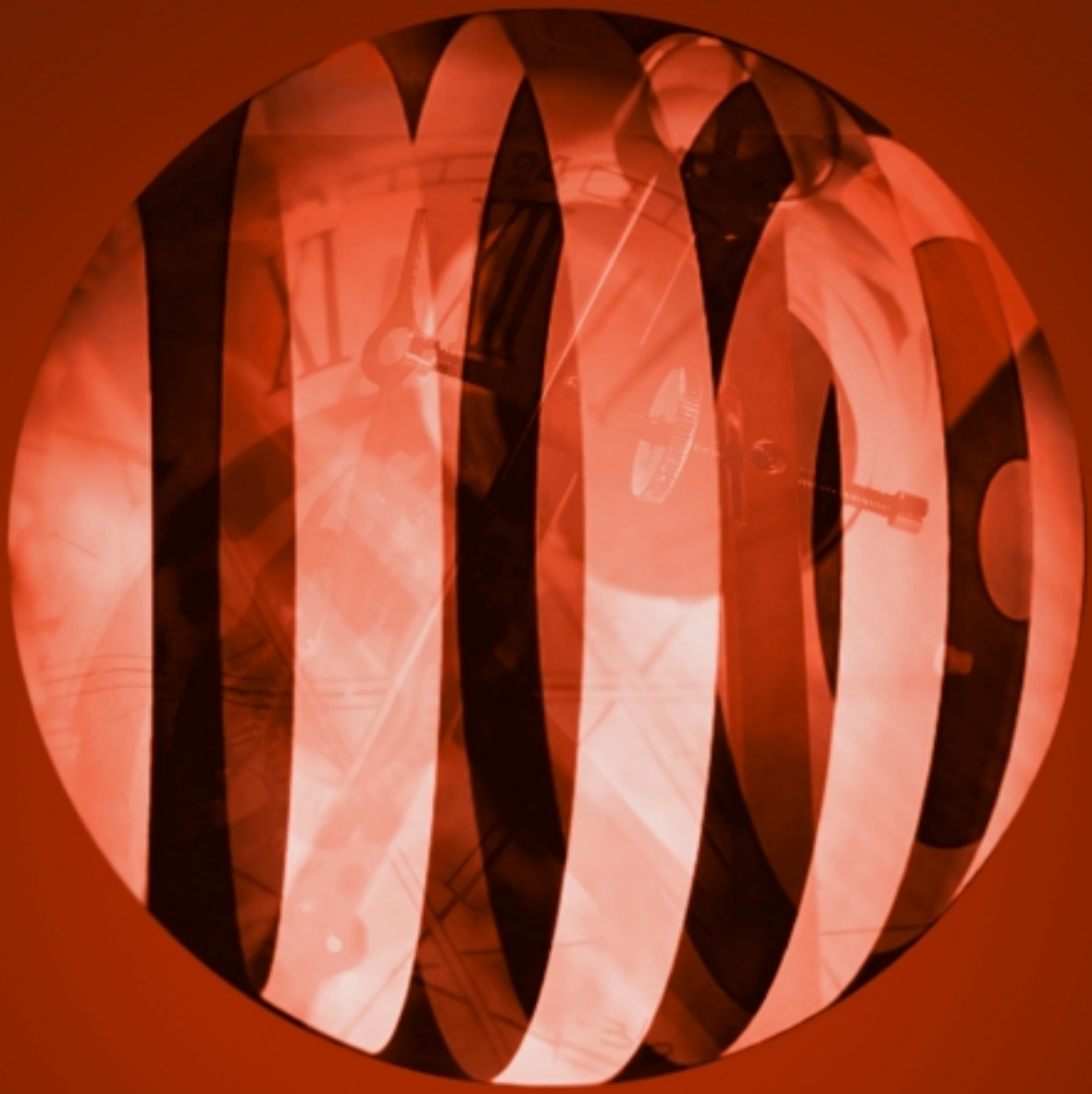
COUNCIL ON HIGHER EDUCATION



PROCEEDINGS OF THE CHE

# -COLLOQUIUM-

SANDTON, 27 & 28 JUNE 2002

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# FOREWORD

A high quality and socially responsive higher education is crucial for social equity, economic and social development and the existence of a vibrant democracy and civil society. Without higher education producing knowledgeable, competent and skilled graduates, research and knowledge and being responsive to economic and social needs, equity, democracy and development will all be constrained. The challenges of reconstruction, social transformation and development are tremendous. Higher education must not fail in meeting the new priorities and needs of South Africa

The Council on Higher Education (CHE) is an independent statutory body established by the *Higher Education Act* of 1997. Its mandate is to advise the Minister of Education on all matters of higher education so that the system becomes characterised by equity, quality, responsiveness to economic and social development needs, and effective and efficient provision and management and also contributes to the public good. The CHE is also responsible, through its Higher Education Quality Committee (HEQC), for quality assurance in higher education.

One specific responsibility allocated to the CHE is to advise the Minister of Education on stimulating greater responsiveness on the part of higher education to societal needs, especially those linked to developing South Africa's economy through enhanced higher education - industry partnerships.

This advice, however, implied the investigation of some fundamental aspects of the relationship between higher education and the private and public sectors. Primarily, it was necessary to develop an understanding of the changing requirements of knowledge, skills, and competencies in the world of work and their implications for the work of higher education institutions. In addition, it was necessary also to investigate the theoretical and methodological approaches that underpin the issue of responsiveness and the different forms of organising the relationship between higher education and industry that derive from them.

To this end the CHE established a research investigation and thereafter convened a colloquium in June 2002 on the theme of *Building Relationships between Higher Education and the Private and Public Sectors* so as to address and contribute to the high-level personpower and knowledge needs of the private and public sectors.

The commissioned research papers constituted the background for the actual colloquium, which took place at the Sandton Convention Centre on 27 and 28 June 2002. The colloquium itself gathered together representatives of higher education, the private and public sectors, and labour as well as three government ministers, the Ministers of Education, Trade and Industry and Arts, Culture, Science and Technology, with three aims:

- To begin a dialogue about the nature, strengths and weaknesses of present relationships between higher education and the private and public sectors.
- To explore possible mechanisms and ways to build robust and long-term relationships between higher education and the public and private sectors to advance South Africa's economic and social development through the production of appropriate knowledge and high-level personpower.

- To provide an opportunity for leaders and representatives of higher education and the public and private sectors to engage with issues concerning the knowledge, skills and competencies required by the world of work and how these relate to the diverse social purposes of higher education.

This publication draws together the commissioned research papers and the proceedings of the June 2002 colloquium. It represents an important contribution to thinking and other action on the issue of building partnerships between higher education and the public and private sectors.

The CHE itself has no implementation mandate outside of quality assurance and therefore no role to play beyond acting as a facilitator, a catalyst, for initiating relationships between higher education institutions and the public and private sectors at the local, regional and national levels and in different economic and social sectors. It seeks to draw on these encounters for providing informed and considered advice to the Minister of Education. The cultivation and hopefully blossoming of a relationship between the local, regional, provincial and national authorities and higher education institutions is the responsibility principally of these institutions. The CHE, through its responsibility for monitoring the achievement of higher education policy goals, will monitor future developments with great interest.

