

Minutes of the Colloquium on Information and Communication Technology Education and Training and the Production of Graduates Held at the Birchwood Conference Centre, Boksburg, on Monday 19 March 2007

The first part of the Colloquium consisted of an introduction by the Minister of Education, Mrs. Naledi Pandor, and presentations on the context and current status by the following speakers:

- Mr. Mark Harris, Country General Manager: IBM South Africa & Central Africa
- Mr. Bonisile Gantile, Executive: Telkom Centre for Learning
- Ms. Dillo Lehlokoe, HRD Coordinator, Office of the Presidency
- Prof. George Wells, HoD Computer Science, Rhodes University
- Dr. Andrew Paterson, Research Director: Education Science and Skills Development, HSRC

The presentations given by these speakers are all available on the Colloquium website (<http://www.cs.ru.ac.za/ICTSkills/>) and are not minuted here.

Discussion

(Chaired by: Prof. Peter Clayton and Prof. David Sewry, Rhodes University)

A number of points had been identified during the previous presentations and were used as the basis for eight focused lunchtime discussion groups. These points were:

1) What has been overlooked?

The following points were mentioned:

- “Shape and Size” and differentiation.
- Curriculum issues, and the impact of human and equipment resource limitations.
- Unemployed graduates: Are they from specific institutions? Are there curriculum issues that affect employability? Are there resource issues? Are there quality assurance issues?
- Retraining of non-ICT graduates.
- Are industry and Higher Education (HE) “missing” each other?
- Are there national standards?
- Quality in schools: universities should consider partnering with local schools.
- Volunteer activities from industry could also help address the needs of schools.

2) Capacity

It was generally agreed that there was capacity in the HE system for increased production of ICT graduates. However, this is not evenly spread across institutions, levels or sub-disciplines. In particular, there is less capacity for expansion at a postgraduate level. It was felt that a framework was needed to assess the skills being produced in comparison to the needs of the ICT industry. The production and retention of academic staff was identified as a capacity-limiting problem.

3) University Intake

One of the primary mechanisms identified for improving the intake of new students into ICT subjects was a “marketing” drive. Specific ideas that were mentioned included:

- Newspaper articles on ICT topics.

- Summer camps for school children.
- Computer clubs.
- Competitions.
- Role models: sending students back to the schools they attended.

Other topics mentioned in this session included:

- Some form of “community service” for PhD students, where they would be used as lecturers in universities for a period after the completion of the PhD.
- Industry funded professorial chairs.
- Funding for student conference attendance.
- Career guidance in historically disadvantaged schools.
- Funding for workshops for staff development.
- Is the curriculum “boring”?
- Addressing a lack of self-confidence in students.
- Increasing the “public understanding” of ICT.

4) Curriculum Issues

- There was a suggestion that curricula should be “localised” if sufficient resources could be found.
- The ACM curricula were mentioned as the primary source of curriculum guidance for most institutions and ICT teaching departments.
- It was noted that the former technikons have a national consensus on their curriculum, drawn up with industry input (HEICTA is the organisation that manages this process).
- The possibility of new ICT degree offerings was raised.
- The “conversion masters” degree model that has been used very successfully overseas, and at a few local institutions was suggested as a useful mechanism for addressing the shortage of ICT skills; funding for such degree programmes was raised as an issue.
- It was noted that the general degrees (BSc, BComm, etc.) usually have a co-major, which provides an inter-disciplinary aspect
- Advisory boards/committees were mentioned as a mechanism that enables academic institutions to keep abreast of industry trends and needs.
- The tension between “education” and professional training was raised.
- It was noted that it is important for institutions to share their experience in curriculum design.

5) Partnerships

- The importance for HE, the ICT industry *and* government to all work together was noted.
- The need for national government to give a single “message” was raised (rather than sometimes conflicting or contradictory messages from DoE, DST, DoL, DoC, etc.).
- Interdisciplinary fields such as bioinformatics were suggested as areas where partnerships are essential.
- The need for collaboration between various fora was noted (e.g. BITF and CSSA).
- Partnerships with other African universities were mentioned.
- The need to think outside traditional “boxes” was noted.

