

**ACM Education Board  
Annual Report for FY 09**

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## Executive Summary

This report summarizes the activities of the ACM Education Board and the Education Council in FY 09 and outlines priorities for the coming year. Major accomplishments for this past year include the following:

- Having obtained funding from NSF, taking the lead in organizing and running a Summit in Computing Education that brought together the major professional societies with an involvement in Computing Education
- Continuing the work on reversing declining enrollments in computing disciplines and in the process fostering a positive image of computing among young people
- Supporting K-12 activity and the Two-Year College Education Committee
- Completing work on the latest computer science and information technology reports
- Continuing to support the work on new information science curriculum guidelines
- Further supporting Masters level activity on curricular guidance
- Promoting new curricular themes and strategies
- Broadening international participation in computing education activities
- Enhancing the effectiveness of the Education Board and Education Council
- Increasing our visibility within the community

Challenges for FY 10 include further development of many of last year's activities:

- Producing a report on the Future of Computing Education Summit
- Providing Education Board perspectives on the various action items emerging from the Future of Computing Education Summit
- Having taken the lead in the organization of the Summit, ensuring that the expected deliverable emerge and there is suitable follow-up
- Further evolving the Education Board and Education Council arrangements and this will include a review of charter statements
- Continuing to support K-12 activity and the Two-Year College Education Committee
- Further advancing the curricular guidance in Information Systems in the form of a publications in this area
- Developing a strategy on the future of curricular guidance
- Providing guidance to the community on Masters provision in the form of a publication
- Increasing web based support for the community to keep them more involved with curriculum development
- Increasing international activity
- Providing support for publication outlets for the computing education community
- Further extending the leadership role of the Education Board / Education Council

## Section one

### Summary of FY 09 activities

#### 1.1 Education Council activities

In accord with the arrangement (entered into at the EC budget meeting in February 2007) that there should be one Education Council meeting each 8 months approximately, there was just one meeting of the Council in FY 09 and it took place in San Diego on 12<sup>th</sup> and 13<sup>th</sup> December 2008. This was the fifth meeting of the Education Council. As was clear from the earlier meetings, the energy level of the Education Council is always extraordinarily high. The participants share a continuing sense of urgency about the state of computing education and a strong commitment to improving the situation, and this includes attracting more students to the field and taking steps to heighten the profile of the area.

A feature of Education Council meetings has been the inclusion in the program of a panel session. On this occasion high school teachers (from the San Diego area) made presentations on their work and their perspectives about Computing in schools including the likely interest of students in advanced study of computing; this had been organized by Lisa Kaczmarczyk. Shirley Miranda and Neil McCurdy came highly recommended from the local teaching community and their views were complemented by input from Robb Cutler of CSTA. After presentations, there was then an opportunity for Education Council members to engage in a question / answer session. This was a lively session with a stimulating and thought provoking interchange of views. It provided insights that would help members of the Education Council to better understand the K-12 issues, and it complemented the important discussion about AP developments.

There is considerable interest in the current developments involving AP computing, with several members of the Education Council being deeply involved (Jan Cuny, Owen Astrachan, Dan Garcia, Mark Guzdial, Deepak Kumar, Eric Roberts and of course Chris Stephenson). Ultimately this is something that has the potential to have a huge impact throughout computing education. So an important aspect of the meeting was a discussion about these current AP developments. There were reports on College Board meetings in Atlanta and in Chicago.

The program for the meeting included a report from Cameron Wilson on the work of the Education Policy Committee and a report from Joe Turner about the Seoul Accord (ABET is a participant in this and the main Seoul Accord committee is chaired by Joe, a distinguished member of the Education Council). There was also discussion about the China Summit that had taken place on October 24<sup>th</sup> and 25<sup>th</sup> 2008 in Beijing, with consideration being given to the way ahead in terms of possible similar future activity.

Although not directly the work of the Education Council, support was given to the creation of a new journal, with the title *Transactions on Computing Education*. There was a presentation on this from one of the Editors, Josh Tenenberg. It is intended that the Council should continue to support this activity as well as the evolving *Inroads* in line with the wishes of the editors. But in addition reports were provided on a set of important activities that were identified beyond the work of the task forces already in existence (namely enrollment crisis and public image, technology and tools, curriculum and accreditation, the latter one on accreditation being in abeyance). These new activities included looking at the first year experience, embarking on data gathering to inform decisions of the Education Council, looking at the question of sustainability, looking at the possibility of curriculum guidance for joint or interdisciplinary degrees, and embarking on the publication of a handbook to infuse the community with novel ideas on selected topics.

The members of the Education Council are always actively engaged during these meetings, with very high praise indeed being given in an assessment session at the end of the meeting. From the perspective of the Education Board there remain problems in maintaining that energy in the intervening times; almost of necessity the Board needs to be constantly thinking of ways to improve effectiveness. At the next meeting in Vancouver participants will be expected to have 'done their homework'; this included reading various reports and being in a position to pass comment and recommend action to the Education Board.

#### 1.2 The Future of Computing Education Summit

## *Background*

As an important step in terms of its leadership role, the Education Board initiated a meeting in December 07 with Harriet Taylor and Joe Urban of the National Science Foundation (NSF) to discuss areas of mutual interest and to consider possible collaborative activity. In summary, this gave rise to the Education Board being funded by the NSF to host a meeting of US-based professional societies and organizations who are concerned with the current challenges of computing education.

As a result of this "The Future of Computing Education Summit" came into being with the Education Board playing a leading role. Invitations for participation were sent to various organizations to participate. The goal was to come to a shared vision of the problems facing those in computing education and of how those problems might be addressed. The over-the-top success would be for the groups to decide on common, coordinated action that would benefit computing education as a whole and all computing disciplines.

The meeting was held on June 25-26, 2009 in Washington, DC, just before the National Educational Computing Conference (NECC) and CSTA's Computer Science & Information Technology conference. The NSF grant paid for lodging and meals for up to two representatives from each organization; each organization was asked to pay for the travel costs of their representatives.

A document describing the participating organizations was put together prior to the meeting. This contained the program but also background statements from each of the participating organizations covering such matters as name of society / organization, web site, mission, membership profile, organization's influence on computing education, perceptions of current problems, possible insights into solutions, and so on. A printed report on the event would be produced and this would be published by ACM.

## *Attendance*

The individuals present and the groups represented included

Mark Guzdial	ACM Ed Board / Planning
Jane Prey	ACM Ed Board / Planning
Joe Urban	Planning
David Schneider	ACM Ed Board / Planning
Lillian Cassel	ACM Ed Board
Heikki Topi	ACM Ed Board and AIS / Planning
Mary J Granger	AIS
Sarah Rajala	ASEE (American Society or Engineering Education)
Dennis Silage	ASEE
Dennis Zimmerman	CompTIA
Amy Alexander	CompTIA
Andy Bernat	CRA
Andy Van Dam	CRA
Gail Chapman	CSTA
Stephanie Hoepfner	CSTA
Tom Hilburn	IEEE Computer Society
Alan Clements	IEEE Computer Society
Stephen B Seidman	IEEE Compute Society
Diana G Oblinger	EDUCAUSE
Julie Little	EDUCAUSE
Lucy Sanders	NCWIT
Lecia Barker	NCWIT
Barbara Boucher Owens	ACM SIGCSE
Han Reichgelt	ACM SIGITE
Debabroto 'Dave' Chatterjee	SIM
Peter Gruenbaum	Booley Consulting
Ed Trainer	SIM (CEO Amtrak)

and representing NSF: Harriet Taylor, Joe Urban, Amy Sharma, Jan Cuny, Joan Peckam.

