Editor’s introduction

4th Annual SATN Conference 2011: Curriculum transformation at universities of technology: Towards development of new generation universities

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INTRODUCTION

The South African Technology Network (SATN) would like to thank the Editor of the South African Journal of Higher Education (SAJHE) for the opportunity to publish papers read at the 4th Annual SATN Conference that was hosted by Central University of Technology and held in Bloemfontein in November 2011. The journal makes it possible for universities of technology (UoTs) to share their collective thoughts, plans and strategies on UoT curriculum planning, design and dissemination with the rest of the higher education fraternity. Undoubtedly, this edition contributes to the development, nuance and expansion of curricula at UoTs and in other types of universities.

One may ask a few questions: What is so particular or special about curriculum at UoTs? As universities, do UoTs not employ similar curriculum strategies as others? Should they or should they not? What trends are there internationally and nationally on curriculum transformation that UoTs should find applicable?

The 4th Annual SATN Conference 2011 was organised to provide answers to the questions above and many more. The SATN believes the conference helped, in particular, to promote academic debate and knowledge sharing on philosophies, content and structure of workplace focused curricula at UoTs.

Special elements of a unique curriculum transformation framework that were addressed are the following: Work Integrated Learning (WIL) in its widest sense,1 institutional differentiation,2 technology enhanced teaching and learning methodologies, quality and standards and how we might cause a mind shift of academics to embrace technology and focus on student learning rather than teaching. As a result, the theme of the conference was:
Curriculum transformation at universities of technology: towards development of new generation universities.

The conference also provided an opportunity for attendees to gain a deeper understanding of the implications of the higher education qualifications framework (HEQF), something that has been a bone of contention for UoTs for many years. In fact, the very establishment of the SATN had so much to do with this, amongst many other reasons.

Whilst universities hustle to ensure that research becomes a significant activity and a core value, the bulk of what they actually do – teaching and learning – tends to be taken for granted, if not ignored, at university level. Michael Young (2011)\textsuperscript{3} attests to this: ‘Debates about curriculum are nothing new, and curriculum studies are a flourishing field of educational research in many countries. However, the focus has been almost exclusively on schools (and sometimes post-school provision in colleges), and rarely on universities.’\textsuperscript{4}

This special edition is, therefore, seminal in many ways, especially amongst UoTs, most of which do not have a tradition of curriculum research. It should help to reach a common understanding, within the higher education sector and within the country in general, on the realities and complexities UoTs face in curriculum transformation. Without doubt, other types of universities will benefit, too, from this body of work.

NATIONAL POLICY CHANGES AND THE EMERGENCE OF UNIVERSITIES OF TECHNOLOGY AND THE SATN

It should be appropriate at this stage to provide some background information about UoTs, and in particular, the origin, history and aims of the SATN, the network that consists of UoTs and other agencies that, by fiat, are in the business of technological education and advancement.

The National Plan on Higher Education (2001) pointed to a need to restructure the system in order to, amongst others, achieve a unitary but differentiated system. Part of this goal would be achieved by jettisoning the binary system of universities and technikons that South Africa had. Subsequently, incorporation of some campuses was promulgated and mergers – mostly forced – of whole universities and technikons were also promulgated. By 2004, six out of the 15 technikons had survived as independent universities which were to be called universities of technology.

In retrospect, there was not much thought given to what functions and role the new universities of technology were to play as a new type of university.\textsuperscript{5} But, the idea that South Africa would have a unitary but differentiated system of higher education remained intact. The unitary aspect was pursued more vigorously through the three steering mechanisms of planning, funding and quality.

Almost forgotten was the ‘differentiated’ part of the ‘unitary but differentiated system’ mantra. Universities of all types, especially the newer ones started to scramble for new meaning, role and space. This resulted in unintended mission drift
and attempts at cloning. This mission drift went both ways. There are traditional universities that also scrambled for responsiveness and relevance, so they thought. That led them to introduce work oriented rather than purely academic programmes as they would traditionally offer.

Incorporations and mergers also led to a re-alignment of a number of the binary structures that had existed. The Committee of University Principals and the Committee of Technikon Principals merged in 2005 to become the South African Universities Vice-Chancellors Association, a predecessor to the current Higher Education South Africa. No sooner had these integrated structures been established than UoTs discovered that their sub-sectoral interests could not be fully accommodated within HESA without them focusing on them collectively. One example of such sub-sectoral interest is that UoTs must produce graduates with skills and competences geared for the workplace whilst education at traditional universities could be broad-based and detached from the sometimes narrow workplace focused programmes.