The national challenge of the reconstruction and transformation of the economy and society requires responsive higher education institutions, and unless they are organised to undertake these functions effectively and efficiently and with close attention to equity and quality they are unlikely to be innovative, dynamic and responsive institutions. This will inhibit their ability to make a powerful and critical contribution to the economic, social, cultural and intellectual development of South Africa.

I look forward to working with leaders and officials of the public and private sectors and higher education institutions to building strong and enduring relationships and partnerships.

**Saki Macozoma**

**Chairperson**
**Council on Higher education**

# Content

# ACRONYMS

| | |
|---|---|
| ABASA | Association for the Advancement of Black Accountants of South Africa |
| ABSIP | Association for Black Securities and Investment Professionals |
| ACU | Association of Commonwealth Universities |
| BMF | Black Management Forum |
| BRAIN | Business Referral and Information Network |
| CDE | Centre for Development and Enterprise |
| CHERI | Centre for Research into Higher Education (of the Open University, UK) |
| CHE | Council on Higher Education |
| CIHE | Council for Industry and Higher Education (UK) |
| CHIETA | Chemical Industries SETA |
| CSIR | Centre for Scientific and Industrial Reseach |
| CTP | Committee of Technikon Principals |
| DACST | Department of Arts, Culture, Science and Technology |
| DFID | Department for International Development (UK) |
| DTI | Department of Trade and Industry |
| ECSA | Engineering Council of South Africa |
| E-SETA | Energy SETA |
| ETDP SETA | Education Training & Development Practices SETA |
| EU | European Union |
| FASSET | Finance and Accounting SETA |
| FET | Further Education and Training |
| GEAR | Growth, Employment and Redistribution |
| HAI | Historically Advantaged Institution |
| HDI | Historically Disadvantaged Institution |
| HEI | Higher Education Institution |
| HEQC | Higher Education Quality Committee |
| HSRC | Human Sciences Research Council |
| IPR | Intellectual property rights |
| IRPA | Intensification of Research in Priority Areas (Malaysia) |
| MQA | Mining Qualifications Authority |
| MRC | Medical Research Council |
| NEPAD | New Partnership for Africa's Development |
| NQF | National Qualifications Framework |
| NRF | National Research Foundation |
| OECD | Organisation for Economic Cooperation and Development |
| R&D | Research and development |
| SAICA | SA Institute of Chartered Accountants |
| SAPTO | South African Patents and Trademarks Office |
| SARIMA | Southern African Research and Innovation Managers' Association |
| SAUVCA | South African Universities Vice-Chancellors Association |
| SEIFSA | Steel and Engineering Industries Federation of SA |
| SERVICES | Public Services SETA |
| SETA | Sectoral Education and Training Authorities |
| SETASA | Secondary Agriculture SETA |
| SMMEs | Small and medium enterprises |

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|---|---|
| THRIP | Technology and Human Resources for Industry Programme |
| TLO | Technology Licensing Office |
| TRIPS | Trade-Related Aspects of Intellectual Property Rights |
| UCT | University of Cape Town |
| UK | United Kingdom |
| UNESCO | United Nations Educational, Scientific and Cultural Organisation |
| UNISA | University of South Africa |
| UWC | University of the Western Cape |
| WIPO | World Intellectual Property Organisation |
| WPET 1997 | White Paper on Education and Training 3: A Programme for the Transformation of Higher Education (1997) |
| WTO | World Trade Organisation |

# Introduction

One specific responsibility allocated to the Council on Higher Education (CHE) by the Higher Education Act of 1997 is to advise the Minister of Education on stimulating greater responsiveness on the part of higher education to societal needs, especially those linked to developing South Africa's economy through enhanced higher education-industry partnerships.

The general question of the responsiveness of higher education to the social and economic development of South Africa was discussed at the 2000 CHE II National Consultative Conference. This conference agreed that there was need for a project and gathering with a specific focus on the theme of "Building Relationships between Higher Education and the Private and Public Sectors" so as to address and contribute to the high-level personpower and knowledge needs of the private and public sectors. For the CHE the principal focus of this project was to provide advice to the Minister of Education on the nature of this relationship and on possible mechanisms to develop fruitful, responsive, close, durable and effective relationships between higher education and the private and public sectors in order to respond to the challenges of economic growth and development of our country.

To provide the Minister with this advice, however, implied the investigation of some fundamental aspects of the relationship between higher education and the private and public sectors. First and foremost it was necessary to develop an understanding of the changing requirements of knowledge, skills, and competencies in the world of work and their implications for the work of higher education institutions (HEIs). In addition, it was necessary also to investigate the theoretical and methodological approaches that underpin the issue of responsiveness and the different forms of organising the relationship between higher education and industry that derive from them.

With these broad objectives in mind the CHE Secretariat worked for nearly a year so as to give a clear focus to the project. This was to be about building relationships around the specifically high-level personpower needs of the private and public sectors and their knowledge and R&D needs. An essential part of the project was about defining higher education responsiveness and understanding the kinds of relationships that are needed between higher education and the private and public sectors. Thus the project was to be based on commissioned research and an engagement between higher education and private and public employers of higher education graduates that would take the form of a colloquium, a dialogue between two panels composed of representatives of HEIs, science councils and business, and of audience participation.

These conceptual and methodological decisions were made after meetings and consultations with various important stakeholders, organisations and individuals, including donors, to discuss ideas and obtain support for the project and colloquium. During this process the CHE received the generous support of DFID, the Ford Foundation and Standard Bank Foundation, who contributed in different proportions to the funding of this project.

A number of agencies and individuals were commissioned to conduct research and prepare background papers to help inform a discussion about the following concerns:

- What are the necessary attributes of high-level personpower in South Africa and what are the challenges of its formation and development?

- What are private and public sector views and perceptions on the role and contribution of HEIs in the creation of knowledge and the development of high-level personpower for the economy and society?
- How can higher education respond to the needs of the labour market in a rapidly evolving and dynamic economic and social environment and, in particular, in the context of the systemic changes which characterise the world of work as we enter the 21st century?
- What are the most effective approaches and strategies for higher education to contribute to the demand for high-level personpower?
- What are the problems and tensions in developing strategic and long-term relationships between higher education and the private and public sectors? Of what use are comparative international experiences in developing national strategy?
- What demands do the development of intellectual property rights place on the relationships between HEIs, business and government? What should be the nature of the relationships between higher education and business and government in regard to their reciprocal rights and responsibilities in the production, ownership and dissemination of knowledge? What should be the regulatory role of government in these relationships?
- Finally, what kind of relationships should exist between the private and public sectors and higher education in the light of the diverse social purposes that have been accorded to higher education and the idea of higher education as a public good?