#### *Acknowledgements*

The organization of the event was carried out by a planning committee consisting of Mark Guzdial, Heikki Topi, Jane Prey, David Schneider (all from the Education Board) and Harriet Taylor and Joe Urban (representing NSF). Lillian Cassel of the Ed Board made available certain funds. A considerable debt of gratitude is due to them all; the issues involved in bringing this unique and very successful event to fruition were all rather complex and their efforts have been considerable.

### **1.3 Supporting the K-12 computing effort**

#### *Reversing declining enrollments in computing disciplines*

Within certain institutions there have been some very positive indicators of expanding enrollments. In particular in the CRA Taulbee Survey of March 2009 the following statements appear:

- *Total enrollment per department by majors and pre-majors in U.S. computer science programs is up 6.2 percent over last year. If only majors are considered, the increase is 8.1 percent. This is the first increase in total enrollment in computer science programs in six years.*
- *The average number of new undergraduate students per department in U.S. computer science programs is up 1.7 percent over last year. If only majors are considered, the increase is 9.5 percent.*
- *Bachelor's degree production in computer science was down 10 percent this year, compared to a nearly 20 percent decline last year.*
- *Diversity in computer science undergraduate programs remains poor. The fraction of Bachelor's degrees awarded to women held steady at 11.8 percent this year. As was the case last year, nearly two-thirds of those receiving bachelor's degrees were White, non-Hispanics.*
- *Total Ph.D. production among the responding departments grew to 1,877 for the period between July 2007 and June 2008. This represents a 5.7 percent increase over last year.*

Of course the Taulbee Survey is based on activity in PhD granting institutions in the US. Declining enrollments remain a worrying feature of large sections of the computing education community. This matter remains of concern, not only to those in education, but also to employers and to industrialists. Given the strong link between information technology and innovation, this matter remains vital.

Members of the Education Board / Education Council had produced:

- A brochure which went out to approximately 62,000 high schools and middle schools in the United States. The hope is that broad distribution would encourage students— particularly women and students from disadvantaged communities—to consider studying computing, even if they might otherwise have given little or no thought to that possibility. Around 1,000,000 copies of this have now been produced and distributed; the brochure has also been used (with some element of customization) in Canada, and in Scotland and there is now a Spanish version that can be downloaded from the careers web site.
- A web site for further guidance and information. The brochure contains the address of a web site at [www.computingcareers.acm.org](http://www.computingcareers.acm.org) that includes additional material on educational and career options in the computing field. The web site also links back to the brochure and makes it easy for interested parties to obtain additional copies.

This activity was undertaken with the help, support, approval, and guidance of Chris Stephenson in CSTA and her colleagues. It is important that this close partnership should continue. Indeed it has. Copies of the brochure continue to be distributed both within the US and in other countries (where in many cases permission has been given to customize it to local needs). Recently there have been requests for the brochure to be updated and that is being investigated.

### *Developments involving AP*

The ongoing discussions about the AP Computer Science exams are important for computing in the US; a decision had been made by the College Board in Spring of 2008 to discontinue the AB exam (a second exam in Computer Science) from May 2009 on the grounds of small numbers of students taking the exam and its overall impact on minority students. So to be precise from May 2010 there will be no AB exam; only the AP Computer Science A exam will be available. Owen Astrachan, Mark Guzdial, Dan Garcia, Deepak Kumar and Eric Roberts in conjunction with Chris Stephenson from the Education Board / Council are active in providing advice and guidance to the College Board to look at the best way forward as far as future Computer Science exams are concerned. The College Board hosted meetings in Atlanta on 13<sup>th</sup> – 14<sup>th</sup> September 2008 and in Chicago on 24<sup>th</sup> October to consider the way forward.

### *Fostering a positive image of computing among young people*

One of the factors contributing to the enrollment crisis has been that young people do not see today's programs of study in computing as being sufficiently attractive or offering attractive career opportunities. The reasons given for this loss of interest in the popular press include the phenomena of offshoring and outsourcing, a poor understanding of the discipline among the general public, problems with the teaching of the discipline in high school, inadequate attention to the achievements of the discipline, and a lack of diversity in the field that reduces its appeal to women and minorities. These factors are complex and interconnected. The Education Board and Education Council have continued to analyze the situation to try to gain a better understanding of the dynamics and relative importance of these issues.

Grady Booch gave an inspiring keynote address at SIGCSE 2007, in which he talked about the need to rediscover the wonder and awe of computing and to make its joys more evident to the next generation. At SIGCSE 08 in Portland and again at SIGCSE 09 in Chattanooga, members of the Education Board put forward a submission for a special panel session that would build on this. Their session on *Rediscovering the Passion, Beauty, Joy and Awe: Making Computing Fun Again* attracted a considerable audience and they were both later deemed to be one of the successes of these conferences. Indeed there have been suggestions that this should become a regular feature of future SIGCSE conferences.

### *Curriculum considerations*

It has seemed clear that any action plan we develop would need to include a campaign of some kind to foster more positive images of the discipline among young people. That campaign would probably involve developing new curricular offerings that hold greater appeal and greater promise. We expect that it will be important over the next several years to experiment with different models intended to increase the attractiveness of the discipline. It is unlikely that any single model or any single remedy will meet the needs of all students. Individual members of the Education Board / Education Council have developed ideas in this regard and are experimenting in order to gain a better understanding of the factors that shed light on the situation or contribute to success. The metrics for success in this endeavor must include both increased admissions and increased retention rates in degree programs.

#### **1.4 Two-year college activities**

Dr. Elizabeth K. Hawthorne is chair of the Two-Year College Education Committee (TYCEC) which consists of Elizabeth K. Hawthorne (Union County College), Robert D. Campbell (CUNY), Karl J. Klee (Alfred State College) and Anita Wright (Camden County College).

The Two-Year College Education Committee is a standing committee (since October, 1991) of the ACM Education Board. The Committee is concerned with all education issues that affect computing at two-year colleges and in two-year degree programs. The primary purpose of the Committee is to provide curriculum recommendations in all areas of computing for such degree programs. The Committee may also make recommendations on other educational matters affecting such programs.

