should not make all classrooms technologically enhanced clones of each other, and, no, many teachers are not ready to take full advantage of such environments. So, how does a university get to be smart? By finding answers to the other three questions—recruiting and developing smart teachers, obtaining and effectively deploying smart technology, and sustaining faculty efforts with the aid of smart pedagogical centers.

Smart Teachers

At its best, teaching pairs instruction with interactive exchange. A smart teacher spends less time lecturing. Certainly teachers of the past did an excellent job educating students. Today, many classrooms include instructional technology to support teachers and their chosen approaches to pedagogy.

Amazingly, many undergraduate institutions make hiring decisions based mainly on a candidate's involvement in or potential for research. We have no idea why a candidate's ability to teach isn't scrutinized as closely during interviews. Most doctoral graduates who become college professors have not taken a single course in educational methodologies. Should the hiring and employment of new teachers continue without proper pedagogical training in smart teaching? And what about an instructor's ability to use instructional technology in pedagogically effective ways? An instructor's style of teaching will be significantly impacted by smart classrooms, requiring not just training in how to effectively use the technology but also the appropriate evaluation of teaching effectiveness in the new environment.

Smart Evaluation of Teaching and Learning

The teaching evaluation systems being developed at PSU consider two key assumptions:

- There is no single correct way to teach.
- Instructors have different objectives.

The best evaluation form we found is the one used by the Individual Development and Educational Assessment (IDEA) Center (http://www.idea.ksu.edu). The IDEA developers claim their approach has two major advantages:

- Tailoring each assessment to fit the instructor's teaching objectives.
- Determining teaching effectiveness from student progress against goals chosen by the instructor.

At PSU, the development of a web-based Smart Customizable University Evaluation System (SCUES) has already begun. Our strategy relies on the following tactics:

- Reducing the effect of external factors that are outside the instructor's control by avoiding questions students cannot answer objectively.
- Emphasizing formative questions that guide students to assess their own learning.
- Including questions about the use of smart classroom equipment to provide feedback to technology planning officials.

Smart Classrooms

A smart classroom contains video and auditory educational technologies and electronic whiteboards.[1] Everything written on an electronic whiteboard is stored onto, and can be displayed back from, a computer. An interactive whiteboard functions as a computer screen manipulated by a special marker. We at PSU believe that whiteboards have become a necessity in laboratories, classrooms, libraries, auditoriums, and secured open spaces because they enable:

- Use of course content for students to review and for feedback to benefit faculty.
- Making course content available on the teacher's website for reference anytime, anywhere access to the Internet is available.
- Use of content as the starting point for an ombudsman arbitrating disagreements between a student and an instructor.

Despite all the conveniences they offer, electronic whiteboards alone do not make classrooms or laboratories smart. Some instructors require an integrated control panel to use the board effectively. Others add a direct telephone line to a technician trained in the operation, maintenance, troubleshooting, and repair of the classroom equipment.

In addition, PSU is using an access control device in place of traditional keys. Employees have the option of using their PSU badges or fingerprints to obtain access to facilities on campus.[2] Upon authentication, the device can unlock office doors, turn on lights, adjust room temperature, and log in the person to his or her roaming profile. This process eliminates username and password-related problems, including user impersonation. We are also extending use of the device to logging classroom attendance and employee hours; hardening PSU resources against intrusion; controlling times users may access resources; reporting authorized users who try to access resources outside authorized times; and capturing intruders' attempts and evidence identifying them.

We do not consider the addition of smart classrooms, smart laboratories, and smart access controls sufficient to make PSU a smart campus, however. A smart campus requires one more pillar—a smart pedagogical development center.

Smart Pedagogical Development Center

The best institutional investment for the future of education is the establishment of a center for training faculty.[3] Although online educational support is readily available, students usually surpass faculty in being at ease with the Internet. Faculty who are busy with research and teaching have limited or no time to cope with rapidly changing technologies. In addition, students are often required to take soft skills courses that put them, after only one year in college, ahead of most of their teachers in some aspects of the technology. Some instructors find themselves at a disadvantage because their students know more about technology than they expected.

Perhaps a colleague described as "brilliant" a student who helped that person with a new technology. A legitimate question is, "What do you think the student your colleague described as brilliant thought of that person?" It is just as important for

faculty to study and keep up with technology skills as it is for them to keep up with other professional skills. The pedagogical center's role in supporting teachers is, therefore, a major one.

Pedagogical development centers should provide the resources and tools faculty need to create a culture of scholarship, creativity, inquiry, and innovation. The center's staff must keep up with technological innovations in academia to support faculty effectively. In addition to helping faculty with planning, organizing, and executing courses, these centers should have experts on their staff who can train faculty to use learning management systems, e-learning technologies, and smart classroom equipment. The centers should also keep contact information for professional organizations and companies that offer specialized training, conduct workshops, hold conferences, publish periodicals, and provide online discussion forums and relevant blogs.

