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Curriculum Transformation at Universities of Technology: Towards the Development of New Generation Universities

CAMPUS OF THE CENTRAL UNIVERSITY OF TECHNOLOGY (CUT), BLOEMFONTEIN
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1.	**OPENING AND WELCOME** ***Prof. Thandwa Mthembu, VC: CUT & Chairperson: SATN***
	Prof. Thandwa Mthembu, Vice-Chancellor and Principal of CUT and Chairperson of SATN, opened the conference and extended a word of welcome to all delegates, and international guests in particular. A special word of gratitude was extended to the companies and organisations that sponsored the event. This year's theme feeds into the overall development trajectory followed by the SATN and the country since SATN's inception in 2006. The organisation has made progress in the following areas since the previous conference: A summary of conference proposals was discussed by the SATN Board meeting in December 2010, and informed a strategy for UoTs going forward. A project-based approach was followed to translate strategic intent into actual outcomes. At present, 8 projects are underway, among them a project focusing on differentiation, in terms of which the SATN (as a minority stakeholder of HESA) has done a lot to keep at the forefront. Secondly, there has been engagement with stakeholders and the media to promote advocacy. Enhancing the knowledge base and driving innovation on areas such as housing, water, agriculture and the environment, as well as research training, received attention. While the SATN partners are aware that it is essential to collaborate among themselves to increase their impact, this strategy failed to some extent when applications were submitted to the NRF for research chairs. In terms of knowledge and skills development, UoTs are meant to produce graduates with workplace-focused knowledge and skills that will allow them to develop innovative ways of doing things, feeding into socio-economic development and increasing the beneficial impact on society. In the area of partnerships with FET Colleges the UoT sector can also play a critical role to grow the country's workforce.

	The SATN has also been engaged in the development of performance key indicators for the UoT sector, identifying outputs that will inform the resourcing and support of the sector. The UoT sector's approach to the HEQF has been worked on tirelessly, with many proposals developed and submitted to the CHE and the DHET. It can only be hoped that these proposals will be taken into account. The CHE also recently published guidelines for Work Integrated Learning (WIL) throughout the higher education sector, in which proposals were contained for the funding of WIL. The inaugural conference of the SATN looked at the nature of the UoTs, followed in 2009 by an examination of technological innovation to drive economic growth and social development. The 2010 conference focused on the lack of critical and high-level skills, and sought to drive partnerships to address this issue. With a captive audience of young minds in UoTs, how can the sector go about equipping these young minds with the necessary skills? The theme of curriculum transformation at UoTs sprang to mind. The idea of a new generation university was the subject of a conference hosted by VUT in 2009, and will be further explored at this conference. The term "new generation organisation" is used to describe organisations that look at new ways of doing things and unlocking value despite facing adversity, overcoming tunnel vision and risk aversion and focusing strongly on the road ahead. A rigorous process was followed to identify the papers presented at the conference. A selection of those presented for consideration will be published in accredited journals to highlight research done into the area of curriculum transformation at UoTs, while the practical manifestations of curriculum transformation will be explored during the two days. In reiterating his welcome to all delegates, Prof. Mthembu also expressed a word of gratitude to the staff of the SATN office and all other participants who made the conference a reality.
2.	**PHILOSOPHIES, CONTENT AND STRUCTURE OF THE WORKPLACE-FOCUSED CURRICULUM** ***Chair: Prof. Ahmed Bawa, VC: DUT***
2.1	**Keynote Address: Forms of Knowledge and Types of Tertiary Education and their Implications for UoTs** ***Associate Professor Leesa Wheelahan, LH Martin Institute for Higher Education Leadership and Management University of Melbourne***
	The argument that I'm going to develop is that UoTs have a central role in developing the knowledge base of practice, preparing people for work but also transforming work. UoTs have two focus areas as identified by Boyer, namely scholarship of application (reflecting orientation to practice) and scholarship of teaching (reflecting the nature of students). Constructing curricula requires a theory of knowledge. But increasing

access is not enough; it is necessary to state access to what will be opened up.

We live in a knowledge economy, but there has been a retreat from knowledge in curricula. We mistake the contents of disciplinary knowledge with structured systems of meaning; disciplinary knowledge is associated with elitism. Students need criteria to judge the validity of knowledge claims, which are often lacking in curricula. They need these elements in order to be able to participate. Socially, powerful knowledge may be monopolised by social elites, but we should democratise knowledge and not deny its importance.

Why does knowledge matter? Basil Bernstein argued for access to theoretical knowledge as grounds for democracy and a means for social justice, providing people access to "society's conversation". It is used to think the unthinkable and the not yet thought in work and society, and is a means to debate the nature of the field of practice. Knowledge obviously matters more in a knowledge society, providing a key way for individuals to participate in controversies and debates in their field of practice. Increasing access is not enough; it is essential to determine access to what?

One has to determine the differences between theoretical and everyday knowledge. These are different systems of organising meaning, one being organised vertically and the other horizontally. Theoretical knowledge is general principled knowledge, following a vertical discourse. Everyday knowledge is particularised knowledge, following a horizontal discourse. Education and the workplace as different sites of learning provide access to each type of knowledge, and while the boundary is important; both are essential and cannot be traduced. Students need to be able to distinguish the basis for selecting, integrating and synthesising each. In order to render knowledge visible, we need to ensure that it is properly classified and framed.

There is a difference between academic and occupational/intermediate/professional qualifications. Academic qualifications serve to induct students into a field of knowledge versus a field of practice. The principle for selection and translation to curriculum is different, and there is a different orientation to knowledge. The issues for the same occupations, intermediate occupations and professions follow a continuum. Knowledge-based practice will differ depending on the discipline, but there will also be different social relations underpinning vocational practice; classification and framing is related to complexity of knowledge underpinning practice and social relations of communities of interest. This is where UoTs have a particularly important role to play. In "new" professions and the intermediate occupations, there is a stronger orientation toward practice.

What do universities do? They provide institutional frameworks for different frameworks for different types of programmes. Boyer's model of scholarship identified the following elements: discovery, integration, application and teaching. All universities must encompass all four forms of scholarship, but the emphasis and combination will vary depending on the type of university, its mission and its students. UoTs may place the emphasis on scholarship of application (nature of occupations and applied focus),

	and scholarship of teaching (nature of students). What does scholarship of application mean? It means building knowledge base of practice, transforming work, and preparing for work. Knowledge is not first discovered and then applied. The process should also entail new intellectual understandings arising out of the act of application. In activities such as these, theory and practice vitally interact and renew each other. Knowledge should be responsibly applied to problems. Scholarship of teaching is an area of increasing emphasis in Australia. It is important to know who your students are, how they learn, how you teach, how you remain at the cutting edge of your field, researching and improving student learning in your discipline and supporting colleagues to improve teaching. This is a major issue for UoTs, where strategies are needed at sectoral, institutional, departmental and individual levels, and capacity will have to be built at all of them. Institutions need strategies to connect with other scholarly communities. Implications for curriculum means that qualifications need to face both ways, both to the field of knowledge and the field of practice. For a qualification to qualify as a higher education qualification, it must contain a base of systematically organised knowledge. Students need recognition and realisation rules, to recognise the workplace and institution as distinct sites of learning. Students should use one site to reflect on what they learn in the other. This emphasises the importance of social partnerships with the employer, professional bodies, unions and the FET sector to support learning pathways.
2.2	**Sub-theme: Philosophies on Workplace Focused Curriculum** **Reframing Notions of Knowledge, Curriculum and Pedagogy in Universities of Technology** ***Associate Professor Isaac Ntshoe, Research Professor: Academic and Professional Pedagogy, CUT***
	Beliefs around the distinctiveness of purposes, curricula and pedagogies of UoTs are peppered by sentiments such as rapid responsiveness to the demands of the labour market, appointments of experts acknowledged by industry (not academic), promotion of equity and provision of low and high level skills. UoTs are considered unique in their ability to provide applied knowledge and their ability to adapt quickly to the demands of employers. But the curricula, pedagogy and the type of knowledge offered by UoTs have been exaggerated and oversimplified, which could have been a consequence of notions of matching and predicting supply and demand planning in the 1960s and 1970s. Often WIL is considered a unique feature of UoTs, which is also too simplistic a view. There is a danger to linking the development of curricula too closely to the demands of the labour market.

An alternative angle is needed to conceptualise curricula and pedagogy in order to make graduates employable under the changing conditions. Practice alone cannot generate the knowledge that students need to function effectively in changing employment environments. This recontextualisation entails the process of *delocating* knowledge from the disciplines where it is produced, and *relocating* it in the pedagogic discourse. For example, when we produce fitters in Engineering, we need to realise and acknowledge that practice should be based on a sound theoretical base.

Can the HEQF, competence and outcomes drive curriculum and pedagogical practices of UoTs? All qualifications necessarily involve outcomes in the sense that they represent what the holder knows and can do; i.e. the outcomes of learning. Qualifications are used in most societies by students, trainees, employees and employers to categorise these outcomes. While the HEQF and CESM are useful as guides assisting each UoT to develop a unique Programme and Qualification Mix (PQM), they also have the potential of inhibiting discussions on the improvement of UoT curricula and pedagogical practices.

Lessons learnt:

- We must be wary of using HEQF, competence, standards and outcomes-based models as drivers of curricula and pedagogy;
- Curricula and pedagogy that focus exclusively on specialised knowledge (practice) are problematic;
- The curricula themselves should be the starting points, and not competences and outcomes.
- While sectoral knowledge derived from specific occupations remains the primary resource for UoTs, such specialised knowledge needs to be strengthened in the curricula. We do not aim to compete with the traditional universities.
- Institutions should be pro-active and should not always respond to external demands that they frequently do not have control over.
- The notion of recontextualisation is the key in designing curricula that will prepare UoT graduates to function effectively in practice.
- Recontextualisation is a process of consciously *delocating* knowledge from the original field where it was produced, and *relocating* it in a different context.
- Designing innovative curricula knowledge can be decontextualized (not context bound) so that graduates will be able to function in changing employment environments and technologies.

Alternative curricula and pedagogical discourses:

- While all jobs require context-specific knowledge, many jobs also require knowledge involving theoretical ideas shared by a community of specialists who are not tied to specific contexts;
- Workers need to be able to transcend specific contexts;
- Students therefore need to be able to access theoretical knowledge to do so; this means that occupational progression is strongly related to educational progression.
- Students need to acquire the capacity to integrate knowledge (and underpinning

	principles) rather than learning the isolated and unconnected contents of disciplinary knowledge: students need to learn the systems of meaning. Issues: • Newly created UoTs have dual purposes – how do we reconcile these purposes in our curricula and pedagogies? • UoTs face a unique challenge when compared to conventional universities. The changing nature of employment and knowledge (**matching and forecasting**) means that tailoring UoT programmes according to market demands may be short-sighted as employers' views could be biased towards the short-term (**the danger of preparing graduates for specific contexts)**. • Closely related to the matching principle is the extent to which outcomes and competences drive educational reforms (curriculum change and their related pedagogical practices). Emphasis on competence statements in learning outcomes results in knowledge being categorized as 'essential embedded knowledge'. • Competence-based training assumes that outcomes can be achieved by directly teaching **outcomes;** but doing so ignores the complexity needed to create capacity. • Knowledge generated within particular UoT contexts cannot be *delocated* from contexts and relocated in diverse situations. Suggestions: • Knowledge should be decontextualized to enable graduates to transcend context-specific knowledge. • Students need to know how complex bodies of knowledge fit together in order to decide what knowledge is relevant for a particular purpose. Innovations do not come from constant practice only, but the innovation of ideas in knowledge. • Unless students have access to the generative principles of disciplinary knowledge, they will not be able to transcend the particular. • Students need to know how complex bodies of knowledge fit together to decide what knowledge is relevant for a particular purpose. • Significant innovations that are conceptually based but practically implemented might define the long term goals of UoTs.
2.3	**Sub-theme: Content and Curriculum Structure** **Towards Distinctive and Developmental Curricula at UoTs: The STEPS process at the CUT** ***Prof Thandwa Mthembu, VC of CUT*** ***Prof. Mark Orkin, Professor of Public Management, CUT*** ***Dr Michael Gering, STEPS Consultant, CUT***
	What is curriculum? Lawrence Stenhouse suggests that "a curriculum is an attempt to communicate the essential principles and features of an educational proposal in such a form that it is open to critical scrutiny and *capable of effective translation into practice*". On this basis, our paper is more about the process to consult and develop distinctive