The TYCEC achieved the following milestones in FY09 (July 1, 2008 – June 30, 2009):

- In June/July 2008 presented poster session and participated in the ITiCSE conference, Madrid, Spain.
- in July 2008 participated in the NSF-funded SAME-TEC 2008 Seamless Connections convention.
- in October 2008 presented a poster and participated in the annual SIGITE conference to continue research and collaboration efforts toward crafting associate-degree transfer guidelines in Information Technology.
- in January 2009 concluded the project of updating the *Guidelines for Associate-degree Transfer Curriculum in Computer Science* and posted on committee website – acmtyc.org.
- in February 2009 received formal award notice from NSF to conduct a *Strategic Summit on the Computing Education Challenges facing Community Colleges*; completed substantial planning and organization activities; organized and conducted first meeting of Advisory Committee; finalized and secured contract with host hotel; established ACM as fiscal agent.
- in June 2009 met with select members of the two-year writing group of SIGITE to work on associate-degree IT transfer guidelines.
- in June 2009 participated in CISSE, Colloquium for Information Systems Security Education (attendance funded by NSF).
- in June 2009 participated in the Alice Symposium at Duke University (attendance funded by NSF)
- contributed to the efforts of the CSTA by providing feedback on proposed learning outcomes for the K-12 computer science curriculum and participated in the South Jersey chapter meetings.
- designed initial version of CAP Space, an interactive repository of associate-level curricula, assessment and pedagogy. (Note: this effort encompasses previously stated activities to 1) initiate a major undertaking to craft *associate-degree career guidelines in computing*; and 2) conclude *associate-degree transfer guidelines in computing* that will eventually include CS, CE, SE, IS and IT.)
- secured Ed Board funding to implement committee’s initial design of CAP Space using Web 2.0 technologies. Website is currently in the beta stage of development and testing.
- furthered the internationalization of its work by presenting a poster and participating in the Information Assurance Education working group at the ITiCSE conference in Paris, France (July 2009).
- continued to inform constituents of its activities via the regular column in the SIGCSE Inroads publication, *Community College Corner*.
- requested (and was granted) two-year college representation on the ACM Education Policy Committee (EPC).
- supported the goals and objectives of the ACM Education Council through a variety of synergistic activities.

## 1.5 Updating the computing curricula guidelines

With five volumes of curricular guidelines now published (or are about to be) as well as an Overview volume, we had to put in place a process that demonstrated ACM’s commitment to keeping these curricular models up-to-date. The following sub-sections offer additional comments about how that work proceeded in each of the major areas.

### 1.5.1 Computer science

The CS volume in the Computing Curricula 2001 series was originally published back in December 2001. The joint ACM/IEEE-CS Executive Committee had initiated a review of the Computer Science volume in the spring of 2006 and subsequently commissioned an interim review of the CS volume in 2007. This review was carried out jointly by the Education Board and the Education Activities Board of the IEEE Computer Society. Interim reviews were a new concept, and this is the first such effort. It was always intended to be less resource intensive than a full review but a key requirement was to keep the curricular guidance up-to-date and in the process address matters of major concern to the community. Thus, for instance, the expectation was that the structure of the original volume would be retained. But this effort was to be seen as something of an experiment and the findings would feed through to other such efforts.

The Interim Review Task Force consisted of: from ACM, Andrew McGettrick (co-chair, University of

Strathclyde, UK), Boots Cassel (Villanova University), Gordon Davies (formerly Open University in UK, consultant), Mark Guzdial (Georgia Tech), Larry Snyder (University of Washington); from the Computer Society, Renee McCauley (co-chair, College of Charleston), Alan Clements (University of Teesside, UK), Bob Sloan (University of Illinois at Chicago), Paul Tymann (Rochester Institute of Technology) and Bruce Weide (Ohio State University). A Special Advisory Group was also set up to provide guidance on all matters; importantly that included the co-chairs of the previous report plus industrial representation involving those with an interest in these curricular developments as well as Two-Year College representation. It consisted of Eric Roberts (Stanford), James Cross (Auburn University), Anita Wright (Camden County College, NJ), Maggie Johnson (Google) and James Whittaker (Microsoft).

The review is now complete and has been made available on line; the publication issue was considered at length by the Education Board and their decision reflects the fact that it is interim and therefore not of the same standing as a full review.

Part of this activity has also been the development of a methodology for having a web-based mechanism to engage the community in ongoing involvement with this kind of curricular guidance. Delicate balances have to be drawn here, part of the challenge being to avoid creating confusion within the community and to provide something that is genuinely useful.

### **1.5.2 Information systems**

The existing version of the Information Systems (IS) report dates back to 2002. A thorough review and revision of this work has been needed, particularly in light of the fact that the 2002 report consists largely of updates to the previous IS report. A comprehensive in-depth review is under way and nearing completion. The work is a joint effort between ACM and the Association for Information Systems (AIS). By way of background, the AIS is primarily an academic organization the mission of which is to advance knowledge in the use of information technology to improve organizational performance and individual quality of work.

The ACM/AIS Undergraduate Revision Task Force consists of Heikki Topi and Joe Valacich as co-chairs. More completely, the ACM representatives are Heikki Topi from Bentley College, Jay Nunamaker from the University of Arizona, and Janice Sipior from Villanova University; representing AIS are Joe Valacich, College of Business and Economics at Washington State University, Kate Kaiser from Marquette University, and GJ de Vreede from the University of Nebraska at Omaha.

The major review of the Information Systems volume has continued through FY 09. In August 2007 the first public introduction of the work to the IS community occurred at the Americas Conference on Information Systems AMCIS 2007 at Colorado State University; around this time there was the launch of the associated wiki at [blogsandwikis.bentley.edu/iscurriculum](http://blogsandwikis.bentley.edu/iscurriculum) to encourage the community to participate in the ongoing review process. In November 2007 a journal article on the project was published in the Communications of the AIS; in December 2007 there was a presentation and status report at the AIS SIG-ED (IAIM) meeting in Montreal. Following these consultation exercises in February 2008 at a task force meeting in Seattle, there was a major reorientation of the project based on community feedback; in particular there was a strong focus on learning outcomes (which have changed significantly). In addition,

- In June 2008, there was a panel presentation at the European Conference on Information Systems 2008 in Galway, Ireland focusing on global participation issues.
- In August 2008 there was a panel presentation at AMCIS 2008 focusing on the revised learning outcomes
- Between September 2008 until early December 2008 there was a number of rounds of solicitation of public feedback on specific curriculum issues and incorporation of the results in the product
- In December 2008 the first draft was presented at the AIS SIG-ED (IAIM) conference
- At the start of 2009 there was an additional period of gathering feedback and engaging in rewrites

At the time of writing the release of the document is being considered and it will come before the Vancouver meeting of the Education Council for discussion and reaction.

### **1.5.3 Information technology**

This report on guidelines for undergraduate degrees in Information Technology is the final component of the Computing Curricula 2001 effort. This document is now published. This followed a period of extensive review and consultation, resulting in approval by the ACM Education Board and also by the IEEE Computer Society.

The publication of this volume completes the ambitious work of CC2001, to produce volumes covering Computer Engineering, Computer Science, Information Systems, Information Technology, Software Engineering and the accompanying Overview volume.