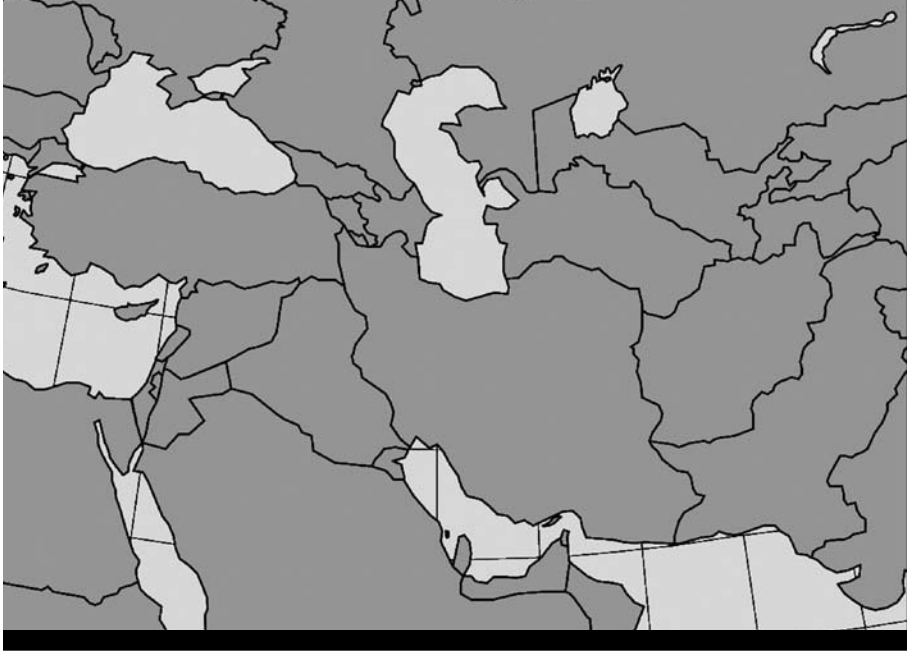
Smart Campuses

Two conditions are necessary for a smart campus:

- Connectivity to the Internet
- The ability to use computing resources from anywhere in the world

The former, achievable via wirelines or wireless networks, furnishes the infrastructure necessary for the latter. The Milwaukee School of Engineering (MSE), for example, offers every student a new, wireless-ready laptop upon enrollment and replaces it every other year.[4] The use of laptops anywhere, anytime on the MSE campus has become the norm. Providing wireless connectivity to networking resources throughout campus reportedly doubled students' productivity.[5]

The technology used for global connectivity at PSU allows students to use thin clients (diskless computers) from within the campus and any laptop or personal computer from outside. In both cases, once a student's login credentials are authenticated, a window opens with a set of icons representing services, applications, and tools such as Internet Explorer, Microsoft Word, Adobe Reader, and CAD Tools, among others. Two major advantages are offered: reduced cost and increased productivity. PSU students no longer need to buy software packages for their home computers, and they no longer have to be on campus to do their work. As a result, PSU is investigating whether to retain conventional computer laboratories for student use.



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Conclusion

A smart campus deploys smart teachers and gives them smart tools and ongoing support to do their jobs while assessing their pedagogical effectiveness using smart evaluation forms. A smart campus also provides its students with reliable services anytime and anywhere access to the Internet is available. The smart use of instructional and supporting technology strengthens the options a smart campus can offer students and faculty. *e*

Endnotes

1. Amanda Smith and MirandaNet Fellows of the Boston Spa Comprehensive School found that "All staff who used the Whiteboard were extremely enthusiastic about the possibilities of the technology, and a lot were inspired to use ICT more in their lessons and were given confidence by the fact that the Whiteboard was reliable and easy to use." They explained their findings in "Interactive Whiteboard Evaluation (2000)," available at http://www.mirandanet.ac.uk/pubs/smartboard.htm.
2. For information on the Actatek Finger Print Access Device used, see http://www.homesecuritystore.com/ezStore123/DTProductZoom.asp?productID=1763.
3. Jon E. Travis, "Models for Improving College Teaching: A Faculty Resource," *Higher Education Report*, vol. 24, no. 6, 1996, pp. 95–6.
4. MSE negotiated prices for the laptops and pays for the program through a student technology fee. For a description of the MSE laptop program, see http://www.msoe.edu/admission/why_msoe/laptop_program.shtml.
5. I gave a seminar at MSE in spring 2004, at which time I came to know the effects of the laptop and wireless program on student productivity.

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