planning, monitoring & evaluation

Department:
Planning, Monitoring and Evaluation
REPUBLIC OF SOUTH AFRICA

PSPPD
PROGRAMME TO SUPPORT PRO-POOR POLICY DEVELOPMENT

POLICY BRIEF SERIES

Evidence for policy-making and implementation

The Technology and Human Resources for Industry Programme (THRIP)

EXECUTIVE SUMMARY

The Technology and Human Resources for Industry Programme (THRIP) is a research and development programme of the Department of Trade and Industry (dti). It was established in 1992, prompted by concern over the quality and quantity of engineering graduates in the country, with the objective of accelerating economic growth, creating wealth on a sustainable basis, and improving the quality of life of all South Africans. THRIP is administered by the National Research Foundation (NRF) and, as such, has the broader aim of supporting research and development. The programme is essential for the country because it aims to respond to the critical shortage of high-level technical skills required by industry and improve the competitive edge of South Africa's industry through the development of advanced technologies.

Although the dti undertakes periodic monitoring of this programme, an in-depth evaluation was needed to assess its effectiveness. As part of its mandate under the National Evaluation Policy Framework (NEPF), and in partnership with the dti, the Department of Planning, Monitoring and Evaluation (DPME) therefore coordinated an impact and implementation evaluation of THRIP. The aim of this policy brief is to present key findings and recommendations based on that evaluation.

In the main, the evaluation established that THRIP should be retained and further strengthened. The programme is efficient and offers considerable value for money in terms of technology development, as well as in developing human resources with industry-related skills. Its core principles of collaboration and quality of research and development are in accordance with international best practices.

INTRODUCTION TO THRIP

THRIP is funded by the dti and managed by the NRF. It aims to improve the competitiveness of South African industry by supporting research and technology development and enhancing the quality and quantity of appropriately skilled people. It is structured in a way that enables the South African industry to have access to innovation in order to respond to technological needs and produce a flow of highly skilled researchers and technology personnel through applied research performed at Higher Education Institutions (HEIs) and Science, Engineering and Technology Institutions (SETIs).

One of the most critical issues addressed by the programme relates to South Africa's international competitiveness – to increase the number and quality of people with appropriate skills in the development and management of technology and innovation.

THE EVALUATION

In its broadest sense, the evaluation aimed to identify THRIP's relevance to the country's national system of innovation; the effects of processes (such as structure and administration) on THRIP's performance, as well as the programme's cost-effectiveness in comparison to other approaches. The evaluation also intended to compare this programme with similar ones in other countries. From an impact perspective, a number of issues were explored: impact on technology development; small, medium and micro enterprises (SMMEs); skills development; economic development; competitiveness; tax revenue; and intellectual property.

The methods used in this evaluation included literature and archive reviews, data collection from the THRIP databases, a survey of university and archive reviews, a survey of university administrators and THRIP grant holders, a survey of industrial participants, comparisons of similar national and international programmes, interviews with key informants/stakeholders, and a theory of change workshop.

Shortly after the initiation of the project, the assessment of THRIP's impact was broadened to also include an evaluation of the implementation of the programme. Thus, the evaluation was both an implementation and an impact one and therefore, two sets of findings are relevant to this evaluation: implementation findings and findings on the eight impact questions posed.

IMPLEMENTATION FINDINGS

The implementation questions focused on THRIP's relevance, the effects of institutional mechanisms (e.g. structure, administration and processes), cost-effectiveness, and benchmarking. The key findings can be summarised as follows:

Relevance: Empirical evidence shows that THRIP has retained its unique position in the array of government instruments that support human capacity building and the production of new knowledge in a collaborative way between SETIs and industry.

Effects of institutional mechanisms: The analyses showed that THRIP has a commendable structure and follows best practices in managing, processing, and monitoring the funded projects. The selection criteria applied by the programme enable it to meet broad national needs and help ensure that the benefits of successful awards extend across firms and industries.

Cost-effectiveness: THRIP was shown to have substantially lower overheads than other research funding programmes and compares very favourably to some international programmes.

Benchmarking: International comparative analyses showed that THRIP thematically compared very favourably with overseas programmes in this field, that it follows international best practices in the management and evaluation of research proposals, but that it operated with more modest government funding.

IMPACT FINDINGS

The impact questions concerned THRIP's effect on technology development, industrial return on investment, SMMEs, skills development, national return on investment, commercialisation, possible migration of benefits, and the strengthening of beneficial effects. This brief will however only focus on the first five.

Technology development: The evaluation research justifies the conclusion that THRIP has contributed meaningfully to technology development in terms of the production of new applied knowledge in health, mining, and the manufacturing industry, as well as the stakeholder perceptions of the strategic importance of the projects.

Return on investment by industry: Stakeholders declared that they expected substantial revenues from selling goods or services that incorporate THRIP technology (on average R24 million after five years and R224 million 10 years after the completion of the project).

Perceived impact on SMMEs: Approximately twice as many SMMEs as large enterprises participate in THRIP. In addition, they expect to receive commercial returns above those of the average participating industry.

Skills development: THRIP makes a substantial contribution to the development of human resources for industry. Approximately 1 400 postgraduate students participate in THRIP per financial year, and a substantial number of staff members of the participating industries also earn qualifications as a result of those industries participating in the programme.

National return on investment: The estimated total gross domestic product (GDP) directly and indirectly generated through THRIP is R508 million; industry provided more than R300 million. Furthermore, it is estimated that the programme supported 2 290 jobs in the economy (through direct and indirect effects). THRIP clearly makes a meaningful contribution to the national economy.

POLICY IMPLICATIONS AND RECOMMENDATIONS

Retain THRIP and enhance government's financial support Evidence showed that THRIP is an essential element of the South African government's portfolio of innovation support measures and should therefore be retained. Its available funding should also be increased according to industrial absorptive capacity and needs. Doubling of the programme's funding should be the first objective over the intermediate term.

Protect and enforce core principles
The dti and NRF should protect and enforce the core principles contributing to THRIP's successes. The recommended principles that should be considered minimum entry requirements are:

- Collaborative research involving at least two partners;
- Quality scientific research;
- Safeguarding of the pre-commercial character of research through the participation of more than one firm.

Furthermore, the maximum funding available from government should be reconsidered by the dti with the objective of bringing the programme on par with international standards and supporting the local industry appropriately.

Improve operational challenges
The dti and NRF should improve the operational challenges of the programme, viz. the relatively broad spectrum of objectives; the discouraging effect of partial funding; the promotion of participation by companies partially owned by HEI/SETIs; encouragement of participation by universities that were previously unsuccessful in obtaining THRIP funds; and programme evaluation.

Links with similar international programmes
The THRIP management and executive should create links with similar international programmes and learn from their experience. THRIP could benefit by establishing active linkages with similar international programmes, such as the Canadian Collaborative Research Development Grants and the Advanced Technology Programme in the United States of America.

Expand and supplement THRIP in support of industry
The dti should consider the expansion and supplementation of THRIP in support of industry for the uptake and commercialisation of the knowledge generated, as well as for the monitoring and evaluation of THRIP project outcomes beyond project conclusion.

Resolve challenge of intellectual ownership
The dti should engage with the Department of Science and Technology (DST) in order to resolve the challenge of intellectual property ownership. THRIP participants identified the intellectual property regime, within which the programme operates, as an obstacle to commercialisation. THRIP and the dti should engage with the DST to identify ways of simplifying the intellectual property regime for THRIP projects.

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