

TSHWANE UNIVERSITY OF TECHNOLOGY

Date: 8 March 2004

This policy and its rules, guidelines and procedures replace all previous policy and/or circulars on Research and Development.

1. POLICY

1.1 Policy on Research and Development

It is the policy of Tshwane University of Technology that Research and Development (R&D) be driven by a Research and Development Strategy and executed in identified Research Focus Areas which promote innovative research for the economic development of the country.

2. DEFINITIONS

2.1 Research and Development

Research and Development (R&D) is seen to be creative investigation, conducted systematically to contribute to new knowledge, and to increase scientific and technological knowledge, with the emphasis on utilizing existing and new knowledge in devising applications and solving problems.

2.2 Focus Areas

A Focus Area has a well-defined central research focus, and involves several disciplines or aspects of one discipline. The Focus Area provides the framework for the research activities of the group, and the individual, component projects should be inter-related and synergistic.

2.3 Innovation

The process of transferring an idea into a new or improved product, process, service or approach. The innovation chain covers all the steps – from the idea or invention, right up to its successful implementation and commercialisation.

2.4 Application of Technology

Application of technology is a term used to describe a formal transferring of new discoveries, innovations, and technology, resulting from research and development at higher education institutions, to the commercial and industrial sectors.

2.5 Research and Development funding strategy

Of all the resources required for research, the procurement of sufficient funding to finance projects is, next to the availability of high-level personpower, probably the most important. There is a tendency to under estimate the cost of research. Research needs to be planned in such a way as to optimise the utilisation of the available funding.

In addition, the free market of research and its underlying dynamic of supply and demand for goods, services and open competition is seen to be playing an increasingly important role in South Africa. There is increasing competition among institutions for the funds available for the research required by the state and industry. Increasingly, too, research is being seen as the solution to the country's social and developmental problems, which adds to the competition for monetary resources and necessitates proper planning by all institutions for higher education for the acquisition of resources.

Any funding plan for Research and Development needs to consider the range of available sources of financing. These include:

- The generation of state subsidy through the production of recognised research outputs by staff and students;
- Core funding of the science councils and national facilities;
- Agency funding (NRF, MRC, ARC and WRC);
- Competitive funding (National Innovation Fund, THRIP);
- Formula-based funding for universities and technikons;
- Contract funding, especially from industry, and
- Third-stream income.

2.6 Research and Development output

R&D output is defined as the following:

- Research output recognised for subsidy purposes by the Department of Education (i.e. articles published in accredited and peer reviewed national and

international journals - emphasis will be placed on research output in accredited journals);

- Staff gaining qualifications on postgraduate level;
- Students gaining postgraduate degrees;
- Articles published in national and international journals (non-accredited and peer reviewed journals);
- Presentations made to local, national and international conferences, and therefore subject to peer-review;
- Books and/or chapters in books linked to research and development;
- Patents registered that enjoy national or international recognition;
- Artefacts developed that enjoy national and/or international recognition;
- Presentation of research seminars;
- Contract research and reports on research projects entered into with scientific, professional and financial agencies and commerce and industry, of which the outcomes were scientifically acceptable and complied with the needs expressed by the client;
- R&D-related downstream activities, characterised by successful technology transfer;
- NRF rating received by researchers upon consistent research production and achievement.
- NRF rating of research focus areas.

3. PRINCIPLES

- Tshwane University of Technology encourages all its faculties to strive for and achieve R&D excellence, according to performance indicators appropriate to the discipline or academic area or theme.
- R&D is executed according to an agreed funding strategy of the organization with R&D output as integral part of the Mission, Vision and Strategic Goals of Tshwane University of Technology.
- R&D plays an important role in the lives of academic staff members. R&D refreshes and sharpens the intellect and contributes to ensuring authoritative teaching and learning with the emphasis on career focus education, increases the

quality of graduates, contributes to the development of technology and makes available the expertise within the University to the broader community.

- In the ideal situation, research and teaching must complement one another.

4. RULES

The rules and regulations guiding R&D are defined within the following categories:

- 4.1 R&D is performed within the defined Focus Areas of the R&D Strategy
- 4.2 R&D is managed according to the guidelines set in the R&D Strategy
- 4.3 R&D is funded in accordance with the R&D Strategy
- 4.4 R&D is performed within the following framework:
 - Applied research in strategic areas, including product development and process-related work, but not excluding fundamental research.
 - Addressing priorities and needs identified by communities, commerce and industry that will contribute to the economic development of the country.
 - Involvement in components of **technology transfer**, ranging from acquisition and development of technology up to the diffusion and implementation of technology within the understanding of the components as follows:
 - **Acquisition** - obtaining and mastering knowledge and technology.
 - **Development** - contribution to the innovative use of knowledge and skills as well as the advancement of technology.
 - **Application** - utilizing technology in addressing needs and priorities of government, industry and communities.
 - **Diffusion** - ensuring the dissemination of the knowledge and technology through learning programmes and the implementation of technology in solving problems.
 - **Management** - optimising the effective and efficient utilization of technology.
 - A focus on research, technology, demonstration and innovation, ensuring that staff and students are engaged in the different components of the innovation chain.

