

Changing the 'landscape' of learning: The future of blended learning provision in newly merged South African higher education institutions

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ABSTRACT

This article analyses the implications of recent institutional mergers for information systems development and in particular for the provision of blended and collaborative learning in the South African higher education system. The merged institutions are only beginning to address these challenges. The article therefore draws attention to current conditions, key systems integration challenges and strategic decisions that can influence the outcome of information systems integration. Particular emphasis is given to access, equity, competition and cost outcomes of planning, and implementing online blended and collaborative curriculum modalities in the context of the institutional mergers.

Keywords: *Information systems, distance learning, online learning, merger, higher education, knowledge management*

INTRODUCTION

Higher education mergers in South Africa have been undertaken in order to achieve a variety of goals in a wide range of institutions and national systems. Globally, the move toward bigger institutions is driven in part by government's intention to widen participation, expand student numbers and reduce wasteful overlaps in programmes (THES 2001; Utley 2002). The achievement of economies of scale in geographically adjacent institutions is another reason cited for mergers, and it is also claimed that within a merged and unified administration substantial savings will be produced in purchasing, estates management, student services and information technology provision (Light 2002; Gould 1997).

It is argued, moreover, that information systems have a key role to play in leveraging many of the key benefits expected from higher education mergers. The period within which higher education mergers have taken place on a large scale across the globe also overlaps with a phase characterised by the extremely rapid take-up of information technologies in higher education. From the 1990s, the Internet connectivity boom opened up competition in local and global education environments (Castells 2000). Internet technologies have enabled higher education institutions to expand their operations beyond traditional face-to-face learning, by supplementing contact-based learning modalities or by offering fully Internet-based distance education programmes.

The focus of this article is on the impact of mergers on information systems in terms of their capacity to deliver learning opportunities in South African higher education institutions. The merger phase presents challenges and opportunities for those 'new' institutions that seek to develop their capacity to provide online, collaborative and blended forms of learning to current and future generations of students. In order to properly take advantage of these opportunities the new institutions must integrate information system planning with strategic planning processes around curriculum delivery.

The merged institutions are only beginning to address these challenges. For this reason it is too early for the article to describe what has actually happened in particular instances of mergers. The main emphasis is rather on identifying the main challenges, and considering possible approaches and strategic options for institutions engaged in the process.

THE MERGER PROCESS IN SOUTH AFRICA

The development of policy on higher education in South Africa is strongly politicised and is subject to competing demands for local equity-driven and global competitive-based performance frameworks (Jansen 2001). As reflected in the National Commission for Higher Education Report of 1996 and the White Paper (No.4) of 1997, the challenge for government is how to balance the need for equity while allowing for competition and sustainability in the same higher education environment.

The Department of Education (DoE) produced a number of key documents that act as reference points for higher education transformation. The 2001 National Plan for Higher Education outlined five policy goals that guide the framework for transformation (DoE 2001). These goals are to:

- Increase access
- Promote equity, to redress past demographic inequalities
- Ensure diversity, to meet national and regional skills and knowledge needs
- Build research capacity
- Re-organise the institutional landscape; establish new forms and identities.

The equity, access, human capital development and research motives for the move towards institutional mergers – as a form of reorganising the institutional landscape – are clearly reflected in these goals.

Shortly thereafter the DoE published a document entitled “Transformation and Restructuring: A New Institutional Landscape for Higher Education” (DoE 2002) (hereafter the ‘Institutional Landscape’ document) which outlined the intended rationalisation of the sector, giving specific recommendations for the regional consolidation of universities and technikons.¹ The clustering recommended in the report reduced the number of higher education institutions in South Africa from 36 to 21. The selection and allocation process by which institutions were grouped together for mergers has been strongly contested, but this is not the focus of this article which seeks to consider the challenges for information systems in facilitating these mergers.

To provide some perspective on the size of the project, the 36 higher education institutions in 2000 consisted of 21 universities and 15 technikons. In all, there were 591 161 students enrolled, of which 65.7% were enrolled in universities and the balance in technikons. There were some 14 789 permanent and 24 002 temporary academic staff employed at these institutions. The 2003/04 budget for the sector was R8.9 billion (US\$1.27Bn).

The timescale given in the ‘Institutional Landscape’ document specified that institutional implementation plans should be developed for the period, 2004–2006. The Ministry was – and still appears to be – adamant that “substantive” integration can take place in a relatively short timescale, and argued that “it is a three-to-five year process depending on the type and organisational complexity of the merged institutions” (DoE 2002, pp. 34–38). By January 2005, all

of the mergers were legally enacted which means that some of those institutions were only then only able to begin their substantive integration.

The 'Institutional Landscape' document clearly recognises the importance of "the core activities necessary to give effect to the merger such as integrating administrative, financial and *computer systems*" (DoE 2002, p. 35, emphasis added). That the structure and functioning of information systems must be redesigned in order to support such institutional arrangements is indisputable.

