One Size Does Not Fit All: Critical and Timely Issues in Computer Centered Curriculum Development
a Panel Discussion

Wm. H. Burkett
Palm Beach College, West Palm Beach, FL, USA

burkettw@pbac.edu

Panel Members

Linda V. Knight, DePaul University, USA   **lknight@cti.depaul.edu**

Gail Griswold Burkett, Palm Beach Community College, USA   **griswolg@pbcc.cc.fl.us**

Thorne Donnelley Jr., Palm Beach Atlantic College. USA   **thorned@bellsouth.net**

Ian Newman, Loughborough University, United Kingdom   **I.A.Newman@lboro.ac.uk**

Statement of the Problem

The rapidly changing environment of the information age and the need to provide a well-rounded education, often times, are diametrically opposed. Local, regional, national, and international industry needs and pressures interact with school and discipline tradition. The basic requirements of a school's degree often account for over half of the courses required for graduation. Administrations often do not know the difference between the parallel degrees of Computer Information and Information Technology or the complexities of Computer Science as opposed to Informing Science, thus complicating the process. The key question is "does one size fit all" when it comes to determining what a computer centered curriculum should be for a given school of higher education and to what extent do outside influences affect curriculum decisions.

Critical Issues in CIS/IT/IS Curriculum Development

I. External Influences

Global & Regional Issues

How do schools maintain a CIS curriculum that is in sync with the demands of industry? How do we, as professors, stay updated with a rapidly changing discipline? To what extent do we let industry drive the development of the CIS curriculum? How does the inclusion of non-national or 'foreign' students affect the programs offered via the CIS curriculum?

II. <u>Internal Issues</u>

A. *University Level Issues*

What is the appropriate role of liberal arts requirements? How do we insure that liberal arts courses are "value added", and not "time wasted?" How much liberal arts is just enough? How do we determine the right balance between major courses and requirements from other departments within the university? Who determines the right balance? What is the nature of the University? How do the University politics influence the CIS curriculum? Does the University demand compliance to and/or accreditation by a recognized authority? (1)

B. *School Level Issues*

What is the nature of the School? In what manner does the School politics influence the CIS curriculum? What school is the CIS department housed in – Mathematics, Engineering, Business, or ? To what level (monetarily, staffing, or …) does the school support the CIS department? To what level does it in influence the CIS curriculum? Does the School insist upon compliance to and/or accreditation by a recognized authority (1)?

C. *Department Level Issues*

What is the nature of the Department? How do the Department politics influence the CIS curriculum? How does the staffing of the CIS department influence the CIS curriculum? What part of the CIS/IT/IS curriculum is core, essential, expected to change rarely, if ever? What proportion of the curriculum is expected to change regularly, morphing in concert with changes in technology and the business environment? Operating Systems, System Analysis, Hardware Architecture? How often should we update our teaching objectives? Does the Department stipulate compliance to and/or accreditation by a recognized authority (1)? Can the teaching style help? - the role of active learning as part of the curriculum. How can we prepare students for the changes in required knowledge and skills that will occur after they leave (the lifelong learning issue). How do we give them the confidence to tackle subjects/problems about which they have not been taught? How do we encourage deep learning rather than learning for a particular examination/test? How do we encourage the generation of 'soft' (but long lasting) skills (e.g. team working, empathy, holism, problem decomposition, solution synthesis, requirements elicitation, effective presentation)? How do we introduce new ('state of the art') subjects into the syllabus without a major time delay and significant reorganization of the existing curriculum (many new 'subjects' leap to prominence, bloom, and then disappear all within the four year time horizon which is needed to change an undergraduate degree and the produce the first graduates).

D. *Student Level Issues*

How do the demands of students, perceived future needs, drive the development of the CIS curriculum? Do the students or alumni request compliance to and/or accreditation by a recognized authority (1)?

III. <u>Emerging Factors</u>

How does lead-time for publishing updated text and materials affect the development of CIS curriculum? How does the pressure on students to leave academia and pursue a lucrative career affect what is taught and when it is taught?

(1) Curriculum models include (but are not limited to) the IEEE/ACM Computer Curricula 2001 (CC2001) model, the 1996 Office Systems Research Association's (OSRA) Organizational and End-user Information Systems (OEIS) Curriculum Model, the Computer Science Accreditation Commission (CSAC) of the Computing Sciences Accreditation Board (CSAB), January

2000, the Information Resources Management Association / Data Administration Managers Association 2000 Curriculum Model, the IS '97 Curriculum, the Information Systems-Centric Curriculum '99, and the Australian Computer Society Core Body of Knowledge for IT Professionals.

Biographies & Positions on Issues

Panel Chair: William H. Burkett serves as Chair and Assistant Professor of Computer Information Systems at [Rinker School of Business](#) at Palm Beach Atlantic College http://www.pbac.edu/faculty/burkettw205/ , member of the Academic Technology Committee, co-editor of 'The Awakenings', PBAC's peer reviewed journal, and president of the Palm Beach Atlantic College chapter of Sigma Beta Delta National Honor Society in Business, Management, and Administration. He is active in research in computer anxiety, computer based training and learning, and cooperative learning. Formerly, he was Systems Manager, State of Florida, Marine Supervisor of Offshore Seismic Vessels, and Safety Engineer, Teledyne Exploration, Inc., and Petty Officer First Class; United States Coast Guard. He is a member of the Association for Computing Machinery; American Association for Artificial Intelligence, and Association of Information Technology Professionals.