## **1.6 Masters degree initiatives**

There are two aspects to work involving Masters degrees, the first initiated from within the Education Board itself and the second stemming from external activity funded by the US Department of Defense.

### **1.6.1 Masters report**

Part of the motivation behind this initiative has been the attention being given to Masters programs in many countries. In Europe, for instance, the Bologna agreement has spawned considerable interest in and attention to Masters programs. But worldwide there is ever greater attention to the effectiveness of degree programs and to mutual recognition of qualifications across the globe. Given the ACM leadership position in computing education, it was deemed important that Education Board should seek to provide guidance in this area.

This Masters initiative is a joint activity involving members of the Education Board and Education Council working with members of the IEEE Computer Society. The team involved is: Lillian Cassel (chair), Michael Caspersen, Gordon Davies, Art Pyster, Kevin Scott, and Heikki Topi.

The findings of the group to date include the following:

- Masters Programs exist in large numbers, and they vary greatly; recently the CRA Bulletin highlighted the fact that in 2005 graduates from Masters degrees in Computing had risen by some 11%
- There should be a wider dissemination of knowledge about these programs
- There was a need for the group to gain a broader understanding of the reasons for these different programs.

It would be worthwhile to document what schools are actually doing by conducting a global survey. For example, at Stanford University specialization is required in one of nine specializations whereas at Berkeley Masters programs were viewed as a fifth-year program. There was a need to determine the following:

- the mix of full time and part time students, and the percentage of returning mature students
- the balance of professional and research-oriented Masters programs
- the typical character of specialized degrees (e.g. gaming, forensics) and where these programs are located
- the nature of fifth year Masters programs.

The students in these programs have a variety of goals: to specialize in a particular field, to broaden their skill set, or to change careers. It seemed desirable to develop a scheme for categorizing these programs recognizing that they cover topics such as Information Systems and Software Engineering.

“Best practices” had to be established with regard to Masters programs outside the U.S. where there has tended to be more of a mixture of different kinds of students – these programs often have more of a professional rather than research orientation. Many Business Schools are partners in many of these Masters programs. The trends influencing these programs were of interest.

The final report is now nearing completion. It will not seek to micro-manage Masters programs; they are often seen primarily as a financial resource by institutions and generally are very diverse in character. Rather the intention will be to characterize them and to offer insights into their expected essential nature.

### **1.6.2 The GSwERC report**

The Graduate Software Engineering Reference Curriculum document (GSwERC, and lovingly referred to as Guesswork for short!!) stems from a project funded by the US Department of Defense (DoD) to produce graduate level recommendations for Masters programs in the general area of software and systems engineering. It involves various experts in the field (38 in total) and is being managed by Art Pyster at Stevens Institute of Technology in New Jersey. Both the IEEE Computer Society and more recently the Education Board have members on the Curriculum Author Team, Greg Hislop and Lillian Cassel respectively.

The DoD had funded the project; they had adopted a very arms length approach to the development of their report. They wished the work to be made widely available and Art and his colleagues had to make all major decisions about content, about publication, etc. There had been no ‘interference’ at all, just helpful support.

In terms of the way ahead and Education Board involvement, there were two main issues:

- The possibility of a request for some form of recognition of the work by ACM and by the Computer Society
- The possibility of a request for the Education Board to undertake responsibility for ongoing maintenance of the work possibly with the IEEE Computer Society

At the time of writing, members of the Education Board have provided feedback on version 0.50 of the report and have considered the implications of a request for recognition. The first of these requests is likely to be imminent.

### **1.7 Computing education publications**

At an earlier Education Council meeting in Boston consideration was given to the possibility of creating a *Transactions on Computing Education*. Following dialogue with the editors, there has been a very constructive process whereby Jeric would be transformed into a *Transactions on Computing Education*. Indeed this has now happened and the first issue of the Transactions appeared in March 2009.

Although not formally part of Education Board activity, it is encouraging to also see the evolution of *Inroads* into an even more important publication for the computing education community; John Impagliazzo as its editor is a member of the Education Board.

### **1.8 International activity**

There have been a number of aspects to the international activities of the Education Board. Members of the Board / Council have been involved in

- monitoring the activities of Informatics Europe through participation in the organizing committee and in attendance at the annual European Computer Science Summit that was held in October 2008 in Zurich in Switzerland. Originally it had been envisioned that this would result in the creation of a CRA-Europe, though interest in education has been quite apparent. Indeed the first report (and the only one to date) of Informatics Europe has addressed the image of the discipline and members of the Education Board have been heavily involved in this. The latter has reflected a recognition of concerns related to enrollment, public perception, and so on.
- planning and in leading the Informatics Education Europe conference which was held in

Venice in Italy in December 2008

- keeping a close eye on accreditation developments within Europe. There had been an EU funded project called the Euro-Inf project managed by ASIIN in Germany with main partners the University of Paderborn and the University of Applied Sciences in Hamburg in Germany and involving CEPIS in Brussels. The main purpose of this project has been to devise criteria for the accreditation of degrees in Informatics across Europe, both at the undergraduate level and at Masters level. Education Board / Education Council members were involved in this in an international advisory capacity and were present at the major meetings. This has given rise to EQANIE, the European Quality Assurance Network in Informatics Education and the work of that is being based on the outputs from Euro-Inf. Andrew McGettrick has been elected as a member of the EQANIE Board.
- monitoring activity leading to the signing of the Seoul Accord. A number of countries (South Korea, US, UK, Canada, Australia and Japan) were seeking to develop criteria for the mutual recognition internationally of accreditation activity. This was intended to mirror for informatics the Washington Accord for engineering. The groups originally involved were: the Accreditation Board for Engineering Education of Korea, ABET, the BCS, the Canadian Information Processing Society, the Australian Computer Society and the Japan Accreditation Board for Engineers. At the first general meeting of the Accord held in Kyoto in Japan on 20<sup>th</sup> June 2009 two additional members were added: the Hong Kong Institution of Engineers and the Institution of Engineering Education Taiwan. Importantly also Joe Turner, (a member of the Education Council) was unanimously elected as chair.
- beyond this, members of the Board had been involved (as members of the conference committee) in planning an Education Summit in China. John White, Larry Snyder, and Jane Prey all attended and were involved in giving keynote addresses. This was held in Beijing on 24<sup>th</sup> and 25<sup>th</sup> October 2008.

### **1.9 Promoting new curricular themes and strategies**

The continuing decline in enrollments and poor retention rates in certain quarters suggest that there continue to be problems with the image and effectiveness of computing education, which seems to have limited appeal to current students and problems with its popularity. This continues to be true at many levels in the world of education. It is appropriate to continue to address this head-on and to continue to see it as important.

One of the major challenges is to understand in detail the nature of computing education at all levels and to decide how we can re-conceptualize computing education in a way that will make it more appealing. Can we create at least one image of computing education that is new and different and does not suffer from the ills of the present situation?