A scan of the challenges for mergers that the 'Institutional Landscape' document raises (DoE 2002, pp. 38–39) shows that there are multiple dimensions through which information systems can contribute. These include supporting integration at the substantive or institutional level, and at the technical and systems level such as in:

- Establishing a new culture and ethos;
- Developing new academic structures;
- Integrating academic programmes;
- Integrating research support and intellectual property management systems;
- Integrating administrative, financial, procurement and computer systems and procedures;
- Developing financial plans and consolidated budgets;
- Integrating support services;
- Integrating facilities and infrastructure planning and utilisation.

KEY QUESTIONS

This article specifically focuses on the impact of institutional mergers on information systems and on the capacity of these information systems to support current and future blended learning provision. This aspect of mergers has not been addressed in the literature. (For recent contributions on other aspects of the merger process, see for example, Jansen 2002a; Jansen 2002b; Harman & Meek 2002; Hay & Fourie 2002).

The article asks two main questions. First, how will the South African higher education merger plan, and the characteristics and capacities of information systems of the former campuses influence the integration of information systems in the new institutions? Second, how will the configuration of information systems in the merged higher education institutions facilitate or limit curriculum development based partly on blended and collaborative learning forms? This is admittedly an ambitious task, since the article deals with a range of interconnected elements: information systems, learning technology infrastructure, curriculum development, distance and blended forms of learning and strategic institutional planning. In addition, the mergers have upset the old spatial arrangement of higher education institutions in relation to their student populations, leading to potentially new alliances of institutions providing different, and even competing, patterns of access.

The article consists of two main parts. The first deals chiefly with higher education mergers and information systems. Accordingly it will discuss the key implications of mergers for information systems in South African higher education. The second part of the article explores how the provision of blended and collaborative learning in the merged institutions will be influenced by

strategic choices of delivery mode, curriculum development and inter-institutional collaboration in order to reach student populations.

In this article, 'information systems' refers to: the combination of information and communication technologies arranged in a systematic fashion in an institution, for the purpose of capturing, processing, analysing, creating, transmitting and storing data and information. This assumes a non-technicist understanding and recognises the importance of interaction between human and information systems.

MERGING INSTITUTIONS AND INFORMATION SYSTEMS

Mergers consolidate organisational entities in ways that have implications for information systems. Different kinds of merger will have consequences for information systems, as sketched below.

- There is a *weak* merger where the partners retain their original identities. There are low levels of strategic linkages in the information systems. Therefore semi-autonomous information systems are hardly affected.
- There is a *strong* merger where constituent organisations retain limited independent identity. Strategic interdependence is high. Post-merger information systems integration is complex.
- There is *full absorption* with pressure to assume a unitary institutional identity. Full operational consolidation is required. There is greatest difficulty in post-merger integration of information systems infrastructure because it requires high levels of strategic interdependence.

The mergers envisioned in the new South African 'Institutional Landscape' document accord with the *strong* or *full absorption* models described above. The 'Institutional Landscape' document presses for what it terms as 'substantive' integration of institutions that goes beyond the formal adoption of new policies, procedures and structures. The document argues that the fundamental aim of mergers is "the creation of a new institution in the full meaning of the term, that is real integration with a new institutional culture and ethos that is more than the sum of the parts" (DoE 2002, p. 39).

Table 1 is a summary of the plan for merged institutions as envisaged in that document. As indicated, 36 institutions have been reduced to 21 through mergers. The left-hand column shows the number of new institutions that are the product of the merger of a number of formerly independent universities or technikons. In effect, many of the new institutions consist of multiple campuses each with a particular number of constituent sites.

Seven of the set of 21 institutions have not been made part of a merger, or have not been required to incorporate another campus or unit. These institutions have an advantage in respect to the stability of their information systems which will not be obliged to undergo major disruptions – at least on account of the mergers. However, there are eight instances where a proposed merger involves three campuses, one example that involves four campus entities, and five new institutions which consist of two campuses.

Table 1: Summary giving the number of sites per new merged institution

Number of sites per merged institution	Number of institutions
1 (ie: no merger with any other institution)	7
2	5
3	8
4	1
Total	21

The number of sub-units and their geographical dispersion – in terms of distance from each other – represent a challenge for generating a unitary institutional identity. Arising from such configurations there are also significant academic and management challenges with respect to: consolidating learning programmes, sustaining programme quality, supporting academic staff communications and securing the integrity of administrative systems. The extent to which the new institutions meet these fundamental challenges will depend on the implementation of information systems that are based on, or are aligned with, the new mission of the institution and based on sound knowledge management principles.

This situation presents both challenges and opportunities. First, with increasing numbers of satellite campuses, all aspects of institutional management become more complex with obvious information system implications and challenges.

Second, the distance separating campuses from each other is a major factor. Distance has both positive and negative consequences. On the one hand, dispersed campuses present the opportunity of reaching a greater market of potential students. But this distance will have the unwanted effect of increasing time and travel costs associated with face-to-face interactions between staff members – academic or administrative. Consequently, information systems such as intranet infrastructures which facilitate communication become more important. This is not necessarily a simple matter of systems implementation, since technologically mediated interaction presents many challenges.