	and developmental *qualifications*, i.e. curricula translated into practice –modules, modalities, activities, materials, support, etc. It is an attempt to communicate the essential principles and features of an educational proposal in such a form that it is open to critical scrutiny and capable of effective translation into practice. As a UoT, the CUT distinguishes itself from traditional universities on institutional and educational grounds. Vision 2020 at the CUT aims to fulfil the following institutional objectives: • Future-oriented philosophy • Developmental role • Output/impact orientation • Strategic partnerships with business, government, civil society • Flexible new generation institution • Innovation-oriented, applied research. At an educational level, the following deliverables were identified: • Entrants with diploma level school leaving qualifications; • Broad/deep, contextual and conceptual curricula; • Intense, technology-infused teaching and learning; • Comprehensive WIL; • Creating academic entrepreneurs, and • Niche-oriented mid-level graduates. CUT looked firstly at the performance of different programmes across faculties before introducing the STEPS (Strategic Transformation of Educational Programmes and Structures) programme. A workshop was held to introduce STEPS, where priorities for improving curriculum were identified. 12 task teams were identified to design and consult on the directions document. Recommendations and proposals for CUT's organisation of curriculum were formulated. The task teams consulted, benchmarked and planned widely to ensure student success through transformation of the curriculum. A more developmental focus was adopted in programmes particularly focused on the environment and sustainability. Ideal qualifications should be characterised by: • Adequate demand by students, employers and WIL placements; • Capacity should be available – qualified staff and links to triple helix organisations; • Affordability, through viable class sizes, user support and external income; • Sustainability through interdisciplinary synergies and progression; • Focus decisively on diplomas and advanced diplomas. Following these characterisations, the B.Ed programme was re-vamped using interdisciplinary themes and internet materials to meet new requirements. CUT had five B. Ed streams which lacked a guiding conceptual framework; there was a fourth year tacked on, and the quality of the programme was often criticised. New requirements were specified in a Policy on Minimum Requirements for Teacher

	Education Qualifications. The historical way that B. Ed programmes were structured was reorganised in an interdisciplinary way, taught as integrated cross-cutting themes rather than in previous silos, using OER web-based materials. Sequencing and time tabling will meet students' needs for linkage and progression. A Higher Certificate and Diploma in Renewable Energy Technology or Advising were developed. South Africa faces strong pressure to reduce its carbon footprint with renewable energy sources. Benchmarking, interviews and industry workshops were held to clarify user needs and levels. The Higher Certificate will produce technicians for installing/maintaining solar, voltaic, wind, and biogas plants. A last case study looked at WIL which dramatically improved students' chances for actual employment. A recent exit survey of 1 250 graduates showed that of students with no or poor WIL, 63% were still unemployed. Of students with good, integrated WIL, only 26% were unemployed. A good WIL cycle involves identifying placements, agreeing outcomes, preparing students, monitoring and feedback. Re-curriculating for WIL involves choice and consultation. Of 42 CUT diplomas, 55% have comprehensive WIL. STEPS new qualifications are addressing some of the rest, while 11 other qualifications have to be re-curriculated in 2012. A central office will monitor standards and delivery; faculty officers will implement the WIL cycle with the programme's help. Other task teams have made recommendations that have been mainstreamed for implementation in 2012. A modern, knowledge-based economy demands human resources that are numerically and scientifically literate, technologically fluent, and skilled at problem solving, critical analysis and engagement, as stated by Dr Charles Nwaila. UoTs need people equipped to transform and participate in the work. We need students who will not only meet labour market needs now, but also into the future. What will re-curriculation mean for re-organising the curriculum in terms of theory, theoretical application and practice? When we think about these elements, conceptual and contextual knowledge are important and have to be bridged through WIL, but we also have to think about how these elements will be incorporated into the curriculum, and how students have to be taught.
2.4	**DISCUSSION:**
	TUT: The time has gone when we produce graduates who are not able to adapt to the world of work. We should take what the panel has said to drive our thinking. VUT: What would the role of Teaching and Learning specialists be in developing new curricula? Q: The role of new technologies and social media, adopted by students themselves has not been taken into consideration as a means to change the curriculum. How can we challenge curriculum development without taking note of these new developments?

	HESA: I would like to request Prof. Wheelahan to clarify her statement that the workplace and institutions represent two different sites of learning that cannot be traduced – what are the implications of this for the binary divide? Is this important in redesigning our curricula? How does this match up to the STEPS process, and is STEPS not taking account of research at all? Prof. Wheelahan: Social media is a big part of the debate all over the world. I support mobilising all possible vehicles to support learning, but we should also be sure that we add value and open up new learning opportunities. We have to give students access to systematically organised knowledge. I'm not denigrating the use of social media. It is a tool, and not the primary focus. On education in the workplace, I don't think you can learn without doing, You cannot learn something completely in the abstract, but you can also not get access to underpinning knowledge by focusing only on practice. There is a careful balance needed between workplace learning and theory. In some places workplace learning is quite badly done – we have to make sure that workplaces are indeed learning environments. Instead of various subsidies that exist, I think we should fund employers working with educators to put structured learning environments and opportunities in place. We need curriculum outcomes and structured learning interventions. Prof. Ntshoe: The point I emphasised is that when we try to transform the curriculum, we need to think about the underlying theories in the particular discipline to enable students to apply that knowledge in the workplace in an innovative manner. In the Humanities, we require teachers to be reflective; the point is that no-one can be reflective without a deep, intellectual understanding of the teaching discipline. Prof. Orkin: When talking about differentiation, we as UoTs are frustrated because the positive elements that can arise from differentiation of the higher sector are being overlooked. While the DHET has a praiseworthy commitment to access and success, there is talk about bringing colleges into a complementary relationship with universities, and UoTs are overlooked in this relationship. I think there has to be a three-part relationship between the different layers – I'd love the SATN and HESA to meet the Minister and his advisors to take this issue forward. UoTs are committed to admitting under-prepared students who will need intensified attention of all kinds to reach graduation. The intersection between teaching the conceptual base and subject knowledge is a challenge for all lecturers. We need students who are able to talk about more than just what they have learnt, but who are able to apply the knowledge that they have learnt and solve some problems in the workplace. As for social media and new technology, I am for it. We have to think wider about the possibilities available to us. The possibilities of group learning, but also web-based and open access learning platforms should be explored, and could be used very well in large class teaching.

	The mantra at UoTs is that we want innovation oriented research, which has to be distinctive and focused particularly on issues relevant to UoTs.
3.	**PARALLEL SESSIONS**
	Sub-theme: Philosophies on Workplace Focused Curriculum ***Chair: Prof. Ahmed Bawa, VC: DUT***
3.1	**The Relevance of Workplace Learning in Guiding Student and Curriculum Development** ***Dr Joyce Nduna, Director: CE & WIL, CPUT***
	In an attempt to demonstrate that WIL is relevant in guiding student and curriculum development, it is necessary to look firstly at the theoretical framework for WIL, followed by research into current practice as well as institutional attempts to address shortcomings of current practice in responding to the HEQF. UoTs are confronted by increasing calls for graduate employability and associated graduate attributes. Although a long established tradition of UoTs, there has been little or no alignment of workplace experience to the learning outcomes of programmes and qualifications (with some exceptions). WIL has also not received dedicated funding from the DHET as time spent in the workplace has not been regarded as contact time in student learning. Several studies have outlined models for integrating theoretical and workplace learning. What complicates the transfer of academic knowledge into practical application is that knowledge in traditional learning environments are structured in silos rather than in cross-disciplinary fashion, while in the workplace the knowledge has to be applied across different cross-cutting environments. In an ideal situation, workplace learning should be aligned with academic learning through a logical relationship between the qualification's learning outcomes and the workplace. Students should be adequately prepared for workplace learning; thought should be given to when and how they will engage with workplaces at different HEQF levels in the curriculum. There should be vibrant interaction and collaboration between academia and the world of work. Quality mentoring in workplaces and continued support through technology should be provided. Effective assessment strategies and explicit articulation of learning outcomes and assessment criteria should be put in place. Students should be visited and monitored in the workplace, and the staff of institutions should be capacitated to plan, implement and monitor workplace learning. There should be adequate allocation of infrastructure, financial and human resources to support WIL. Evaluation research should be a top priority in order to integrate and align WIL and learning at the institution. Effective systems and processes for RPL should be set up to facilitate career progression and alignment of academic learning with WIL. There should be centralised information management that provide a holistic

	picture of institutional practice to add value to the function of WIL. Planning, implementing and monitoring of workplace education should be guided by an institutional policy encouraging critical engagement and continuous improvement, rather than compliance. Although an attempt was made to look at current practice in a number of fields, this presentation focuses on Engineering programmes. A SWOT analysis was conducted in preparation for a 2008 evaluation by ECSA. Documents used to conduct the analysis included a pre-audit report by the Faculty of Engineering, the actual ECSA evaluation, a SASCE survey and a report on the coordination of workplace learning by the Quality Management Directorate at CPUT. Research findings highlighted areas of improvement; it was clear that the coordination of WIL was a challenge. Areas that needed addressing included mentoring, communication, monitoring and assessment of WIL. Students were required to find their own placements, or were placed in positions where they learnt nothing. Although some programmes were found to be lacking, this was not the case throughout the institution. The 2008 ECSA evaluation report highlighted concerns about little or no evidence that there was a link between WIL and outcomes of the learning programmes. Work preparedness programmes are not credit bearing, and not part of the timetable. Some programmes did not prepare students for WIL, and in some there was little or no proof of collaboration with industry – some learning took place in a training laboratory at neighbouring educational institutions. Most mentors or evaluators did not have proof of competency to carry out assessments. In some cases, students were not assessed by an industry mentor or supervisor; assessment was left to Cooperative Education practitioners. Moderation of assessment was lacking. Some students were not visited and monitored, and records were not kept for review purposes. In some cases, students were encouraged to place themselves, which raised concerns about the suitability of placements. There was no evidence that the capacity of staff to deliver WIL had been assessed, or that there were capacity building programmes in place. There was little or no evidence of feedback from industry and how feedback was used to improve the curriculum. There was no evidence that career progression and integration of academic learning with workplace learning were facilitated through RPL. There were no centralised information management systems to provide a holistic, institutional picture of WIL. There was no WIL policy inclusive of other modalities of WIL to assist students. Research findings were reflected in a draft discussion document, which was tabled at various committees in 2010. The document was used as the basis for conceptual clarity on how learning happens in a work environment, and how it should be aligned to academic knowledge. The HEQF re-curriculation process and implementation of other modalities of WIL and WIL policy formulation would also be addressed. Workshops providing opportunities for academic departments to share how they piloted project-based learning as part of the experiential learning process were facilitated at the end of 2011.

