Central University of Technology, Free State

Research and Development @ CUT

The next chapter

For discussion at the First Annual Research Breakaway, 18-19 July 2013

"Would you tell me, please, which way I ought to go from here? That depends a good deal on where you want to get to" (Lewis Caroll, Alice in Wonderland).

Part 1
Where are we?

In 2002 a Research and Development Office and a Technology Transfer Office were introduced to support Faculties with their Research and Technology Transfer projects. These Offices functioned separately and both reported to the DVC: Academic. In 2009 these Offices were integrated into a combined portfolio focusing on Research and Innovation. The objective of this portfolio is to *support* Faculties in their Research and Innovation projects. The focus is on academic staff, postgraduate students and postdoctoral fellows.

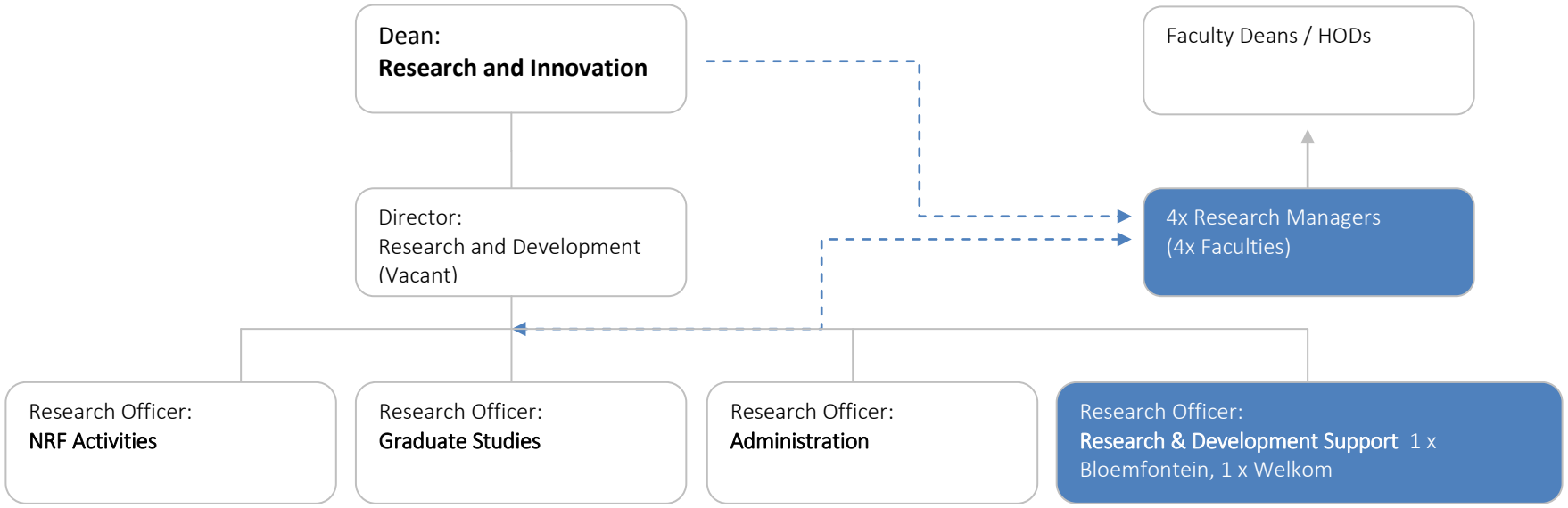
The Research and Development Unit performs a number of core activities:

- Implementation of research and development policies.
- General Administration of all research activities and their funding.
- Monitoring and evaluation of research and development activities.
- Annual Report to Senate, Council and DHET on research and development activities.
- Annual submission of research publications to DHET as per DHET policy.
- Roll-out and implementation of research development activities (workshops, funding calls and applications, Interim Journal)

The Research and Development Unit administered a virtual Graduate School with no additional staff. The purpose of this School is to provide collective support to supervisors and postgraduate students to grow their research capacities and to have access to best practice resources in support of research. Consequently a research programme on research education was developed and a number of books and a journal were published to support the academic staff, postgraduate students and postdocs in their research projects.

The Research and Development Unit is structurally organised in the following way:

Table 1: Research and Development support structure



ROLE PROFILE:
Research Officer: R & D

- Co-ordination of the development of research clusters and programmes
- Workshops
- Journals and publications
- Development of a Graduate School
- Marketing

ROLE PROFILE:
Research Managers

- Development of research clusters and programmes
- Identify and assist with applications for research grants and equipment
- Initiate research workshops for faculty specific needs
- Facilitate Faculty's Research Plan

NOTE: on **Director Research and Development** and **Research Managers**

- Use vacant position to fund under-mentioned positions:
- 5x Managers in Faculties and Welkom = Secondary appointments – 3 Year FT secondary appointments
- 1x Research Officer: R&D: 3 year fixed term contract

For the period 2005-2010 and 2011-2013 two respective research and development plans were steering the development of research at the university. The overall-emphasis of these plans is on:

- The development of a sustained, relevant and responsive research culture,
- The qualitative and quantitative improvement of research outputs,
- Socio-economic development through research, transfer and innovation and
- The development of strategic research and innovation partners and programmes.