Third, the merged institutions are much larger in scale, which can bring potential economic advantages. But this cannot be realised until various systems have been put in place to leverage the potential advantages of economies of scale. Information systems can make a vital contribution toward accruing such benefits by cancelling out distance as a factor.

Lastly, the merger process presents a strategically important opportunity for institutions that hitherto have had poorly developed information systems to obtain the needed information system functionality as part of a newly merged mega-institution.

MERGING DIVERSE INFORMATION SYSTEMS IN SOUTH AFRICAN HIGHER EDUCATION

Over and above fundamental issues regarding scale, the number of campuses, their spatial locations, and strategic decisions around integration strategy, attention must also be drawn to the actual characteristics of the information system(s) in each constituent campus that will influence the eventual shape of the information system of the merged institution.

- The campuses with a larger proportion of divergent legacy (old) systems and stored data will have higher initial investment requirements to make their systems compatible and functional. In some instances, the development of information systems may require the digitisation of administration, research and learning and teaching systems and processes.
- The purchase of software licenses is significant expenditure for higher education institutions. Decisions regarding such purchases have long-term implications. There is a need to avoid the problem of incompatibility by putting in place a shared approach to software selection and diversity in the institution.
- There will be campus constellations which between them have very different levels in information systems development and sophistication that is a consequence of historical and geographical disadvantage (Letseka 2001). Where there are one or more institutions in a merger, each bringing with them fairly well developed information systems, the challenge of integration must be informed by a decision regarding which pre-existing campus system will be taken as the benchmark for planning.
- The decision was made to create a new institutional form, the 'comprehensive institutions' through merging universities and technikons. Mergers at the intersectoral level (between a university and a technikon) may engender more challenges than intrasectoral mergers (for example, between two universities) (Patterson 2001, p. 6).
- The evaluation of information system investments is an essential precursor to planning, and should not be taken to mean merely obtaining an inventory (or due-diligence report) of the existing hardware and software systems. It is necessary to quantify the full value of systems that include the human skills base in the form of experienced information systems staff.
- The construction of information systems in the newly merged systems must also take into account how they will facilitate the uploading of data into the Higher Education Information Management System (HEMIS). This presents an opportunity to renovate systems at this level as deemed necessary.

INFORMATION SYSTEM INTEGRATION IN MERGERS

A critical challenge for management in a merger is to identify the appropriate option for information systems integration in two strategic dimensions (See Table 2). The first dimension concerns the location of the computer architecture. This may range from full 'centralisation' to a fully distributed approach. Such a decision becomes more complex as the number of sub-campuses which will comprise the new merged institution increases.

The second dimension concerns the level of standardisation between software systems which can be fully standardised or structured at different levels of partial standardisation. The decision in this dimension becomes more complex where the constituent institutional systems have different levels of development (for example, bringing with them legacy systems) and different software applications (for example, from operating systems through to end-user software).

These two dimensions define the levels of inter-operability and data sharing that can be achieved between the constituent information technology sub-systems. Targeting the highest possible level of integration of the information technology systems will maximise the capacity of information systems to support integration of a range of business and communication activities at the technical level of operations.

Table 2: information system integration options in a higher education merger

Software Computer architecture	Standardised	Partially standardised	Not standardised
Centralised	Total integration		
Partially distributed			
Fully distributed			No integration

(Giacomazzi et al. 1997, p. 291)

Total integration will not necessarily be the most appropriate option. This is because the application of the Internet can offer high levels of functionality where particular information system structures or functions are decentralised to one or more campus rather than brought to the centre. Although obtaining centralisation will be tempting as a 'big bang' plan which creates the opportunity for achieving inter-operability from scratch, planners may discover that the costs associated with implementing a new system are too expensive in terms of capital investment, the migration of old systems and the disruption of personnel.

The two main functions of higher education information systems – to support academic programmes and management functions – are increasingly inseparable at the systems level as the technology of Internet portals and of Enterprise Resource Planning (ERP) systems are capable of bringing together various levels of functionality together in one system. Nevertheless they must be considered separately as they have different cost drivers. The value of ERP for the purposes of higher education is that through such systems, all areas of the institution's operations can be integrated and made 'conversant' with one another. These systems can provide value in terms of savings from automating processes, improving workflow, tightening controls and providing a user-friendly interface. But this is the ideal. In practice, many ERP systems are only loosely integrated, and data sharing is limited to periodic batch transfers. Furthermore, ERP systems are long-term projects with a timescale of several years in implementation, and are expensive to put in place (Swartz & Orgill 2001).

INFORMATION SYSTEMS AND THE DEVELOPMENT OF LEARNING INFRASTRUCTURE

There are key generic areas of operation in which information systems play a role across most higher education institutions, and some of these are: course development and design; hosting and disseminating courseware; student services; academic staff administration; research; library services; facilities management; marketing; community engagement; and management information.

For the sake of this analysis, the contribution of information systems to higher education delivery can be separated into two main activities:

- Support of higher education curriculum or programme delivery;
- Support of higher education management and administrative functions.