The papers constituted the background for the actual colloquium which took place at the Sandton Convention Centre on 27 and 28 June 2002. The colloquium itself gathered together representatives of higher education, the private and public sectors, and labour as well as three government ministers, the Ministers of Education, Trade and Industry and Arts, Culture, Science and Technology, with three aims:

- To begin a dialogue about the nature, strengths and weaknesses of present relationships between higher education and the private and public sectors.
- To explore possible mechanisms and ways to build robust and long-term relationships between higher education and the public and private sectors to advance South Africa's economic and social development through the production of appropriate knowledge and high-level personpower.
- To provide an opportunity for leaders and representatives of higher education and the public and private sectors to engage with issues concerning the knowledge, skills and competencies required by the world of work and how these relate to the diverse social purposes of higher education.

The issues proposed for discussion at the colloquium as well as the research papers were based on one fundamental assumption, the role of education in economic development. Education has been long recognised as critical to economic and social development. Classical economists like David Ricardo observed that British manufacturing superiority was attributable to the improvement in machinery, the better division and distribution of labour and to increased skills in the science and art of the producers. John Stuart Mill included among the principal forces for increasing progress in science and technology, education and improved skills.

From a different standpoint, Marx too talked of the transformation of labour from a basis of skill to a basis of science, incorporating the content of scientific and engineering revolutions. With the

rise of modern industry, Marx wrote,

> the varied, apparently unconnected, and petrified forms of the industrial processes now resolved themselves into so many conscious and systematic applications of natural science to the attainment of given useful effects.[1]

Equally, the idea that the development of industry is closely related to the progress of science and technology (and hence education) is an old one. Thorstein Veblen, notwithstanding his "sweeping attacks on the exploiting role of Big Business",

> was undoubtedly right in his emphasis on the realities of applied science and technology, so utterly neglected by most economists of his day. Particularly interesting from our present point of view was his discernment not only of the effects of applied science upon industry, but also of the reverse effects of industrial technological development on science, interactions which he traced back to the Industrial Revolution, though developing mainly in the modern period.[2]

Despite the relationship between science and technological development and social progress, the relationship between educational outcomes and economic growth is not a simple matter of predicting labour demand and supply in the manner of manpower planning. This was made clear by the research commissioned by the CHE. The difficult relation between higher education and the world of work is not restricted to developing countries, it is a worldwide phenomenon. A recent UNESCO report recognises that:

> Divergent views persist because systematic information on graduate employment and work is scarce and there are no indisputable criteria for assessing graduate employment. Graduate employment is assessed more favourably when compared to that of non-graduates than when compared to the graduate employment and work situation which prevailed a few years ago. All in all, the signals from the employment system are more blurred and ambivalent than ever before.[3]

The very complexity of the relationship between economic development and education is often confounded by the incomplete definitions of "employability" that are pervasive in the national and international discourses. The Report into Higher Education in the UK recognised the problem of adequately defining employability and suggests that despite this there is an "emerging consensus"[4] that the skills required for employability should include:

- Traditional intellectual skills (critical evaluation of evidence, application of theory, logical argument to challenge given assumptions).
- The new core or key skills (communication, information and communication technology, application of numbers, teamwork and improving performance).
- Personal attributes (self-reliance, adaptability, flexibility, nous and creativity).
- Knowledge about how organisations work.

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1 Referred to in Braverman, H, (1974) *Labor and Monopoly Capital* (Monthly Review Press, New York) p. 155.

2 *Ibid* p. 7

3 *Higher education in the 21st Century: Vision and Action* (1998) October (Unesco, Paris).

4 *Skills development in higher education: Short Report* (c 1999) (DfEE and HEQE).

Issues of responsiveness and employability, however, are not accepted without reservations. There is another discourse, not only within higher education, that suggests that the role of higher education is and must be much greater than responsiveness to the labour market (the market itself reduced to the needs of industry, mining and commerce). This discourse argues that higher education must also respond to wider societal goals of a socially committed and critical citizenry that embraces new values of non-discrimination, tolerance, service to community and so forth. This discourse is particularly critical of what it interprets to be the narrowing of higher education's remit to responsiveness, to the demands of specific and identifiable high-level professions, vocations and careers, at the expense of the intellectual and critical functions associated with general education.

Yet another discourse is built around the topic of the "entrepreneurial" university. HEIs are criticised for not being entrepreneurial enough and, in the face of declining public subsidies, are implored to search for new sources of income. Some consider institutions of higher learning to be businesses like any other and expect them to behave as such. They are quite comfortable with the importation into HEIs of traditionally corporate structures and styles of management.

The ostensible benefits of, and enthusiasm for, entrepreneurial institutions, however, are not equally shared by all higher education constituencies. There are worries about the consequences of this for traditional practices of knowledge production and dissemination and for the nature and trajectory of learning and teaching. Those in doubt about the value of entrepreneurialism also express concern about the effects on traditional academic cultures, communities and conduct of borrowing from the corporate culture. In the specific case of South Africa those institutions that because of our apartheid past did not have the opportunities to develop strong relationships with the private and public sectors could be especially lukewarm about calls to become entrepreneurial since this could reinforce and set up new bases of disadvantage and privilege amongst institutions. More generally, there could be the concern that the active promotion of relationships between higher education and the private and public sectors is simply another manifestation of the push towards entrepreneurial higher education.

No doubt there could be benefits for higher education becoming more entrepreneurial. Equally there could also be dangers and unfortunate consequences for knowledge production and dissemination and other areas of higher education life. Ultimately, it requires debate on the purposes and aims of higher education entrepreneurialism, the possible forms of entrepreneurialism and those that are appropriate to the specific missions of HEIs.

On the terrain of research and, fundamentally, of research and development, there is similar contestation and potential conflict over the ownership, use and diffusion of knowledge and technology and the property rights attached to it. These contestations are shaped by conceptions about the nature of the ties between industry and higher education. Some welcome the closer ties between higher education and industry. Others express apprehension that these ties result in increased emphasis on commercially relevant research at the expense of basic and fundamental research. A recent book on university-industry relations notes that:

> The last few decades have been characterized by growing contributions of academic research to the foundations of industrial innovation and to the informing of regulatory decisions and legislation relating to resources, environment, health and safety. This positive development, however, has had certain side effects that create problems for academic researchers and research institutions. One of these is the

> erosion of the traditional openness of the academic research system through restraints on the disclosure of, and free access of all qualified scholars to, the results of academic research. A second is public concern about possible undisclosed conflicts-of-interest or strong ideological affiliations of university researchers and their effects on the objectivity and public credibility of the research results emanating from academic R&D.[5]

These arguments relate essentially to the seeming incompatibilities between industry and higher education arising from questions about research objectives, policies concerning the disclosure of research findings, the ownership of proprietary rights in the research and from conflicting financial interests. These incompatibilities in turn threaten to undermine the possibilities for closer higher education-industry cooperation.