For the period 2005-2010 the objectives of the plan were on:

- Objective 1: The development of staff and student researchers
- Objective 2: Postgraduate retention and throughput
- Objective 3: Increase in accredited publications
- Objective 4: Accreditation of Journal for New Generation Sciences
- Objective 5: Sustainability of existing external funded research projects
- Objective 6: Ongoing development of new SET research niche areas
- Objective 7: Develop and sustain partnerships with public and private funding agencies and regional, national and international universities
- Objective 8: Develop and sustain partnerships with business and industry
- Objective 9: Increase the income through research projects
- Objective 10: Develop postdoctoral research fellows as future research fellows of the CUT
- Objective 11: Market the CUT as regional leader in SET research
- Objective 12: Develop opportunities to read papers at national and international conferences
- Objective 13: Measuring the impact of the research

For the period 2011-2013 the focus is on:

- Scholarly development through Research and Innovation Training
- Research partnership development
- Development of research clusters and programmes
- Development of technology transfer and innovation

During this period the emphasis was on building critical mass in research activities. Two driving forces were (i) research clusters and associated research programmes (common to many research systems) and (ii) a shift away from disciplinary-driven research to multi-, inter- and transdisciplinary research (as a result of the STEPS 2010-2012).

The indentified research clusters and programmes are enablers for building a research and innovation culture. The identification of a research programme is based on the critical mass in a particular field of research, research outputs, completed qualifications, funding awarded, etc. The cluster is based on a collection of related research programmes. The following clusters and programmes were approved in 2005 with an update of programmes during 2012. These clusters and programmes are:

Table 2: Research clusters and programmes, 2011-2013

CLUSTER	PROGRAMMES
Industrial design, communication and development	• New product development and design • Evolvable manufacturing, automation and vision systems • Sustainable engineering • Water Resource Management • Information and Communication Technology
Quality of health and living	• Applied food safety and –biotechnology • Sustainable farming systems • Applied health technology • Environmental assessment and management • Biotechnology
People and skills development	• Socio-economic development studies • Leisure management • Education (sub-themes: health science education, general education, service learning, vocational pedagogy) • Research education

From these plans it is important to note the difference between (1) research participation and research productivity, (2) the areas of research activities and areas that are subsidised / earning income and (3) research activities depending only on university funding and self-funded research activities.

In acknowledging the research development cycle and the execution of the research assignment as core university value, the following categories for research participation and productivity are identified:

- Study towards highest qualification in field of study
- Participation in research training
- Publication writing
- Conference presentations
- Postgraduate supervision
- Research grants
- Professional research engagement (editorial boards, review panels, assessment panels, etc)

Research participation and productivity increase as staff members improve their research training and experience. Ideally speaking should junior lecturers engage with the improvements of qualifications and participation in research training whilst the professoriate should engage with all activities associated with research participation and productivity.

The Research and Development Unit is currently drafting a new research and development plan (2014-2020) as supplementary plan to the approved Academic Plan 2014-2020. The proposed plan is based on the foundations of the 2011-2013 Plan and will be extended based on the strategies recommended in Section 3 of this document.

Table 3: Draft Research and Innovation Plan, 2014-2020:

Focus	Objective	Activity
Scholarly development through Research and Innovation Training	Scholarly engagement with the research process and research cycle	• Staff and student development programmes • Programme on postgraduate supervision • Programme on scientific writing • Programme on research ethics and integrity • Programme on tech transfer and innovation • Annual Faculty Research Seminars • Colloquiums and discussion groups
Research partnership development	Capacity growth of research projects	• Multi-, inter- and transdisciplinary research • Joint ventures with national and international universities, research bodies and research councils • Joint ventures with government/business/industry
Development of research clusters and programmes	Strengthening of research capacity	• Student retention and throughput • Publications • Conference attendance • Patents • Rated researchers • Research Funding
Development of technology transfer and innovation	To develop the institutional level of involvement and expertise in technology transfer and innovation	• IP Act of 2008 and Technology Transfer Office training • Training of staff and students in innovation cycle • Identification of research outputs for possible innovation • Studying sustainable technological development • Supporting the community in innovation and new product development

The final plan should be read in conjunction with the following extract from the Academic Plan as approved by Senate on 12 November 2012:

RESEARCH AND INNOVATION IMPROVEMENTS

Strategic aims: The key integrated improvement elements would be to improve:

- The quality and quantity of research and innovation output, especially in social and technological innovations that advance Vision 2020. Among others, this would require improving the research and innovation impact on developing CUT's comparative advantages in human, technology and economic development.
- The sustainability of and talent management within Vision 2020 high-impact/outcome niche research and innovation areas.

