

**ACM Education Council Meeting
Hyatt Regency, Reston, VA
Saturday, June 10, 2006**

Attendees

Co-Chairs: Andrew McGettrick and Eric Roberts

Florence Appel (in place of Carol Spradling)
Gordon Bailes
Deborah Boisvert (in place of Eydie Lawson)
Michael Caspersen
Boots Cassel
Jan Cuny
Robb Cutler
Gordon Davies
Dan Garcia
Roscoe Giles
Laura Hill
John Impagliazzo
Lisa Kaczmarcyk
Deepak Kumar
Terry Linkletter
Ken Martin
Barbara Price
Larry Snyder
Heikki Topi
Joe Turner
Patrick Walsh
Alison Young

ACM HQ Liaison: Katalin Lovasz

Meeting Notes

1. Welcome and Overview of New Education Council

Eric Roberts began the meeting by setting the context for the Education Council's operation. He mentioned the challenges faced by computing education today, of which the most important ones include responding to the ever-changing field through public misperceptions of computing and the pressing issue of declining enrollments.

Eric then gave an overview of the Education Board/Council structure, and the background on the current status of the Education Board's work. This Board has a long history, with its most visible efforts being the curriculum volumes beginning with Curriculum 78, which is noted as having been sponsored by the Ed Board. The new Education Board's members were introduced, all of whom were attending with the exception of Gordon Davies, Mark Guzdial, and Jane Prey. Eric also listed recent major activities of Board:

- First meeting of new streamlined Ed Board held on April 29, 2006;
- Ed Council has been created;
- CC2004 SE & CE volumes out;
- CC2004 Overview Volume is in production;
- Brochure for prospective students is making good progress;
- The final Java Task Force report will be out in June;
- Working to dispel myths about the lack of jobs;
- Work is continuing with regard to European activities – Gordon reported on Montpellier workshop, Zurich is growing to be focal point of European Organizing, led by B. Meyer from ETA – its subject areas very close to our task force list – Education & falling enrollments, use of technology to enhance teaching, addressing misconceptions;
- Two ongoing projects: Ontology & Great Principles – Boots described Ontology project, there is wiki page, in process of being turned into a formal ontology; Peter Denning's Great Principles project is assembling well-respected people in fields to articulate specific principles in narrative form, in a way that's accessible to students.

Eric then discussed the tentative proposal for the Education Council's Task Force structure, based, in part, on the lists of priorities submitted by Ed Council members before the meeting and overlapping problem areas. The task forces would report to Education Board, make proposals and recommendations that the Education Board would then review and respond to, also making funding recommendations, possibly to bring to ACM Council. The task force structure was also informed by the four ICER workshops' outcomes, which attempted to identify what the central issues facing computing education were and what funding agencies should be supporting them. ICER itself was funded by NSF.

2. Proposed Task Forces

Based on responses to a query sent to Education Council members previous to the meeting, the following initial breakdown of task forces was proposed to help define the problem space of the Education Council's operation:

1. Enrollment crisis and public image
 - 1a) Image and myths affecting student choice
 - 1b) Diversity and outreach
 - 1c) Influencing public policy toward education
 - 1d) Outreach to our own community

2. Curriculum
 - 2a) Innovative models
 - 2b) Effective modules for K-12 use
 - 2c) Interdisciplinarity (to be chartered as a part of the ACM/IEEE-CS joint task force for curriculum review)
 - 2d) Social relevance / improving ethical training
 - 2e) Anticipating future directions and trends

3. Technology and tools
 - 3a) Pedagogical strategies and tools
 - 3b) "Best of the Best" selection from repositories

4. Industry/Academic collaboration

5. Internationalization

Commenting on this proposal, meeting attendees noted that professional development should likely be included under the fourth task force proposed (Industry/Academic Collaboration). Other issues that the task forces will need to address include the question of articulating the goals of education, how to build value from K-12 education, through community colleges to 4-year institution. The question of accreditation across international boundaries would fit well with the curriculum task force's work, as well as with internationalization directly. There are likely other task forces as well whose work will include issues relating to accreditation – as a response, a task force on accreditation was added to the list as a sixth center of activity. This addition also reflects the past task force on accreditation that the former Education Board also had. Other members mentioned the issue of internationalization as it relates to the role of this council with regard to TC3 (technical committee focusing on education within IFIP: <http://www.edu.ge.ch/cptic/prospective/projets/ifip/>).

