Using ICT in Tertiary Education - Do We Dare To Compare?

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Proceedings of the 16th Annual NACCQ, Palmerston North New Zealand July, 2003 (eds) Mann, S. and Williamson, A. www.naccq.ac.nz

ABSTRACT

Information and Communication Technologies (ICT) are major driving forces of globalised and knowledge-based societies of a new world era. They will have a profound impact on teaching and learning for two decades to come, including having dramatic effects on the way tertiary education institutions carry out their functions of teaching, learning and research, particularly on the creation, dissemination and application of knowledge. These developments pose unprecedented challenges to tertiary institutions. The purpose of this paper is then to describe a high-level framework that could be used to assess tertiary institutions' use of ICT for improvements in the tertiary sector. The empirical study has already commenced in South Africa and the comparative study in New Zealand will start near the end of the year.

Key words

IT Management, Academic Management

1. INTRODUCTION

As countries increasingly become knowledge-based societies, there will be a greater demand for continuing and life-long education. With this development the need for even more flexible learning, available anywhere, anytime and on any topic will increase. The impact of technology puts South African institutions of higher education (Higher Education Institutions - HEIs) under pressure to provide learners with technological skills in order to adapt to all the challenges of a competitive economic environment. The shift from the Paper age to the Information age requires that the user-centered models replace provider-centered ones in which learners construct their own knowledge (Cronje & Clarke 1999:1).

Policies for South African higher education acknowledge the imperatives posed by Information and Communication Technology (ICT). So is the integration of ICT in course content and delivery emphasized by The National Plan for Higher Education (April 2001). This document emphasizes the role ICT can play in enhancing students' mobility, delivering information and to provide broader access to knowledge. However, South African HEIs still have a long way to make optimal use of ICT in the learning process. Although some institutions have made progress in this regard, there are a number of institutions and academics for which the new knowledge based era has not yet dawned.

It is hoped that through this paper HEIs can be guided to develop programmes with effective integration and utilization of ICTs in their multidimensional functions and stimulate academics to explore opportunities posed by ICT much more. Lastly, the authors provide guidelines on how to compile an institutional ICT profile to determine the readiness and maturity of an institution to apply ICT. The application of the suggested maturity tool will assist HEIs to develop a ICT profile as well as the important ICT policy document, the strategic directive of ICT implementation of an institution.

2. DETERMINE THE HEI'S MATURITY REGARDING ICT

At a conference of Rectors, Vice Chancellors and Presidents of African Universities held in Arusha, Tanzania in February 1999, the Association of African Universities (AAU) was mandated to undertake a survey

and assessment of the ICT capacities of African universities with the objective of synthesizing the knowledge base of how African universities are using ICT to improve their teaching methods, enhance learning, strengthen research functions and manage library and other academic information services.

The Carnegie Corporation funded the study. A Working Group of Experts (WGE) of some thirty selected African and international scholars and donor representatives was established. John Daly, an independent consultant, was commissioned to synthesise the knowledge base of global trends of ICT applications in academic settings, with case studies of experiences and best practices. A three-week on-line-discussion was carried out by the WGE in April 2000. The report of the on-line-discussion by the WGE was presented at the meeting of the WGE held in May 2000 at the University of Dar Es Salaam, Tanzania. Several key issues were identified (AAU 2000:3), indicating that a broad scope of further study is required.

One of the key issues is that an assessment should be undertaken of the present state of ICT in HEIs on the one hand and the future needs, on the other hand, in order to give an indication of the existing gap and also point at some critical issues. In addition should the adequacy of the ICT infrastructure to address the training needs of students to use the available ICTs in the Africa workplace after graduation be researched. Study is also recommended for curricula development to ensure that all graduates are ICT literate, to research appropriateness of ICTs to increase the efficiency of education delivery and adequate response to a new learning paradigm and the adequacy of the ICT for research and development in the light of globalization. They also recommend that studies should be done about the provision of Internet facilities to the community and being in the forefront of ICT development in the country, identification and development of ICT models that can be utilized from the experiences gathered from the case studies, and curricula development for optimal utilization of African academics and possible credit transfer for on-line courses. And finally did they recommend that steps are taken to ensure that the HEI could perform the roles expected of them in ICT innovations and that the necessity for institutional ICT policy, plans and strategies for implementation are promoted.

ICT is used in a wide range of applications in HEI's. Clearly one should be aware of the possible innovations with ICT when formulating high-level strategies and policies. Innovation can be achieved by the integration of ICT in teaching, learning, research, academic information services and other key support processes (AAU, 2000:5). For this purpose the AAU' developed an ICT Maturity Tool. This "ICT maturity tool" is a guide for studying an HEI's planning and integration of ICT resources. The purpose of this tool is to set benchmarks and goals, support application for technology related grants and create self-assessment goals. The tool can be used as framework to assess a HEI's maturity regarding the use and integration of ICT.

3. APPLYING THE MATURITY TOOL

The tool suggests looking at nine sets of variables. At high level should one consider the planning and monitoring tools, in specific the availability of an institutional strategic plan for technology, derived information policy plan, derived information master plan, and derived information project plans. Then consideration is required regarding the application of ICT in teaching and learning, covering objectives for using ICT, professional development of academic staff, technology access and usage patterns of academic staff, and technology access and usage patterns of students. Application of ICT in research is a separate consideration, including the research objectives of academic staff and students for using ICT.

Slightly removed from the core academic matters is the application of ICT in academic information services (Library), including the extent of access to online public access catalogue, services in academic information management, and training in academic information management. Then the application of ICT in administration and management: extent of ICT application for administration and management is covered, as well as ICT infrastructure (type of infrastructure, accessibility and usage patterns) and ICT organizational/support infrastructure (staff responsibilities in technical as well as functional areas). Finally should the financing of ICT be considered (funding for ICT internally and via fundraising; with distinction within budget votes or budget line items), as well as Training, Research and Development in ICT.