AP outcome 5: By 2020, the following research and innovation targets would be achieved.

Research and innovation performance targets

Measure		Current target / status	2020 target
1.1.	Percentage of postgraduate student residency period spent at an accredited foreign partner institution, preferably within SADC; the time spent could be for project or course work, including online coursework.	Not measured	15%
1.2.	Research output credits per fulltime equivalent instructional/research professional	0.1603 Year 2011	0.565
1.3.	Percentage of grants secured for research projects, including partner research projects, funding needs of "mature niche research areas". The executive-in-charge must define the human and intellectual input and output characteristics of "mature niche research areas"	Not measured	25%
1.4.	Number of biennial international or national academic events with at least 70% external attendance-paying participation per "mature niche research area"	Not measured	1

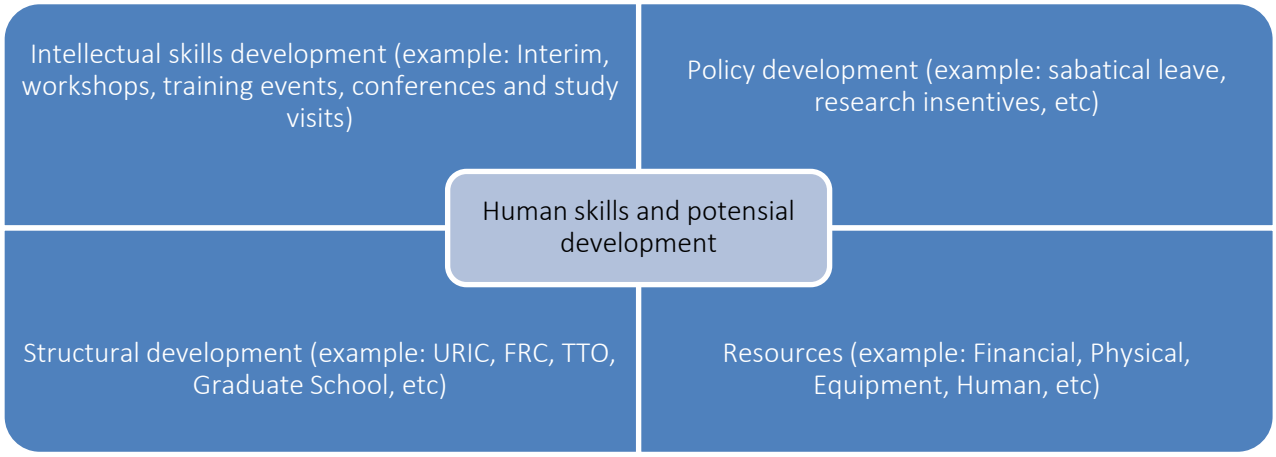
Provisional lead fund #2**:** In support of these research and innovation performance targets, the following provisional lead fund would be provided (subject to the CUT budget):

Provisional lead fund # 2

2013 for 2014 ('mil)	2014 for 2015 ('mil)	2015 for 2016 ('mil)	2016 for 2017 ('mil)	**Primary aims:** Providing the transitional human and other resources to support the research and innovation performance improvement targets
R 6.020	R 5.910	R 5.930	R 5.950	

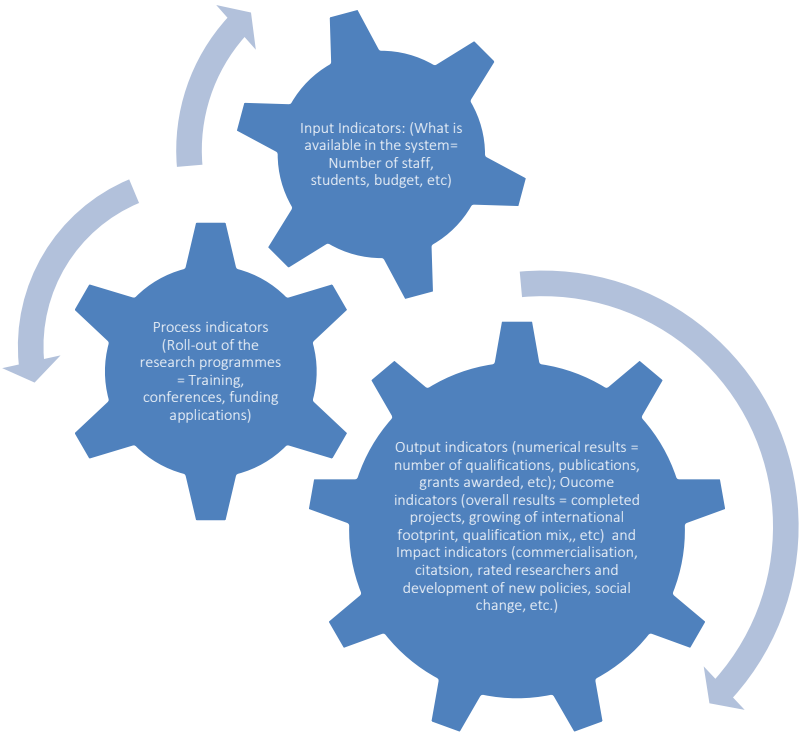
The Research and Development Unit also developed a *managerial model* in support of its *monitoring* and *evaluation* function. The plan is based on (i) a multi-focused approach to capacity development where human skills and potential development form the core of the capacity development activities and (2) levels of performance indicators for research and development. This model can graphically be presented as follows:

Graph 1: Research Management Model



The following performance indicators are indicated for Research and Development

Graph 2: Research Indicators



It should be evident that the focus of all research development activities is to result in outputs, outcomes and impact. The importance of the above mentioned approach is that whilst an enabling environment is created in support of research, the policy directives and management of research are aimed at maximising the outputs, outcomes and impact. This approach corresponds with Vision 2020 and international best practice in research management.

The university has invested substantially in the development of academic staff, postgraduate students and postdocs the last ten years. A cumulative amount of R 28 124 228 for the period 2001-2013 can be reported.

The collective performance of the Faculties for 2012 (Table 4) and 2013 (Table 5) can be reported as follows. It is evident that all input and process targets were exceeded in 2012. The publication and M Degree output also surpassed the targets. The D Degree target reached only 75%. Although it is highly recommendable the output targets were above the targets set by the Faculty, it is still below the expected DHET target, it is 0.565 output unit per full-time academic staff. In 2012 the CUT had 274 full-time academic staff members. According to the DHET criteria 155 credit output units should have been produced. The calculation for 2012 suggests almost 110 credit units [55.36 article units, 36 M Degree units and 18 (6x3) D Degree units]. This is approximately 71% of the expected norm.

Faculty Targets for 2014-2020 is reflected in Table 6. Table 7 and Table 8 outline the budget parameters for 2013 based on the CUT and DHET's research and development grants.

Table 4: Research Outputs and Progress - 2012

Item	EIT Commitment	EIT Progress	HES Commitment	HES Progress	HUM Commitment	HUM Progress	MAN Commitment	MAN Progress	Total Committed	Total Progress	Performance
Accredited article credit units	10	4.48	14	11.65	12	25.57	14	13.66	50	55.36	>100%
Papers read at SA Conferences (1st author)	5	6	20	20	15	9	15	19	55	54	98%
Papers read at international conferences (1st author)	8	9	11	14	10	10	7	9	36	42	>100%
Patents (1st inventor)	1	0	0	0	0	0	0	0	1	0	
Staff with M Degrees	43	33	18	14	22	27	19	30	102	104	>100%
Staff with D Degrees	14	13	19	19	21	20	19	18	73	70	95.9%
Students enrolled for M Degrees	39	37	67	61	40	51	38	42	184	191	>100%
Students enrolled for D Degrees	7	10	12	12	26	37	25	23	70	82	>100%
Post Docs	0	0	3	3	0	0	1	1	4	4	100%
Completed M Degrees	7	3	11	14	8	14	7	5	33	36	>100%
Completed D Degrees	2	2	2	1	1	1	3	2	8	6	75%
Rated researchers	0	0	3	4	2	2	1	1	6	7	>100%
External Funding (excluding student grants & block grants)	R 3m	R332 000	R1.1m	R947 000	R500 000	R130 000	R300 000	R199 000		R1 608 000	
External: MRC		0		0		0		0		0	
External: ARC		0		R100 000		0		0		R100 000	
External: Other											
NRF Block grants										R3 179 996	
PA Malan Trust										R75 000	

Table 5: Committed Research Outputs and Progress - 2013 (14-June-2013)

Item	EIT Commitment	EIT Progress	HES Commitment	HES Progress	HUM Commitment	HUM Progress	MAN Commitment	MAN Progress	Total Committed	Total Progress	Performance
Accredited article credit units	11	4	20	1.25	25	3.66	14	2	70	10.91	15.61%
Papers read at SA Conferences (1st author)	10	4 (+ 1)	17	9 (+ 9)	18	4 (+ 1)	16	3	61	20 (+ 11)	32.78%
Papers read at international conferences (1st author)	11	7 (+ 2)	8	2 (+11)	12	4 (+10)	8	7 (+ 1)	39	20 (+ 24)	51.82%
Patents from Faculties (1st inventor)	3		1		0		0		4	0	0%
Patents from Technology and Innovation	3								3 (Under evaluation)	0	0%
Staff with M Degrees	36		23		30		38		127	116	91.34%
Staff with D Degrees	16		19		25		19		79	73	92.41%
Students enrolled for M Degrees	34	42	59	59	45	56	35	37	173	194	>100%
Students enrolled for D Degrees	9	9	14	16	30	40	22	18	75	83	>100%
Post Docs	2	1	3	3	0	0	1	1	6	5	83.3%
Completed M Degrees	12	1	12	5	10	2	6	1	40	9	22.25%
Completed D Degrees	2	2	2	0	2	0	3	0	9	2	22.22%
Rated researchers	0	0	5	4	2	2	3	1	10	7	70%
External Funding (excluding student grants & block grants)	R250 000	R1 911 170	R1 500 000	R574 150	R40 000	R127 450	R150 000	R40 000	R1 950 000	R2 652 770	
External: MRC				R250 000						R250 000	
External: ARC											
NRF Block grants										R3 280 000	
PA Malan Trust											