Finally, the question of responsiveness is not easily separable from concerns about higher education as a public good and there is the vexed issue of reconciling the public good and private and particular interests with the idea of higher education responsiveness. Apropos of the question of how to reconcile "the public good of free access to information and the commercial necessity of paying for the creation of that information", Teresa Hackett is concerned that:

> The situation is coming to a head. The core issues have yet to be resolved and we are nowhere near resolving them satisfactorily. Government's attempts to balance public good and private gain through patents and copyrights is in need of radical change according to those who want a 'shift in favour of public good'. It calls for policy-makers and stakeholders to work together to ensure that the important public purposes embodied in copyright law continue to be fulfilled in the digital age through the development of 'reasonable' compromises to allow the nation to benefit from the opportunities it can bring.[6]

The CHE itself recently devoted the first issue of its Higher Education Discussion Series, Kagisano, to this question. There it is argued that far-reaching changes captured by the concept "globalisation" have a direct bearing on the role of higher education in developed and developing countries alike. It is noted that:

> With globalisation and the increasing marketisation of higher education it appears that locally and internationally the notion of higher education as a public good is being eroded. At the same time, it may be that higher education's relation to the public good is not self-evident and the benefits of higher education are not immediately obvious to or felt by particular social groups.[7]

Conceptions of public good are therefore likely to be highly contested because of the many claims that higher education is expected to satisfy. In the transformative role ascribed to it in South Africa, higher education is obliged to contend not only with the "globally homogenising pressure for conformity to particular economic principles" but also with the "differences in the social political and moral demands made on the notion of transformation as invoked in the con-

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5 Brooks H and Randazzese *University-Industry Relations: The Next four years and Beyond,* p. 391.

6 *Times Higher* 23 March 2002.

7 Introduction to *Kagisano* Issue 1 Summer 2001.

texts where far-reaching changes in higher education are occurring".[8] Therefore in higher education itself, strategic choices are needed which strive to engage simultaneously with the need for cost efficiency and "broader social development priorities" and make "social justice issues explicit and real within notions of higher education responsiveness and accountability".[9]

The fit between higher education and the labour market, employability and the attributes of high-level personpower, intellectual property rights and the public good and private interests in relation to higher education responsiveness are part of different and divergent discourses. The contending positions on these issues are held by important constituencies, each of which seeks to influence in differing ways the definition and role of higher education in economy and society. One of the objectives of the "Colloquium on Building Relationships Between Higher Education and the Private and Public Sectors and Contributing to their High-level Personpower and Knowledge Needs" was to be a platform for the discussion of these issues and a forum to find collectively possible ways of continuing the dialogue between higher education and the private and public sectors.

The publication of these proceedings is part of the CHE's continuos commitment to encourage dialogue on this issue. We hope that participants to the colloquium and those interested in the topic will find them useful and stimulating.

This publication includes a summary of the research reports commissioned by the CHE and the discussions elicited by them; the actual research papers and the keynote addresses delivered by Minister Kader Asmal, Minister Alec Erwin and Minister Ben Ngubane.

8 Singh, M. in *Kagisano,* Issue 1 Summer 2001 p. 8.
9 *Ibid* p. 20.

# A summary of the research commissioned by the CHE

## ● The linkages between education and the labour market

Key points:

1. This paper examines the link between education and human capital accumulation within the context of the employment and labour force shifts which took place in South Africa during the period 1995-1999.

2. It refutes the idea that there has been jobless growth in South Africa and shows that the real problem has been the inability of the South African economy to generate enough jobs to keep pace with the growth of the economically active population - i.e. through new entrants into the labour market.

3. Most importantly, it illustrates the different levels of labour absorption viewed along the axes of race, levels of skills and economic sector differences. It shows in particular:
   - The preference for skilled over semi-skilled and unskilled labour.
   - That the poor absorption of tertiary qualified workers tends to be concentrated mainly (or solely) amongst Africans who have such qualifications.
   - That the most important reason for this is the restructuring that has taken place in service sector parts of the public service - i.e. in health and education.
   - That the acquisition of higher education itself does not mean improved or equal opportunities.

4. The paper argues that there is a need therefore to understand the phenomenon of non-absorption better, as broad generalisations are unhelpful. For example, it is important to understand the areas in which African skilled employees have concentrated their education relative to, say, whites.

5. Research shows, it says, that African graduates have qualifications mainly in the fields of teaching and nursing while whites are in managerial, service and scientific professions. This is also confirmed by a World Bank study.

6. A key omission in the research in South Africa, the paper points out, relates to a number of qualitative variables which are critical to understanding the relationship of education to labour market participation. Of these one of the most important relates to the quality of schooling. The literature assumes equal quality of schooling for all (urban and rural, black and white, socially advantaged and disadvantaged, etc) while this is not true. Were a range of indicators to be examined this would become obvious, it argues. These include quality indicators like matriculation pass rates, pupil teacher ratios, teacher salaries, curriculum choices, school infrastructure, physical locations, etc. The impact of these variables on the quality of schooling and on labour market opportunity must be taken into account.

7. Similarly, the paper shows that in the case of higher education it is clear that there are different career choices and levels, and questions what the effect is of this variable on labour market opportunities. There is also the question of employer perceptions and how these shape responses to the labour market.

8. Another weakness identified by the paper is the inability to factor household level influences on the outcomes of education. At this level, family and neighborhood influences are very important as are questions about race, gender, age and individual characteristics. A large part is also played by factors affecting cognitive skills, ability, attributes and skills.

9. Similarly, the paper develops the following critique of manpower planning:
   - All manpower projections are inexact.
   - Exogenous and endogenous factors, which cannot be captured by manpower planning, also shape labour market trends and make predictions about future trends (based on the past) inexact and inappropriate.
   - Manpower planning may have a limited use only in broad terms, for example to indicate an increasing demand for skilled workers. However, it cannot do more than this.

10. Manpower planning and earnings function analysis have until now been the principal analytical tools for understanding the relationship between education and the labour market. The paper argues that the research is not particularly useful as it is largely confirmatory and does not appreciate the complexity of the relationship between outcomes of education and employment.

11. It concludes that neither of these tools of analysis, which have been dominant for several decades, provide an "integrated human capital measurement instrument" which can:
   - Provide data that is more diverse.
   - Assign different levels of importance to each component of capital accumulated.
   - Place importance on "attributes and abilities" and not only on the number of years of schooling.
   - Provide better planning information for institutions.

## ● Universities and the world of work: a case study on graduate attributes

Key points:

1. This is a study done by the University of Natal on employer satisfaction with its graduates.

2. It investigates two broad themes:
   - Employers' views on standards and quality.
   - Those which employers regard as priority graduate attributes, and how they rated the importance of these attributes and their satisfaction with the performance of graduates in respect of these attributes.

3. The study shows that about half of the respondents believe that standards have remained the same and think that higher education equips graduates only moderately well for the workplace.

4. However, it also demonstrates a remarkable overlap between the ranking of attributes in terms of their importance and those qualities with which employers were most satisfied in respect of University of Natal graduates.