Overall could institutions be at any of five stages of ICT development. At the entry stage, they teach students to use the technology. At adoption stage, they use technology to support traditional instruction. At adaptation stage, they use technology to enrich curriculum. At appropriation stage, they integrate technology and use it for its unique capabilities. And at invention stage, they are prepared to develop entirely new learning environments that use technology as a flexible tool; learning becomes collaborative, interactive,

and customised. Depending on the variable, institutions may vary very much, while within the institution the differences could also be very large.

Apart from applying the maturity tool to institutions in order to understand current uses, the question arises as to how one would promote further consideration of the use of ICT at HEI's. This is of course assuming that the use of ICT in HEI's should be promoted as a key element of strategy to ensure African universities do not fall behind too much. The report of Ajayi (2002:5-13) also proposed that certain strategies and actions could be embarked on to promote the use of ICT. These and other strategies could be used simultaneously.

At executive level institutions could be encouraged and assisted to formulate sound ICT policies and sustainable strategies for their implementation, as well as to establish an ICT unit that operate at a strategic level. One could also advocate for a regulatory framework and suitable standards conducive to more effective use, growth and development of ICT in institutions. The facilitation of the creation of a network of ICT experts could also be useful to exchange staff, use e-forums to facilitate sharing of ideas and professional development and dissemination of information related to use of ICT at institutions.

Several strategies could be considered to encourage institutions. Examples include bringing together best practices in education and in ICT, supporting institutions to use ICT in services and projects reaching out to communities, advising them on the use of ICT to improve support services and human resource capacity, and facilitating initiatives increase connectivity.

These strategies with their action plans are useful to all HEI's in South Africa and Africa to make use of and to become part of this initiative. "African universities have to run very fast to avoid falling very far behind" (Kim, 2002:3). This is perhaps a good starting philosophy. The dynamic nature of ICT will be taken into consideration in setting time periods in view of the rapid development in the field.

4. OBSERVATIONS

We feel it necessary to qualify our use of this framework, because the framework holds assumptions and implications that should be considered. In the first place is there some indication that increased use of ICT may be seen by Ajayi (2002) and the people participating in the debate as an unqualified benefit to the challenges faced by tertiary educational institutions in Africa. While surveys of current applications of ICT hold possibilities, the increased use of ICT does certainly not necessarily lead to improvements. It would be expected of a survey to in fact expose relative successes as well as major shortcomings.

Furthermore is the success of applying ICT not easily assessable. We know that a broad spectrum of outcomes is possible such as financial, service levels, enabling new services and improved pass rates of students. Because role players in the application of ICT also have different expectations, the measurement of the outcome can be very complicated and one sometimes experience unexpected outcomes. The same application of ICT can have different outcomes at different institutions, perceptions of role players differ and the true "need" of the institution may be different from others.

We also note that the categories of ICT applications are possibly very different from each other, and each requires a fair awareness of current literature about the applications. For example, the use if ICT for teaching has recently seen major new developments, and several papers should be available describing the types of applications and outcomes. Even within this category, in-depth analysis and comparisons are possible and has probably already been done. If the aim is to objectively compare institutions, then further study would be required to refine the framework.

Above observations indicate that it may be difficult to identify "best practices". A mix of objective and subjective views will be required along with the use of approaches in the IT field where "best practices" of the use of ICT are identified by institutions such as Meta Group. Maturity frameworks such as CMM and SPICE indicate a progressive hierarchy of activities whereby presence of the full spectrum of activities indicate advancement and especially implicitly increased success. The use of the proposed framework of Ajayi (2002) gives us the opportunity to explore the current spectrum of applications of ICT and possible benefits to the institution towards proposing maturity levels.

The first phase of the empirical study will involve a series of structured interviews with one University and one Technikon ("Polytechnic") in South Africa to study the current application of ICT and outcomes at each institution. The same will be done in New Zealand, starting near the end of the interviews in South Africa. These pilot projects will help us to understand the framework better before we progress to assessing national levels.

We will be asking respondents to, for each category in the framework, propose one application of ICT that could be considered as a best practice. Through our further inquiry we will explore their descriptions and explanations in order to profile and compare the applications. This should results in better

understanding of the framework, early indications of best practices and indications of overall levels of maturity. The usefulness of this framework as a tool to assess maturity and recommend strategies for actions will become clear. Further surveys with the updated tool can then expose relative strengths and weaknesses and open possibilities for improvement at institutions. It I hoped that in the end certain key best practices will enable researchers to set core criteria for the establishment of an ICT policy for all HEIs, whether in South Africa or New Zealand.

5. CONCLUSION

Various aspects of ICT capacity building for HEIs in Africa were discussed. These institutions could integrate ICT into teaching, learning, research and development and support systems. The development of an ICT profile with an ICT policy document should be viewed by any HEI as the first step. Useful advise on using the maturity tool and applying the actions with a strategy is the starting point. It is anticipated that New Zealand will gain from the initiative by participating in the pilot projects in order to apply improved frameworks for local benefit in a relative short time period. As Charles Darwin profoundly indicated: It is not the biggest, brightest, or the best that will survive, but those who adapt the quickest!

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Further recognition:

Prof HR Hay of the University of the Free State (South Africa) was investigator and co-author of the draft research report from which this paper was developed.

The project is funded by the National Research Foundation of South Africa, Technikon Pretoria and Waikato Institute of Technology from 2003 to 2005.