Table 6: Summary of Faculty projections toward Research Outputs 2014-2020

Totals of Faculty Projections	2014	2015	2016	2017	2018	2019	2020
Accredited articles/credit outputs	73	84	98	110	127	143	153
Papers read at South African conferences	72	78	84	88	92	95	99
Papers read at international conferences	46	49	56	58	62	65	68
Patents	3	3	3	4	4	4	4
Staff with M-Degrees	147	152	158	163	168	175	185
Staff with D-Degrees	90	92	96	98	103	108	115
Students enrolled for M-Degrees	185	203	227	254	288	323	360
Students enrolled for D-Degrees	76	80	89	97	104	118	132
Post-doctoral Fellows	7	8	11	13	14	16	17
Completed M-Degrees	40	41	44	45	48	51	53
Completed D-Degrees	10	11	14	16	19	21	25
Rated researchers	9	12	13	13	16	16	17
External funding, excl. block grants	2.550 000	2.675 000	3.200 000	3.300 000	3.820 000	3.970 000	4.020 000

Table 7: Budget for Committed Research Outputs - 2013

Item	Total Committed	Contents	Budget per item	Total budget	Comments
Accredited article credit units	70	(1) Publication fees (2) Incentives	(1) R 5000 per paper (2) R 23580 per credit unit	(1) R 350 000 (2) R1 000 000*	
Papers read at SA Conferences (1st author)	61	(1) Travel, accommodation, day fees	(1) R 12 000	(1) R 732 000	
Papers read at international conferences (1st author)	39	(1) Travel, accommodation, day fees	(1) R 40 000	(1) 1 560 000	
Students enrolled for M Degrees	173				See DHET Grant
Students enrolled for D Degrees	75				See DHET Grant
Post Docs	6	(1) Living expenses (2) Project cost	(1) R 120 000 (2) R 100 000	(1) R 240 000 (2) R 600 000	See DHET Grant
Rated researchers	10	(1) Project incentive	(1) R 280 000	(1) R 280 000	
External Funding supplementation: (excluding student grants & block grants)	R1 950 000	(1) Supplementation	(1) Depends on applications	(1) R 1000 000	See DHET Grant
Fellow commitments				(1) R 1000 000	
Projects: Faculties		(1) Faculty projects			See DHET Grant
Projects: Research and Development		(1) Workshops, breakaway, journals, annual reports		(2) R 200 000	
Projects: Transfer and Innovation		(1) Innovation development		(2) R 100 000	
Total				R 7 062 000	

SEU Grant for 2013 – R 3000 000
Roll-over 2012-2013 – R 2 300 000
*Payable by Finance
Total: R 5 300 000

Shortfall: R 762 000

Table 8: Summative overview of DHET grant 2013-2014

	Staff and postgraduate student development initiatives	Research costs and research infrastructure development projects	Incentives for academics and other researchers	Research project cost and other fees
Postgraduate bursaries	R1 590 000			
Postdoctoral fellowships	R 945 000			
Capacity building among staff, including qualifications and mentorship	R350 000			
Research related training workshops e.g. how to write or publish or supervise etc.	R320 000			
Academic exchanges		R180 000		
Funding for research activities (local and international)			R610 000	
Topping up NRF grants				R435 000

TOTAL: R4 430 000

The Research and Development Unit supports the Faculties in setting platforms for student participation in research. Typical examples are:

- Faculty Research Seminars
- Departmental Research Colloquiums
- Guest Lecturers on research ideas/projects
- Various student competitions
- External collaboration projects
- Student exchange programmes

Faculties have also drafted Faculty Research Plans for 2014-2020. From these plans Faculties are advised to attend to the six priority areas for which Research Professors were appointed, how Faculties intend to develop these areas and how these activities will be mainstreamed in a Faculty's Research Plan.

The university takes note of the progress the JNGS has made since its inauguration - to obtain DHET accreditation, the focus of the JNGS (applied sciences in the context of Mode 2 Knowledge Production), the management of the JNGS in the context of the DHET policy for accredited publications and the intension of the editorial board to obtain ISI status.

Part 2
Where do we want to be?