It is mainly for these reasons that the SATN was established in 2006 by five of the six UoTs, namely, Cape Peninsula University of Technology, Central University of Technology, Durban University of Technology, Tshwane University of Technology and Vaal University of Technology. The SATN Trust was registered in August 2008. In September 2009, Mangosuthu University of Technology (MUT) became a member of the SATN; thus, completing the full complement of six UoTs. In September 2010 the Polytechnic of Namibia also joined the SATN, signaling a need for this organisation beyond just South Africa. From inception, the SATN has had, as representatives in its board, a HESA representative, a Department of Higher Education and Training representative, and representatives from relevant government agencies like the then Tshumisano Trust which recently became part of the Technology Innovation Agency.

The SATN was established to:

- provide a forum to discuss higher education issues affecting universities of technology, including co-operative education, work-focused teaching and learning, research training, technological innovation and technology transfer;
- advocate the needs, interests and purposes of technological higher education and its communities to government, industry and other sectors of society;
- develop policy positions and guidelines on various related higher education matters;
- encourage international co-operation with universities and organisations of similar type;
- foster links and exchanges of information with similar organizations in higher education in South Africa and abroad;
- act as a source of information about South African technology higher education institutions;
- share best practices in higher education.
SATN conferences are used to express and elucidate our value proposition to business/industry, government and other organs of society interested in workplace focused education, and in applied research and innovation. Because of the relatively young age of UoTs as universities, their value proposition goes a long way to collectively brand and market them, create an awareness of UoTs and differentiate them from other universities and post-school institutions. The conferences also provide a forum for discussing pertinent and unique UoT matters.

The inaugural conference held in 2008 was hosted by Durban University of Technology. The theme of this conference was: *The nature and characteristics of universities of technology*. From this conference and other work prior to it emerged an SATN publication in 2009 entitled: *The place and role of Universities of Technology in South Africa* (Du Pré 2009).

The theme of the 2\textsuperscript{nd} Annual Conference held in 2009 and hosted by Cape Peninsula University of Technology was: *Technological innovation at universities in South Africa: towards industrial and socio-economic development*. A publication entitled: *Universities of Technology – Deepening the Debate* (2010) followed in February 2010. During this conference, for the first time, UoTs and business/industry partners had the opportunity to exhibit their most recent research and innovation related projects.

The 3\textsuperscript{rd} Annual SATN Conference held in September 2010 was hosted by Vaal University of Technology in Vanderbijlpark. The theme of the conference was: *Universities of technology driving human resource development through partnerships*.

WHAT DRIVES CURRICULUM TRANSFORMATION DEBATES AT UoTs?

One of the most important directives from the then Department of Education (now the Department of Higher Education and Training) since the publication of the White Paper 3 – *A Programme for the Transformation of Higher Education* (July 1997) – came through the promulgation of the Higher Education Qualifications Framework (HEQF) in October 2008.

To align UoT programmes with the HEQF, virtually all UoT programmes would have to be redesigned within the new HEQF paradigm. This new paradigm suggests a completely different approach to qualifications design in that, amongst others, multiple exit points in a qualification trajectory are being discouraged. Further, stacking of sub-qualifications on a journey to a whole new qualification is also being discouraged. These have been some of the basic pillars of a number of qualifications at UoTs, with certificates leading to diplomas and diplomas leading to degrees.

Invariably, for UoTs who have to stare this radical shift in the face, it is important to have a common understanding of the concept *curriculum* and its ramifications in planning, design and dissemination. The term curriculum refers to all the facets of teaching and learning which are planned, guided and offered by an educational institution. If one of the purposes of a UoT is to provide education most suited
to the workplace, then curriculum design and dissemination strategies have to be commensurate. As a result of this focus on the workplace, Work Integrated Learning (WIL) in all its various guises – like experiential learning, cooperative education and to some extent, service learning – forms an integral part of the curriculum. The workplace and broader society, and problems these face that require solutions, tend to require multidisciplinary and transdisciplinary knowledge. Not only should UoT education provide the relevant skills, but it should equally be deep enough to afford our graduates intellectual rigour and versatility so that they could adapt to a continually changing workplace. There are many other aspects and characteristics of a technological education that UoTs need to incorporate and amongst which they need to create a critical balance.