### **1.10 Enhancing the effectiveness of the Education Board and Education Council**

The Education Board and the Education Council have been in existence now since 2006. There have been minor changes (usually caused by events such as resignations) but no major adjustment to membership. Back in 2006 at the time of the formation of the new bodies, there was a mandate from on high to introduce new blood, to have younger folk involved, etc. but also to refresh the Board and Council. To some extent that happened and this has been very successful. Yet within the education community there is a need to gain experience and confidence prior to ‘making a difference’ and so it is not always easy to find appropriate young blood.

For the record, it is important to emphasize that the positive aspects of the last reorganization have been

- The reduction in the size of the Education Board
- Accompanying the above, an Education Board that is now engaged and operating well
- An Education Board that does act well in relation to the Education Council
- An Education Council that is consulted and kept informed

- Education Council meetings that do seem to be welcomed and enjoyed but the problem is that we have not really managed to create activity between events.

It must be essential to keep the Board and the Council fresh and alive. So it seems timely, having gained experience of the present arrangements, to embark on a modest adjustment to the membership of the Education Council. In particular, the process of asking folk to stand down needs to be done sensitively for reasons of good people management; for instance, it could be seen to imply loss of status. Should any mistakes be made, folk can become very bitter very quickly and yet we will wish to keep them involved. This needs careful thought.

During recent conference calls the Education Board took the view that we should progress via the route of the original appointment letters. That was wise and we have sought to follow that route. We still need to phrase everything now with the utmost care. Part of the story must be *not* to raise expectations of everlasting membership at the time of appointment.

### *Changes*

Over the last year the Board has been augmented with the addition of Maggie Johnson from Google who has moved from the Education Council to the Education Board. In addition considerable thought has been given to revamping the Education Council. It was felt desirable to do this by agreeing a set of principles that would guide the evolution of the Education Council.

The principles on which upon which membership of the Education Council is based would guide selection, but it also provides a firm foundation and a basis for defending the selection.

In its present incarnation, the Education Council remains internal to ACM and contains representatives of all significant educational interest within ACM. Thus

- All members of the Education Board are automatically members of the Education Council
- Those SIGs with significant educational activity have a formal representative on the Education Council
- There are representatives of CSTA, the Two-Year College Education Committee, the Education Policy Council
- Certain ABET representation will be included
- Certain people are included because of the distinctive contribution they make (e.g. as NSF Distinguished Educators, because of their research or scholarship)
- Additional SIG and other representatives will be included

There is an expectation that members should attend meetings and contribute to the work of the Council.

In making decisions about the phrase ‘significant educational activity’, activity such as an education strand or theme within an annual conference will qualify or the existence of an education officer. For this purpose Lillian Israel’s activity chart can be referenced. So at present this includes SIGCSE, SIGITE, SIGPLAN, SIGGRAPH, SIGCHI.

To clarify the above, it would be natural to expect more than one member of some SIGs (e.g. SIGCSE) to be a member of the Education Council although one will be identified as the formal representative of the SIG.

## Section two

### Priorities for FY 10

#### 2.1 The Future of Computing Education Summit – moving forward

The Summit has been deemed a huge success by all concerned. The final report is due out in September. Preliminary feedback suggests there have been six main outcomes. Attendees agreed that their organizations would be willing to take on roles as either owners or participants, and one individual was selected to be the convener to make sure that the owners and participants would continue to meet in order to keep the action item going. In brief, and by way of explanation, an owner has a higher level of involvement than a participant.

##### 2.1.1 Summit Outcomes

A brief summary of the Summit outcomes is captured below.

###### *The Formation of a Coalition for Computing Education*

Initially this was seen as

- an entity to speak with a united front
- a ‘goto’ clearinghouse/repository of: ideas, policy recommendations, curricula, i.e. “The Computing Education Act of 2012” comes from here.
- being able to declare ‘Year of X’/”Grand Challenge”
- bringing large and small together
- ultimately accountable for Computing Education

Participants: Ensemble, SIGCSE, CSTA, CRA, ASEE, SIGITE.

Owners: IEEE CS, NCWIT, and the ACM Education Board.

Convener: Tom Hilburn of IEEE CS

###### *Research and Measurement*

There are two separate activities under this heading.

a) In the first, the intention would be to have a committee of organization representatives to write a white paper: The Top 5 Research Questions to advance computing education

Participants: i-School, ACM Education Board, Ensemble, SIGCSE, CRA, SIGITE, SIM

Owners: i-School, ACM Education Board.

Convener: John Unsworth at i-Schools.

b) Here, in the second activity, the intention would be to

- Develop a better way to archive and seek/search findings on computing education research
- Identify what resources, messages, research and etc. already exist
- Develop resources and disseminate with funding development
- Develop resources (talking points) to inform faculty about appropriate messages
- Build a repository of resources, examples stories on message, templates, posters, links and press releases

Participants: Ensemble, SIGCSE, SIGITE, NCWIT, ASEE, CSTA, i-Schools, AIS

Owners: NCWIT, ASEE, AIS.

Convener: AIS would supply the Convener.

###### *Public Relations*

Three different activities are proposed under this heading

- a) Identify audiences for greatest impact, develop appropriate message (with requisite research) and gather funding for this.

Participants: NCWIT, and the ACM Education Board  
Owners: None.  
Convener: There is no Convener to date.

- b) Develop mini-grants for teachers (maybe for curriculum development) so local press has a reason to write about computing and bring positive attention to the school districts.

Participants: NCWIT, ASEEE  
Owners: NCWIT, ASEEE.  
Convener: NCWIT will supply the Convener

Note that already NCWIT gives teacher's aspiration awards.

- c) Develop partnership with CSTA Cohort leadership and university faculty to support state-level advocacy

Participants: CSTA, IEEE-CS and ACM Ed Board (ACM Education Policy Council)  
Owners: none  
Convener: currently Mark Guzdial is the Convener, but will see if he can get Cameron Wilson of ACM EPC to take over.

Note that the ACM Education Policy Council maybe doing this already

#### *University-Industry Partnerships*

There are four dimensions to this topic.

- a) Urge funders to support collaborative ventures and strategic partnerships

Participants: CSTA, IEEE-CS and ACM Ed Board (ACM Education Policy Council)  
Owners: SIM  
Convener: Dave Chatterjee of SIM

- b) Encourage academia to create incentives to promote industry-IHE participation in joint conferences

Participants: SIM, i-Schools  
Owners: none  
Convener: None at present.

- c) Engage the industry to collaborate in computing work with faculty and students

Participants: SIM, i-Schools  
Owners: SIM  
Convener: Dave Chatterjee at SIM

#### *Changing the University*

There are several aspects to this work item.