- Promotion of multi- and trans-disciplinary approaches, which allows for teamwork, varied perspectives and shared use of facilities.
- Extended networks and partnerships across departments and faculties, institutions, industries and countries.
- Involvement in R&D-related down-stream activities such as –
 - Patenting, licensing, commercialisation of IP and R&D
 - Results in the form of products, processes and services;
 - The promotion and development of new knowledge intensive enterprises; and
 - Supportive environments, such as technology and business incubators, business and technology parks.

5 MANAGEMENT OF RESEARCH AND DEVELOPMENT

R&D is managed by defined R&D structures that focus on the formal research and development activities within the University. Refer to diagram 1:

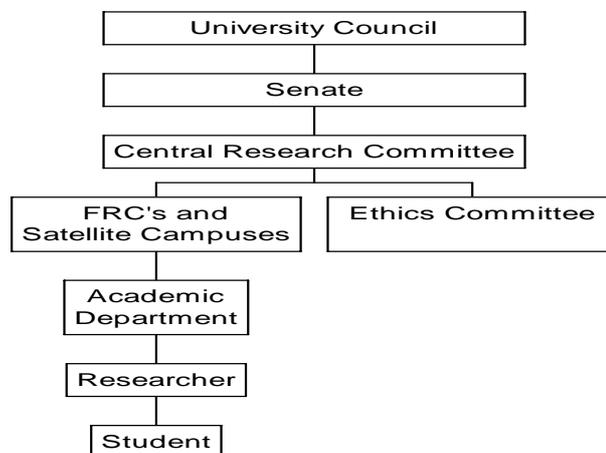


Diagram 1: Research and Development structure

The roles and responsibilities of these structures are as follows:

- University Council

Refer to Corporate Quality Manual

- Senate

Refer to Corporate Quality Manual

- The Central Research Committee (CRC)

The CRC determines the R&D Strategy of the University. An Ethics Committee is an obligatory standing sub-committee of the CRC.

- The purpose of the Ethics Committee is the evaluation and approval of all research including or affecting humans, animals and the environment. The most important function of the Ethics Committee is to protect the well being of humans, the environment and animals and also to ensure that the rights of humans are protected during a research project. The Ethics Committee therefore approves research protocols for ethical clearance.

- Faculties

Faculties produce an R&D plan for the respective faculty, and publish their criteria, in accordance with the University policy, which serve as basis for the selection of the research and development to be undertaken.

- Faculty Research Committees

Faculty Research Committees (FRC) direct faculty research. Each Faculty is required to establish a FRC and select a Chairperson who will be the Chair of the committee. The FRC develops the Faculty R&D plan and devise the strategies necessary to attain it, promotes, monitors and reviews R&D activities within the Faculty.

- The R&D Professors facilitate the development the R&D culture and promote R&D within the University.
- Researchers identify and establish mechanisms to extend the availability of external funds, through enterprise and initiative in their R&D and advanced consultancy activities.
- The researcher captures R&D information on the Monthly Reporting System.

- Each Faculty investigates and proceeds to protect the possibility of patents, inventions and intellectual property that may result from its R&D and commercial development activities.
- Faculties, departments, individuals and other divisions are required to ensure that professional indemnity cover exists prior to engaging in consultancy and contract work.
- The Directorate: Research and Development advises Faculties on the protection of intellectual property rights, patents applications and professional indemnity, related to R&D.
- All R&D project proposals are submitted to funding agencies according to an agreed format and plan before evaluation by peers.
 - R&D performance is evaluated or assessed by way of an annual R&D report.
- R&D incentives are used to promote R&D at Tshwane University of Technology.
- R&D contributions and products must meet recognised local and international standards. In some cases this will mean the development of new assessment criteria to take into account the social and economic impact of R&D results, patents, technical reports, creative works, artefacts and various other forms of research output. The principle of peer review and evaluation, based on tangible outputs, will apply.
- Research management is within the line function of each Deputy Vice-Chancellor (DVC) Academic. The DVC Academic (responsible for R&D) assumes the overall responsibility for the policy, strategy and the strategic management of R&D at the University, refer to Diagram 2.

The Directorate: R&D reports to the DVC Academic (responsible for R&D) who has the responsibility for the overall R&D Policy and Strategy of the institution.