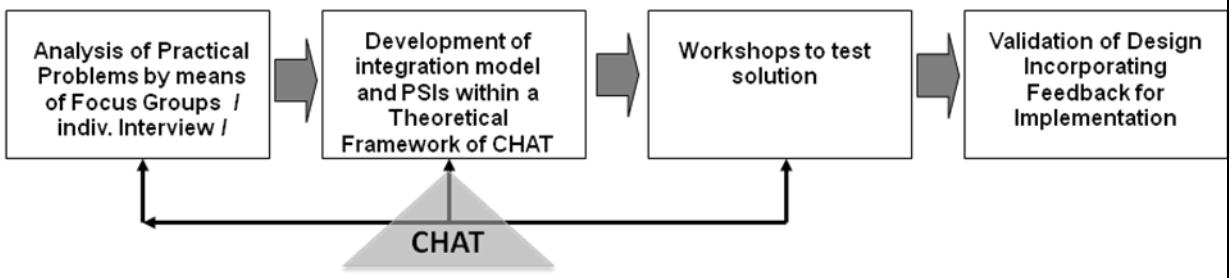
	WIL currently presents two main challenges: • It should not be viewed as a separate experiential component by the DHET for funding purposes; • It should be viewed as an integral part of teaching, learning and assessment, and should be viewed as learning rather than work, with credits assigned to it. The HEQF re-curriculation process raised the following issues: • If WIL is seen as a credit bearing element of professional curriculum, will it be funded by DHET? • Can WIL be an optional component (credit bearing but not funded by DHET)? • How do we curriculate workplace learning as an optional component? • How will UoT programmes differ from those of traditional universities? • Should we not look at the pros and cons of WIL in relation to the availability of placements, the economic climate, and the institutional cost of offering workplace learning? • If credits are assigned, does the institution have resources to support WIL? • Do we have all the facts to make an informed decision around WIL? WIL in academic programmes needs urgent attention. Challenges could be addressed through a collaborative curriculum development process requiring commitment from all stakeholders. Partnerships could make it possible for external stakeholders to monitor and assess the impact of WIL on student development. There is a need for a clear national strategy for WIL in UoTs to enable workplace learning to make a meaningful contribution to both student and curriculum development.
3.2	**Response: Perspectives on Philosophies, Content and Structure of the Workplace-Focused Curriculum** ***Mrs Bella Sattar, Director: Centre for Quality Promotion & Assurance, DUT***
	We've had quite an interesting morning so far, with some theoretical perspectives on knowledge and what constitutes workplace learning, as well as how these two learning environments should be distinguished. One of the recurrent themes that emerged is that of collaborative partnerships between the workplace and academia, but also within institutions themselves to talk about teaching and learning and research within the curriculum. The job of education is to prepare individuals for life, the better part of which is spent on work. We also need to be clear about the various formulations distinguishing between work integrated learning (WIL), experiential learning, etc. and how we know that we are doing well in all these areas. Are there boundaries between what we learn as part of the academic programme, and practice? It is necessary for any practice to be based on a strong knowledge base. Prof. Wheelahan's presentation made it clear that we should look both ways, at the teaching as well as practice. We should look carefully at academic standards, and know that it is necessary to maintain a balance

	between the conceptual and the contextual. De-contextualising WIL as a component of the curriculum is difficult; that component is often not as well structured, which raises concerns in terms of assessment and integrating WIL into the overall curriculum. One has to think carefully about the role of WIL in the curriculum, and why it is being selected as a pedagogy in the design of the curriculum. Research has indicated that the coordination of WIL and alignment with academic learning is difficult; there is no direct link. Evaluative and accreditation processes instituted by professional bodies may drive WIL processes, but could also in some instances stifle innovation. Learning outcomes are viewed from different perspectives: while it is not possible to teach outcomes, it is important to have meaningful and achievable outcomes in order to structure the curriculum. Enhancing and improving conceptual knowledge may lead to an overloaded content structure. The model of scholarship which incorporates community engagement is particularly apposite in UoTs, and could be helpful in further developing curriculum in UoTs. But, in designing pedagogy, one should be wary of content overload.
3.3	**DISCUSSION:**
	Q: Cooperative education is significant in UoTs. In most UoTs, the additional burden placed on academics through WIL has become impossible, and is something that should be addressed. Academics cannot teach, do research, do community engagement and do WIL – something will suffer in the long run. There should be some centralised management system for WIL at UoTs and dedicated staff to ensure that WIL is addressed. Q: In terms of mentoring students for WIL, there should be formal agreements in place to ensure that students are properly mentored. VUT: How do we create links between students and the world of work without professionalising WIL? Would it not help if we had a module as part of the curriculum to prepare students for WIL? DUT: The professions that traditionally had WIL (which they called experiential learning or clinical placement) were quite limited. Is it realistic of us to think about work placements in those programmes where the numbers are known to be high? We have thousands of students in some programmes. In order to do it right, we have to secure sufficient placements for these students. What do we actually mean by work based learning? Q: There is a strong view that WIL is more associated with programmes at the Diploma level. How can WIL be integrated into degree programmes, and what attributes should the staff driving WIL have – should they be administrators or academics, or a hybrid of the two? How can they deliver best on the objectives of WIL?

	Dr Nduna: Regarding the question about formal agreements, what we do is to put MoUs in place for cooperative learning and technology transfer. We also had a workshop on partnerships and the roles and responsibilities of the different partners. The issue of the workload model remains a challenge for all institutions. In terms of the attributes that staff should have, we must understand that there is a history here. People were appointed to these positions but now experience challenges in terms of the curriculum and assessment since they were purely administrative appointments. It is up to us to try and make this whole thing work. It depends on how one conceptualises WIL: if it is seen as pure work, and not linked to a qualification and learning, then it will not be successful. We need to be realistic, responsive and relevant in dealing with WIL. I know that the Deans were requested to come up with workload models at my institution, but there are a lot of sensitive issues that we have to address. A one-size-fits-all approach will not work. Q: By virtue of admitting a student, we are signing a contract with that student, so we commit ourselves to ensure that the curriculum, with all its integral parts, will provide that student with a viable qualification. We need to get together as a system to talk about that agreement. My second concern is that there is an element of our population that is constantly marginalised by work entry programmes, namely female students; we need to enter into a discussion with government and industry partners about this issue. Ms Sattar: The issues around WIL is challenging for all institutions that have enrolled higher student numbers. But, will we say that we will not have WIL, or will we look at other modalities for WIL and experiential learning that can develop and deliver the kinds of skills that we need? We will never be able to simulate the work environment one hundred percent, but it has worked in some other countries. It will obviously not work in the professions, but we have to think creatively about this issue. There was a concern about cooperative education and the skills required – academic or administrative? I don't think I can respond to that issue, it will depend on the institution itself. Q: We should not be talking about WIL when that is not what we mean – we should talk about experiential learning if that is what is required.
4.	**PARALLEL SESSION**
	11:30 - 12:45 – Sub-theme: Content and Curriculum Structure ***Chair Prof A Staak***
	The facilitator, Prof. Staak, welcomed everybody present at the first parallel session. The overriding theme of the morning's plenary session was "Philosophies, content and structures of the workplace-focused curriculum", followed by another parallel session on "Content and curriculum structure". The objective of this was to take the theme a

	little deeper and further in order to focus on specific institutional practice Prof. Staak introduced Ms Nadia Rhodes (Vice-HOD and Senior Lecturer in the Department of Commercial Accounting at the University of Johannesburg), who made a presentation on "Gateways to positioning information and communication technology in accounting education", which formed part of her larger PhD study. Ms Rhodes also shared some of her experiences in changing the Diploma in Accounting at UJ.
4.1	**Gateways to positioning information and communication technology in accounting education** ***Ms Nadia Rhodes*** ***Vice HOD and Senior Lecturer, Department of Commercial Accounting, University of Johannesburg***
	There was a discussion of some research methodologies that assisted in the integration of information and communication technologies for students enrolled for the Diploma in Accounting, namely the design-based research (DBR) and cultural-historical activity theory (CHAT) that had served as gateways in the process. Over the past 40 years, the job description of the financial specialist evolved to a greater reliance on technology. The accounting industry evolved to embrace technology, and there was a definite need for accountants to have ICT skills in order to perform business tasks. Regardless of the technological evolution in the industry, however, accounting education at tertiary level continued to focus on manual accounting systems, with little integration of accounting software. There were many benefits to having ICT as an integral part of the coursework, such as the shift from passive to active learning, as well as the enhancement of student motivation, interest and attention. The alignment of accounting education and accounting practice would help to ensure improved alignment between the accounting graduate and the future employer. This alignment would only be possible with the integration of the use and understanding of accounting software packages into the overall learning experience throughout the student's studies. This unique challenge led to the design and development of a new diploma in Accounting Education at UJ, with the imperative that staff and management would have to buy into this change in order to ensure that it would be sustained throughout the process. The challenge lay in how best to design curriculum change with the focus on maintaining the existing knowledge base.

	Two innovations were proposed to effect the integration: i. A planned series of interventions for the lecturing staff in the Department of Commercial Accounting at UJ; and ii. An integration model, which was a combination of accounting educational tools, rules and principles represented in any accounting system, and the linking of these rules and principles governing the software. The process started with staff and management recognising a possible gap and a contradiction between what was being taught and what was required in the workplace. Staff interventions were designed to work through the integration model in order to develop new pedagogy knowledge for the lecturing staff. This was implemented in January 2011 for the students in all three years of the diploma. Some key features of the integration model: - The model consists of a map/guide to be used to negotiate any accounting system. - The model was primarily applicable to students in all three years of the Diploma in Accounting. - Activities could be identified by means of different colours. - There was no contradiction between the accounting rules and principles and the accounting software. - Pastel Evolution was used due to it, being powerful enough to sustain the integrations through all three years of the diploma, and also to enrich the finance-related subjects at the core of the diploma. - Add-on modules allowed for these subjects to be incorporated in the teaching process, giving a more holistic view of the business environment. The first gateway was DBR, with the following key features being imperative in the change process: - Design-Based Research (DBR) is suited to effecting practical change in education; and - DBR had facilitated a working relationship with staff and a co-operative environment, with these key features being imperative in the change process. The second gateway was Cultural-historical activity theory (CHAT): - This theory consists of two distinct parts, namely the cultural-historical theory and the activity theory. From the cultural-historical side, it was important to recognise culture in the historical background of a career-focused diploma. The integration of accounting software skills into the curriculum enhanced the career-focused feature. Graduates would now have the potential to be work-ready in a technologically enhanced work environment. - The activity theory recognised all the interlocking relationships of the education environment of the diploma.



Iterative cycles of refinement of problems, solutions, and methods

The design logic of DBR:

- The four proposed phases gave a directional map for problem identification to the verification and documentation of the interventions and the integration model.
- The cycles, as identified by the arrows, had gone through the process of CHAT.
- The four cycles refined and authenticated the findings.
- Familiarity with accounting practice assisted in the development of a practical and feasible design to affect the reform of accounting education for diploma students.
- Cycle 1 involved the substantiation cycle of the data and findings.
- Cycles 2, 3 and 4 involved the coming together of staff, management and industry in the change management process.

The graphical representation of the journey, including the four phases and the four cycles supported by DBR with the infusion of CHAT, was noted. Each cycle gone through the filtering of CHAT.

Lessons learned:

- The manual accounting system was converted into a fully integrated, computerised accounting software system.
- A gap was identified in accounting education, leading to the identification of the cycles, as well as the reading of relevant literature, linked to the initial conceptualisation of the integration model and the design of staff intervention.
- The ideas would have to be substantiated.
- Phase 1 was been designed for the purpose of data collection.
- Six months' exposure to the degree programme did not sufficiently address the gap for accounting graduates.
- Phase 1 clearly revealed staff members' fears that the inception of accounting software skills would lead to a loss of basic accounting knowledge. All subsequent workshops should therefore reassure staff that the integration model would merely facilitate the theory in terms of practical application;
- The design of phase 2 emanated from the need to authenticate and refine the core features. The first cycle in design phase 2 was cycle 2, namely the staff buy-in workshop to which staff have been invited in view of buying into the process and

	recognising the imperatives (namely the gap in accounting education compared to the accounting workplace, the need to change the teaching and learning strategies, the integration model as an avenue and a possible means of aligning accounting education to accounting practice, and the urgency and feasibility of change in accounting education). - Staff feedback affirmed the urgent need for change with the support of all staff in the process. - Cycle 3 involved a series of management and industry interventions to secure curriculum change and a working/supportive relationship with industry, as well as management's buy-in of the process. - Cycle 4 was aimed at facilitating the expectance of staff re-skilling and determining their software training needs. Three very distinct fears of staff became evident, namely the fear of the unknown, the lack of support in an unfamiliar environment, and the fear of making the jump from the acquisition of the skill to the teaching of the skill. These fears were been addressed in the final intervention, during which staff were required to pass the assessment and then apply that skill by completing a real-to-life assignment. Staff also had to train tutors who would be there to offer support in all practical sessions. The training exposed staff to the new teaching environment in the computer labs. The support and validation provide by DBR was based on the following: - Pragmatic and theoretical change in education should be facilitated. - Authentic real-to-life teaching and learning should be provided. - In the three environments of accounting, education and ICT, all variables should be considered for holistic and interactive integration. - All practical considerations should be considered in order for implementation to be effective. - The flexible iterative design revisions should facilitate a rigorist and reflective inquiry to test and refine the innovative learning environments. - The involvement of complex social interactions should be a critical component of this study. - The profile development should recognise the features of accounting practice. - Intense collaboration with staff should be evident in all phases and cycles of the design. - There should be commitment towards solving the real problem of a lack of integration in under-skilled graduates. In conclusion: - DBR, supported by CHAT, provided gateways to shape and model the designs. - The potential to close the gap for diploma students at UJ was a step closer to reality. - The interventions for staff and tutors for 2012 have commenced, and the lessons learned in the 2011 training would serve as a point of reference. - Integration developed further interest in research among staff. - At the end of the first year of implementation, there was every indication that there would be a desirable outcome at the end of the three-year period.