In the past, the higher education information systems requirements were defined largely in terms of internal business processes. Now we are seeing the shape of these systems being determined to a large extent by the outward focus on ICT-based learning platforms. For this reason, the section that follows will undertake an analysis of the challenges for curriculum and programme delivery in a merger situation.

Lest this paper be misconstrued as uncritically technicist in orientation, the following critical assumptions concerning the use of technologies in higher education learning infrastructures underly the discussion that follows. It is observed that ICT can support a learning process that is discursive, adaptive, interactive, reflective (Laurillard cited in Scholtz & Lovshin 2001, p.3) and adequately contextualised. However, there are clear challenges:

- “The use of information technology does not of itself improve learning” (Alexander 2001, pp.243–244).
- “Successful e-learning takes place within a complex system, composed of many inter-related parts, where failure of only one part of that system can cause the entire initiative to fail” (Alexander 2001, pp.240–241).
- From the point of view of learning as quintessentially a social activity, the use of technology cannot substitute for face-to-face contact with lecturers and with other students, and there are limits to how information systems can mediate such interaction.
- There are logistical and other challenges associated with the roll-out of online delivery including: system reliability (Hannah 1998, p.17); access bottlenecks from poor local connectivity services outside of the institution’s control; and variation in the sophistication of clients whose competencies are likely to affect their own perceptions of the value of the programmes for which they are registered.

INFRASTRUCTURE TO SUPPORT BLENDED AND COLLABORATIVE LEARNING

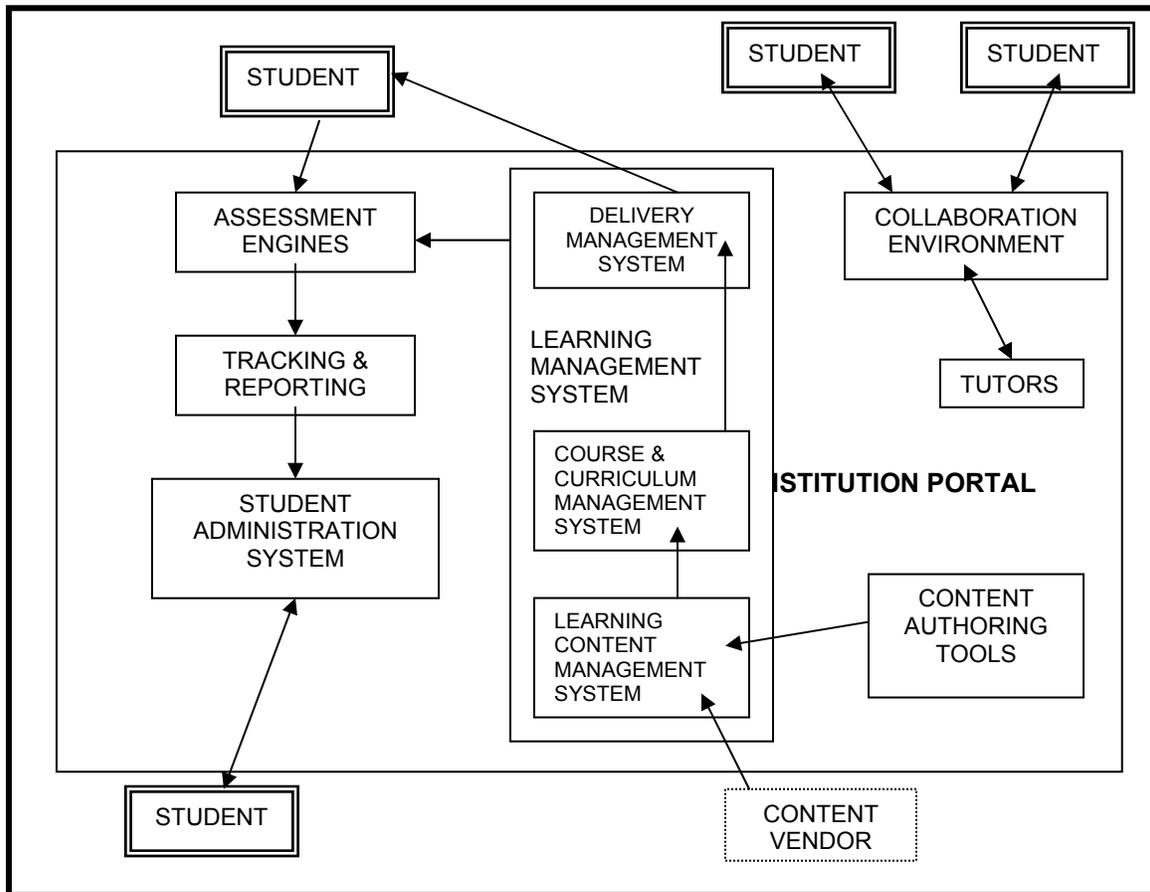
The application of information and telecommunications technologies presents opportunities for flexible learning based on collaboration and the blending of online and face-to-face interaction. This implies having the technical capacity to provide services equivalent with 4th and 5th generation distance education modes (DETYA 2001). However, the capacity to deliver such programmes must be complemented by the capacity to create them. The aim in this section is to provide an overview of the different elements that will usually be identified in a fully-fledged learning technology system.