- a) Develop a study by a representative group of industry of what they need/want in computing student preparation:
- What is the skill set?
  - What do you project 10 years out? (characterize roles)
  - Multiple groups

- IT
- Software Development
- Research Labs

Participants: SIM, Ensemble, IEEE-CS, NCWIT, SIGITE  
 Owners: SIGITE  
 Convener: Hans Reichgelt of SIGITE

b) Initiate recognition of pedagogical achievement (e.g. best paper, best education resources, etc)

Participants: ASEE, Ensemble, IEEE-CS, SIGCSE, SIGITE, AIS, i-Schools  
 Owners: ASEE, IEEE-CS  
 Convener: ASEE will supply the Convener

c) Work with centers and institutes of teaching and learning to disseminate good practice with respect to computing education

Participants: SIM, ASEE  
 Owners: None  
 Convener: There is no Convener at present

d) Redefine faculty development to include pedagogy

Participants: ASEE  
 Owners: None  
 Convener: There is no Convener at present

e) Gather data about experiences on dual track tenure lines (research and teaching)

Participants: SIGSCE, AIS, i-Schools  
 Owners: SIGSCE  
 Convener: SIGSCE to supply the Convener

f) Survey non-major's computing courses, get reviews and find exemplars; survey general education schemes for including computing

Participants: SIGSCE, IEEE-CS, NCWIT, CSTA, CRE  
 Owners: SIGSCE  
 Convener: SIGSCE supplies the Convener

### 2.1.2 Responding to action items

At the Education Council meeting in September the opportunity will be taken to provide responses on behalf of ACM to (at least) the various action items that involve the Society. To ensure an ACM- wide involvement in these matters the opportunity has been taken to invite interested parties so that their voice can be heard and their input noted.

The main items on which a response is required include

- The formation of a coalition
- The identification of the top 5 research questions
- Greatest impact considerations

However, it will be desirable that the Education Board has a view about all action items. These all need to be developed in the coming year and the results from all participants brought together and made available to the community in a reasonable manner. Of course, any response will serve as input to a wider discussion involving the other players in the original Summit.

Since the Education Board has been adopting a leadership role with respect to the Summit, it will need

to make sure that the outputs are properly co-coordinated and that the Summit does lead to useful and tangible beneficial impact. In particular, how will the contributions from the various professional societies and organizations be pulled together to ensure ongoing action? Of course such considerations are likely to involve ongoing collaboration with NSF.

## **2.2 Forthcoming Education Council activities**

### **2.2.1 The Vancouver meeting**

During the coming year it will be important that the issues raised via the Future of Computing Summit are addressed. Accordingly this topic will be a major feature of the Education Council meeting in Vancouver at the end of September. There will be

- A report on the Summit by Mark Guzdial
- Groups who will discuss the three major issues with which the Education Board is associated, namely
  - The coalition
  - The five main challenges
  - Impact considerations
- Groups discussing the remaining issues.

As preparation for these discussions care has been taken to invite representation from the ACM's Computer Policy Committee as well as other interested parties to ensure that carefully considered views emerge.

The resulting views will then represent the Education Board / Council contribution to the actions emerging from the Summit. These will need to be reconciled with contributions from other parties so that a shared view emerges. But the timely meeting of the Ed Council in Vancouver will mean that the momentum created at the Summit is maintained.

Additional activity in Vancouver will include: hearing from John White about the work of the ACM Policy Committee, receiving curriculum reports, holding an international panel, hearing about AP developments and the work of the TYCEC, and giving consideration to supporting publication outlets.

### **2.2.2 Updating Education Council membership**

Following extensive discussions within the Education Board, various plans have now been agreed regarding the difficult and sensitive task of updating Council membership and a timescale for implementing them have been set. In terms of asking folk to stand down,

- in some cases there is duplication in terms of the expertise they bring
- in other cases certain members have not attended meetings (but we may need to check if they have been asked)
- in all cases, their term of office has expired.

In the interests of continuity, a certain proportion (say 50%) of the present Education Council membership excluding Education Board members should be retained.

A list has been drawn up of Education Council members who should remain (e.g. because of the contribution they have made, because of their involvement in some particular research area, etc.); another list has been drawn up of members who will be thanked for their contribution and asked to stand down with the possibility of involvement again at a later stage.

In certain cases SIG chairs did send a nominee back in 2006; others did not. Steps are now being taken to review this and to ensure involvement of all SIGs with significant educational activity.

#### *Include*

The following are to be invited to join:

- Formal representatives from SIGCSE, SIGITE, SIGGRAPH, SIGCHI, SIGPLAN and possibly SIGSOFT; note that the Chairs may nominate someone who is already on the Ed Council
- The current Co-Editors in Chief of JERIC, namely Robert McCartney of University of Connecticut (e-mail: [robert@engr.uconn.edu](mailto:robert@engr.uconn.edu)) and Josh Tenenberg from the University of Washington (e-mail: [jtenenbg@u.washington.edu](mailto:jtenenbg@u.washington.edu))
- Jan Cuny who is heavily involved in the new AP developments and the ongoing related issue of teacher recruitment should be included; she is in NSF and so the cost will be minimal
- Michael Wrinn from Intel in Portland
- A member of the Education Policy Committee of ACM; this ensures the Council then potentially has representatives of all major education groups within ACM
- Michelle Hutton, as the new Chair of CSTA

#### *Agreed actions*

1. Approach chairs of SIGCSE, SIGITE, SIGPLAN, SIGGRAPH, SIGCHI to obtain name of a formal representative. The nominated person would attend the April (approx.) meeting when the new Council will meet.
2. Immediately approach the Education Policy Committee, the Transactions editors, and include Jan Cuny (NSF) and Michael Wrinn of Intel
3. Seek a representative from SIGSOFT immediately; the urgency here stems from the need to consider the US DoD funded Software Engineering Masters volume at the meeting in September
4. At the start of October seek involvement from the current chair of CSTA
5. At the start of October, send letters asking the identified folk to stand down forthwith; caution needed in how any letter is phrased.
6. In their letters of appointment, to be sent out at the beginning of October, existing members to be given a term of office that lasts for the next 2 years.

#### **2.2.3 Additional considerations**

Given the increased importance of Computing Education and the many important activities within ACM, over the coming year the Education Board will review the mission statements of

- the Education Board itself
- the Education Council
- the Two-Year College Education Committee, and indeed the TYCEC has already asked for a change to their mission statement,

### **2.3 Supporting K-12 efforts**

#### *Building on the success of the brochure*

The production of the brochure and the linked web site has been a high profile activity that seems to have had a beneficial impact. Recent statistics point to the fact that around 40,000 hits per month are occurring and this peak was reached in August 2009.

Every piece of feedback has been entirely positive. Although there are indications from the top institutions that there is a recent alleviation of the enrolment problems, it is far too early to make sweeping claims; moreover, there are still indications of considerable problems in other institutions.

Meanwhile developments of the web site <http://computingcareers.acm.org> have occurred. The oversight for the ongoing development and evolution of the web site has been vested in one of the Task Forces of the Education Council that keeps in mind the specific issues facing K-12 education and the need to work closely with CSTA. The material on the web site has been refined to provide more helpful information; profiles of students from different institutions including pictures and quotes have been included; cross links to other relevant sites (e.g. to include video) have been provided; and, generally

efforts have been made to make it more attractive to the younger generation.