The next phase in developing a responsive research community is based on a number of *agreed-upon principles and practices* (reference URIC meetings, AMF meetings and Mancom Targets). These principles and practices are:

- Growing the number of postgraduate enrolments to reflect 5% of all enrolments by 2020.
- Growing the seniorisation of the academic profile (senior lecturers, associate professors and professors) to 50% of the total academic staff component by 2020.
- Academic staff participating in studies towards higher qualifications in their disciplines (aimed at decreasing the juniorisation of the system to the seniorisation thereof) and increased participation in research outputs (primarily grant awards, publications, completed postgraduate studies and rated researchers.)
- Growing the number of rated researchers to 10% of senior academic staff by 2020.
- Growing the number of publication outputs to be at 75% of the expected DHET norm by 2020. (Currently the norm is 1.1 credit output unit per fulltime academic staff.)
- Increasing the number of completed M Degree studies by 100% by 2020.
- Increasing the number of completed D Degree studies by 150% by 2020.
- Decreasing the number of years to complete postgraduate studies to fit into the current residential period for postgraduate studies. (Currently one year for full-time Masters and two years for full-time Doctorate studies and four years for part-time Masters and five years for part-time Doctoral studies.)
- Decreasing the dependency on institutional funding and growing the number of successfully awarded research grants.
- Increasing national, continental and international research participation through partnerships, joint projects, joint funding and joint postgraduate offerings and supervision.

The university is mindful that growing the research culture is depending on a number of institutional challenges that should be addressed. Some of these challenges as reported by the Faculties are:

- Workload – too much teaching time.
- Uneven participation in research activities (internally – supervision, publications and externally grant applications)
- Limited funding for staff and students (because of limited internal resources and low participation in external research grant applications)
- Absence of well-equipped laboratories, outdated infrastructure, non availability of relevant academic programmes and postgraduate students and a small critical mass contributing to limited participation in research activities.

Part 3

What strategies do we need?

Based on the capacity-development model presented in Table 1 the following strategies are proposed:

Human skills and potential development strategies

It is proposed that an integrated strategy should be followed directed at academic staff, final year undergraduate, postgraduate students and postdoctoral fellows to offer opportunities for research growth and strategic positioning. The following ten programmes are suggested:

Strategy 1: The roll-out of ten strategic research programmes to grow human skills and potential development strategies. These programmes are:

Table 9: Human skills and potential development strategies

Programme	Activity	Targets/Expected outcomes	Support and enablers	Estimated Budget
Undergraduate to graduate students programme	(1) An annual workshop on the research process (2) Workshop to prepare for funding applications	(1) Grow postgraduate enrolments, shorter period to completion (2) Funding applications for postgraduate studies	Possible funding through NRF B Tech Block Grants, NRF Grantholder-linked funding	R 100 000
Masters Education Programme	(1) Workshops to focus on research design, methodology, literature review and scientific writing. (2) Workshops to prepare for funding applications (3) Support to read one conference paper at Faculty's prestige research day (4) Participation in Research and Development's	(1) Completion of studies in residential period	(1) CUT Masters Funding	R 1.1m (for grants) R 100 000 for conference support

	Five minute conference presentation			
Doctoral Education Programme	(1) Workshops to focus on methodology, statistical analysis and scientific writing. (2) Workshops to prepare for funding applications (3) Support to read one conference paper at a national conference and one colloquium presentation (4) Participation in Research and Development's Five minute conference presentation	(1) Completion of studies in residential period	(2) CUT Masters Funding	R 1.7 m (for grants) R 100 000 (conference support)
Next Generation Researchers Programme	(1) Staff to complete D Degree studies	Completion of D Degree studies	Training for supervisors to act as supervisors. As staff members – waiving of tuition fees. Project cost of R 30 000 per year for residential period of study.	R 300 000
Postdoc Fellowships Programme	Three types: Full-time postdoc fellows for three years All staff who completed D Degrees for three years in Postdoc Programme All students who completed D Degrees and employed full-time to be three years in Postdoc Programme	Participate in official research programme. Focus on development of research competencies Writing-up and publication of research results	Full-time postdocs: R 200 000 per annum. (Status to be discussed.) Submission of application to develop research competencies to the value of R 100 000 per application for the duration of postdoc fellowship. R 30 000 for the duration of posdoc fellowship	R 1.4m R 1 m R 300 000

Emerging Researcher Programme	Preparing for research career after completing doctorate and completion. (This is for newly appointed staff who graduated in the two years before joining CUT.)	Focus on development of research competencies	Submission of application to develop research competencies to the value of R 100 000 per application for a three year period. Five competitive grants will be available.	R 500 000
Mid-career Researchers Programme	Developing own research programme with participating members and students	Research competencies and infrastructure in support of research	Submission of application to develop research programme to the value of R 150 000 per application for a three year period. Five competitive grants will be available.	R 750 000
Established Researchers Programme	Becoming an international leader in a research programme	International expert in research programme through international funding, collaboration and joint programmes	Submission of application to develop research competencies to the value of R 200 000 per application for a three year period. Five competitive grants will be available.	R 1m
Black Female Researchers Career Programme	Enabling black female researchers to complete doctorates and (2) for researchers with doctorates to develop their careers	Developing research competencies	Submission of applications to supplement funding for short period study visits or sabbatical leave.	R 100 000 (available via SEU)
Rated Researchers Programme	Maintaining rating	National and International recognition	R 200 000 for duration of rating period	R 2 000 000
Total				R 10 250 000