Possible outcomes for the task forces' work include a "day in the life of" product to explain differences between computing disciplines succinctly and simply – something very concrete that also excites students, and aimed to replace the "image and myths"

phraseology currently in use when describing computing and its disciplines. Heikki Topi mentioned the point of interdisciplinarity point and the need to address it to all task forces. Flo Appel added that another possible product would be one that describes the use of technology in our time from ethical/social standpoint, for example, showing to students where computing is used in the military and/or assisting students in how they can make informed choices as voters and citizens. Roscoe Giles mentioned what he perceived to be a problem with current curriculum reports: they are organized around an academic perception of world and do not properly address the challenges of responding to changes in the industry. Which means that another important issue to keep in mind is professional development for educators, along with certification or credentialing that works similarly to accreditation. This is an important topic to consider in terms of internationalization as well

It was noted again that the work of each of the task forces applies to a great extent to the work of other task forces and it is therefore important for each to be mindful of other topics that apply to the work of any specific task force.

3. Education Council Member Introductions

During the next segment of the meeting, members introduced themselves, citing institutional affiliations.

4. Lunchtime Presentation and Discussion

Following introductions, a lunch discussion on CS education policy with Cameron Wilson, Executive Director of USACM took place, in response to a presentation he: “Math/Science (Computing) – US Education Policy”

Cameron Wilson gave a thorough overview of problems posed, current policies, grant options – for education in general, also pointing out where computing fits into the general scheme, or where that scheme touches and affects computing education. Finally, he mentioned challenges we are facing in the policy arena when it comes to computing education. (Note: slides for this presentation are available upon request.) Cameron Wilson noted that one of the tasks for ACM’s Education Board and Council is, since their members have expertise about educational matters, to bridge the gap between themselves and policy makers. Current innovation bills may not support innovation in computing, however, the reauthorization process for such bills is a vehicle for change. The issue of innovation is not going away, and this could be a long-term opportunity for policy-making. In addition, NCLB bill is due for reauthorization, which could be another opportunity to effect needed change.

In response to the presentation, concern was expressed with the term ‘technology’ as Education Council members perceived it as too broad and at risk of diluting the Education Council’s message. Laura Hill noted that computing has a science part, an engineering part, and a technology part, and it is often difficult to determine which should receive most focus. Richard LeBlanc then noted that engineering is not taught in high schools, which complicates perceptions of CS from high school to the college level. Also, AP CS has hurt computing education in high schools as it created the gamer-geek subculture and image. Barbara Price then mentioned that maybe AP CS is just that: AP CS – there is a lot of computing not covered in AP CS classes, and, possibly, these other areas of computing could be covered in high school computing classes that are not CS. Jan Cuny warned against reducing the number of AP CS courses as that may mean risking the disappearance of CS courses altogether. Larry Snyder then noted that if, indeed, the CRA, ACM, NWIT, CSTA are vehicles for influencing policy makers, by what process could they be employed to do so? Cameron Wilson responded that we would need to work on identifying representative members of each of those organizations, then and bring them together with USACM.

Other questions raised were whether we could leverage headline issues (e.g. energy consumption) to influence education policy, especially as it relates to computing, and whether MS and Intel are involved with such efforts.

Cameron Wilson stressed that the core message of USACM and similar offices/organizations is to get the argument right and to educate policy makers, not to lobby.