UNIVERSITIES OF TECHNOLOGY AS NEW GENERATION ORGANISATIONS

According to Nasser and Vivier (1995), *new generation* is a term describing those organisations, principles and methods which defy the traditional way of doing things in order to find new horizons for the process of value-creation in organisations in particular, and the nation in general. It implies that the organisation is able to take a quantum leap and effect such major changes as are required to make it a leader in its sector. New generation organisations are recognized for their high degree of innovation, psychological stamina and levels of creative insight.

In the sense defined above, UoTs are by design and purpose new generation organisations. Traditionally, a university educates the bulk of its students intellectually, with the hope that those who do not remain as academics would then use their sophisticated intellectual skills to adapt to any workplace that requires cognate intellectual and practical skills.

For UoTs, the double challenge is not just to educate intellectually, but, in addition, to ensure that graduates have practical skills they could immediately apply in a workplace. This is indeed, a task bigger than what traditional universities face. It requires a critical balance between the theoretical and the practical.

CURRICULUM TRANSFORMATION IMPERATIVES FOR UoTs

As UoTs make sense of how to transform their curricula, there are various imperatives that have to be considered in all the areas of their mission of research and innovation, teaching and learning and engagement. Below, some unique features are identified and briefly discussed.

In the field of general scholarship, the typology of scholarship propounded by Boyer (1990) includes four types of scholarship, namely, discovery, integration, application and teaching. The defining mantra of traditional universities, especially following the Humboldtian revolution of the nineteenth century, has mainly been the scholarship of discovery within vertical academic fields. Because of the double challenge they face, UoTs have to embed what they do in the scholarship trinity of integration, application and teaching.
Put plainly, they have to combine the tenets of a scholarly university with market oriented imperatives. These imperatives are: to provide career focused education; to be responsive to community and industry needs; to provide social and technological innovations; to provide more open access; to frequently use advisory groups to ensure that curricula align with business/industry demands; and to provide work integrated learning in all learning programmes, where practicable, and thereby ensure that students also learn from real-life workplaces the majority should graduate into.

In the field of research and innovation, UoTs, as their primary function, have to apply whatever knowledge has been discovered and produce social and technological innovations that business and industry could find useful. Transdisciplinarity and multidisciplinary thus become integral as technology has to be exchanged and transferred to solve real-life problems in business/industry and in other organs of society. Outputs of these engagements in applied research and innovation are rarely understood and accepted by the broader research community. They tend to be more localised, if not completely different in form and nature. They would, therefore, be less prone to being published in international journals. To help to change this situation, in 2008, the SATN produced a document entitled: *The development of performance indicators for Universities of Technology and University of Technology related parts of comprehensive universities*. Though we have not seen its proposals being embraced and incorporated in the South African research and innovation system, they remain a testimony to SATN’s quest to locate its place.

In developing curricula UoTs have to engage with business, government and civil society. Amongst academics in these universities, there cannot be any pretensions of omniscience about practical manifestations of their field of academic endeavour and leadership. There cannot be any room for aloofness or disinterestedness from what the market economy out there demands. Teams of *entrepreneurial academics* and *academic entrepreneurs* from disciplines other than the major ones in which a particular learning programme is located have to collaborate and design multidisciplinary curricula because real life problems simply require such an approach.

In the field of teaching and learning, which consumes most of our time and energy in all universities, learning has to be inherently student centred. The practical learning outcomes expected in the workplace demand this. There are many implications of this learning and student centred paradigm: in the design of curricula and how the theoretical integrates with the practical; in teaching and learning methodologies and technologies required in business/industry; in assessment strategies that take place both within the university and during placements in business/industry.

Within this broad field of teaching and learning, WIL forms an integral component of education and training in UoTs. There is still a big challenge in this area: in how WIL is designed, sequenced and integrated with the theoretical aspects of the modules; how well exposed the lecturers are to the workplace environment and practical changes and nuances they need to prepare students for; how prepared students are for its practical challenges; how prepared the workplace is to receive and
impart knowledge and skills; what assessment strategies are employed during both the theory and practical sessions and how these produce a coherent outcome; what evidence exists to prove that this form of learning is efficacious and effective; what direct or indirect impact it has on employability. The list of these critical questions may be endless.

All the challenges that manifest under each field of a university’s teaching and learning process clearly show that for UoTs, engagement cannot just be an added function, but a core value, as Bjarnason and Coldstream (2003) would have.