5. The study makes the point that while it is important for universities (and technikons) to take heed of the employers' view and "the demands for future places on the development of university curricula in the present", the causal link between higher education and the "package of attributes that meshes with what the employer is looking for" is not easy to make, for reasons such as that:
   - "Socio-cultural circumstances" might well be more important than the outcomes of higher education learning and that the ostensibly "ideal qualities of graduateness might be different from the reality of employment practices".
   - The concept of attributes or qualities "which entail a range of competencies and abilities - knowledge, skills, approach, intellect and attitude" is not easy to understand. For example, "communication skills" is often interpreted differently from one organisation to another and indeed from its connotation in higher education.
   - Abilities and attributes are therefore "context bound". The question is whether universities "do develop attributes that fit the demands of the workplace".
   - "Universities have become diverse and differentiated" with no "grand organising principle" to "delineate the role and idea of a university and neither the kinds of knowledge, skills and competencies that ought to be developed".
   - There is no "grand narrative" of these attributes "that best fit the demands of the world of work". Knowledge is seen by some commentators as "information" and information technology is seen as a fundamental resource in a global, knowledge-driven society. Others see the curriculum as more than the "transmission of knowledge and techniques" to enhance the performance of particular occupations and refer to other characteristics of knowledge such as critical enquiry and rational debate, "the ability to distinguish opinion from evidence, to evaluate an argument dispassionately, to present coherent arguments, to think conceptually, and so on".
   - In addition, from another point of view, universities have limited abilities in the transmission of some kinds of knowledge such as communication skills and the ability to cooperate with others while they may be better equipped to "to shape the cognitive domain of academic learning".

6. The study points to the fact that there is likewise more than one discourse about curriculum: a traditional "disciplinary discourse" and one that is driven by the new qualifications and credit accumulation discourse. These reflect a difference between the demands for producing graduates for the workplace and education the purpose of which is "an apprenticeship into powerful ways of knowing: of modes of analysis, of critique and knowledge production".

7. The study argues that "it seems feasible to conclude" that the attributes regarded as most important by employers and about which they appeared to be most satisfied show that shifts are already taking place in regard to the curriculum in the institution in question. These shifts are consonant with the changing context, although areas of weakness remain. A similar report in the UK suggests that "in many organisations knowledge of something is much less important than the ability to acquire knowledge".

8. It concludes that universities are best positioned to deliver "flexible, adaptable and intellectually talented individuals with a sound knowledge foundation and skills appropriate to the demands of the 21st century world".

## ● Intellectual property management in South African higher education institutions: some policy issues

Key points:

1. This paper starts out by saying that intellectual capital is now replacing physical capital as a source of wealth.

2. It says issues of intellectual property have become increasingly important to world trade and national development in areas such as sustainable development, access to drugs, food security, technology transfer and biodiversity.

3. Academic research institutions are becoming increasingly important players in this field and therefore have a large interest in the question of intellectual property (IP) management.

4. Many institutions have become increasingly entrepreneurial, both to show their responsiveness and because of the funding pressures they face, the paper points out.

5. However, it argues, these developments come with risks, particularly to HEIs in developing countries, because of their limited ability to mediate the conditions attached to funding. The paper details the concerns raised about this reality and the possibility that:
   - New activity would compromise the educational mission of these institutions.
   - Research is likely to be driven by a corporate agenda and not the "public good", and "disinterested enquiry" would be inhibited.
   - It would limit academic freedom through the confidentiality clauses of the agreements with researchers and give rise to potential conflicts of interests through profit sharing.
   - Institutions would grow "fragmented" as special interests were asserted, leading to for example, the marginalisation of the humanities, and the decline in the number of programmes, research and academics associated with these.
   - Applied research would invariably be favoured above basic research, and this would have long-term effects on the missions of institutions that were further fragmented (for e.g. natural sciences versus humanities).

6. The paper argues that these dangers are not inevitable because, for instance, responsive applied research (serving the country's needs) and "blue-sky" research need not be counterpoised and that in reality a proper balance is called for between these activities.

7. However, it says, few South African institutions are in a position to reject funding based on "unsuitable" demands in respect of ownership and the use of IP. A flexible approach is necessary and it is better to deal with these issues at an institutional rather than individual (researcher) level to ensure consistency and to build long-term relationships.

8. The paper argues that in South Africa IP management remains generally unsophisticated in relation to developed countries although there is now increasing awareness of it and some effort at properly institutionalising IP management to negotiate the rights to the use, ownership, use and exploitation of IP rights.

9. The paper also provides a country scan of IP legislation and policies in the US, Japan, and Brazil.

## ● Employment and employability: expectations of higher education responsiveness

Key points:

1. The study investigates the expectation that higher education should become more responsive to socio-economic demands in South Africa. It accesses the expectations of five distinct constituencies:
   - The public sector.
   - The private sector.
   - Professional associations.
   - Sectoral Education and Training Authorities (SETAs).
   - Public and private higher education providers.

2. It shows how there is both convergence and divergence in the expectations of these five constituencies.

3. A new model of the idea of responsiveness is emerging, it says, in regard to the link between higher education and the workplace. Now HEIs are expected to prepare directly employable graduates to enter the labour market.

4. It is expected that these graduates will have the "tacit experiential knowledge, the high-level skills and attitudes required by the labour market, alongside general and specialist academic knowledge".

5. The study argues that new higher education policy has largely provided symbolic frameworks. It expects HEIs to become more responsive, but it does not provide details or plans for how this should happen. Such policy is open to multiple mediations by different constituencies and interest groups in different contexts. They develop their own interpretations and expectations of what responsiveness should mean, and begin to develop strategies and mechanisms based on these interpretations.

6. The constituencies "mediate" their interpretations of the idea of responsiveness in different ways, it points out. These range from relating their responsiveness to national economic and social development, to global competitiveness and the knowledge economy or to narrow vocationalism.

7. Generally, business and industry leaders in the study tend to have a highly sophisticated view of responsiveness, in terms of its significance for ensuring global competitiveness and development of a knowledge economy, although recognising the demands of national development. The study reports widespread condemnation of the failure of large parts of the higher education sector to meet these expectations, of the failure to be innovative, or to identify the needs of business and opportunities for new programmes.

8. It says that HEIs tend to frame their expectations of their new role in terms of a classic liberal education discourse, which articulates in differing ways with the three labour

market discourses of the other constituencies. Leaders argued that the role of higher education is to prepare graduates for employability so that they can enter the labour market and at the same time assume active citizenship in society. They also argued that the creation of knowledge for future socio-economic needs is critical.

9. However, conceptions within and across these sectors are not uniform, according to the study. There is a great deal of variation in expectations and the extent of change between general and professional programmes, between universities and technikons, between private and public institutions, and within the same institution, and these are traced in the study. In practice, there is a tension between the past models and the increasing dominance of the new model of direct employability, at least in some institutions.