5. Task Force Breakout Session

The afternoon session began with task force assignments for meeting attendees, and with a breakout session for those task forces to brainstorm and create a basis from which to work.

Task force assignments:

1. Enrollment crisis and public image

Jan Cuny, Robb Cutler, Roscoe Giles, Lisa Kaczmarczyk, Barbara Price, Joe Turner, Cameron Wilson, Heikki Topi, Alison Young,

2. Technology and tools

Michael Caspersen, Jim Kurose, Eric Roberts, Terry Linkletter, Dan Garcia, Boots Cassel

3. Curriculum

Florence Appel, Deepak Kumar, Rich LeBlanc, Laura Hill, Larry Snyder, Bob Campbell, Deborah Boisvert, Andrew McGettrick

4. Accreditation

John Impagliazzo, Gordon Davies, Don Bailes, Pat Walsh, Ken Martin

Eric Roberts listed the following task force deliverables:

1. more detailed assessment of the challenges
2. brainstorming-style set of “great ideas” that might help
3. high-level list of long-term goals
4. one or two short-term achievable goals
5. plan for carrying out continuing work

6. Reports on Task Force Break-Out Sessions

At the end of the afternoon each of the task forces reported back about the results of the breakout session.

Task Force 1: Enrollment crisis and image problem (Heikki Topi reporting)

1. Challenges

- public image of computing is at the root of the problem
- we have to make sure that our shared understanding of the problem is correct, in that we really share an understanding
- one problem affecting perception of computing is that it’s not seen as socially relevant, so students are not motivated to study it – and, in addition to the perception that there are no jobs
- motivating students to become & remain engaged & interested in computing is critical – Q: how can we influence it?
- there are areas of computing where enrollments are not down and we need to understand why this is the case and apply lessons learned
- need better feedback mechanism
- diversity is important factor

2. Brainstorming

- Target those who have strongest impact on students: counselors, parents, peers, media.
- Take message to target audience, and using language they understand: to movie theaters, fast-food restaurants
- Understand importance of media – a static brochure might not be enough anymore
- create more interaction between education schools and computing departments
- science fairs are lacking in computing-related projects so another goal would be to get more such projects into science fairs
- work to expand the ways of teaching computing

- focus on accreditation as mechanism for creating a need for certified professionals

3. Long-term goals

- change perceptions regarding nature of computing and computing professionals
- role of computational thinking in many professions
- get to situation
- improve quality of computing education at all levels

4. Short-term, achievable goals

- get computing majors/careers brochure for high schools done and put it out there
- get guide web site done
- create a dvd/video game on computing careers, maybe do more promotion in a student competition format
- parse the perception problem to understand better just whose perception we are trying to change and how – this relates to the need to identifying target audiences and the best ways to reach them
- get funding commitment from a large company for these efforts
- make a concentrated effort to ensure that all interested parties are working together
 - data collection
 - outreach efforts

5. Plan for carrying out continuing work

- charge ed board with the above-listed short-term tasks
- become more closely involved with the CRA's image taskforce
- work together electronically, for example by creating an e-mail list for this task force

Task Force 2: Curriculum (Laura Hill reporting)

1. Challenges

- The discussion needs to cover, or be specific about what pieces it discovering of Computing education across a broad range of both educational levels and focus areas. We have defined a matrix to help us discuss this:

	<i>CS/CE</i>	<i>IT/IS</i>	<i>Interdisciplinary</i>	<i>Productivity tools</i>	<i>Online literacy</i>
<i>Grad</i>					
<i>Undergrad</i>					
<i>2 year</i>					

	<i>CS/CE</i>	<i>IT/IS</i>	<i>Interdisciplinary</i>	<i>Productivity tools</i>	<i>Online literacy</i>
<i>HS</i>					
<i>K-8</i>					