A THEMATIC SUMMARY OF THE CONTENTS OF CONFERENCE PAPERS

The organisation and structure of this conference was radically different from the past conferences. In the past, only invited papers by national and international experts were delivered. The SATN felt that providing an opportunity for researchers and academics to submit papers would be more beneficial. It would help, amongst others, to elicit a plethora of ideas within and outside the sector; and, it would provide a real practical platform for academics to learn amongst themselves about different advances being made in curriculum transformation. Indeed, the conference papers are a mix of the theoretical and the practical.

Philosophy, content and structure

On the broader philosophical issues regarding curriculum, keynote papers and other papers provided some imperatives and thinking behind curriculum development at universities of technology. Some of these imperatives are: understanding different models of knowledge and choosing an appropriate package; the demands of the knowledge society and its rapid transformation through information and communication technologies; the challenge to provide products and processes that help to safeguard the future beyond just securing the present; given the burgeoning of knowledge in the 21st century, how specialization and deepening of disciplinary knowledge need to be re-infused even as we are in a multi-disciplinary space of the real world; the search for a critical balance between academic and vocational knowledge or conceptual and contextual knowledge or the field of knowledge and the field of practice; engendering professional relevance in graduate attributes rather than mere employability.

Papers by Wheelahan, Ntshoe and Garrod successfully deal with many of the imperatives referred to above and they should arouse, as they did, a lot of debate on the philosophy of UoT curricula.

As should be typical of universities of technology, theory must be seen in practice. Thus, in addition to the theory around the imperatives above, some case studies were presented to demonstrate how they are beginning to shape curriculum development in UoTs. The Central University of Technology’s STEPS process presented in a paper by Mthembu et al. provides a major case study in this area.
For researchers, there are many critical questions that still need to be settled, amongst which are the following: Are UoTs about professional and/or about vocational education? The challenge is that beyond these two types of education, they have to add a third element – conceptual and academic knowledge. Does this mean a fourth type of higher education with all three types innovatively and efficiently infused together into something new? UoTs tend to have more socially and academically challenged students who would have to cope with all the added layers of knowledge, whilst their counterparts at ‘traditional universities’ – arguably better academically qualified – have less layers to grapple with?

Special focus on WIL
As argued above, work integrated learning (WIL) is one of the characteristic features of a university of technology’s career focused education. It was emphasized that WIL is an integral part of the curriculum and not just an incidental ‘add on’. In the design of the curriculum, the aims, method of implementation, assessment and credit of the WIL component should be clearly described. There are major logistical and management aspects of WIL that have to be seriously considered and planned for as a UoT embarks on WIL.

Papers, like those of Nduna, Njozela and Bohloko show that the implementation of WIL requires a less didactic and more participative real world approach to university learning; and that there are serious logistical and management challenges that UoTs have yet to meet fully, beyond just the financing of WIL.

For researchers, there are several challenges regarding WIL. It seems to mean many different things to as many people. There must be a coherent model of it. The CHE guideline referred to above is a step in the right direction. But, more work still needs to be done in practice within UoTs in terms of philosophy, content, structure, dissemination and assessment of WIL.

Technology enhanced education
In this era of information and communication technologies, technology enhanced teaching and learning methodologies are becoming an essential part of a university learning environment, much more so in universities of technology. The SATN is currently engaged in a research project to determine the extent and efficiency of the use of teaching and learning technology in its member universities. In addition, some study tours have been taken to third world countries like the United Arab Emirates where there is state of the art ICT infrastructure.

The current generation of students grows up in a world with electronic devices such as television, computers, internet, email, mobile phones, GPS devices and social media such as Facebook, Twitter and Mixit. At this stage it would be difficult to imagine a university without computers, email, and electronic platforms such as Blackboard, Sakai, WebCT to support the teaching and learning process.

To remain student centred and competitive, universities must invest in Teaching and Learning Technology (TLT) infrastructure and in technical staff to maintain the
electronic equipment and provide support to academics. A great deal of effort must be put in changing the attitude of academics to make proper use of the new TLT. Universities must ensure that academics are supported to enable them to integrate technology into their teaching and learning efforts.

In their paper, Bester and Scholtz provide a theoretical framework for technology enhanced curriculum review. In addition, papers like those of Rhodes, Harilaal and Du Plessis and Van Niekerk give us practical examples of how some of these available technologies could be infused in programmes as diverse as accounting and geographical information systems.