6) Promotion of Research and Innovation

- The suggestion was made that government and the ICT industry should form a body to formulate “Grand Challenges” in ICT (the Meraka Institute suggested that they might be this body).
- The DST research and development strategy was mentioned.
- It was claimed that 16% of South African research and development expenditure is spent in the ICT sector.
- It was suggested that industry should propose postgraduate research projects to be carried out at universities.

7) The “Flavour” of Tertiary Education

- There was some discussion about “remodularising” the curriculum, but the need for this was not generally accepted.
- The question was posed as to whether Mathematics should be a pre-requisite for study in ICT?
- Distance education was proposed as a solution for the needs of people studying and working.
- There was a call to standardise curricula (module names, terminology, content descriptors, etc.).
- There was some discussion about perceptions of “Matric grade inflation”.
- The tension between education and training was raised again.

8) Other Encumbrances to ICT Skills Production

- The negative impact of the DoE funding formula on ICT subjects was noted. This is having a very serious impact, particularly at some HE institutions.
- Managing the demands of teaching, research, industry linkage, community involvement, etc. was noted as a particular problem for academic staff.
- Academic salaries (in comparison with ICT industry salaries) were noted as a problem. Public-private partnerships for salary subvention were mentioned as a possible solution.
- Similarly, postgraduate bursary funding levels were noted as a problem in comparison with generous salary offers made to graduates from the ICT industry.
- The qualification levels of academic staff are not uniform across the HE system.
- The rapid rate of change in the ICT sector, and the consequent impact on staff workloads was noted.

Minister Pandor made the following points before departing for another meeting:

- Universities are in the business of education (rather training).
- Consideration should be given to redefining curricula, incorporating a broad first-year base.
- There is support for differentiation with the education system (e.g. universities of technology should focus on “practical degrees”, FET colleges should focus on training).
- Lastly, she reminded delegates of the need to be creative, to “slip out of the ivory tower”.

Action Plan

It was accepted that there is some capacity in the HE system to increase the production of ICT graduates, and that there is a national (and international) need for people with these skills.

Arising from the points made above, various suggestions were made that might be included in a “Birchwood Declaration” and form the basis for a plan of action arising from the Colloquium:

- A national advertising campaign, on TV and in the press.
- Put the “Wow!” back into IT.
- Improve the public image of ICT (the CSSA might play a role here).
- Academic staff development (salaries, etc.).
- HESA might produce guides.
- Increased engagement between HE and the ICT industry:
 - Local dialogue.
 - Stretching our thinking.
- Convergence (between IT and communications) is an issue for some industry sectors.
- Entrepreneurship is an important skill for ICT students to learn.
- Commercial “software development units” may be an avenue for universities to explore. These need to be properly managed and sustainable. (UCT reported that they have had some success in this regard, mainly undertaking work for US companies).
- There was a call for the development of a “skills shortage matrix”, arranged by skill and by region.
- Partnerships were seen as important.
 - Consolidation of representative bodies.
 - Reduced competition between universities.
- The issue of the recognition of “ICT Professional Status” was raised.

A task team was established to develop a declaration/action plan, which would then be circulated to all participants. The task team consists of:

- Prof. Ken MacGregor (UCT)
- Prof. Manoj Maharaj (UKZN)
- Prof. Malcom Sainsbury (Industry — UTi Sun)
- Mr. Sean McLean (Industry — IBM)
- Mr. Roger Layton (CSSA)
- Mr. Boni Gantile (Industry — Telkom)
- Mr. Chief Mabizela (DoE)
- Prof. Dave Sewry (Rhodes University)
- Prof. Peter Clayton (Rhodes University)
- Prof. George Wells (Rhodes University)

Conclusion

(Dr. Saleem Badat, Vice-Chancellor, Rhodes University)

In closing, Dr. Badat noted the need to be realistic in expectations of the Colloquium, and that the group should be proactive and make a plan before a plan is imposed. He presented a vision of a “community of practice” for ICT, with the following characteristics:

- Healthy competition with cooperation.
- Minimum standards (through external examination, etc.).
- Curriculum planning.
- Innovative solutions (e.g. a pamphlet that could be distributed to all schools).
- A mechanism for an ongoing dialogue (three-way, between government, HE and the ICT industry).

He noted that people will take the community seriously, if it is proactive in addressing the issues around the ICT skills shortage.