10. The study concludes by saying that some may choose to question fundamentally the emerging model of direct employability, and indeed, many academics and institutions have effectively done so. Alternatively, they may choose to engage with those who propose a narrow vocationalised mediation of responsiveness, to encourage a broader set of expectations. Again, they may choose to elaborate the implications of mediation in terms of national development, or global competitiveness, to develop mechanisms for partnerships. The study opens up a wide range of possibilities for the higher education sector to engage actively with the challenges of the current context.

## ● An essential partnership: business/ higher education relationships

Key points:

1. The paper is based on the assumption that business and higher education are inextricably linked and are "interdependent for the supply of critical inputs that contribute to their respective productivity and performance".

2. It provides a brief overview of business-higher education relationships in a selection of developed and developing countries.

3. These relationships are diverse and range from cooperation on R&D and knowledge transfer to curriculum planning and student placement.

4. In all cases government has played a crucial facilitating role in building this relationship.

5. There are real benefits, says the paper, from such closer relationships, such as:
   - R&D activity, especially of an applied nature, which can be funded and lead to start-up companies.
   - Curriculum reform to facilitate graduate employability.
   - Consultancy services, work-based learning and continuous professional development.
   - The possibility of cross-representation on boards and councils.

6. The relationship, the paper argues, should be of a strategic long-term nature and should tackle issues of national importance.

# Summary of topics discussed

***This record of the discussions demonstrates the wide range of ideas, emphases and preferences in the participants' views and the fact that no single view of the role of higher education could be framed.***

The issues discussed were the following:

**1. Education and the labour market**

1.1 The discussion on the relation between educational achievement and labour market outcomes, informed by one of the commissioned papers, did not follow the key proposition of the research paper, i.e. that the prevailing quantitative analysis failed to recognise the nature and complexity of the relationship between education and the labour market and the many factors determining it.

1.2 On the contrary, in the course of the discussion, argument was also made that despite these limitations there was some value in indicative planning - especially for such employment categories as teachers and nurses.

1.3 The discussion raised a number of general issues about educational outcomes and the labour market such as that:

- There was a high level of dysfunctionality between the outputs of education and the labour market, a situation that could be seen from the low levels of higher education graduate employment. This, according to some participants, was the direct consequence of the "poor" and "irrelevant" education that HEIs were providing.
- A high level of unemployment amongst higher education graduates meant that institutions of higher learning had not met students' expectations. This, in turn, had lowered the demand for higher education because potential students did not think that higher education would guarantee their absorption into the labour market. Non-absorption of graduates into the labour market was attributed to the poor quality of the programmes offered at private and public institutions of higher education. The solution to this problem, it was argued, lay in part in curriculum change and in part in the development of graduates.
- It was suggested that to a certain extent the dysfunctionalities of higher education could also be attributed to the poor relationship between business and higher education. There were also difficulties at a conceptual level in understanding this relationship in the context of the broader mandates and missions of higher education.

1.4 The discussion also focused on issues beyond the relationship between higher education and the labour market. Questions raised in this regard included: Are the "products" of higher education required solely for the labour market? What is the role of higher education in the development of skills for self-employment? And what indeed about the many and varied social, political, cultural and community roles which are required in society outside the arena of formal high-level employment? These roles meant that the work of HEIs was complex and could not simply be reduced to their role as a supplier of high-level skills to the labour market. One of the conclusions reached regarding this point was that every HEI has to respond to a wide range of demands.

1.5 A view expressed in the research was that there was a broad and complex range of learning attributes (knowledge, competencies, skills, understandings) required of graduates. The question that was asked, in the light of these requirements, was whether there was not too great an expectation of higher education. Could it actually develop all the attributes and competencies which were required by business - did it play that role? Did it have that capacity?

1.6 It was even suggested that in exploring the relation between HEIs and business the actual concept of "the labour market" needed to be reviewed. The "labour market", it was argued, does not exist in any tangible form. What exists is a "constant state of flux, a fluid exchange of wealth and effort" and creativity. Focusing on the labour market alone was not useful as it was not an adequate barometer of what was required from HEIs. The relationship between higher education and business needed to have an intellectual and knowledge related content. It had to be constructed on the knowledge demands that arose in the context of actual problem solving in industry and in the processes of production, through research and application.

1.7 There was also the need, it was argued, to increase the "tempo" of the contributions of industry to higher education so that the relationship became based on more substantive issues and to do this it was necessary to actively promote regional discussions about these issues.

1.8 A question was also raised about whether institutions recognised that many learners brought particular knowledge and experiences with them and how these were or were not validated as knowledge.

2. Contextual changes affecting the relationship

2.1 Inevitably, the discussion raised the question of the particularities of the South African context and how it framed the relationship between the economy and higher education. It was argued that these factors required a fresh look at the role of higher education.

2.2 The relationship between higher education and public and private business was changing rapidly because of these factors and these changes had important effects on the way in which knowledge had to be conceptualised, produced, disseminated and exploited commercially and socially.

2.3 Amongst the contextual issues mentioned by participants it is necessary to distinguish between issues of context within higher education and those of a more general nature. Amongst the former was the impending restructuring of the higher education system which was flagged as the "single most important issue", and the international trends that lent primacy to the market and the commodification of education. Amongst the broader contextual issues participants mentioned the impact of new technologies, the government's macro-economic framework and the challenge of job creation which was implied in the government's GEAR strategy. Other contextual factors such as the sectoral composition of services - the change from primary to tertiary services and the concomitant need for more skilled labour - were also referred to and the view was expressed that business itself was not fully cognizant of these changes nor was it able to respond to these adequately.

2.4 These contextual changes called for a new framework within which the relationship between higher education and business had to be constructed. Such a framework had to deal with both the "high and low" ends of the production of knowledge and called for a wider relationship between higher education and business. That is, a relationship that went beyond the old privileged relationships established with Historically Advantaged Institution (HAIs).

**3. Knowledge and the research problem**

3.1 Participants said there was a need to envision teaching and research in new ways in order to produce a new research community and to define the nature of the research problem differently. The country faced new socio-economic challenges and R&D capacity had to be developed in the context of that changed relationship. These changes related to the nature of the post-apartheid economy, unemployment, poverty, the rapid changes in the communication technology environment and in global economic relations, etc. There was still a considerable backlog in the production of a research community because of the legacy of apartheid on the development of such a community. In this regard the need to take the necessary steps to augment the number of new black researchers was mentioned.

3.2 At the same time, it was deemed critical to expand the research community and "intellectual capital" more generally. From the point of view of the country's development it was extremely important to sustain, renew and expand national research capability.