There are several gaping challenges in this area. The quality, efficiency and effectiveness of technology enhanced education are being taken for granted. How would we assure the quality of teaching and learning in this area and even broadly? How does one introduce university wide technology enhanced systems? What tools could be used and how would they be used in such a way that they do not stultify students and make them slaves of those tools? How do we ensure that students have versatile knowledge they can use to move from one tool to another as technology advances? Some people end up blaming tools when tools do not produce what they expect, instead of thinking harder about how to produce what they need and thereby innovate and push technology forward. How do we change the mindsets of academics so that they could optimally utilize all the available technologies and transfer versatile knowledge and practical skills relating to available technologies?

Student centred learning and assessment
A student centred approach to learning requires that students take charge of their learning process, with academics only facilitating and providing guidance. This is easier said than done in a South Africa where academic integrity amongst students is under much strain through Google-inspired plagiarism and intellectual engagement, amongst others.

Papers like those of Du Preez and Fossey provide some understanding of student perspectives in such a largely self-regulated environment and what academic attributes would make our students more successful. In addition, Fossey’s paper deals with assessment strategies, using biotechnology as a case study.

What was glaringly missing from the conference debates that ensued was an appreciation of the teaching and learning challenges UoTs face generally. If UoTs claim, as they do, that they have a unique approach to teaching and learning for the workplace, then: are their academics well trained and experienced in the workplace and competent in its pedagogy; do we assume they will simply imbibe what we think are unique elements of UoT education through some osmosis and implement it efficiently and effectively? Some institutions have introduced some training programmes, some of which are even compulsory. But, how appropriate or adequate are these? Who teaches them? Have they ever been in the workplace? Do academics being taught these new methods have some regular exposure, however limited, to the workplace? Some of these questions raise more questions about pre-requisites for a
UoT academic. Clearly, a master’s degree or a doctorate, whilst very necessary, may not be sufficient.

Quality, academic standards and the HEQF

A keynote paper by Garrod provides a good backdrop of what is happening in the U.K. and other parts of Europe in this area: contestations in terms of approach, content and structure of what is commonly known in higher education circles. The paper also provides an example of a merger between a vocational college and a university in the U.K. where curriculum ‘boundary spanners’ exist despite the structural elegance of a merged university. Closer to home, a paper by Sattar et al. provides a practical example of Durban University of Technology’s conceptual framework for the quality assurance of programme design. In a paper presented in a light-hearted and psychologically focused manner, a paper by Erasmus helps to unpack the questions of what, why, how and who in the HEQF implementation process.

Because the HEQF contains provisions that UoTs have found most unsettling and have fought for many years to have revised, it should be appropriate to present some of the prevalent contentions on it.

There are four main inter-related contentions, namely, an arduous articulation route from diploma to master’s and doctoral degrees; prohibition of stacking of qualifications, an approach that allowed students with inferior academic performance to move from certificate, to diploma and eventually to degree programmes; prohibition of multiple exit points; and, the fact that the basic structure of the HEQF favours the traditional university model that is not focused on providing just-in-time skills for the workplace that could be built upon in chunks over time. In addition to these contentions, it is only the UoTs that will have to radically review their curricula, at great cost in time, energy and resources.

Given the scenario as sketched above, the HEQF will fossilise many students who access higher education through the certificate and diploma routes at just those levels. It is just unfortunate that most of these come from the most socially and educationally disadvantaged sectors of our population. This way, the middle class kids will continue to hoard the upper rungs of the higher education ladder and inequality will equally be fossilised. This is, undoubtedly, not in keeping with a developmental state that should bring within the core some of our most disadvantaged people so that they could play their rightful role in making this country prosper.

Ironically, government made the same mistake when it came to establishing a unitary, but differentiated system. As argued above, the unitary aspect was pursued at the expense of differentiation. After many attempts at unjust and haphazard differentiation it is only now that it is being taken seriously. A unitary but undifferentiated HEQF will cause its own set of difficulties that will have to be corrected in future after many casualties would have fallen by the wayside.
CONCLUSION

Since the establishment of UoTs in 2004 these institutions have made concerted efforts to do justice to their status as universities in a unitary but differentiated system of higher education.

Extensive staff development programmes have been implemented to increase the number of suitably qualified academics. And, as the conference attests, curricula have been continuously redesigned in order to produce graduates with the appropriate attributes for the labour market. Applied research and innovation have been pursued vigorously despite the small number of suitably qualified researchers. These should prove how serious UoTs are about being universities like any other university in the world.