In higher education, a set of software systems will support the provision of learning opportunities by an institution whether in part or wholly by electronic means. The functionality required of a system of the kind suitable for installation by a higher education institution may be spread across a number of products or tools and vendors. These systems must be integratable and ensure inter-operability across platforms and environments. The extent of success in this aim is directly influenced by prior decisions regarding the shape and scale of the information system of the institution. The challenges for the integration of information systems discussed earlier will impact directly on learning technology selection and acquisition. As important is to recognise that decisions about learning technologies must be informed by the institutional strategy for curriculum planning based on an assessment of who and where the target student populations are, what

knowledge and programme areas will be presented, and what kinds of learning interaction will be supported.

A variety of different software products created by vendors provide functionality in more than one area of a learning technology system. The core components of a broad 'learning technology system' are described in Figure 1 below.

Figure 1: Functions of a learning technology system



- The Learning Management system manages the learning environment providing a place where content can be organised, catalogued and presented to learners, learning plans can be managed and where learning activities can be tracked and assessed. It will have a connection to a delivery environment for delivery of learning content, for example, click2learn, Docent, Thing, desire2learn and IBM Mindspan Solutions.
- The Student Administration System manages learner registration, planning and learner profiles, for example, PeopleSoft, SCT, DataTel.
- The Delivery Management System manages the content assembly, interacts with authoring tools and supports learning delivery, for example, WebCT or Blackboard.

- The Learning Content Management System is an environment where learning developers can create (author), store, reuse, manage and deliver digital learning content, for example, Trivantis, Macromedia Products, StarOffice, PowerPoint.
- The Collaboration Environment (CE) is an environment in which students and teachers can interact in an asynchronous mode outside of the more structured systems noted above, for example, Centra, Webex, Placeware and Interwise (Collier 2002, pp.10–13).

While choosing the most appropriate configuration of platform, architecture and software elements to meet institutional needs, decision makers must consider complex trade-offs between “affordability, features, flexibility and risk” (Czerniewicz, Ravjee, & Mlitwa 2005, p.62). Central to this strategic process is achieving the optimal balance between open source, proprietary and self-developed software systems, between which all kinds of combinations are possible (Bruggink 2003, p.3).

Those favouring an open source approach argue that moving towards standards compliant open source solutions will facilitate the development and sharing of third party applications and learning content – such as learning objects (LOs) - among institutions. However, even though open source software code may in general be used, modified and distributed without cost at source, many higher education institutions are not necessarily funded or appropriately equipped with the - potentially expensive - services necessary to develop, deploy or support open source software in their own environments. In addition, LOs - or small, stand-alone units of learning content smaller than a course (Godwin-Jones 2004; Gallagher 2005, p.5) which can be stored in an ‘object library’ and shared or distributed as needed – have been described as a technology rather than a model or approach to learning as such. It is argued that LOs lack the contextual specificity to enable certain forms of learning, and a theoretical framework necessary to inform learning programme design. The learning object debate has foregrounded the tensions between instructional design and constructivist approaches to learning (Mayes & De Freitas 2004, p.30) and demonstrates that learning technology choices have implications for curriculum theory and practice.

On the other hand, the risks associated with proprietary software are well known and include: cost, vendor lock-in and limitations on system flexibility (Smart & Meyer 2005). The full complexity of the issues cannot be explored here, but it is clear that decisions regarding software strategy in higher education will inevitably impact on immediate and future system development costs and system utility.

Developing a learning system is not just a technology challenge, but requires an understanding of the bigger strategic process within which learning programme development must take place. A major obstacle to designing and developing programmes for online communities is the large development times associated with these activities (Edling 2000, p.10; Alexander 2001, pp.245–246). The main resource allocation of the institution to the costs of developing online learning programmes lies in academic/faculty time, which can easily range from the hundreds of hours over a year into thousands of hours over a longer course development process (Hannah 1998, p.15). Many institutions have IT support centres and some have instructional support centres. Yet despite calls for greater integration of ICT into higher education curricula, academics in South Africa and more broadly have been slow to respond. In some cases, institutions expect academics to do more with technology, but do not incentivise the process. Typically, the formal mechanisms for academic recognition privilege research output, rather than the quality of an academic’s commitment to implementing ICT-based courseware.

THE ENVIRONMENT WITHIN WHICH BLENDED AND COLLABORATIVE LEARNING WILL BE OFFERED

Before the merger process, South African higher education institutions had advanced to various stages of sophistication in the development of their online presence and their capacity to support learning. This produced an emerging segmentation of the higher education market based on the patterns of physical and online access among registered students. The reconfigured institutional shape of higher education in South Africa presents new opportunities and challenges for recently merged institutions to consider how to obtain an optimal pattern of delivery of learning opportunities. It remains to be seen how competitive this environment will be. In other contexts, mergers have been undertaken to improve institutional shares of markets (Borrego 2001; Maslan 2000). What follows is an attempt to identify the main drivers causing higher education institutions to invest in learning technologies for the purpose of providing blended and collaborative learning.