3.3 Several points were made in regard to the research questions that seem important in the context of the relationship between higher education and business:

- It was important that national objectives informed research and development.
- The problem in South Africa was not the level of expenditure on R&D, it was pointed out, but more importantly the question of freeing up researchers to ask the "big questions" - on the issues of poverty, unemployment, access to basic rights and quality of life of the citizens. These issues were related directly to social and contextual issues and were essential to the task of addressing social problems. Recognising the importance of these areas of research implied the creative use of research funds for strategic and applied research.
- Patents were a major indicator of the ability of the research system, said participants, and this had to be improved vastly if South Africa were to have any hopes of intervening in this regard. The key problem was therefore the need to have more knowledge workers and to produce more patents, etc.
- It was also argued that patents were a key measure of an economy's performance in the global arena because they were essential to "quality, connectivity and economic growth".
- There was a limited discussion about the relationship between theoretical and applied research and the observation was made that while in the last decade there had been movement away from basic towards applied research, there was a need to treat basic research as inviolable.

3.4 It was also necessary, it was said, to develop a "sustained conversation" between partners to research and knowledge production through the idea of enlightened self-interest, and government incentives. The partners should be full partners in foresight studies.

3.5 A concern was expressed about the "dog-eat-dog" relationship between higher education and science councils. This was regarded as totally unproductive because "they could jointly leverage the private sector". There was a need for science councils to do the applied work but higher education also had to face the market and deal with the question of relevance. The view was expressed that it was government's responsibility to keep basic research alive and responsive to the market through tax incentives.

3.6 There was a warning that the private sector would invariably use those institutions which responded to its own needs and that government therefore had a broader research mandate to ensure that research went beyond such needs.

**4. Changes in knowledge (its effects on teaching and research)**

4.1 There was a wide diversity of ideas about knowledge. No particular view could be regarded as representing the demands of knowledge production in any comprehensive way. Linear constructs of what knowledge represents were not very useful for the purposes of defining the relationship between higher education and the demands of the public and private sector in regard to high-level personpower. There were many ideas about the kinds of knowledge that were useful. These included ideas such as that:

- In regard to the workplace itself, the requirements of knowledge ranged from the technical to the general, from specific skills to broad understandings, from the social to the organisational, etc.
- There were many sites where knowledge was produced outside the HEIs. In reality, there was a great deal of "migration" of knowledge out of the higher education system.
- The question of access to knowledge shaped the nature of knowledge production in higher education. For instance, knowledge based on interactions with young school-leavers was different in many ways from that which came from adults and mature learners.
- Knowledge in contemporary society was to a large extent a social endeavour because of its growing dependence on networking, rapidity of access, and the procedures used for its validation, etc.
- Knowledge had various characteristics relating to the way in which it was used, the rapidity with which it changed, its transferability and its greater complexity.
- The questions about knowledge also raised questions about the idea of a "university" and the values that ought to be espoused by such institutions.
- From a social point of view changes in knowledge also meant changes in the relations between employers and employees, where the latter were not merely new employees but "knowledge transactors".

4.2 In terms of the sites of knowledge production it was mentioned that the leaders in the knowledge economy were often not in higher education but in industry. The division between the producers of knowledge and the "recipients" of knowledge was a false division as knowledge was being produced everywhere.

4.3 The development of knowledge required "flexible" learning organisations, it was pointed out.

4.4 The insistence on the usability of knowledge should not obscure the nature of knowledge itself. Knowledge was not a commodity. This argument was made especially by

the Minister of Trade and Industry, who stressed the social character of knowledge production and warned about the effects of the privatisation of knowledge for any society.

4.5 There was also the danger of the privatisation of knowledge (through patents) and the consequent restriction upon, and selective use of, the flow of knowledge.

4.6 There was therefore, it was emphasised, a need for protocols to protect the collective dynamism of knowledge production and the need for conscious planning to produce excellence.

**5. Partnerships as necessary**

5.1 It was widely accepted that partnerships were both necessary and unavoidable to enhance the relationship between higher education and business and that these partnerships required a commitment on every side. In particular, there were different roles to be played by members of the partnership.

5.2 Conversations about the relationship could only be constructive, it was argued, if higher education and business were not posited as opposites and if both parties could transcend "the vocabulary of condemnation" to construct a sound relationship. There were many converging interests and emphasising differences was not useful. There was a need for continued dialogue to explore how higher education and the economic actors could be brought closer together to develop a mutually reinforcing relationship. This relationship had to be more than a formal relationship - it had to be complemented by substantive relationships.

5.3 The partnership had to be voluntary, based on mutual interest and had to evince intellectual integrity to deal with both specific and broader knowledge issues, said participants.

5.4 The relationship between higher education and business had to be based on mutually satisfactory purposes and on nationally agreed objectives such as:

- To encourage science, maths and technology.
- Improve retention and throughput rates.
- Placement with business, etc.

5.5 The relationship had to understand the "culture of institutions" and other issues such as:

- Strategic long-term partnerships for national development.
- Regional economic development.
- A focus on small companies.
- Sharing responsibilities to develop continuous dialogue for specific outcomes to enhance enlightened self-interest.
- The need for both higher education and business to mobilise greater resources for institutional (including curriculum) change.

5.6 It was necessary to prevent fragmentation and therefore to work at national and regional levels, it was pointed out.

5.7 The flow of knowledge had to be in both directions between higher education and industry and these had to recognise also other sources of knowledge.

5.8 The relationship could also enhance the importance of interdisciplinary studies and make it possible for natural science students in particular to understand the social context of their knowledge better. The view was expressed that it was important to think of interdisciplinarity especially at the postgraduate studies level.

5.9 The partnership between higher education and business should not be a preparatory process to facilitate "takeover" and the silencing of the voices of "critical" academics. Similarly, selective partnership based on historical and racial relationships, cultural and social barriers had to be replaced by relationships based on a democratic framework for engagement.

5.10 There was also recognition of the fact that the ability to respond to the demands for new knowledge placed some institutions of higher education at an advantage in relation to others. An aspect of the relative disadvantage of Historically Disadvantaged Institutions (HDIs) had to do with their poor relationship with business, as was evidenced in the workings of their councils, it was pointed out.

5.11 It was very important to have a higher education sector that was diverse and the restructuring issue itself was important to this relationship.

**6. What type of organisation?**

6.1 The need to have a cooperative business and higher education forum for continuous dialogue and to influence decision-making in higher education was favoured by participants.

6.2 Such a forum would need to set clear objectives and not be a policy-making body.

6.3 The forum would have to mediate a number of different roles and interests and responsibilities and have a number of functions such as:

- To mediate between different interests such as between big and small and multinational and umbrella organisations.
- To assist to develop "concrete, energetic and enthusiastic" arrangements as important starting points to enhance the relationship.
- To ensure that the dialogue was wider than with the Department of Education only.
- To ensure that HEIs that were in rural areas were included in the dialogue.
- To ensure that the relationship became a collective one, based on more than sectoral interests.
- To ensure that it was a partnership not only of the strong institutions - which would only increase historical disadvantage - and not only of high-level skills and big business.
- To provide specific focus issues on which to concentrate such as job creation, poverty and unemployment issues.
- To think of sectoral forums as important in bringing together networks of small companies.
- To ensure that the process of local dialogue was complemented by national level discussions where "paradigmatic issues" were dealt with.