Recently there have been suggestions of updating the brochure and the associated web site. Undertaking such activity has cost implications as well as effort implications. Due consideration will be given to this in the coming year. Of course, it remains important to consider how to build on this successful collaboration between the Education Board / Council and CSTA to drive home benefits. For instance, a decision needs to be taken on whether further mailings of the brochure to high schools would be beneficial. In addition we should seek to identify ways in which the web site can be made more effective in reaching its audience.

#### *AP initiatives*

There have been AP meetings held in the week of 15<sup>th</sup> – 19<sup>th</sup> June and another on September. Apart from Chris Stephenson being involved, Owen Astrachan, Dan Garcia, Mark Guzdial, Deepak Kumar and Eric Roberts are all maintaining an active interest and an involvement in the ongoing developments under the leadership of Jan Cuny. All are members of the Education Council.

To be more specific Owen Astrachan is one of the Co-Pi's of the Commission and both Chris Stephenson and Mark Guzdial are members of the Commission. Each of Jan Cuny, Dan Garcia, Deepak Kumar and Eric Roberts are members of the associated Advisory Group. The Commission met on 16<sup>th</sup> -18<sup>th</sup> June and had another meeting on 11<sup>th</sup> -13<sup>th</sup> September; its next meeting is now on 14<sup>th</sup> and 15<sup>th</sup> November 2009. The Advisory Group met on 1<sup>st</sup>-2<sup>nd</sup> August 2009 and, due to financial imperatives, there is now just one more meeting to occur and that is now planned to take place in January 2010 when there are likely to be more developments to consider.

The meetings have been going well with participants bringing a lot to the table. The deadlines are forceful, and everyone is aware the challenges and the importance of ensuring that these developments are advanced over the coming year. The development committee is continuing to develop the existing A exam.

## **2.4 Two-year college education committee plans**

In FY 10 the Two Year College Education Committee plans to pursue the following activities: (July 1, 2009 – June 30, 2010):

- conduct our NSF-funded grant, *Strategic Summit on the Computing Education Challenges facing Community Colleges*, as well as produce the proceedings and disseminate the findings.
- complete initial release of CAP Space and through feedback develop specifications for next phase.
- continue collaboration efforts with the two-year writing group of SIGITE.
- present a poster session and participate in the annual SIGITE conference (October 2009).
- present a poster session and participate in the northeast regional Consortium for Computing Sciences in Colleges (CCSC) conference (October 2009).
- participate in AACC's ATE PI conference, *Technicians in the Green Economy* (October 2009).
- present a special session at the annual SIGCSE conference (March 2010).
- present at the September 2009 ACM Education Council in Vancouver, BC.
- identify a replacement for retiring committee member Karl Klee (first TYCEC chair).
- secure Ed Board approval on revised committee charter: "*As a standing committee of the ACM Education Board, the Two-Year College Education Committee is charged with and responsible for ACM-endorsed curricula, assessment and pedagogy specific to associate-degree granting institutions worldwide. The Committee promotes the scholarship of teaching and learning in a variety of computing education communities.*"
- continue its dissemination and outreach activities, including mailings, website enhancements, conference sessions and exchanges with colleagues, as well as continuing our SIGCSE Inroads column and participating with the ACM Education Council.

## **2.5 Undergraduate curriculum efforts**

Within the Education Board / Education Council a dialogue has started on whether the current five-volume strategy employed within CC 2001 remains appropriate. That is an important discussion and it will evolve over the coming year. It is fundamental to the strategy that needs to be adopted generally regarding curricular guidance.

### **2.5.1 Computer science**

An important outcome of the interim review is the realization that a more fundamental activity needs to be launched in the near future to produce a new Computer Science volume. This will then maintain the well-established tradition of undertaking such an activity on a 10-yearly time scale. It is intended that this will be carried out jointly with the IEEE Computer Society and will maintain the ACM / Computer Society leadership role in terms of curriculum guidance.

Key concerns here are the choice of team to undertake this work and setting the context in which that should be done. It would be important that such an endeavor should build on earlier work, notably that of the recent interim review. For in many instances, as the interim review drew to a conclusion there was a recognition that radical change was needed, but the constraints of the interim review process rendered major adjustments undesirable from a range of perspective (resources, practicality, causing undue turbulence in the community, etc).

### **2.5.2 Information systems**

This report on the latest developments in Information Systems will come before the Education Council at its meeting in Vancouver. It is anticipated that the document will be approved during the coming year. The experience from this, and in particular the experience of involving the community in ongoing public consultation, will be considered in Vancouver with a view to using this for consultation involving other volumes.

## **2.6 Masters initiatives**

It is intended that the group undertaking this Masters initiative will report in the very near future with a final report being made to the education Council in Vancouver. In addition there will be a report to the Education Council there on the GSwERC by Art Pyster.

In furtherance of these Masters developments, the Education Board in conjunction with the Computer Society will clarify its definitions of terms such as 'endorsement', etc which carry implications of different forms of recognition of curricular efforts.

## **2.7 Extending the leadership role**

Having started a number of initiatives here, it is important to build momentum and, where relevant, do so in a manner that is sustainable.

### *Computing Education Summit*

The ACM Education Board with funding from NSF lead the Summit to bring together a group of key players interested in promoting computing. This type of a meeting should serve a useful purpose beyond being just as a venue for the various actors to learn to know about each other's work. It should, of course, lead to immediate coordinated action. The types of questions that were identified some time ago and needed answers include:

- How do we integrate existing initiatives so that they get the best possible visibility?
- Can there be a comprehensive study that integrates what is known about the enrollment crisis in computing?
- How do we transform the results of the study into a form that creates a compelling case that will receive attention in national media?

- Can we find the resources to design and implement a web site or sites so that there is a very high quality interactive and dynamic web presence for the initiative? Ideally the site(s) should bring members of the target audience back repeatedly and have the effect of creating a social network.
- How can the message be presented to the political decision makers in a compelling way that demonstrates the critical importance of the issue from the perspective of national competitiveness?
- How can a systematic message from the leading companies in the IT industry and other industries be sent out regarding the continued need for professionals with a very strong background in computing?
- Overall, how do we reach the target audience (middle and high school students and college freshmen and their parents; relevant guidance counselors) in a way that genuinely changes their thinking? We might need a national media campaign that would cost a very large amount of money. How can we get this funded?

It is clear that the one meeting would not change things overnight, but it is crucial that the meeting would have beneficial outcomes in the form of a list of significant action items and commitments to execute them. Over the next year the Education Board / Council will need to be alert to the need to take action as necessary to maintain its leadership role.

### *Publications*

Although not formally part of Education Board accomplishments, there was important support for the creation of the new *Transactions on Computing Education*. The first issue appeared in March and the second has just been posted in the digital library. See

<http://portal.acm.org/toc.cfm?id=1513593>  
<http://portal.acm.org/toc.cfm?id=1538234>

Allied with this, the two editors of the *Transactions* have been invited to become members of the Education Council. They are excited about the prospect of using the Education Council as well as its meetings and activities to inspire the promotion of a successful *Transactions*. There is an important issue here regarding the sustainability of the new *Transactions*.