Basic position regarding this panel session: 'One size does not fit all': Each college/university and each environment that they must teach in is unique and as such no one 'model' curriculum will suffice for every need. CIS/IT/IS departments must have the freedom to respond to demands made on their resources and yet there should be accreditation that says to prospective interested parties that this department educates to the highest standards, that graduates are well rounded in their knowledge and will be an asset to society. Key points that I feel need to be addressed include: (1) Who should determine which set of curriculum guides are apropos to the local situation, (2) should industry fuel the departmental curriculum or vice versa, and (3) what is the ultimate goal of our departments and how do we go about guiding it?

Linda V. Knight is Associate Dean of DePaul University's School of Computer Science, Telecommunications and Information Systems. She is also Director of CTI's Center for the Application of Emerging Technology ([www.saet.cti.depaul.edu](#)), which specializes in e-commerce research. Dr. Knight lectures on the topic of e-commerce curricula, and teaches and conducts research in the area of e-commerce business strategy, development and implementation. She is Associate Editor of the Journal of IT Education ([www.jite.org](#)), a member of the Information Resources Management Journal's Editorial Review Board, and President of the Society for the Advancement of Information Systems, an affiliate of the Midwest Business Administration ([www.mbaaconference.org](#)). An entrepreneur and IT consultant, she has held industry positions in IT management and Quality Assurance management. In addition to a Ph.D. in computer science from DePaul University, Dr. Knight holds a B.A. in mathematics and an M.B.A., both from Dominican University.

Basic position regarding this panel session: Each institution is unique, and subject to unique internal pressures and external influences. Two corollaries emerge from this position: (1) model curricula should not be applied directly, but rather used as a source of guidance in the curriculum planning process; and (2) accrediting bodies that set specific curriculum expectations are harmful in the long run because they prevent institutions from responding promptly and appropriately to internal and environmental change.

Gail Griswold Burkett is an Associate Professor of CPI Math at Palm Beach community College and serves as Cluster Chair of Palm Beach Community College CPI and is active in the development and implementation of the Center for Personalized Instruction, mathematics program. Formerly she was Educational Program Manager, State of Florida, and Chapter President of the Florida Council on Crime and Delinquency, and presented with the Correctional Educational Directors Award, 1989. She is active in re-

search in computer anxiety, computer based training and learning, cooperative learning, and math pedagogy. She is a member of the Florida Developmental Education Association, Florida Association of Community Colleges, NADE, and United Faculty of Florida.

Basic position regarding this panel session: Viable curriculums must maintain strong, lower level, general education requirements. The upper level courses must have the flexibility to adapt to a changing environment. Individual schools should have curriculum committees willing to move at the pace of industry. One size does not fit all. The curriculum models would best be used to steer institutions toward their individual program goals.

Thorne Donnelley Jr. is an Adjunct Professor of Computer Information Systems at Palm Beach Atlantic College. He is currently finishing his doctorate with an emphasis on the elderly's usage of the Internet. Formerly, he was a venture capitalist with interests in the fields of agriculture, aviation, and telecommunications. He has had several articles published in the fields of information technology and logistics. He is a member of the Association for Information Systems and the Society of Logistical Engineers.

Basic position regarding this panel session:

1) External Issues: a) Monetary pressures – Governmental organizations, private industry, and wealthy individuals can all be an important source of funds for academia. However, this aid comes with a price. Endowed chairs, grants, and special funding awards are usually made with a particular objective in mind. Care must be taken to ensure the intellectual compatibility of all parties before funds are accepted. Even with the recent crash in values of "new economy" companies, academia still cannot compete in terms of salaries or long term potential wealth building. Salaries in the $50,000.00 (small school) to $100,000.00 (large school or state university) are no match for promises of stock options or equity.

   b) Changing needs – Less than two years ago, many business schools were offering e-commerce courses and/or concentrations and were unable to fulfill the demand. Today, the emphasis seems to have shifted back to traditional course offerings with the CIS component being vastly scaled back.

2) Emerging Factors: a) Publishing problems – For a discipline that defines "cutting edge technology", the current method of delivering text and materials (via print) is ludicrous. However, with the growth of online education and the Internet, this is bound to change. In fact, I feel that the electronic delivery of information is the key to the answer that One Size Does Not Fit All.

Ian Newman originally trained as a Physicist and then undertook a PhD in Theoretical (Quantum) Physics. Since writing programs seemed the most interesting part of his research, Ian joined the computer revolution working in a University computer centre for seven years before moving to Loughborough University as an academic. For more than a quarter of a century he has tried to combine the exploration of newly emerging areas of research with encouraging students to believe that they are capable of tackling anything the world will throw at them. The main theme of his research has always been creating computer-assisted systems, which help rather than hinder the people who are involved. This has covered a wide variety of topics from operating systems interfaces, via parallel and distributed systems architectures to database management systems and distributed information management. At one time or other Ian has taught courses on many of the subjects that appear in computer science, information science and software engineering curricula but always with a focus on the relationships between people and the technology. In the last few years he has combined his research and teaching interests, focusing on how students can be helped to learn for themselves both during and after their University careers and how they can be encouraged to develop skills, which will assist them throughout their lives.

Basic position regarding this panel session: How important, or even relevant, the curriculum is depends on perspective. Academically, it is arguable that a good intellectual grounding is the only important issue. Some subjects must be taught to depth but it does not matter much which ones. Students should be encouraged to believe in, and think for, themselves. Their skills in team working, analysis and synthesis should be developed and they should be empowered to learn for themselves. On the other hand, many employers want students to arrive with a good understanding of 'fundamental' technologies (though they

will often disagree about what is fundamental). Employers and professional associations want to be able to look at the curriculum to compare the education being offered by different institutions and most professions emphasise what has been learned as the 'entrance' criterion (because this is measurable?). Getting everyone to recognise the different agendas is a key issue.