	Both staff and students enjoyed and appreciated the experience, and June 2011 revealed an improvement in the throughput in Financial Accounting I. A Financial Accounting I team leader had reflected as follows in her annual report: *"It gives us a lot of pride in our work to produce students who will immediately be relevant in the work place and who have a practical skill which is necessary in this day and age since very few entities use manual book-keeping."* Twenty-one out of 27 Accounting staff members had completed all three phases of training in 2010 for implementation in 2011. Approximately 70 Pastel tutors had been trained for support in 2011, while new tutors were currently being trained for 2012. The newly trained tutors for 2012 would collaborate with experienced staff to tutor first-year students. The experienced tutors from 2011 would then go on to assist staff members involved in implementation for the first time in 2012.
4.2	**Response: Perspective on philosophies, content and structure of workplace-focussed curriculum** ***Prof. LOK Lategan: Executive Dean: Research and Innovation at CUT***
	The following papers were presented: - "New knowledge, new modes or new purposes? Dilemmas confronting universities of technology" - "Reframing notions of knowledge, curriculum and pedagogy in universities of technology" - "Towards distinctive and developmental curricula of UoTs: The STEPS process at the Central University of Technology" - "Gateways to positioning information and communication technology in accounting education" Prof. LOK Lategan indicated that he had scanned the various papers and would be sharing his own understanding of them, giving four general reflections. During the first session, Prof. L Wheelahan pointed out that there should be an understanding of what knowledge was all about. Having only a simplistic understanding of knowledge might not be wise – not only in a UoT environment, but in a university environment in general. During the second session, Prof. I Nthsoe indicated that there should be a scientific understanding of what this practical or applied knowledge is all about. He also alluded to the extreme importance of understanding one's environment.

During the third session, Prof. T Mthembu, in collaboration with Dr M Orkin and Mr M Gering, presented a case study of the CUT and the implications of an "ideal curriculum". He referred to the major difference between being employable and being employed. He also stated that there should be a scientific understanding of whatever was being done, in view of the CUT claiming university status.

During the fourth session, Ms N Rhodes ensured that the attendees gained valuable experience in terms of information on theoretical knowledge and how it should be applied to enrich the programme to be offered to students.

Reflection on the sessions:

- Universities had perhaps reached the stage of moving their degrees.
- The book "Who moved my cheese?", which is all about the notion of change, points out that people are often afraid of moving from one position to another, and have fixed ideas of things. The aim of this conference was to move people towards a different way of understanding, and it would have to be knowledge informed.

The notion of academic identity involved four major changes:

- First stage: Knowledge for the sake of knowledge.
- Second stage: What constitutes knowledge?
- Third stage: The complexity of learning.
- Fourth stage: The search for academic identity.

- It was suggested that a future conference should perhaps include a discussion of the notion of continuity and discontinuity in the core function of a university of technology.

Four general responses:

- <u>Response 1</u>:
  - Changing the curriculum constitutes an immediate confrontation of academic identity (Marrow).
  - As the higher education environment is confronted with change, it would seem that academics are refraining from getting involved in what is happening with the academic and institutional identity (Teichler & Kogan).

- <u>Response 2</u>:
  - Knowledge (Plato, Kant, Thompson), knowledge production (M Gibbons) and forms of knowledge (E Castells) were explained.
  - At a theoretical level, there should be engagement with the prolegomena of knowledge for UoTs.

- <u>Response 3</u>:
  - Building on Boyer's model of scholarship, namely teaching, discovery, integration and application.

	○ The scholarship of practice (Burgener) – looking at the four-quadrant approach of Boyer, this is perhaps a fifth dimension to be added to the current understanding of scholarship. - <u>Response 4</u>: ○ In 2010, the Mail & Guardian newspaper had published a column by J Jansen on the whole notion of "Death of the intellect". The column had focused on how to balance what a university is on the one hand, with the demands of society on the other. ○ The three most important missions of a university are teaching, learning and research. ○ RRR: ▪ Role (three missions of the university) – i.e. teaching, learning and research). ▪ Responsibility (university and society) – continue producing a sound knowledge base. ▪ Relevance ("national strategy") – looking for solutions. It would appear that somehow, change should start with the universities – by thinking a new, and also symbolically by starting to move their degrees in the sense of thinking beyond the limitations that may be currently experienced in their own discourse on the matter.
4.3	**DISCUSSION**
	- UJ did not presently have a formal online assessment for Pastel, and the university was conducting its own practical assessment by running a real-to-life business, taking theoretical knowledge into account. An additional Pastel certificate would not add value to the Diploma in Accounting. - The venues on UJ's main campus were extremely small, only accommodating between 30and 55 people each. - UJ's new Soweto campus could accommodate classes of up to 184 students. Each venue had between 84 and 184 computers, with one tutor for every aisle. - UJ uses the highest level of accounting software, which is aligned to mid-sized and large companies, and any technological advance in that software is incorporated in the university's teaching and learning. UJ purchases the most up-to-date software annually, and trains the lecturers in these new developments. UJ works hard to maintain its relationship with industry, taking steps to close the gap and address the contradiction between what happens in practice and what happens in education. The university makes every effort to remain aligned with technology changes and advances in software. - After ensuring that the lecturers had a good accounting knowledge basis, UJ had then re-skilled them with the accounting software, so they had been required to make the link between the software and their accounting knowledge. ICT staff had also been re-skilled to assist in the event of any software problems. - The audience did not really understand what Ms Rhodes meant with her

	statement that UJ's work had been informed by CHAT. - Ms Rhodes explained the importance of people buying into change and recognising the relevance thereof. One could not distinguish between a practical application and the theory, so staff would therefore have to change their teaching and learning strategies. The historical culture in the teaching of Accounting Diploma students had to be identified. The change also had to be work relevant in order to meet the requirements of a career-focused diploma. Ms Rhodes' abstract and references would be made available, and everyone was invited to look at some of her references or to discuss them with her.
5.	**TECHNOLOGY ENHANCED TEACHING AND LEARNING METHODOLOGIES** **Chair: Professor Irene Moutlana, VC: VUT**
5.1	**Keynote Address: Curriculum Mapping as a Possible Technology-enhanced Curriculum Review Approach** ***Ms Marianne Bester, Head: Curriculum Development, Fundani Centre for Higher Education Development, CPUT*** ***Ms Desiree Scholtz, Faculty of Business: Teaching & Learning Coordinator, CPUT***
	Transformation of the higher education sector resulted in a need to reflect on the relevance and responsiveness of HE curricula. Considering that higher education is about complex learning, how do we ensure curricula that sustain complex learning that is coherent and progressive? The paper argues that curriculum mapping as a process and tool should look at the following issues: • What do we wish to achieve? • What do we teach? • Why teach what we teach? • What do students learn, and how? • How do we assess, and how well do student perform in assessment tasks to show that they have attained learning? • The mapping tool and the mapping process are integrated aspects of the process; these can be used to overcome the limitations of a constructivist framework. Past curriculum design practices at UoTs - lack of staff participation and teacher-centered approaches – will be addressed. The NQF was put in place in the late 1990s to create a single national framework for learning achievements, based on outcomes-based curricula. Technikons responded to the discourse of accountability and efficiency by creating modular subject structures to enable credit accumulation and transfer, but this led to a narrow notion of skills and a technicist response based on a compliance mind-set of process oriented administrative procedures. The majority of outcomes based curricula were conceptualised in a manner that displaced UoT curricula and knowledge. In the past, there was also a focus on

	functional task analysis appropriate to specific occupations. The lack of critical involvement by teaching staff led to an inability to engage with the HEQF re-curriculation process adequately. Curriculum orientation of academic staff was often characterised by one of two approaches, namely: • Fidelity approach – centrally controlled, teacher focuses on covering subject content, limited evidence of student engagement, and curriculum transmission; • Adaptation approach – teachers adapt curriculum to some extent, although the curriculum is still centrally controlled, teacher focuses on limited adaptation to suit the needs of students, curriculum adaptation; But what we do need is a shift towards student-centered learning: • Enactment approach – the engagement and enactment of both teacher and student in teaching and learning experiences, teacher responds to student needs by creating curriculum, curriculum maker. The constructivist point of view to learning expressed by McDonald & van der Horst, (2007) was that learning is a process of conceptual change whereby individuals construct new understandings of reality. Within this framework, students must discover, construct and transform knowledge to make it their own. All aspects of the system have to be in accord to support appropriate learning. In a case study focusing on a Business-related diploma programme, subject guides were used to evaluate current offerings. The rationale was that the subject guides would be used to populate a curriculum map. Subject guides are generally compiled by lecturers to guide the learners in terms of teaching outcomes and assessment related to a subject. It became apparent that there were omissions and oversights in the core components; not all learning outcomes were linked to teaching and learning activities, there was evidence of lower level cognitive skills and tasks being expected from students, and insufficient integration of theory and practice. Constructive alignment was incomplete, inconsistent or misaligned. A constructive alignment template was created, with the aim of stimulating deep and reflective conversations at the preparatory stage for developing curriculum maps. One aspect that emerged is the pertinent focus on occupational needs, with an increased emphasis on “doing” rather than “knowing” (Barnett et al. 2001). The absence of scaffolding of cognitive challenge indicated a segmented curriculum structure, which should be guarded against in re-curriculation. In curriculum mapping, it should be kept in mind that the curriculum is a blend of educational strategies, course content, outcomes, etc. It is a process that helps ensure that what is planned is actually taught, and learnt and experienced by students. Two possible examples of curriculum mapping were highlighted, and identified unit information, learning outcomes, assessment, learning experiences, learning resources, and curriculum themes.

	Another example, the web-based curriculum mapping system, was provided. This system uses technology enhanced processes to provide conceptual tools for curriculum review and development by focusing on constructive alignment, cognitive demand, coherence, outcomes, etc. It provides lines of inquiry for the intended, taught, experienced and assessed curriculum at subject, programme and institutional level. Looking at the curriculum mapping process, various stakeholders are consulted to feed into the programme review process. Gaps are identified, subject guides are revised and preliminary curriculum maps are devised, before the process is finalised. Curriculum maps are useful to gain a holistic and comprehensive view of curriculum across subject areas and levels of study. IT also acts as a mechanism to foster debate and reflection on key pedagogical issues, and allows working across different layers. The lack of academic staff participation, a result of the convenor system, impacts negatively on the current re-curriculation process. A technicist approach led to a displacement of knowledge in the curriculum. A better understanding of curriculum mapping as a process and as a tool will ensure constructive alignment and foster student-centered learning approaches, which will lead to changed teaching practice.
5.2	**Sub-theme: Technology-enhanced Teaching and Learning Methodologies, Including Work Integrated Learning** **"Mental Models" that students possess about WIL with reference to the new curriculum framework** ***Dr Duduzile Njozela, School of Education, DUT***
	This presentation will look at policy informing teacher education, what mental models are, and lastly the research conducted into the issue. This study took note of the Norms and Standards for Educators, introduced as an initiative of the Government of National Unity. Under this initiative, educators were required to be competent in curriculum design. Curricula had to be outcomes based and had to contain learner-centered pedagogy. Teachers experienced difficulties in ensuring continuity in terms of their experiences and understanding, exacerbated by the Department of Education's failure to provide adequate support and resources. A worrying finding was that teachers from impoverished rural schools benefited least from improved subject knowledge (Bertram, 2002). Teachers' poor subject knowledge was found to be a major reason for poor quality teaching and learning in many South African classrooms (Vinjevold, 1999). Little or no research was done on the implications that the new curriculum had for student teachers. WIL is an integral part of student teachers' training, socialising students to the profession and assisting in accumulating credits that lead to a qualification. Institutions differ in terms of planning for WIL, but the following example may provide some insight: • In the first year, students are meant to observe a mentor for a period of four weeks.

