

# Section E

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CONCLUSION

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## CONCLUSION

This study shows that THRIP and the Innovation Fund have made a marked contribution to incentivising higher education-industry linkages in the three technological bands as well as in other technological areas. In this regard, it has shown that:

- THRIP and the Innovation Fund incentivised a large number of partnerships between industry and higher education. A total of 423 projects were incentivised, with 366 of these in the three technological fields of biotechnology, ICT, new materials development, identified as priorities for innovation.
- THRIP and the Innovation Fund make a marked financial contribution to incentivising higher education-industry linkages in the three technological bands, as well as in other technological areas. THRIP and the Innovation Fund have resulted in a total of R869.1 million being spent on HE/SET-industry linkages and a total of R309.6m on projects in the three technological bands. In this respect, THRIP's strategy of providing matching funding for projects resulted in a large investment being made by industry into these projects. In total, industry invested R308.6m during 2001 to 2002 for research.
- THRIP and the Innovation Fund have impacted on the number of industry partners involved in higher education partnerships. The findings show that THRIP and Innovation Fund projects involve 573 industry partners and that many of these partners are involved in two or more projects, with some involved in as many as eleven projects.
- Equally, THRIP and the Innovation Fund have impacted on the HEI/SETIs in that their projects have involved 41 HE/SET institutions as primary beneficiaries in the partnership. The study has highlighted partnerships that build complex and intensive networks between HE institutions and between departments both within and across institutions.
- One of the most marked achievements is highlighted in the attitude of industry. The study shows that industry views the relationship with HEI/SETIs as a collaborative relationship or a partnership in which there is a commitment

to a common set of goals and overall objectives, rather than a 'business arrangement'. Generally, the research has shown that industry partners on THRIP and Innovation Fund projects show a high level of commitment to HE-industry partnerships in terms of the dedication of human resources to these initiatives. Moreover, industry motives for engaging in these partnerships are linked to issues such as access to research facilities and expertise and to human resource development, rather than just to narrow motives of financial gain and increased competitiveness.

- It shows that these projects have resulted in 1 293 students being involved in research teams and a total of 885 publications being produced. Contrary to concerns raised in the literature that the traditional role of higher education may be jeopardised, these partnerships have resulted in increased publications; that basic rather than applied research is supported and that in many cases a sharing of intellectual property between the industry enterprise and the HE institution(s) takes place.
- In terms of technological advancement, the projects funded by THRIP and the Innovation Fund resulted in a total of 35 patents and 296 artefacts being produced, suggesting that these projects have made a significant contribution both to research but also to industrial innovation in South Africa.
- The study, through the network analysis undertaken and presented in Chapter 10, indicates that a myriad of networks exist in the partnership projects funded by THRIP and the Innovation Fund. An important finding highlighted in this chapter is that biotechnology and ICT appear, on the whole, to consistently show patterns of partnership with other disciplines and other institutions while new materials development consistently differs from this pattern. This may suggest marked differences between the knowledge fields and the way in which they operate.

Together, these findings provide the basis for re-assessing concerns that HE-industry partnerships may impact negatively on the traditional role of higher education. They suggest that the partnerships have resulted in tangible benefits with advantages being gained on both sides. This does not attempt to suggest that all HE-industry partnerships are inherently beneficial, but rather that THRIP and Innovation Fund partnerships do appear to have rested on a formula where mutual benefit is obtainable and which represent exemplars of how HE-industry partnerships can be used to develop science, technology and innovation in South Africa.

## GLOSSARY

**Responsiveness:** As first used in the South African higher education policy context, the term implies that higher education should take seriously the problems and challenges presented by the societal context in which it operates.

**Networking:** A feature of the new global economy is the seemingly paradoxical rise of relations of both competition and co-operation in the form of networking between firms in related product markets. Constant product market innovations, technological breakthroughs, access to expertise and a skilled workforce are often beyond the means of a single firm, but are feasible through co-operation amongst a number of firms. By collaborating around research and development (R&D), training, marketing and producer-supplier relations, firms gain access to the knowledge and expertise of other firms, reduce the cost of R&D, and through joint innovation are able to design new products and processes.

**The networking society:** Improving the nation state's competitiveness is increasingly dependent on the complex interaction between historically-rooted political institutions and increasingly globalised economic agents. For Castells, what becomes crucial for competitiveness in the 'new' global economy is dependent on the political capacity of national institutions to steer growth strategies.

**Three technological bands:** Biotechnology, information and communication technology, and new materials development.

**Black** is used in this publication to refer to African, Indian and coloured students and staff.

**Higher Education:** Refers to Higher Education as defined in the Higher Education Act 1997 (Act No. 101 of 1997).

**Primary beneficiary:** This term has been adopted by THRIP and refers to the main beneficiary or higher education grant holder of each project. The main THRIP contract is a document signed between THRIP and the grant holder at the higher education institution.

**Secondary beneficiary:** Secondary beneficiaries are defined as the industry partners on a project.

**Auxiliary beneficiary:** These are research staff at HEIs or SETIs who form part of the project research team.

**Students:** This includes students who work on or are funded through the project.

**Primary institution:** This refers to the HE institution or SETI that holds the research contract.

**Auxiliary institution:** This refers to the HEIs/SETIs at which auxiliary researchers are located.

**Transdisciplinary:** Term coined by Gibbons et al that refers to transdisciplinary, rather than multidisciplinary forms of knowledge. In this mode of knowledge production, the applied context becomes the primary locus, rather than the traditional realms of academic institutions, departments and disciplines.

**Mode 2 knowledge:** Coined by Gibbons et al refers to 'Mode 2' knowledge, where knowledge and information, traditionally produced in the academic realm, is increasingly linked to forms of application required in the economic and development sectors. 'Mode 2' knowledge is viewed by Gibbons et al as a 'transdisciplinary', rather than multidisciplinary form of knowledge. In this mode of knowledge production, the applied context becomes the primary locus, rather than the traditional realms of academic institutions, departments and disciplines. As such, research teams that bridge the traditional disciplinary and institutional boundaries are established around the locus of an economic or social problem.

**Threefolding:** This is a concept towards understanding the 'new social landscape'. It recognises that the forces, capacities and resources to change the world are clustered in the hands of business, government and global civil society. It acknowledges that government, business and civil society will naturally emphasise different aspects of society as a whole, nevertheless, the boundaries between these three realms are fluid and actions of key institutions are bound to have an impact beyond their own natural habitat and realm. When key institutions of social life are aware of their institutional powers they can make a big difference in societal transformation through 'autonomous interaction' that can advocate for and achieve genuine or comprehensive sustainable development.

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