Likewise the elevation of the status of *Inroads*, although not formally an Education Board accomplishment, is an important development for the community. The editor, John Impagliazzo, has asked that there be an opportunity for enlisting support from members of the Education Council in support of the new activities.

Accordingly in Vancouver there will be group sessions involving both the *Transactions* and *Inroads* with a view to having the Education Council provide important support.

### *Additional activity*

The plans under international activity also feed through to enhancing this leadership role –the international panel at the Education Council meeting in September 09 and so on.

## **2.8 International activities**

During the next FY existing international activities will be maintained but in addition some new initiatives will take place. In terms of ongoing activity

- An international panel will be held at the forthcoming Educational Council meeting in Vancouver, the intention being to ascertain how ACM can better meet the needs of the international community in computing education. It is intended that this should involved a group of international experts making presentations and highlighting the issues that are most relevant for them; this would then be followed by a discussion session. This builds on similar successful sessions involving industrialists and employers; these have been a feature of previous Education Council meetings

- There is a proposal that the Education Board should hold a special meeting in Qatar and in the process hold a number of events that will promote ACM (e.g. setting up an ACM chapter). It is intended that the President and the Chief Executive will be present at this event
- Members of the Education Board / Council are involved in the planning of the Informatics Europe annual summit which is being held in conjunction with an ACM Europe meeting in Paris in October 2009
- Again members of the Board / Council are heavily involved in the organization of the third Informatics Education Europe conference to be held on 5<sup>th</sup> and 6<sup>th</sup> November in Freiburg in Germany
- The Euro-Inf project is now complete and steps have been taken by ASIIN within Europe to set up a more permanent accreditation activity based on the results of the Euro-Inf project. Members of the Board / Council are on the Board of EQANIE and involved in a follow on project called Euro-Inf Spread funded by the European Commission
- Developments associated with the Seoul Accord (with Joe Turner of the Education Council as chair) continue to be monitored

Beyond this certain questions have arisen about Education Board involvement in IFIP Activity and that will be addressed. This relates to ACM representation on TC3 and whether the Education Board should take on this responsibility.

## **2.9 Promoting new curricular themes and strategies**

Addressing the matter of new curricular themes and strategies is central to many of the Education Board / Council activities. In particular, some of the new activity within the Council has this as a central focus and concern. Thus there has been the “First Year” project, the outputs of which are likely to find expression in the new AP initiative.

### *Establishing connections with other disciplines*

As computing becomes more integral to a range of disciplines, it seems likely that computing education will increasingly become more closely tied to education in other areas. These developing connections may develop in several ways:

- By absorbing aspects of other disciplines into computing, which continues to evolve as a discipline
- By expanding the breadth of training we offer to computing students so that graduates can provide effective support in other areas, including science, engineering, economics, business, and education.
- By encouraging students to take a broader set of electives as part of their overall program of study
- By increasing the number of computing courses designed for students in other disciplines who will require those skills

These developments have the potential to lead to new kinds of degree programs.

## **2.10 Continuing to foster a positive image of computing**

The Education Board and Education Council continue to believe that fostering a positive image of the discipline must remain a central concern. The vision must be appealing and stimulating to the community, it needs to offer advantages over existing possibilities, and it must lead to a measurable reversal of recent enrollment trends. The Education Board / Education Council must continue to take the lead in this activity, but it will be important to engage the broader community in this discussion and debate. At recent SIGCSE events, Dan Garcia has taken steps to involve the wider community in articulating the beauty, wonder and awe of the discipline.

We believe that this process will proceed by identifying new curricular models and approaches that have proven to be effective in the institutions at which they were developed and then helping to promote the distribution of those new models by developing new curricular recommendations around those themes. The outputs from the NSF CPATH program will be monitored with these issues in mind. The overall success of this endeavor will almost certainly require experimentation with many models, not all of which will succeed individually. The goal is to promote a diversity of strategies and then to let individual institutions choose models that are likely to work well in that environment.

## **2.11 Increasing visibility within the community**

Another strategic goal toward increasing the effectiveness of the Education Board / Education Council consists of promoting public awareness of our work. Increasing our visibility is important for two reasons:

- The community needs to be informed about the changes that have occurred and the reasons underlying those changes
- At a time in which so many people in computing education continue to feel threatened by declining enrollments, it is important for the ACM to be seen as an organization that not only cares about the problems but also as one that can marshal the resources necessary to have an impact. By showing our support for the community, we will also be in a better position to enlist their aid in solving the many problems we all face.
- The Education Board / Council need to firmly establish their leadership position and a fundamental aspects of this is being visible and being seen to be active in addressing the problems of the day and providing the necessary support.

There are various ways in which these matters can now be addressed more effectively. There have been presentations at conferences, publication of curricular guidance, etc. But now there are the new publications and the close involvement of the editors with the work of the Education Council, there is the imminent publication of the report from the Future of Computing Education conference, there is the Masters report, and so on. But we must continue to address this matters in ways that ensure sustainability.

**Appendix A**  
**Roster of the Education Board and Education Council (FY 09)**

**Education Board**

Andrew McGettrick, Strathclyde University (Chair)  
Mark Guzdial, Georgia Tech (Vice - Chair)  
Boots Cassel, Villanova University  
Dan Garcia, University of California at Berkeley  
John Impagliazzo, Hofstra University  
Maggie Johnson, Google  
Jane Prey, Microsoft  
Eric Roberts, Stanford University (past chair)  
Larry Snyder, University of Washington  
Heikki Topi, Bentley College

David Schneider, ACM Staff Liaison for the Education Board  
Lillian Israel, ACM Director of Membership  
Chris Stephenson, Executive Director, Computer Science Teachers Association  
Gordon Davies, Coordinator of ACM European Education Initiative

**Education Council (which also includes the members of the Education Board)**

Owen Astrachan, Duke University  
Gordon Bailes, East Tennessee State University  
Michael Caspersen, Aarhus University, Denmark  
Jan Cuny, University of Oregon/NSF  
Robb Cutler, The Harker School/CSTA  
Peter Denning, Naval Postgraduate School  
Sally Fincher, University of Kent, England  
Dan Garcia, University of California at Berkeley  
Roscoe Giles, Boston University  
Beth Hawthorne, Union County College (TYCEC)  
Robert Jones, Intel  
Lisa Kaczmarczyk, University of California at San Diego  
Deepak Kumar, Bryn Mawr College  
Jim Kurose, University of Massachusetts  
Han Reichgelt, Southern Polytechnic State University (SIGITE)  
Rich LeBlanc, University of Seattle  
Terry Linkletter, Microsoft  
Jose Maldonado, University of Sao Paulo, Brazil  
Ken Martin, University of North Florida  
Barbara Price, Georgia Southern University  
Eugene Spafford, Purdue University  
Carol Spradling, Northwest Missouri State University  
Joe Turner, Clemson University (retired)  
Patrick Walsh, IBM  
Jeannette Wing, Carnegie Mellon University  
Alison Young, Auckland University of Technology, New Zealand