	• In year two, students observe as well as team teach with an experienced educator. • In the third year, students teach whole lessons and are evaluated by their supervisor, mentor and peers. • In the fourth year, students are assigned to schools for 6 months and are evaluated by their supervisor, mentor and peers. Students were inducted to teaching and prepared for WIL by means of the new approach to teaching and learning as well as design features of the curriculum. However, students experienced difficulties with the design features of the curriculum (outcomes, learner centered pedagogy and integrated knowledge). A formal study was initiated to look at the “mental models” that students possessed about WIL. Mental models are beliefs, ideas or common understandings that the teachers held about children’s minds and learning which caused them to behave in a certain way. Mental models were defined as deeply ingrained pictures and images influencing the way people understand the world and take actions (Senge, 1990). Mental models are embedded in culture, which shape the actions and ways of thinking of people. The study found that the mental models that the students held had little resemblance with the learning that they underwent. Espoused mental models were inferred from interviews; in action models were inferred from what teachers were doing. They believed that knowledge was something outside of the children/pupils’ minds, located in textbooks, and had to be imparted to them. They also believed that children’s knowledge was incomplete and often incorrect. Student teachers also believed that they needed to move the new material from the place it entered children’s minds to the place where it will be stored, thus adding to the current store of already learned concepts skills. Strauss argues that this is a mechanistic view that teachers hold about learners. The approach followed in systematising a study of student teachers included: • Qualitative/interpretive study undertaken using the Flanders Interactive Analysis Category; • Interview questions were designed, using semi-structured questions; • Sample of 18 students assigned to a supervisor; • Research revealed that only two of the ten categories for coding classroom interaction were pupil talk; • Students were randomly assigned to a supervisor located in a specific geographical area but over a combination of disciplines (Science, Technology and Commerce); • The schools where the study was conducted included all rural schools, except for one. • There were no formal structures initiated by the DoE. • No electricity except in one township, with no proper sanitation and classrooms that were not soundproof. The study hoped to reveal: • The “mental models” that students possess during work integrated learning when

	their lessons were evaluated. • To evaluate the extent to which students adhere to the design features of the curriculum; learner centred and outcomes based pedagogy. • To reveal the extent of the challenge that students encounter in trying to find a fit between "policy" and "practice" From the interviews, it became clear that outcomes were often not communicated to learners, because student teachers did not think it was important to do so. Analogies to illustrate different models of "teacher-talk" vs. "learner-talk" were provided, which should be structured according to the 80/20 principle. Outcomes, as broad learning achievements, cannot be achieved all at once, and therefore have to be communicated clearly to learners. Findings indicated that teacher talk accounted for 76% of classroom time, while learners talked only for 24% of the time indicating that lessons were teacher-centered; student teachers did not allow learners to take control of their learning. Student teachers appeared to act on hunches, like experienced educators, rather than on what theory says. Student teachers struggled to show a relationship between learning outcomes and the topic of the lesson. Other studies revealed that the essence of teaching and learning is being lost in mechanical deference to a poorly understood curriculum. Educational policies were also considered out of touch with the reality. Better resourced and historically privileged schools were deemed to be better capable of managing curricula than historically disadvantaged schools, and the exclusion of the personal dimensions of the community in implementation educational policy was considered inadequate.
5.3	**Sub-theme: Assessment Strategies and Graduate Attributes** **Conceptualising postgraduate training in biotechnology at UoTs** ***Prof. Annabel Fossey, Biotechnology, Faculty of Health and Environmental Sciences, CUT***
	Biotechnology is a modern word for a practice that is thousands of years old. Biotechnology gave us our first beer, and also led to the development of the plants and animals that we consume today as food. It has become exceptionally complex over the years, requiring increasingly complex thinking. It is the interdisciplinary merging between biological sciences and technology. It is a technique that uses living organisms or substances from those organisms to make or modify a product. There are many diverse industries linked to biotechnology, ranging from enzyme production to the production of genetically modified pigs for xenotransplantation (pig organs transplanted into humans). Industrial enzymes are created to produce detergents, paper and pulp, fructose and vaccines. DNA profiling has become a prominent service of biotechnology, identifying diseases, and for genetic testing to determine kinship and identify remains. The aim of this presentation is to propose a possible framework for postgraduate qualifications in biotechnology. In 2003, the Minister of Education announced that

	some Technikons would be designated Universities of Technology, to draw upon a greater diversity of students, create career oriented programmes, respond to industry needs, and achieve technology transfer. The characteristics of a UoT is that it should be research informed, curriculum should be defined by industry and the professions, there should be applied research, and an increased focus on technical capabilities. Students should be encouraged to reflect on broader issues of technology and consider its impact on society, be exposed to a wide range of disciplines, deal with management issues, work in teams, and be able to discuss and debate policies in relation to technology. The world of work says that the continuum between basic and applied research should incorporate elements like science, innovation, industrial application and products or services which can be patented and lead to enterprises that will benefit society. This means that the world of work wants graduates who can provide innovative solutions, have technical knowledge, are creative and able to think outside of the box. They must be able to communicate effectively, learn quickly, provide solutions and take decisions. They need affective skills and traits such as responsibility, a positive attitude, interpersonal skills and the ability to work both in a team and independently. Postgraduate education gains prominence on an on-going basis; postgraduates are deemed essential to driving innovation in our society. Building on this thinking, the DST adopted the 10-year Innovation Plan to drive South Africa towards a knowledge-based economy, to strengthen the "Farmer to Pharma" value chain and to establish the country as a leader in biotechnology and pharmaceuticals. These issues informed the design of the curriculum, and prompted the following questions: • At what **level** should the programme be pitched? • What are the **educational objectives**? • What **graduate attributes** should be developed? • How will the curriculum accommodate **flexibility**? • How will the curriculum be **delivered**? Industry changes rapidly, and these changes have to be reflected in the curricula. There has to be an ever widening scale of applications. We need a workforce with an understanding of and an ability to work in a range of industries. Taking the foundation provided at universities one step further, we will have to start focusing on applications and not on how the industry works. It would be appropriate to pitch such a qualification at the 5th year post Grade 12. Students should gain an understanding of biotechnology, and the subject matter, their practical skills and scientific reasoning should be developed, they should develop business acumen and transferable/employability skills, develop entrepreneurial and innovative skills, and understand the ethical skills. SAQA provided a number of expected learning achievements at Level 9, which include scope of knowledge, knowledge literacy, method and procedure, and problem solving.

	To meet these achievements, the curriculum devised has to be flexible. Two learning domains, i.e. the core and elective domains may make this a reality. An integrated approach to the curriculum will stimulate greater intellectual curiosity, improved attitudes towards education and enhanced problem-solving skills. The core curriculum could contain business and legislative content, practical laboratory skills and ethics, while the elective curriculum could focus on disciplinary topics such as enzymology, stem cell technology or immunotechnology among others. A postgraduate qualification combining core and elective components is proposed, which can be expanded with a coursework and master's dissertation. Delivery could occur through e-learning, seminars, debates and presentations. The curriculum mapping process would firstly have to focus on the purpose of the qualification, the components of the curriculum, learning activities and review of the assessment criteria by a panel of specialists. This will be followed by the construction of the student guide. These qualifications could provide students with subject knowledge, technical understanding of biotechnology, understanding the business of biotechnology, thinking out of the box, adaptability, and transferable skills. Perhaps UoTs could collaborate to share delivery of such a programme.
5.4	**DISCUSSION:**
	A number of trends emerged from this session. Curriculum responsiveness was highlighted, and could be achieved through the application of technology. It also became evident that technology driven approaches should be widely applied to deepen students' understanding of what they learn in the disciplines.
6.	**PARALLEL SESSIONS**
	Sub-theme: Technology-enhanced Teaching and Learning Methodologies, including WIL ***Chair: Prof. Irene Moutlana, VC: VUT***
6.1	**Redefining WIL in UoTs** ***Ms Gertrude Bohloko, Academic Administration, CUT***
	The democratisation of South Africa led to some unprecedented changes in education and the transformation of the Higher education landscape. Mergers and incorporations occurred, and UoTs were established, but have things changed? UoTs are seen as better able to respond to employers demands for more skilled, competent and employable students. They provide technical and professional education, focusing mainly on the application of knowledge for specific careers and professions, and provide constant upgrading through short courses. Their purpose is to produce knowledgeable professionals oriented towards the demands of the workplace,

	integrating knowledge and practice and proactively responding to the demands of the workplace as the labour market continues to diversify. UoT graduates are expected to be familiar with the world of work before being offered employment, and should be skilled, competent and employable. The skills they possess are meant to be more relevant to the demands of industry, and they are meant to adapt as diversification occurs. They must provide the means to reason about new trial solutions that are not dependent on context for meaning. However, WIL has always been a component of careers like law, teaching and social work, so it may not be true to say that it is a distinguishing feature of UoTs. UoTs do not draw only in discipline knowledge, but also on regionalised knowledge and knowledge specific to the occupations and professions that they serve. UoT curriculum decision-making is a complex exercise with a dual purpose, where knowledge boundaries are not very strong and external interference (from stakeholders like professional bodies and industry) is very strong. Such examples are to be found in areas like Tourism and Hospitality Management, where the knowledge base is not yet as strongly developed as in other areas. WIL is an integral part of UoTs' curricula and pedagogy. It represents the practical component of the knowledge practice relation; a form of practice therefore cannot generate knowledge. It is a reflective link between knowledge and practice, and is not just practical work to be undertaken in a workshop, laboratory or simulated workplace, or time spent in the workplace. A distinctive UoT curriculum has to include WIL as an integral part, and has to be based on a common philosophy that guides curriculum decision-making. Curricula require a deeper understanding of regionalisation of knowledge and associated challenges, and need to be insulated from external forces. The approach to WIL needs to be consciously decided and incorporated in the curriculum, and associated challenges have to be addressed. There is an assumption that all is going well in terms of WIL, but we need to undertake some introspection to determine if this is the case. If one considers the knowledge bases of some programmes, it is clear that there is a need for knowledge to be formalised, and the same goes for WIL. Existing policies offer little by way of understanding curriculum and pedagogical discourses and practices. At best, the HEQF seems to guide institutions when they develop their PQMs. WIL should first be an integral part of curriculum and a pedagogic issue, thereafter it should be a form of practice. It is an example of re-contextualising conceptual knowledge into procedural knowledge. WIL does not seem to be considered a curriculum issue and is not consistently incorporated in curriculum and pedagogy.