The recapitalization programme of the Department of Higher Education and Training has made an extensive expansion of infrastructure at UoT campuses possible. Bearing in mind that these young universities are only in their ninth year of existence they all seem to be on a successful developmental trajectory and ready to assist with the higher education expansion as envisaged in the 2012 DHET Green Paper for post-school education and training.

References have been made above to various documents that the SATN has produced to show how UoTs understand and practice differentiation in a fair and transparent manner. The focus of the conference and the nuances and approaches to teaching and learning as described above and in the rest of the papers show how seriously UoTs take their role and function in the higher education sector as new generation universities that have to be given space to grow and reach their potential. As Michael Young\(^8\) asserted, not even the most renowned research based universities in South Africa have embarked on the kind of curriculum transformation projects some UoTs have embarked upon.

The body of work this special edition presents and the impact thereof will surely change the way the higher education sector in South Africa and beyond views teaching and learning, and in particular, curriculum transformation.

NOTES

1. The World Association for Cooperative Education (WACE) (2010) defines WIL as ‘combining professional work experiences with classroom learning in many forms, including: Research, Internships, Study Abroad, Service Learning, Community Service, Industry Attachments, Cooperative Education and Professional Work Placements’. In the CHE Work-Integrated Learning: Good Practice Guide (2011) WIL is defined as an umbrella term to describe curricular, pedagogic and assessment practices, across a range of academic disciplines that integrate formal learning and workplace concerns and practices. Historically, UoTs have had close associations with the world of work and the employers of their graduates. This association has always been regarded as one of the strengths of UoT education and a basic requirement for career focused education. It was achieved by a system of referred to as cooperative education which required the
tripartite participation and cooperation of the employer, the student and the educational institution. The efficient implementation of WIL has always been hampered by a lack of adequate finance as this activity is not accounted for in the state subsidy.

2 In our view as the SATN, there has not been any shared understanding, nor a transparent debate, on what the purposes of differentiation are, within what context it is taking place and what the outcomes shall be for a country in development like South Africa. Instead, there have been some glib arguments and even policy proposals that appear to assume that differentiation, any form of it, is ‘inherently just and self-evident’. In 2010, the SATN produced a discussion paper entitled: ‘Towards a fair and transparent HESA approach to institutional differentiation in the South African higher education system’. This paper simply called for some shared principled from which a differentiated system could then be constructed. Several parts of this edition actually speak to differentiation without the conference having had to single it out as an independent theme.

3 Michael Young, a world renowned educationist from the University of London visited Central University of Technology in 2011 to engage with its curriculum transformation process called the Strategic Transformation of Educational Programmes and Structures (STEPS). This process is reported on in one of the papers of the SATN conference.

4 From Michael Young’s paper: The work of Joe Muller and Trish Gibbon of SANTED, Jeanne Gamble of the University of Cape Town (UCT) and Yael Shalem of the University of the Witwatersrand (Wits) are notable exceptions.

5 Some anecdotes suggest that because of some political and other pressure from the then Committee of Technikon Principals, the then Minister of Education simply gave the name ‘university of technology’ not because he intended them to be real universities, but just to appease. This anecdote has sometimes been used to argue that UoTs should not aspire to anything that would make them fully fledged universities in their own right. However, the argument is not borne out by the Minister’s rigorous policy changes that provided a unitary, but rather undifferentiated system, through steering mechanism of planning, quality and funding for all types of universities. In our view, the cause of much angst about differentiation is that it had been undefined, which then allowed what has been called elsewhere, ‘unjust differentiation by stealth’.

6 Quoted from Mthembu (2009): Entrepreneurial academics are those academics and researchers with an entrepreneurial spirit (Clark, 1998). They are strong and productive academically, but they are also agile and progressive when it comes to interacting and benefiting from what the knowledge economy has to offer in the expanded development periphery a lá Clark. They might feel stifled if the university does not allow them opportunities to play freely in the transactional spaces. Neither would they be comfortable being completely outside the university environment. They are the best agents to effect changes in the culture, approaches and methodologies that obtain at a university, for the benefit of business and industry and eventually society.

7 Ibid. Academic entrepreneurs are those entrepreneurs, businesspeople and industrialists who have an academic hunch or orientation. Like entrepreneurial academics, they might not be interested in leaving the business world, but they remain interested in research and contributions that universities could make to enhance their core business. Universities should see these as strong allies who are likely to bring business into the transactional spaces created. A revolving door should be created through adjunct professorships and other mechanisms so that they could spend some limited time
imparting their knowledge of the world of work and perhaps refilling their academic curiosities.


**REFERENCES**