Institutions will seek the capacity to develop online learning opportunities for several reasons:

- As a means of adding value to their face-to-face courses (for example, online course information and materials, online library access);
- As a means of offering blended courseware;
- As a means of providing collaborative learning opportunities;
- As a means of offering distance education.

But the motives identified above do not take account of the competitive dimension. Yetton (1997 cited in McCann 1998, p.11) argues that information technologies produce opportunities for higher education institutions to differentiate themselves in at least four strategic dimensions:

- Value-added strategy where the 'traditional' or the 'elite' university uses ICT to enrich the value of its existing programmes on offer;
- Mass market cost-based strategy where a younger university uses ICT to develop and deliver a focused – restricted – range of programmes to a mass market;
- Niche market cost-based strategy may focus on niche market fields such as alternative therapies, visual and performing arts or business colleges;
- Hybridised strategy which involves using ICT to create a powerful standardised infrastructure for devolved educational programme which are flexible and distributed through several channels.

Each new merged institution will have to critically assess its capability to roll out the preferred strategy. Their analysis will have to take into account the following layers:

- The geographical reach of populations which can physically access one or more of the constituent campuses (either on a full-time or on a part time basis);
- The distribution of curriculum programmes between the constituent campuses;
- The compatibility of similar curriculum programmes between formerly different campuses;
- The extent to which face-to-face curriculum programmes are (a) complemented by existing online blended and collaborative learning resources, or (b) replicated in a fully online version.

This analysis is important since some degree of curriculum rationalisation may be necessary between different campuses in each of the newly merged institutions. Each campus – as a former independent institution – will have a historically unique set of programme offerings and a spatially limited range within which it can draw students.

None of these spatial challenges will affect a programme which is offered entirely on the Internet, and will therefore not be geographically bound. Unfortunately, this does not apply on the other side of the relationship where prospective students do not have either computer, telecommunications or Internet access. It is not possible in the constraints of this paper to address the complexities of competition between higher education institutions based on pure Internet-delivered courseware. Our concern is rather with considering how the new merged institutions will maximise their reach within the framework of a blended learning approach.

Those merged institutions which prefer to offer blended learning opportunities will confront clear spatial limitations on their ability to access student populations even where their campuses are widely dispersed. However, they can achieve greater reach through improved articulation of learning pathways in agreement with other institutions. They can consider collaborating with other institutions in reciprocal relationships in which access to each other's capacity is brought together in combination (for example, one merged institution can offer face-to-face contact while a partner institution can provide online support or vice versa). There will be considerable complexities in bringing together online courseware from one institution and face-to-face lectures and tutorials from another (for example, curriculum differences, quality assurance, co-ordination), not least of all the negotiation of financial rewards from such an agreement. Related to the possible evolution of such shared programme developments, is how the Higher Education Quality Committee of the Council on Higher Education will deal with accreditation of higher education programmes.

Based on this analysis, it is clear that a number of mission strategic decisions must be made in order for the newly merged institutions to properly plan and implement their learning management systems. These include crucial decisions on:

- The balance of emphasis between face-to-face, blended and online learning;
- Which part of the segmented market for higher education services in South Africa to focus on;
- Whether to engage in alliances with other public or private institutions to achieve further reach.

These decisions will not be taken without the influence of institutional politics and disciplinary turf disputes which will shape the merging of curricula through contestation over “whose content matters” (Jansen 2003, p.16) and how such content should be disseminated.

The creation of new merged campus constellations in a context of unequal access to information systems and learning technology infrastructures, together with different interpretations of the strategic mission of the institution may contribute in the long term to inequitable access to higher education opportunities, and provision of education of varying quality. Therefore, the creation of a set of rules for disbursing funding to institutions for developing their information technology resources may be advisable.

IMPLEMENTATION COSTS

In order to support the merger process, R800million (US\$114million) was set aside within the government's Medium Term Expenditure Framework, for disbursement mainly for re-capitalisation of undercapitalised institutions, personnel retrenchment costs, harmonising systems and for physical infrastructure (DoF 2003). Presumably, information technology system funds will be bundled under more than one of these categories. But there may be some room for concern about the ultimate information system costs of mergers.

It is likely that the constituent campuses in each merger will bring very different contributions to the table for the design of the merged information system and the learning system that will be placed on top. The 'Institutional Landscape' document was not so detailed that it gave explicit consideration to balancing the information system capacity between each merged institution. An audit of capacity in each constellation of campuses prior to merger would reveal that some institutions have a clear advantage in terms of their inherited information systems and personnel capacity. To ensure that the outcome of the mergers does not disadvantage any merged institution in respect of its inherited information systems development – and by corollary its ability to roll-out online learning programmes – the Department of Education may elect to specify certain minimum standards that can be used as a base for budget allocations on information systems.