	A common knowledge-based approach to curricula, where WIL forms an integral part of the practice component, is recommended. It should transcend specific contexts and ensure the durability and quality of all offerings. The notion of conceptual and contextual approaches to understanding WIL in UoTs is the way to go, while the notion of re-contextualisation of knowledge will help to add value to the university-industry relationships. We should draw on specialist knowledge and occupational and professional fields to incorporate knowledge and practice, which should be relevant to the occupations and professions our institutions serve. WIL should pro-actively respond to the demands of the workplace as the labour market changes. WIL has the potential to improve the complex knowledge-practice relationship and facilitate life-long learning. It can define distinctiveness of UoTs and inform the criteria for quality for this university type. It can instil the ability to think virtually rather than mechanically performing previously rehearsed routines. Robust debate, consultation and position papers towards a strategy are recommended.
6.2	**Response: Perspectives on Technology-enhanced Teaching and Learning Methodologies** ***Prof. Mabokang Monnapula-Mapesela, Dean: Academic Development and Support, CUT***
	In her response to the papers presented, Prof. Monnapula-Mapesela highlighted the following: The papers presented in the afternoon session focused on curriculum design and the incorporation of WIL in curriculum. The paper focusing on curriculum mapping set the scene for the conference theme and this session in particular. The policy journey post-1994 was highlighted in particular and was helpful in setting out the demands of all stakeholders. UoTs had to cope with the demand for change, which included not only curriculum review but also upgrading of staff qualifications and the development of new qualifications. These shifts required academics at UoTs to embrace change and come out of their comfort zones. A mind shift from the previous Technikon system is required, and can be achieved through new approaches towards new curricula in terms of which all stakeholders have to be consulted; academics should see this as a benefit that can lead to better accountability. While different approaches to curriculum design were highlighted, the issue of technology as a means to enhance the curriculum was not addressed. The next paper focused on the incorporation of WIL in curriculum development. The differences between theory and practice were highlighted, particularly where WIL is concerned. Challenges of becoming more learner-centered and moving away from teacher-centered approaches were noted. The implications that the HEQF will hold for WIL, and in terms of teacher education qualifications, were noted. The last paper focused on WIL as a unique feature of all HEIs. A better understanding

	of WIL as a curriculum and pedagogical issue is called for. Clarifying the role of professional bodies in driving WIL, and using WIL to strengthen relationships between institutions, industry and other stakeholders, was emphasised. The integration of WIL into curricula will require us to take note of policies like the HEQF and the importance of the professional bodies. There is a need for rigorous interrogation of policy to be able to respond to the demands. We need to engage in benchmarking and collaboration, focusing on skills development of academic staff members responsible for curriculum development. We should also look at the challenges we have to overcome to make the most of technological advances to improve teaching and learning. The impact of new technologies has become a major force for change. We should embrace them, innovate and move ahead. Technology is no longer prohibitively costly, and the power of social media platforms should be harnessed to strengthen teaching and learning. Connectivity is an issue; we are still challenged by the divide between the haves and the have nots. Academic staff members' skills gaps have to be addressed and academics who are themselves Generation X members have to prepare for dealing with Generation Y learners. Although the use of technology is widespread, most learners come from a school sector that left them grossly under-prepared for academic study. Regarding content, we need to develop programmes that will connect students and lecturers through collaborative teaching, involving business and other stakeholders. What challenges face us in terms of WIL? UoTs should focus on the centralisation of WIL, should decide what knowledge should be addressed through WIL, should decide on the policy parameters specified by the HEQF, and be realistic in terms of the goals and implementation of WIL in all programmes. Following these decisions, funding issues should be considered.
7.	**PARALLEL SESSIONS**
	Sub-theme: Assessment Strategies and Graduate Attributes **Chair: Prof. Tjama Tjivikua**
7.1	"**Developing academic writing skills as part of graduate attributes in undergraduate curricula for bachelor's degree"** ***Ms Isabel du Preez, Curriculum Development, CUT and Prof Annabel Fossey Faculty of Health and Environmental Sciences, CUT***
	Mrs I du Preez (Curriculum Development at CUT) made a presentation on "Developing academic writing skills as part of graduate attributes in undergraduate curricula for bachelor's degree", highlighting certain issues.

	Writing is regarded as the oldest known form of communication and is also seen as one of the best methods of communication, as well as the most complex form of human behaviour. In the higher education environment, effective writing became a lost art, despite it being an essential skill that supports and fosters academic performance, not only amongst students, but also amongst academics in their journey of lifelong learning. In South Africa: - Employers rank the ability to find and access information, as well as written communication skills and the ability to use information, as the most important graduate attributes. - Academics claim that students have poor writing skills, leading to a daily drop in academic literacy standards. Academics might have the mindset that writing skills should be taught in a tacked-on course. - English is not the mother tongue of the majority of students, and first-year students tend to lack fundamental writing skills. - The curricula lack clear guidelines for the development of writing skills. The aim of the presentation was therefore to propose a process framework showing the development of academic writing skills and the integration thereof with the undergraduate curriculum using an embedded approach. The embedded approach is viewed as the most advantageous, because the curriculum is used as the vehicle to develop different skills in the student. Employing the embedded approach to developing attributes serves to create opportunities for learners to develop a broad range of skills. Process map for the development of writing skills: i. Refine graduate attributes for writing skills at each level. ii. Summarise opportunities to develop writing skills for each module/unit at all four levels. iii. Identify gaps and overlaps in learning activities, teaching activities, assessment strategies and reflective practices, and then revise as necessary. iv. Edit overlaps and fill in gaps in the curriculum. v. In the offering of a subject, document explicitly where the following skills should be built in: Learning activities, teaching activities, assessment strategies, and reflective practices. This could be done by means of noting in study guides. vi. Plan a cycle of review and evaluation. The starting point was the SAQA level descriptors, explaining learning expectations across the educational sector. Higher education works with level descriptors at levels 5 to 8, as provided by SAQA: - Level descriptors for levels 1 to 10; - Ensuring coherence across learning qualifications; - Benchmarking international comparability; and

	- Identifying expected learning achievements for communication, including writing. The refined SAQA level descriptors were aimed at producing and communicating information in respect of which a learner is able to demonstrate certain abilities: - Refined level-5 descriptors are applicable to first-year students and require that they be able to write reliably, accurately and coherently, and that they understand convention, intellectual property, copyright and plagiarism. - Refined level-6 descriptors are applicable to second-year students and require that they be able to write complex information reliably and coherently, and that they use conventions in their field of study, as well as world-of-work formats and technologies. - Refined level-7 descriptors are applicable to third-year students and require that they be able to write ideas or opinions in the form of a well-informed argument, using appropriate academic, professional or occupation discourse. - Refined level-8 descriptors are applicable to fourth-year students and require that they be able to write academic and professional or occupational ideas in texts for a range of audiences, offering creative insights, rigorous interpretations, and solutions to problems The complexity of writing was explained in terms of the student first having to compile proper sentences, then paragraphs, and then essays, reports, articles and theses. Students are sometimes expected to write such things without having had the opportunity to practise the underlying principles, which in actual fact sets them up for failure. Tangible examples of how to develop writing skills in the curriculum: During the first year, the student would be tacked on Academic Language Proficiency (ALP), grammar, language issues, topic sentences, paragraphs, writing of an introduction, body and conclusion, as well as basic argumentation. This would be done by means of workbooks and classes. The lecturer should facilitate the embedding of sentence construction, paragraph construction, linking/coherency, referencing, copyright, plagiarism, subject language, terminology, and instruction words. This would be done by means of essays, one-minute papers, crossword puzzles, mini-reviews, and short paragraphs. During the second year, the student would have to write argumentatively, reliably and coherently, write in subject context and format, and summarise effectively. This would be done by writing argumentative essays, lab reports, field reports and legal reviews and by utilising field software. During the third year, the student would have to give his/her own opinions and ideas in well-formulated arguments, reflect on the strengths/weaknesses of text, and provide recommendations. This would be done by writing critiques on presentations by peers, chapter reviews and study notes.

	During the fourth year, the student would have to write ideas academically and professionally, and write for various audiences in creative and interpretive ways. This would be done by writing formal journal articles, abstracts, newsletter articles, speeches, individual portfolios and reflections of learning experiences. It would be very important for lecturers to give proper feedback to students on their writing skills.
7.2	**Response: Assessment Strategies and Graduate attributes** ***Dr Linda van Ryneveld Director: Curriculum Development and Support, TUT***

	Prof. Staak introduced Dr L van Ryneveld.
	
	These sessions involved the following:
	- Mapping our way to coherence, alignment and responsiveness;
	- "Mental models" that students possess about work-integrated learning (WIL), with reference to the new curriculum framework.
	- Conceptualising postgraduate training in biotechnology at universities of technology; and
	- Developing academic writing skills as part of graduate attributes in undergraduate curricula.
	
	There was a golden thread running through all these sessions.
	
	Since 2005 there had been extensive changes to the school system, and teachers were being expected to keep up with those changes without having adequately prepared and without the necessary knowledge transfer.
	
	UoTs have complaints about school leavers who are underprepared, because they are unable to read, write, learn or study. Despite such complaints, UOTs continue to register these students. UOTs should stop talking about students being underprepared and rather talk about the university being prepared. If such students are admitted, things would have to be done differently. If they appear underprepared and not likely to succeed, they should not be admitted. UoTs complain about the students being admitted, but the workplace is also complaining about the students they have to employ, because they are underprepared and unable to cope, and they have to complete a lengthy in-house training process before they can be productive in the workplace.
	
	Curriculum mapping as the first step:
	- Student support
	  ○ Extended curricula
	  ○ Life-skills programmes, etc.
	- Career-focused content

	○ Knowledge doubles every five to 15 years - Graduate attributes ○ Communication, teamwork, problem-solving, critical thinking, language skills, intellectual curiosity, logical and independent thought, management skills, creativity, ethical practice, integrity, etc. ▪ If students leave with those particular skills they will probably have a mental model that is appropriate for the workplace. Mental models are deeply ingrained assumptions, generalisations, or even pictures and images that influence the way people understand the world and how they take action. - Active participants in creating a curriculum: ○ Lecturers, who are often perceived as curriculum receivers and not curriculum developers. They should learn to think about and identify problems. ○ Students, who also just receive the curriculum, and in an ideal world one would like to see students involved in the curriculum process. Students must learn to think about and identify problems, because that is what the workplace and reality is all about. ○ Industry should be consulted on what is needed and the type of students required. Putting the curriculum into practice: - Student-centred learning ○ 80/20 % principle – Teachers talk 80 % and learners talk 20 %. ○ This should be the exact opposite – students should talk more in order to ensure in-depth learning. - Authentic learning ○ Contextualised learning ○ Synergy with conceptual learning Teaching and learning should be more practical and more authentic. Some lessons learned: - Curriculum mapping is not a technicist approach and ownership. - Mental models cannot happen through knowledge acquisition only. - Graduate attributes should be embedded – act upon industry needs in order to improve the employability of students. - The importance of language skills (writing, reading and speaking skills of graduates).
7.3	**DISCUSSION**
	- Teachers/lecturers have a purpose in the classroom, and in the old-fashioned sense that purpose is to make the classroom teacher centred, but it should become student centred. This process should be facilitated, because it would not happen automatically.

	- The process of writing is complex and it should be a fundamental part of what should be done in terms of extended curricula. - It was suggested that students should give input into the curriculum, and some comments were made about the level of communication and reading skills, i.e. at Grade 7 level. There was concern that the concept of student input would not be objective. - The former technikons had now become universities of technology, and now everybody had to know how to do research. Nothing had been put in place for staff to bridge this huge divide, and they had to learn the skills of how to reduce and crystalise a huge amount of knowledge and be able to put it onto paper. Universities are not addressing their understanding of what is expected of lecturers. - With regard to writing skills, students arrive at university after having had 12 years of very poor teaching and are then expected to perform excellently after three to four years at university level, but this is not realistic. Twelve years' worth of problems cannot be fixed in four years, but universities would have to try their best. There are concerns about the level of language and communication skills offered at all UoTs. There are two issues at stake, namely grammar (basic spelling and sentence construction) and the applied version of writing (business letters, communication skills, presentations, etc.). Students should be able to communicate in English and be able to construct sentences in a way that makes sense. - There are electronic programmes available, and students should be encouraged to go to the labs and work through those grammar courses. Such courses would not count for credits, but without completing the online courses successfully, students would not be able to graduate. - Industry should guide universities, especially in the field of ICT and technology, in terms of how industry would like students to be prepared and made ready. - It should be compulsory for newly appointed lecturers to complete an orientation programme during which they would, for instance, discuss how to transfer knowledge, teaching skills, etc.
8.	**CLOSURE**
	The first day of the conference was closed at 17:00.