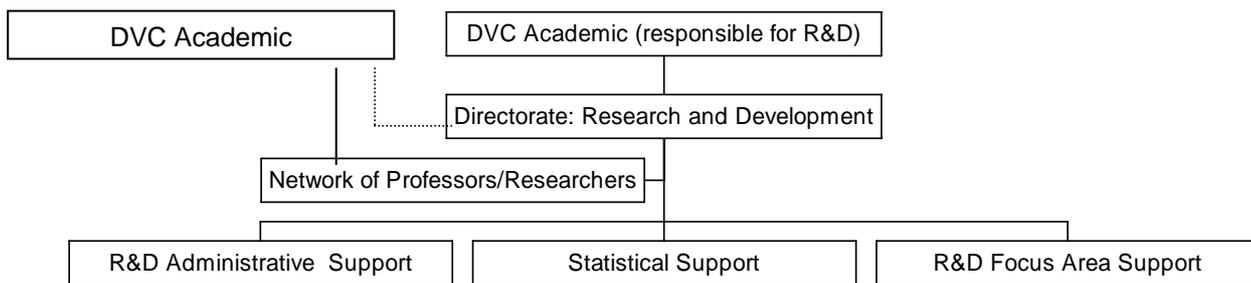


Diagram 2: Strategic Management of R&D

- The network of professors/researchers at the University plays an important role in terms of the development and promotion of an R&D culture at the University.

The Directorate: R&D has the responsibility to:

- Assist the faculties in the development of an R&D culture by building an R&D climate, the development of the expertise of academic staff, an adequate research infrastructure and appropriate support systems.
- Assist the faculties in the development of a limited number of focus areas for R&D, linked to the priorities and needs of South Africa. This must become a strong portfolio with the necessary critical mass of expertise, the support of commerce and industry and the public sector and with local and international recognition.
- Assist the faculties in the development of R&D capacity through addressing imbalances of the past, the active participation of previously disadvantaged communities and by establishing an enabling environment and specific initiatives for the upward mobility and development of staff and students.
- Assist the faculties in the delivery of quality trained students at the B-Tech level and establish a strong postgraduate training portfolio at the M- and D-level linked to the focus areas for R&D.
- Assist the faculties in the development of network relationships and partnerships through collaborative R&D ventures with commerce, industry, science councils, government and other higher education institutions world-wide. This includes a

pro-active and consistent liaison programme with key partners in commerce and industry as well as a strategy to obtain the necessary financial support for the R&D projects.

6. PROCEDURES

The Tshwane University of Technology will ensure the provision of effective, efficient and equitable support for researchers, through the CRC, the FRC and the Directorate: Research and Development.

The overall process for R&D is captured in the document Research and Development Process.

Directorate Research and Development	Process: Research and Development Rev Feb 04
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Purpose of Sub-Process: The purpose of the process is to provide an overview of how research and development is conducted at Tshwane University of Technology.

Scope of Sub-Process: This process includes all the activities such as statistical support, administrative support and research and development focus area support, and how the perspective of the centralized coordination of the Directorate: Research & Development.

Definitions: R&D: Research and Development; SS: Statistical Support; RDA: R&D Administrative Support, FAS: Focus Area support

Input	Flow Diagram	Output
<p>Tshwane University of Technology needs and goal to become a leader in applied research</p>	<pre> graph TD A[Directorate: Research & Development promotes research & development] --> B[R&D needs are identified and classified] B --> C[Directorate: Research & Development identifies and establishes the necessary R&D support structures and network relationships] C --> D[R&D processes are developed and submitted by the researchers to the relevant evaluation structures] D --> E[RESEARCH PROPOSAL] E --> F{Accepted?} F -- No --> D F -- Yes --> G[Assign project with guidelines] G --> H[Guidelines are provided for submission to internal and external funding agencies] H --> I[The final proposal is submitted according to the requirements] I --> J[Funding allocation] J --> K[FRC monitors the progress] J --> L[Directorate: Research & Development coordinates reporting on progress] K --> M[Progress report is submitted by the Researcher] L --> M M --> N[Directorate: Research & Development reports research activity and output to DVC] N --> O[Executive Summary is submitted to University Council] </pre>	<ul style="list-style-type: none"> Possible strategies and solutions R&D opportunities R&D network relationships Better efficiency R&D support R&D Annual Report Award / Reward Statistical Output IR Reports R&D Course Material R&D Databases

Process Owner: DIRECTOR: RESEARCH AND DEVELOPMENT

Checked by:

List of Procedures

(All procedures are linked to the Directorate: Research & Development Process)

Directorate: Research & Development

- Department for Statistical Support
- Department for R&D Focus Area Support
- Department for R&D Administrative Support

DOCUMENTS

- Guidelines for the implementation of research and development programmes at Tshwane University of Technology
- Tshwane University of Technology R&D Policy & Strategy
- Policy and Procedure for Postgraduate study
- Framework for a Research Proposal
- Tshwane University of Technology Postgraduate and Post-doctorate Scholarship Programme

ORGANISATIONAL PROCEDURES

- Academic Administration
- Faculty Research Committees
- Ethics Committee
- Senate
- Bureau for Financial Support
- Foundation
- Department of Education