The 'Institutional Landscape' document states that the National Education Department will cover the direct financial costs to "ensure that the merged institutions are financially sustainable" (DoE 2002, p.35). It is the related ongoing costs that cannot be fully known in advance that may threaten sustainability. Ongoing upgrading and service costs of information systems will be determined by the level of ambition of current information technology plans. For example, an institution which elects to focus more intensely on online courseware is likely to have a much more substantial need for investment in learning technology infrastructures and learning management systems than an institution which aims to work mainly in the contact mode. This raises critical questions regarding the process of allocating budgets and resources between institutions which have taken on different – but equally important – strategic imperatives.

The implementation of ICT in higher education institutions has created important challenges for the management of expenditures and the management of costs. ICT has shown itself to be continuously transformational and disruptive (Kaludis & Stine 2001, p.49) – on account of the expanding power and utility of hardware and software systems. This suggests that high infrastructure costs should not be viewed as an investment because there is a constant need for upgrading. Furthermore, the cost of instructional technology must be measured as a part of the whole institutional development process and not as a stand-alone cost. As a consequence, institutions must find ways of absorbing expansion costs on an ongoing basis. This raises important financial sustainability considerations which must be taken into account at two levels. First, the Education Department should not be expected to fund information systems and learning technology plans which are not deemed sustainable. Second, in the long term institutions may be forced to absorb costs (through additional fund raising), to embed costs in overall fees, or to levy IT fees. The latter two options may prove disadvantageous to students who cannot afford such levies.

CONCLUSION

The discussion in this paper emphasises that the fundamental question underlying the acquisition and development of information systems and learning technology systems is not only technical but also strategic in nature. In this regard, the costing of ICT-based curriculum development is difficult on account of the inability of standard accounting mechanisms to establish – or accurately

measure – costs that are allocated to the development and support of teaching programmes (McCann et al. 1998, p.7). This means that strategic decisions must not be supported solely by accounting/economic information.

The South African higher education merger process was initiated by government on a system-wide basis – though not for the first time internationally. The systemic impact of the merger has changed and will change the landscape of learning in South African higher education in ways that cannot compare with the limited, piecemeal and voluntarist basis on which higher education mergers have taken place between certain institutions in other national contexts.

The main aim of this article was to draw attention to how the creation of new merged campus constellations in a context of unequal access to information systems may reproduce the existence of unequal relations between new institutions in the newly merged institutional environment. This inequality will be expressed through different institutional capacities to mobilise operational information systems and to introduce learning technology infrastructures that will increase institutional capability to access and serve potential student clients.

This suggests three possible interrelated courses of action. The first would be to assess the relative status and quality of institutional information systems and learning technology capacity in relation to reasonable statements by the institutions of their future academic or teaching mission and plan. The second would be to scrutinise the knowledge fields covered by and the intended modalities of curriculum delivery of all institutions to assure adequate coverage and access across the country – quality assurance will remain an ongoing matter. The third would be to apply funding to institutions not only in terms of each individually stated strategic plan, and also in relation to how the combined provision of learning from all institutions - face-to-face, blended and other forms – maximises equitable access to education for students.

It would be an all but impossible task for a government to adopt the three courses of action identified above except where that government holds sway over higher education and where there is low institutional autonomy. Nevertheless, it may be necessary for some South African agent – if not government – to at least address the second course of action of co-ordinating curriculum on a regional and national basis.

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Endnote:

- ¹ Within South Africa's higher education system, technikons until recently specialised in the provision and promotion of quality career and technology education and research. They now constitute universities of technology in the new institutional landscape, similar to institutions found in Australia, Germany, Belgium for example.

REFERENCES

- Alexander, S. (2001), "E-learning developments and experiences", *Education + Training*, vol. 43, nos. 4/5, pp. 240–248.