SOUTH AFRICAN TECHNOLOGY NETWORK
ANNUAL CONFERENCE 2011
Curriculum Transformation at Universities of Technology: Towards the Development of New Generation Universities

CENTRAL UNIVERSITY OF TECHNOLOGY, FREE STATE CAMPUS, BLOEMFONTEIN
29 NOVEMBER 2011

9.	**ANNOUNCEMENTS AND SUMMARY: DAY 1** **Prof. Tjama Tjivikua, Rector: Polytechnic of Namibia**
	Prof. Tjivikua expressed a word of welcome to all delegates, and introduced the speakers of the morning session.
10.	**QUALITY AND ACADEMIC STANDARDS**
10.1	**Keynote Address: Standards, Programmes and Structures in Universities of Technology: War Stories from the UK** ***Prof. Neil Garrod, DVC: University of Greenwich, London, UK***
	In 2004, the higher education landscape in South Africa changed with the institution of traditional and comprehensive universities, and Universities of Technology – the creation of a differentiated sector. In 2007, the HEQF document was published to create an integrated, differentiated and comprehensive higher education sector. Some of the solutions offered are elegant; integration presupposes a single system, while the terms “comprehensive” and “differentiated” presuppose a variety of qualifications. These changes raised as many questions as it answered. Different definitions exist internationally for comprehensive institutions, and there is still no clarification of the differences between traditional versus comprehensive versus universities of technology. Similarly, higher versus advanced, certificate versus diploma, etc. have not been clarified. There is also a sense of traditional institutions defending their space in relation to comprehensive universities and UoTs. Where would the traditional universities in South Africa pitch themselves when compared to the 117 UK institutions, which started with the Oxbridge institutions? In the UK, part of the 1960s expansion saw the establishment of over 30 Polytechnics, to

focus on applied education for work, although they offered degrees and degree level equivalent qualifications. They were offered the opportunity to apply for “university” designation in 1992, which they all took up.

Following this change in nomenclature, there was a tendency for mimetic isomorphism (mission drift) with most institutions aiming to expand their research output in order to increase funding from government. Ten years later, the government started pushing the importance of the development of close links between universities and industries, in order to ensure that the research done will better the economy. One funding stream in the UK, the Higher Education Innovation Fund, was revoked. The research intensive universities took up most of the research funding, meaning that the post-92 universities thought they would qualify for this HEIF funding because of their close links with industry. In reality, traditional research universities got three-quarters of the HEIF funding in 2002, which gradually levelled out towards 2008 with pre-92 universities getting 58% of HEIF funding and post-92 universities getting 42%.

Why is it that the pre-92 universities did so well in setting up relationships with industry? Industry is not interested in doing things they could do themselves, or doing what they have done previously – they want to learn from universities. There have been numerous surveys about what industry are looking for in graduates, which include:

- Relate to a specific issue and to the broader whole;
- Choose appropriate information to address problems;
- Follow and construct logical arguments;
- Communicate effectively verbally and in writing;
- Technical competence;
- In summary, dealing with uncertainty.

Knowledge comes in various kinds, such as Biggs’ model:

- Knowing about things – declarative knowledge;
- What is in libraries and textbooks – “academic” knowledge;
- We are ultimately interested in functioning knowledge, i.e. knowledge allowing us to solve problems.
- Functional knowledge requires a solid foundation of declarative knowledge, but also procedural and conditional knowledge (knowing how to do things, and when).

In developing curricula, we have to enable graduates to perform any job effectively with the possibility for innovation, requiring both an academic and vocational approach – using declarative, procedural, and conditional knowledge – just as in the great academic professions: medicine, law and religion.

A new model for higher education in the UK was instituted by the Government to broaden higher education access. This was achieved through the merger of a vocational college with a university, to increase the rate of progression from vocational qualifications into higher education. The thought was that by bringing together these two types of institutions, many more college graduates would move towards university

	study. In truth, this experiment failed, because progression did not take place; in fact, students who progressed actually left to go to other universities. The most important reason for the failure was cultural differences between the two types of institutions, which did not translate to a single, new culture. As a consequence, there was no integrated curriculum, and no bridging of the knowledge base or of competency versus content-based education. The fact that there was structural elegance unfortunately was not sufficient to resolve the problem that there was no bridging mechanism or a means to span the boundaries. Students needed some guidance from somebody to help them deal with the changes in delivery or to help them deal with changes in nomenclature; simple, operational things were not in place. UoTs should look at the opportunities that may arise from the formal recognition of their new nomenclature. Formal recognition of their full university status means that they are independent, with the power to innovate. They need to be at the cutting edge of innovation, and also need to offer something different to those they serve. UoTs should build on these opportunities to develop their missions. The defining characteristics of a UoT and its graduates are that they are trained to do something; they are trained to question and innovate. UoTs should not attempt to mimic other universities or businesses, and should offer something different. UoTs could think of themselves as “knowledge intermediaries”. Quality is absolutely essential; however fundamental the programme, delivery is critical. There has to be innovation in internal practice, and a belief in the saying that “actions speak louder than words”.
10.2	**DISCUSSION:**
	TUT: Given that the UK higher education sector developed over such a long time, and that there have been such major changes over the past few years, is it too early to judge the post-92 universities? CPUT: While UoTs need to be innovators, how do we deal with the notion of being knowledge intermediaries? UJ: In what you presented, you looked at what was done in the past. Given the global resource constraints for the future, how should we incorporate this challenge in making long-term decisions? TUT: The student intakes at UoTs are generally from those groups that did not gain access to traditional universities. Is there a similar situation in the UK, and how do you deal with it? DUT: In the example of the merged college and university, you mentioned that the merger failed. As UoTs we are trying to embrace FET Colleges, and it may be useful for us to learn from your experience.

	Garrod: Is it too early to look at the success of the post-92 universities. Yes, probably, but there are examples of institutions that have followed unique routes within the boundaries provided to all institutions. As a consequence, they have been very successful. My real concern is that the sub-sectors get driven by expectations, and I would encourage you as UoTs to be less concerned about the expectations from outside and get on with what you do – you know the types of students you attract and the attributes those students need as graduates. You have the opportunity and the freedom to define your own route. If you look at the UK situation, those universities that have taken a slightly individualistic approach to defining what they do have come out tops. The post-92 process was supposed to get rid of the binary divide, which did not happen because there are now post-2000 universities. Comparing oneself with another institution does not necessarily make you better. Think of a bank; it takes in savings, wraps up the money, and lends money to other people. By pooling our savings together it can do more with our money than we can individually; this is a helpful analogy for universities. We should do more with knowledge by linking it through research innovation and consultancy to applications in the real world, and add some value. We need not only transmit knowledge, but do something with it. Curricula and widening access are difficult issues; as universities we must not be constrained by a qualifications framework. We heard yesterday that because of the intake quality of the majority of students coming to UoTs we should focus on diplomas rather than degrees, but I'm rather uncomfortable with that. UoTs are able to add value to those intake qualifications by really good teaching. When we talk about the massification of higher education, there are different aspects to keep in mind. We are meant to open up opportunities for people who could not get into the old system, but the greater portion of that massification is due to the fact that in the knowledge economy we have today, more and more people need degrees to gain employment. We have to be better teachers because we get people who are not as well equipped for university study; we have to add some value to the student. We are broadening higher education but also lowering the entry level, which means that we have to work harder and more creatively to get those students through the system. There are two extremes to the continuum; one is to say that we don't get the appropriate students, putting the blame on the schools. The other is to say that we will give those under prepared students' appropriate interventions to get them through the system. I think the HEQF is a little rigid and does not allow for the necessary creativity to get people through. We need support mechanisms to encourage and support the students we do get to flourish as much as they can, and not to give in to the rigours of a framework that does not really support student mobility. Summer schools and additional training, enhancing written and mathematical skills, etc. have to be provided on top of the technical training that we provide. We need to support students to use the information that they learn from us, and apply that knowledge in practice. There are various groupings of universities in the UK, but mission drift in the UK is deep seated; most institutions try to be what they perceive traditional research universities to be like. The UK is moving towards a fee-based system. The UK government will provide grants to students, but students will need to take out loans to

	cover certain aspects of their qualifications such as living expenses, which could easily add up to R 500 000 for a single degree. The financing of degrees is now very much based on how effective we are in the market place. That means that the future is much more uncertain than it ever used to be. That goes to the point that I made about thinking about different methods of plying our trade, connecting more with industry and offering courses that will link to internal training and continued professional development. I believe that traditional degrees will become less and less an activity of universities. National Department of Human Settlements: One of the problems we have is that there is no formal qualification speaking to what we do. It is great to hear that the UoTs are looking at transforming their curricula; this is an invitation to them to expand their offerings to include a qualification focused on human settlement. The Department has considered ways to fund students who may want to take on study in this area.
10.3	**A conceptual framework for the quality assurance of programme design at the DUT** ***Mrs Bella Sattar, Director: Centre for Quality Promotion & Assurance, DUT*** ***Mrs Lesley Anne Cooke, Quality Specialist: Centre for Quality Promotion & Assurance, DUT***
	The focus of this paper is on quality assurance in curriculum development. Winberg (2005) identified different typologies, namely genealogy and chronotopes, which were applied to the evolution of UoTs and, in particular, to curriculum development and quality assurance. Genealogy shows how the past was different from, strange in relation to, or even threatening to the present. It further shows that the present is foreign and constitutes a break – often violent – with the past. The application of chronotopes to the evolution of UoTs indicated that the process was characterized by historically informed socially distributed modes of engagement, particular sets of practices for particular purposes, and that the process required a reconstruction of its context to be understood. Winberg (2005) identified 3 further chronotopes that related to UoTs development, namely: • Educating for the needs of industry; • Imitating traditional universities; and • Rediscovering technology. DUT was a merger of two Technikons. The influence of history cannot be denied, and the practice of the convenor system had unintended consequences for the sector. The merger of institutions was characterised by the fact that two merging institutions were generally resistant to giving up their own identities.

	The establishment of the ***Centre for Quality Promotion & Assurance(*** CQPA) led to the development of a fifth chronotope at DUT. Biggs (2005) identified two ways of looking at quality assurance: retrospective – looking back on achievements & making judgments accordingly; and prospective – focus on teaching and learning, congruent with developmental, facilitative and transformative approaches. The approach adopted by CQPA was retrospective. This raised the question whether a single definition of quality enhancement would be viable. DUT incorporated a definition for quality assurance in the strategic goals (2009), aiming to build on established foundations for QA, leading to transformative change and aiming to ground QA in a systems-level, collaborative approach to understanding and improving the quality of the entire student experience. Quality enhancement is grounded on the notion that quality teaching transforms students, and that the activities of all centres of the university have a bearing on the student. Coming back to curriculum renewal, a violent break with the past was deemed necessary to change the way learning, teaching and assessment was undertaken at DUT. A project management approach to curriculum development was adopted, based on five different elements. One of the requirements for the programme was an environmental scan of all elements. Consolidation of outcomes of phases at the faculty and university level was undertaken. Developing graduate attributes focused on the following: Generic qualities, skills and attributes that are the hallmark of DUT graduates Need for conceptual underpinning Barrie developed a framework of 7 conceptions of graduate attributes, ranging from basic skills taught in remedial classes to complex abilities that infuse learning and knowledge, learnt through the ways students engage with the university. Each of these had to be quality assured. A conceptual framework was developed for the quality assurance of programme design, characterised by: • Establishing common principles for defining graduate attributes; • Planning, focusing on resources and support; • Analysis (environmental scan); • Design, development and approval of internal and external processes; • Consolidation of outcomes of phases at the faculty and university level, and an identification of trends and opportunities. Developing graduate attributes as the hallmark of DUT graduates required a focus on generic qualities, skills and attributes. The need for a conceptual underpinning was met by the framework of 7 conceptions of graduate attributes developed by Barrie (2004), ranging from basic prerequisite skills taught in remedial classes, to complex abilities that infused learning and knowledge, learnt through the ways students engage with the university. Each of these conceptions had implications for quality assurance.