- How to assess and push the model curriculum for K-12? What is the status?
- How will/should the ontology project inform the curriculum?
- Problem of multiple entry points into the curriculum
- Appropriate placement of students in first year courses
- Culturally everyone is very excited about the application of technology (iPods and other popular products have helped this). How do we leverage this excitement instead of squelching it? How can we get people interested in what happens in the black box?
- How do we appeal to different types of people? Not everyone is excited by computer games, for example.
- Teachers in other disciplines don't have the skills to teach any aspect of computing as part of their domains. They also have no opportunity to learn it.
- Defining computing fluency: skills = contemporary use of computers to do something, e.g. google and word processors; concepts = basic concepts like networking, data organization, etc.; capabilities = higher level thinking like logical reasoning, debugging, testing
- different entry and exit points in a community. Traditional and non traditional students.
- Need to offer best practices, i.e. choices rather than standards
- Professional development of faculty – HCI, privacy, ethics

2. Brainstorming

- Innovative models: take the fact that there are multiple entry points into the curriculum and use it; use different domain models for example to teach an intro course.
- Use socially relevant examples for computer classes (not all games and geek stuff); use diversity in the approach to classes (cooking...)
- Computing TV show – like “Cars” for Computers. Make them cute. Make the people who do computing interesting (like CSI). If SONY owned Ford, what would cars look like?
- In Florida there was a big push for “writing across the curriculum”. Why not “computing across the curriculum”
- Different paths through curriculum – funnels. Encourage more interdisciplinary majors. Offer a minor in computational methods. Computing department teaches lower level basic courses and the other department teaches the specific application to their domain (e.g. biotech). An example would be IT management for finance or marketing. Something about CS50 at Harvard?
- Share the stories and best practices about possibilities. Let every school do their own thing (s opposed to defining THE curriculum.

- Social relevance should pervade the curriculum – not just one class. Even if one class has the meat, the other classes should reference and use as examples offshoring and economics into the classes

3. High Level list of Long Term Goals

- Define the educational model – K-graduate – with what should be taught, what level of knowledge is required, who will teach, and where will we find the teachers
- Break computing = programming model
- Define / explore new models of curriculum delivery

4. Short term goals

- Examine repositories for best practices. Define what we could capture, in what way, using what tool, hosted by whom
- Start a regular CACM column devoted to innovations in curriculum
- Inventory international sources for curriculum models
- Explore continuing education models from industry

5. Next steps

- wiki/email followup work
- task force to spend 2 days or so to define further define goals and begin working with them

Task Force 3: Technology and tools (Boots Cassel reporting)

1. Challenges

- Pedagogical strategies and tools
 - Distance Learning
- Best of the Best” selection from repositories
- Repositories
 - Not write only – worse. How to get submissions and how to get use.
 - Variety of response to materials – how much people want to get from somewhere else.
- Changing technology and details
- Laboratories to support learning
 - Educational materials accessible on line
 - Interactive educational modules

2. Brainstorming

- Top ten downloads – recognize useful, successful resources.
 - Show your dean that you have contributed something useful.
- Annual(?) update of what’s new, what needs refreshing?
- Wikipedia
 - New content
 - Self assessment tools

- What is the best tool for learning python, for example.
- Would the right people make the entries? Do the real experts have the time?
- SIGs monitor their subfield?
 - Miss the interdisciplinary aspect
- Make entries and stamp them with the ACM logo and a timestamp.
 - Too vulnerable to modification by others.
 - Student chapters take on moderation of entries?
- Themes that run through the topics that cross the traditional subfields.
- Great Principles
 - Varying ideas of what they are.
- Collaborate with publishers
- Watering hole – finding similar courses, resources available
 - “MySpace” kind of thing
 - Manuel’s project
 - Faculty support and also student support
 - Place to get together and compare notes and such
 - expand to include homework, exams, lecture notes, presentations, etc.