- Borrego, A.M. (2001) "A wave of consolidation hits for profit higher education", *Chronicle of Higher Education* 47(48) 8 October 2001.
- Bruggink, M. (2003) *Open Source Software: Take it or leave it? The status of Open Source Software in Africa* International Institute for Communication and Development, Research Report No. 16. June. Accessed on 10 June, 2005 at: <http://www.ftpiicd.org/files/research/reports/report16.pdf>
- Castells, M. (2000), "The contours of the network society", *Foresight – The Journal of Future Studies Strategic Thinking and Policy*, vol. 2, no. 2, pp. 151–157.
- Collier, G. (2002), "e-Learning application infrastructure". Eduworks- Sun Microsystems White Paper. Accessed on 6 July 2003 at: <http://sunflash.sun.com/articles/55/3/opt-edu/7701>.
- Czerniewicz, L., Ravjee, N. & Mlitwa, N. (2005) *Information and Communication Technologies (ICTs) and South African higher education: Mapping the landscape* Report Commissioned by the South African Council on Higher Education, Pretoria.
- DoE (Department of Education, South Africa) (2001), *National Plan for Higher Education* Pretoria, Department of Education.
- DoE (Department of Education, South Africa). (2002), *The Transformation and Reconstruction of the Higher Education System of Education*. Accessed on 6 July 2003 at: http://education.pwv.gov.za/Policies%20and%20Reports/2002_Reports/he/transrestructuring.htm.
- DoF (Department of Finance, South Africa). (2003), *Intergovernmental Fiscal Review*, Chapter 4: Education. Available at : www.finance.gov.za/documents/ifr/2003/chp04.pdf. Accessed on 13 October 2003.
- DETYA. (2001), "Fifth Generation Distance Education", Higher Education Series Report No.40, Australian Department of Education, Training and Youth Affairs. Accessed on 2 September 2003 at: <http://www.dest.gov.au/archive/highered/hes/hes40/hes40.pdf>.
- Edling, R.J. (2000), "Information technology in the classroom: Experiences and recommendations", *Campus-Wide Information Systems*, vol. 17, no. 1, pp. 10–15.
- Gallagher, S.R. (2003), "The new landscape for course management systems", *EDUCAUSE Research Bulletin*, Issue 10, 13 May 2003. Accessed on 5 June 2005 at: <http://www.educause.edu/ir/library/pdf/ERB0310.pdf>.
- Giacomazzi, F., Panella, C., Pernici, B., & Sansoni, M. (1997), "Information systems integration in mergers and acquisitions: A normative model", *Information and Management*, no. 32 (1997), pp. 289–302.
- Godwin-Jones, R. (2004) "Emerging technologies, learning objects: Scorn or SCORM?", *Language, learning and technology* 8(2)7-12.
- Gould, F. (1997), "Think big and move for mergers", *Times Higher Education Supplement*. 2 May 1997.

- Hannah, R.L. (1998), "Merging the intellectual and technical infrastructures in higher education: The Internet example", *The Internet and Higher Education*, vol. 1, no. 1, pp. 7–20.
- Harman, K. & Meek, L. (2002) "Introduction" to special issue: 'Merger revisited: international perspectives on mergers in higher education' *Higher Education* 44(1)1-4.
- Hay, D. & Fourie, M. (2002) "Preparing the way for mergers in South African higher and further education institutions: An investigation into staff perceptions", *Higher Education* 44(1)115-131.
- Jansen, J.D. (2001), "Does the national plan effectively address the critical issues facing higher education?" *South Africa Journal of Higher Education*, vol. 15, no. 3, pp. 5–9.
- Jansen, J.D. (ed.) (2002a), *Mergers in Higher Education: Lessons learned in transitional contexts*. University of South Africa, Pretoria.
- Jansen, J.D. (2002b), "What Matters in Mergers", In K. Porteus et al. (eds.) *Higher education: Finding a scaffolding for a new imagination? Quarterly Review of Education and Training in South Africa*, vol. 9, no. 2, pp. 30–32.
- Jansen, J.D. (2003), "How mergers shape the institutional curriculum", *Education as Change*, vol. 7, no. 2, pp. 3–19.
- Kaludis, G. & Stine, G. (2001), "Strategic management for information technology", *Educause Review*, May/June, pp. 48–53.
- Laurillard, D. (1993), *Rethinking university teaching: A framework for the effective use of educational technology*, Routledge, London.
- Letseka, M. (2001), "Information and Communication Technology (ICT) Initiatives at the University of Fort Hare: Cure or Plague?", *Knowledge, Technology and Policy*, vol. 14, no. 1, pp. 67–68.
- Light, W. (2002), "Managing a merger", *Times Higher Education Supplement*, 19 April 2002.
- Maslan, G. (2000), "Rupert Murdoch's company joins with 18 universities in distance education venture", *Chronicle of Higher Education*, vol. 46, no. 39, 6 February 2000.
- McCann, D et al. (1998), "Educational technology in higher education", Occasional Paper Series, Australian Department of Employment, Education, Training and Youth Affairs. Higher Education Division. Accessed on 3 August 2003 at: <http://www.dest.gov.au/archive/highered/occpaper/edtech.pdf>.
- Patterson, G. (2001), "Playing the alliance game in higher education", *Perspectives of the Association of University Administrators*, vol. 5, no. 1, pp. 6–11.
- Scholtz, A. & Lovshin, L. (2001), "Across the great divide: The Centre for IT in Higher Education at Natal University", 3rd Annual Conference on World Wide Web Applications 5–7 September 2001. Accessed on 20 July 2003 at: <http://general.rau.ac.za/infosci/www2001/abstracts/scholtz.htm>.

Smart, K.A. and Meyer, K.A. (2005) "Changing course management systems: Lessons learned", *EDUCAUSE Quarterly* 28(2)12-26. Accessed on 05 June 2005:
<http://www.educause.edu/ir/library/pdf/eqm0322.pdf>.

Swartz, D. & Orgill, K. (2001), "Higher Education ERP: Lessons learned", *Educause Quarterly*, no. 2, pp. 20–27.

THES (Times Higher Education Supplement). (2001), "Mergers mean bigger, but not always better", Editorial, *Times Higher Education Supplement* 19 January 2001.

Utley, A. (2002) "Cultural clashes derailing mergers", *Times Higher Education Supplement* 8 November 2002.

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