Strategy 2: The university is also mindful of the limited number of full-time postgraduate students registered for postgraduate studies. The Research and Development Unit noted that students take a considerable time of the residency period to submit an approved study proposal / protocol. Not all students who applied for extension complete their studies during the first year of extension. It is proposed that the students have a preregistration as M Degree or D Degree *students* for six and twelve months for part-time and full-time students respectively (as per assessment policy) whereafter they are registered as M Degree or D Degree *candidates.* In addition, it is recommended that enrolment for the next year is based on a formative assessment process towards October-November each year.

Strategy 3: An assessment of the research participation of senior academic staff (2010-2012) suggests that guidelines should be set based on seniority in the research process, research productivity and academic commitments. Next to specific output indicators (see Strategy 6 under Intellectual skills development strategies) the following areas of participation should be encouraged depending on the level of seniority: Study towards highest qualification in field of study, participation in research training, publication writing, conference presentations, postgraduate supervision, research grants, professional research engagement (editorial boards, review panels and assessment panels).

Strategy 4: The academic portfolio wants to introduce a system of *research leave* for researchers. It is suggested that one day per month is allocated for research leave and that this leave should be based on a 50-50 proposal. Academic Staff should be afforded the opportunity to use 6 days of the current annual leave for research purposes which will be supplemented by another 6 days leave granted by the university. The research leave can be used for writing of publications, study visits and/or research projects. The leave can be accumulated over a five year period whereafter it can be used for sabbatical leave.

Structural development strategies

The university empowered the research system by adding a Research and Development Office to support Faculties in their research activities, provided funding in support of a Research Manager to manage and promote research in the Faculties, to move away from a centralised to a decentralised research management system, to decentralise research funding to Faculties driven by RAM principles and to advocate for a budget system for Faculties to budget for research activities.

The following structural related strategies are proposed:

Strategy 1: The reactivation of the Graduate School to serve as a support to Faculties to empower academic staff and students to make progress with the completion of their studies. The services will be aimed at identifying opportunities for funding and assistance with applications, training for supervisors and students and developing scientific writing skills. The Graduate School will also administer and manage institutional funding in support of postgraduate students and attend to academic integrity and respectful and responsible research conduct (through promoting a code for research ethics and integrity, programmes such as Turn-it-in and awareness programmes on responsible research conduct).

Strategy 2: The Senate approved constitution of the URIC will be implemented during 2013 to be in full operation during 2014. This will necessitate the introduction of a Research Ethics and Integrity Committee and a Research Grants Awards Committee to streamline the awards of grants to academic staff and students.

Strategy 3: A training course for Faculty's Research Managers will be offered before the first quarter of 2014.

Strategy 4: Research and Technology and Innovation administrative support will be implemented at the Welkom campus from 2014.

Intellectual skills development strategies

The university provides opportunities to travel to conferences and to develop scientific writing skills as input and process indicators in support of the output, outcome and impact indicators. The following strategies are proposed:

Strategy 1: The Graduate School will offer a training programme in support of scientific writing skills to next generation researchers, emerging researchers, postgraduate students and postdoctoral fellows.

Strategy 2: As from 2013 the INTERIM will be published as (i) an institutional edition managed by the Research and Development Unit and (ii) two Faculties each to publish either jointly or individually editions on a biennial basis . One representative from the Research and Development Unit, one from the Graduate School and one from each Faculties will constitute the Editorial Board. The purpose of the INTERIM is to develop scientific writing skills, to publish research meeting an acceptable standard of scientific writing and research, to publish research in progress and to develop the editorial skills of the board. The Research and Development Unit will provide administrative assistance to support the publication of the INTERIM. The Dean: Research and Innovation, who currently acts as Editor, will edit one more institutional edition in 2014 whereafter nominations for an Editor will be invited for a three year period.

Strategy 3: In order to increase the research outputs of the postgraduate students the current assessment policy is confirmed namely a publication submitted at least to the INTERIM before a student can graduate.

Strategy 4: Where funding is required from the university the following policy strategies are confirmed. The attendance of a national conference (South Africa and SADC country) is subject to at least a submission of a paper based on a previous conference attendance. For an international conference the benchmark of at least ten credit units and for an international study visit also ten credit units. It is further recommended that a study visit is linked to a conference. It is adviseable that the conference attendance is approved in the context of how it fits into the targets set by the Faculty (example the number of conference applications), how an activity can contribute towards research outputs (example publications, patents and qualifications) and how the budget fits into the overall budget available for research.