3. Long-term goals

- Teaching the teachers
 - Technology of computing instruction be such that a first time instructor could find modules to plug and play, easily construct a course over a summer.
 - Tools to bring people up to speed to teach a course when they do not have adequate background. Insulate the teacher from their own insecurity.
- Capturing the best that we have in computing instruction
 - Course modules presented by the leading lights of the field.
 - Great lectures, best minds. Give their best lecture.
 - Nifty teaching things
 - Clever ways to make a concept clear
 - “20 cool things to do in class.”
- Teaching the students -- Customized educational experience
 - Smart tutor
 - Pull the weak students up
 - Push the strong students to their potential
 - Give the middle students a good education
 - Various levels of students
 - Surface to deeper interest
- Teaching society
 - Public awareness
 - All levels
 - Cool, interesting introduction, followed up by more detail

4. Short-term goals

- Pilot project built on the ontology
 - Pick a subtopic, make it clean
 - Add recorded lectures in the nodes
 - Material for students and instructors
 - Something for a particular audience
- “Best of the best” competition implementation
- Good, fundable plan for action
- Take the brochure and make it live
 - Expand on the scenarios. People talking about what they do and how exciting it is.

5. Plan for carrying out continuing work

- primarily by electronic communication

Task Force 4: Accreditation & Certification (John Impagliazzo Reporting)

1. Challenges

- no direct accreditation challenge

2. Brainstorming

- Encourage CSAB to foster mutual recognition through a “Computing Accord”, similar to the “Washington Accord” for engineering
- Explore the viability of graduate accreditation in computing
- Explore the viability of TYC accreditation in computing

3. Long-term goals

- Consider ways to promote worldwide computing accreditation, not through universal standards, but through mutual recognition of computing programs
- As less than 5% of the computing programs are currently accredited in the US, develop marketing strategies through CSAB to increase that number to 10% in ten years
- Become more proactive with ABET criteria outcomes
- Transfer all certification issues from the Ed Board to the Professional Board of ACM
- ACM needs to become more familiar with international understandings such as the Bologna Accord and the Tuning Project

4. Short-term goals

- Do a cost / benefit analysis of programs that are accredited
- Ensure that computing programs at Stanford and Hofstra become accredited

5. Plan to do this work

- work more closely with CSAB to market the benefits of accreditation – based on the cost/benefit analysis mentioned above
- develop a brochure through ACM and CSAB to promote benefits of accreditation (reinstating an older brochure)

7. Moving from discussion to action

Eric Roberts took over leading the meeting again at this point, and mentioned that this meeting was meant to get the Education Council started, and it is not yet determined how the Council could keep the meeting's energy going, and do the work it is deciding to do. Eric suggested that it would be beneficial for the Education Council to have its next meeting (the next yearly meeting) earlier in the fiscal year. This still leaves the question of how to get the work the task forces have determined to do in the interim. To facilitate continuing work, it may be beneficial to hold two meetings in the next fiscal year.

Since it is of primary importance to assist in the task forces' beginning their work, doing work in the virtual world, using tools such as wikis, will be important, in addition to email lists. Ed Council members have received each other's email addresses and can use these at their discretion, requesting/setting up email lists as needed.

Another challenge yet to be met is the coordination reporting cycles. Eric Roberts outlined one possible reporting model: each task force could begin by making a report or proposal to the Education Board, describing a plan for work and the estimated costs of work, outline what task force members need to achieve the goal described. The Ed Board would then review such proposals and, if approved, assist with finding funding for the proposed project, taking the project to the ACM Council/EC. In addition, it may be beneficial for the task forces to write a proposal for long-term goals for the organization of the whole of a given task force's proposed work, then define its parts as individual, smaller proposals.

Eric Roberts noted that he hopes that members of the new Education Council will make use of the Council as a prime networking organization – this was a large part of the reason for the Council's creation. It is also important to document the external value of what the Education Council does. The Education Board can assist with using ACM's resources for the Education Council's work - the Board is chartered to marshal these resources to help achieve ACM's educational goals and it is, in a large part, the Ed Council's task to define these goals.

5:00 pm Adjourn