	Collaborative relationships promote organisational change, and involve learning, teaching and assessment units; quality assurance units, and the internal and external community of experts. Academic standards in the context of programme design cannot be based on a naïve approach. Work in progress continues at institutional and international level. HEQF qualification types are used to develop specific academic standards by institutions. Internal and external influences on programme design and academic standards bring together collaborative relationships, as well as the internal and external environments. In South Africa institutions do not have self-accreditation status yet. External quality assurance interventions, including professional bodies' inputs, have to be taken into consideration. Coming back to curriculum renewal, one has to take note of countdown and blow up factors. Countdown relates to putting a plan into action, which in the context of curriculum renewal includes clarity of direction, leadership and support, linkages and collaborative relationships, etc. In the context of blow up factors, these are things that can erode or destroy the impact of a project, and include complexity of prevailing cultures, curriculum development and quality assurance legacy, and resistance to change. Curriculum renewal challenges the comfort zones of academics. DUT as a changing university has taken the stance that it has to be student-centered. It is embracing quality assurance as a means to improve practices in teaching and learning. Count-down factors will prevail to ameliorate blow-up factors, the hallmark of the fifth chronotope. The biggest challenge of all: "How to win the hearts and minds of the ordinary academic, how to shift the perception of quality assurance from one of external policing or central control to one of internalised, individual, professional academic responsibility, bringing with it the wish, intention and means to do even better by one's students. Will this take another ten years? – at least. Holy grails do sometimes take a while to find." (Williams 2008).
10.4	**DISCUSSION:**
	Namibia: We have yet to find a system to measure student learning as an element of quality assurance. What are the panellists' thoughts on that? I would also like the SATN to consider taking a different role, allowing UoTs to develop individually and only to cooperate on issues that are worth doing together. Mrs Sattar: The Holy Grail is about quality enhancement of learning, teaching and assessment. We actually look at the total student experience, and all elements in the UoT that contribute to the experience. Learning, teaching and assessment are challenging. For example, embedding graduate attributes across the university will require different mechanisms, processes and instruments for different contexts. There has to be some sort of assessment of student engagement, for example. We required

	our people to evaluate the first year cohort, to use this information going forward. Q: Have you ever thought of the issue of working across disciplines and putting collaborative relationships in place between different departments? Could this be a means to lighten the load on academics? Mrs Sattar: Why curriculum renewal? If there is no renewal, people will continue to teach the way they always did, which is why collaborative relationships are encouraged to ensure that people will learn about new ways of doing teaching and learning, hopefully lightening the pressure and teaching people to do things better.
11.	**THE HEQF: IMPLICATIONS ON CURRICULUM DEVELOPMENT** **Chair: Prof. Antony Staak, DVC: Academic, CPUT**
11.1	**Keynote Address: The HEQF: whole brain thinking……or not?** ***Prof. Ansu Erasmus, Senior Director: Higher Education Development and Support (HEDS), TUT***
	Four years after the promulgation of the HEQF in 2007, following numerous consultative meetings and frantic activities at all institutions, the revised HEQF is ready to be published. Most institutions may be suffering from HEQF fatigue. By superimposing a framework for whole-brain thinking on the HEQF, a new perspective may be provided. The brain is divided into a left and right sphere. The use of brain profiling identified four different quadrants for brain functioning, namely people who will ask the questions What (facts), Why, How, and Who. No brain profile is good or bad, right or wrong. Brain profiles measure thinking preferences and not skills. A high score in a specific quadrant may indicate strong preferences for some processes and dimensions, but not necessarily all of them. In some cases thinking preferences may change, but it is unlikely. We are born with 20 – 30% of preferences; 70 – 80% are developed through social and environmental interaction. Thinking preferences in low-scoring quadrants may be developed where a desire to do so exists. HEQF: The big picture: The NQF provides a vision, philosophical base and organisational structure for constructing a qualifications system. The process of its development started in 1997 with the Education White Paper 2, which went through a range of iterations to arrive at a single coordinated HE system. The facts about the HEQF will cover a whole lot of information about qualification type specifications, designators, qualifiers, abbreviations, purpose and characteristics,

	minimum admission requirements, progression. This new model includes a number of variants at the different levels of the HEQF. The document also makes provision for some exceptions, such as the B.Ed., PGCE, MBA, Master's degrees in Health Sciences and an advanced Bachelor's degree with 240 credits, all of which contain higher credit levels or fall outside of the current qualification structure. HEQF processes have been exhaustive, including an implementation handbook, templates, communiqués from various stakeholders, due dates and deadlines, etc. All of these activities meant that UoTs spent a lot of time working on HEQF-related issues which could have been spent much better on other issues. The focus on people is probably the most neglected part of the HEQF implementation process. Lecturers want to know why they need to devote precious research time on the HEQF, which is bound to change soon. People don't get rewarded for curriculum development, only for research. They don't know what they should do, because the process is messy and information is often conflicting. Constant changes make it difficult for people to know what to do, when to do it, and how to do it. Impact of whole brain thinking on implementation of the HEQF: • Who was/is involved? Stakeholders at national, institutional, faculty, programme, and group levels; curriculum practitioners. • Was the big picture sufficiently communicated at the implementation level? Perhaps not; this could account for the criticisms levelled against the HEQF by lecturing staff. • Did the possibility of changes as a consequence of the HEQF alienate people with a resistance to change? • Did the long timeframes, constant changes to due dates and templates cause frustration? • Was there a lack of care for people's needs at grass roots level, where implementation of the HEQF had to occur? We have heard much about the binary divide over the past two days. It is hoped that this presentation will have helped people to think differently about the HEQF.
11.2	**DISCUSSION:**
	CPUT: This is a new way of looking at the HEQF which more people should see. Q: The presentation said something about lecturing staff who may not have been adequately prepared for HEQF implementation. We expect our students to be self-directed learners, but what about our staff – do we need to prepare them for dealing with policy changes specifically? Q: Can you comment more on the introduction of the Senior Doctorate, and how this will differ from the current PhD?

	Prof. Erasmus: I think that we should involve our lecturing staff more in processes, and explain what will change more clearly. Sometimes we jump into what has to be done, without explaining the vision and why we're involved in anything to do with the HEQF. Sometimes we don't take account of the workloads of staff members, who have a lot of work to do as it is and are not rewarded for all of it. We need to be more sensitive to people's needs and their time constraints. The Senior Doctorate is a qualification for a person with a high academic standing at international level. There is no description for it in the HEQF; I think it is something that the CHE may be better able to explain. Dr Webbstock: It is recognition beyond the original doctorate that recognises a person's career which may have spanned a number of years and may include high level achievements. It is something very traditional of long-standing universities. Prof. Staak: The Professional Doctorate is targeted at professionals in practice, and will be designed in a way to accommodate their requirements and time constraints, possibly through block release and modules. CPUT: From the diagram it appears that there will no longer be a B Tech. What is going to happen to the number of pipeline students? Prof. Erasmus: The B Tech will no longer exist, so I guess there will have to be arrangements made for a teach-out period to allow these students to complete their studies. Q: Why would students want to do an advanced diploma at NQF Level 7, following either the 240 or 360 credit diplomas at level 6? Prof. Erasmus: Persons doing the 240 credit diploma cannot progress to the advanced diploma at NQF Level 7. This would require the endorsement of a professional body, and such persons will have to do 120 additional credits as part of a WIL component or experiential learning.
12.	**CONFERENCE SUMMARY AND CLOSING REMARKS** ***Prof. Thandwa Mthembu, VC and Principal: CUT, Chairperson: SATN***
12.1	Prof. Mthembu provided a summary of the conference proceedings: Several clear proposals, covering a wide range of matters relating to curriculum transformation, were presented. Looking at the philosophical elements of curriculum transformation, the conference was told about disciplinary knowledge, contextualised knowledge based on practice in

	the workplace, and knowledge developed in the field of practice. Academe and workplace are seen as two distinct sides of teaching, but which need to cooperate to produce graduates that will be employable. Prof. Ntshoe supported these notions of integrating various types of knowledge from different contexts. The question is whether UoTs are only about professional and vocational education. What we would like to see is that UoTs should fuse conceptual or disciplinary knowledge and vocational knowledge with what can be learnt in the workplace. If this is done, will it not introduce another type of education into the current scope of UoTs? The problem we are facing is that while we have to find ways to include all these types of knowledge into what we do and our curricula, we have more academically challenged students coming into our institutions. How can we consolidate the various types of knowledge into our curricula in an effective manner? The case studies that were presented suggested that the mandate of UoTs is different from other universities. Differentiation must be fair and not suggest unshakable boundaries and hierarchies in terms of different types of knowledge. The references to UK universities were telling and could provide valuable lessons in the South African context. In no way should there be mimetic isomorphism in South Africa. The fact that the majority of UoT enrolments are at the level of diplomas is prescribed by the Minister of Higher Education. We should ask ourselves whether our aspirations will match the expectations of our audiences; can we ignore labour market needs, and for whose benefit are we doing particular research? References were made to initiatives that require us to be knowledge intermediaries, but are they conscious of vocational and procedural knowledge aimed at practice. We need to connect the dots and determine how what we have learnt will feed into the overall structure. How do we integrate these different pieces of knowledge into practices that will inform teaching, learning and research? A number of papers dealt with WIL, calling for an alignment between academic and workplace spaces and practices, and the need for WIL to be beneficial for students, institutions and the work place. WIL and its many associated terms have to be clarified. We need to be clear about the meaning of WIL, service learning, problem-based learning, experiential learning, etc. Inasmuch as the CHE produced a document in this regard, we, as UoTs, have to continue debating the issue and refine our understanding of WIL. It was also suggested that a more structured approach to WIL – similar to those used by professional bodies – should be explored. In pure Engineering programmes, there is a lot more clarity in terms of WIL and what is expected, but the challenge around WIL arises around those programmes that are not covered by professional bodies. Student preparedness was mentioned in one paper, but there was no further exploration of what can be done to deal with such students. The quality of teaching and learning has to be assessed, considering that we claim to have a unique approach

	that meets the needs of industry. How do we monitor and evaluate our lecturing staff's competence? How do we ensure that good practices are spread to other levels of the organisation? Have we made teaching and learning programmes compulsory, who teaches them, and are they effective? How do we spread these competencies to our partners who are responsible for WIL assessment in the workplace? How will we ensure that technology becomes the bedrock of what we teach at UoTs? A case study was presented, and there were questions about how social media can be integrated in our student centered approach to teaching and learning. This could be a way for us to meet our students halfway and make our education more student centered. In the debate about technology-enhanced curricula, how does one introduce an institution-wide technology-enhanced system? What tools does one use, and how do we ensure adoption throughout institutions? How do we change the mind sets of our lecturers to optimally use all available technologies? Sometimes, technology is available but not used optimally. Sometimes students are introduced to new technologies, but they become caught up and are unable to move along to other programmes. UoT representatives visited the UAE in 2009, which was followed by a visit from another delegation in 2011, with the aim of embedding technology-enhanced teaching and learning throughout all South African UoTs. The presentation on the HEQF demonstrated clearly that teaching can be fun. The questions that emerged from this session were quite telling in terms of how widely the sector has engaged, at all levels, with the changed HEQF. Prof. Garrod highlighted the HEQF as a possible vehicle for curriculum transformation, highlighting that our ideas should drive the system instead of the other way around. What had been missing in the discourse around the HEQF to date had been the big picture characteristics and the human perspectives, rather than processes and timelines. We should ask the question whether the HEQF will allow us to transform our curricula as UoTs in a meaningful way. These inputs to the conference will be valuable as springboards for taking the sector forward, stimulating debate and action in the coming year.
12.2	Prof. Chris Jansen van Rensburg expressed a heartfelt vote of thanks to the following sponsors, organisations and individuals: • Sasol; • Bestmed; • TIA; • Oxford University Press; • NRF; • CUT management and staff who assisted the SATN staff in arranging the conference;

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