Strategy 5: The Research and Development Unit will offer four institutional training programmes a year: Postgraduate Supervision, Scientific Writing, Research Ethics and Integrity and one general workshop on the research process reflecting on general aspects of the research process and support offered by the university for research.

Strategy 6: It is common practice in the higher education system that a norm is set for senior academics to publish a number of research publications in a three year cycle and to successfully supervise students for M and D Degrees. It is expected from staff at the junior level to study towards a Doctorate within their given discipline. The following publication credit outputs (as per DHET calculation) are

proposed in a three year context: Research Professor: 9; Full Professor 6; Associate Professor 4,5 and Senior Lecturer 3. The following supervision credit outputs (as per DHET calculation) are proposed in a three year context: Research Professor: 9; Full Professor 5; Associate Professor 3 and Senior Lecturer 1,5. (These credits depend on Masters and Doctoral completion.)

Resources strategies

The following resource-related strategies are proposed.

Strategy 1: Faculties to receive *70% of the annual Institutional Research Grant* and *30% of the DHET Research and Development Grant* based on their research outputs (publications and awarded postgraduate qualifications as per DHET guideline) over a three year rolling period. (For 2013 the Institutional Grant was R 3m and the DHET Research and Development Grant was R4 430 000). This money should be used for all activities associated with the research process (research fellows, conference attendance, staff training, publication fees, research running expenses, equipment and infrastructure, etc). The university should increase its grant for researcher activities as well as the operational funds associated with research. In this regard should the subsidy earned through the research activities be made available to the Research and Development Unit and Faculties in support of research activities. For 2013 the total value for research is R 3m (CUT) + R 2m roll-over from 2012 (ca) and R 4.430m (DHET) = ca R 9.4m.

Strategy 2: The Research and Development Unit will use the 30% of the Institutional Research Gant and the 70% of the DHET to fund the supportive research development activities (primarily training, funding proposal development, students grants and support for the research development programmes).

Strategy 3: The university is currently paying an incentive to all researchers who published research outputs as per DHET categories. The pay-out is based on the submission of outputs (n) to the DHET (n+1) and the subsidy received (n+2). The objective was to pay an incentive (not salary) to researchers to promote research outputs and for the researchers to use these funds in support of their research. Evidence suggests that very few researchers support their research through these incentives. For 2013 the total pay-out of incentives will be closed to R 1m. This is not sustainable anymore if these funds are not used in the promotion of research. The proposal is to increase this incentive to a maximum of R 30 000 per publication output unit of which R 10 000 per unit can be taken as personal incentive whilst the remaining R 20 000 should be used in support of the candidate's research activities.

Strategy 4: Cutting edge research demands high state of the art research equipment and facilities. Evidence from the higher education system suggests that universities are generally not in a position to finance all required infrastructure and facilities. The evidence further suggests that these requirements are best supported through national collaborations / teamwork, awarded grants and joint projects. The proposal is for the Faculties to (i) identify their needs by October 2013 whereafter (ii) a consultant can be

recruited to assist Faculties to draft relevant funding applications to be ready by February 2014. (iii) The Research and Development Unit will assist to identify appropriate funding agencies. (iv) The Research and Development Unit will release R 25 000 per Faculty in support of such applications.

Strategy 5: The university should be recommended for its awarding of close to R 28m to staff and students to grow their research capacities. The current grants for staff and students were aiming to support academic staff and postgraduate students to grow their research capacities and to serve as seed funding to increase their opportunities and capacities to apply for external grants. Currently very few students hold external research support concurrent with their institutional research grants. It is proposed that the grants are revised to be more competitive in nature. For full-time students it is recommended that a total of *20 grants* to a maximum of R 70 000 for M Degree Students and R 100 000 for D Degree Students to a maximum period of two years for M Degree Students and three years for D Degree Students are available. The grants must be used for tuition, R 30 000 for project expenses and the remainder for living expenses paid-out twice a year based on a satisfactory progress report approved by the supervisor and Research Manager. For part-time students it is recommended that a total of *20 grants* to a maximum of R 40 000 for M Degree Students and R 60 000 for D Degree Students to a maximum period of three years for M Degree Students and four years for D Degree Students are available. The grants must be used for tuition and project expenses. These grants should be available during the next year (n+1) of award (n) based on satisfactory progress approved by the supervisor and HOD. Awards are based on applications that will be externally reviewed by peers. Applications can be submitted end July for award the next year and end February for award in July. The review will be organized by the Graduate School. It is further proposed that the awards granted up to end 2013 should be managed in the context of the current policy. Postgraduate students are entitled to have one more grant concurrent with the university's grant subject to the external funding agency's conditions of grant.

Policy Strategies

The existing institutional research policies will be revised to reflect the new institutional framework for Research and Development and the agreed-upon strategies.

Drafted by Laetus OK Lategan, 12 July 2013