- To have active social and economic objectives, shared language etc, and practical outcomes on every side e.g. science, maths and technology education.
- To ensure the participation of science councils because of their key role in the economic mission of the country.

6.4 Participants thought it important for government to take a leading role in restructuring higher education so that it could provide clear directions in regard to curriculum change. Government would also have a role in providing a balance between markets and intervention.

6.5 It was understood that it might be best to start informally with a few captains of industry and vice chancellors at the regional level because it was not appropriate to form a structured body, such as a council, at this stage. A follow-up conference should be organised to consolidate the work done thus far and bring in key players for engagements that were more intimate.

**Conclusion**

As Prof Saleem Badat, the CHE CEO, pointed out in his summary of the deliberations, the actors who need to come together to build strong, healthy and durable relationships between higher education and the public and private sectors operate in particular spaces, often have particular preoccupations and may work according to different rhythms.

In terms of the higher education system it is clear that the sector agrees on the following points:

1. That the key functions of HEIs today are the production and dissemination of knowledge and the induction of learners into knowledge, skills and competencies that ensure that they are equipped to be economically and socially productive as well as critical and democratic citizens.

2. That unless HEIs are organised to undertake these functions effectively and efficiently and with close attention to equity and quality they are unlikely to be innovative, dynamic and responsive institutions. This would inhibit their ability to make a powerful and critical contribution to the economic, social, cultural and intellectual development of South Africa.

3. That the national challenge of the reconstruction and transformation of the economy and society requires responsive HEIs.

It is also widely acknowledged that if there is no fundamental renewal, reconstruction and transformation, the functions that are today performed by HEIs, and especially public HEIs, will be increasingly undertaken by other knowledge-producing institutions as well as private institutions.

As for the private and public sectors, they clearly have their own transformation challenges. These include the present pattern of ownership of productive assets, the racial and gender composition of high- and middle-level occupations, job creation, reduction of inequalities and poverty, effective and efficient delivery of services, social security and generally the creation of a better life for all.

Just as with HEIs, the legacy of the past continues to manifest itself in the private and public sec-

tors. If there are concerns about the institutional cultures of various HEIs, concerns can equally be raised about the institutional cultures of private and public sector organisations.

One of the points that both the research commissioned by the CHE and the discussion during the colloquium made amply clear is that it is unlikely that there will ever be a congruence between the outputs of higher education in terms of graduates and the immediate and specific needs of public and private sector employers. In this regard, if HEIs must become learning organisations, private businesses, parastatals, public organisations and government departments need to become mentoring organisations or they will not retain the staff who are endowed with great potential or expertise.

The deliberations of the colloquium brought to the fore a series of future tasks and activities that may or may not be undertaken by the CHE. Firstly, there is the need for research investigating the extent, nature and forms of partnerships between HEIs and the private and public sectors. Secondly, it was suggested that attention could be given to developing a principled relationship between higher education and the private and public sectors at the national level. The basis, nature and form of this relationship, the projects that could be undertaken jointly and indicators of its progress would need to be defined. Thirdly, it was suggested that regional interactions as well as individual interactions between a higher education institution and relevant private and public sector bodies could be more effective in yielding concrete benefits to both sectors.

All these suggestions will be incorporated into the advice that the CHE will provide to the Minister of Education.

Finally, Badat stated that whatever the next steps the CHE defined, these would be canvassed with key higher education, public sector and business organisations in order to ensure that there is a shared language, understanding and agreement around areas of initiative and cooperation.

# RESEARCH PAPERS

# The linkages between education and the labour market: random thoughts on narrowing the mismatch between demand and supply

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## Executive summary

The link between educational outcomes or human capital accumulation and employment has received relatively little attention in South African policy and applied research and our paper tries to address this lacuna. Our starting point is to locate the problem within the context of employment and labour force shifts that took place between 1995 and 1999. These shifts are tabulated further along other axes and social categories. The research debunks the notion of jobless growth in the South African economy and posits evidence to show that employment growth has not been rapid enough to absorb the level of unemployment growth. This indicates poor employment growth as the problem confronting the South African labour market.

However, further tabulations illustrate significant differentials in labour market performance, particularly as measured through the labour absorption rate, viewed along the axes of race, skills and economic sector. And despite the incidence of positive employment growth, this growth was refracted poorly along the axes of race. Race therefore continues to be an important marker in the South African labour market. Along the axis of skill, the evidence shows that over both the short and the long run, there is a increasing preference for skilled workers over the semi-skilled and unskilled. But it is not necessarily the case that workers with degrees are more in demand than those without. In fact, the low absorption rates of graduates into the labour market indicate that the labour demand needs of the economy are not being met by the supply of graduates emerging from the higher education system. Further analysis shows that this poor performance of tertiary qualified workers tends to be concentrated solely amongst Africans. In fact the demand for non-African graduates, and in particular white and Asian graduates, showed significant changes. Public sector restructuring, particularly in the community services sector, is seen as the key reason for the decline in African graduate employment, with suggestions that most of the decline was in the teaching and nursing professions.

Further analysis shows that African human capital accumulation is disproportionately concentrated in areas where labour demand is relatively lower than in other areas. The largest skilled occupation shares for African graduates are in the teaching and nursing occupations. In contrast, white employees are represented in managerial, service professional and scientific professional occupations. The latter occupations exhibit strong labour demand. A survey of employer preferences for the institutions from which skilled labour comes showed that private training schools and training acquired by business partners were preferred by employers to the training conducted at universities and technikons. The evidence tentatively suggests that the curricula of HEIs are not entirely in sinc with the needs of employers. But race is a predictor for the specific

labour market characteristics that have been engendered through education. The ways that the human capital accumulation of African workers in particular are being addressed within these institutions needs to be scrutinised. Manpower planning is not able to identify these concerns because the problem of human capital accumulation is not its objective (its objectives are vacancy rates and skills shortages). Earnings function models also cannot demonstrate the heterogeneous nature of human capital accumulation and background effects relating to the history and geography of South Africa, which bear a strong impact on the labour market. In addition, individual characteristics such as cognitive skills, attributes and abilities need to be invoked as a further explanation. Employers therefore assign a differential value to, for instance, the value of particular graduates to the firm. Understanding this heterogeneity in higher education is critical to appreciating its impact on employment and earnings outcomes. Therefore, the measure of formal education, which the earnings function models propagate, is inadequate to understand the efficacy of human capital accumulation needs. Manpower planning models are similar to earnings function models in their inability to distinguish quantity from quality and in the imposition of generalities on to specificities, which can hinder our understanding of the link between educational accumulation and the labour market.

The paper specifies a methodology by which the institutions of human capital accumulation can be linked to exogenous and endogenous factors that play a role in labour market participation and labour demand preferences being secured. The type of qualifications awarded and the quality and length of schooling are the central ingredients stemming from the institutions of human capital accumulation that bear directly on labour market outcomes. Exogenous factors of human capital accumulation relate to individual and household characteristics, while the endogenous factors include those that shape an individual's human capital asset base and are built up through family effects, neighbourhood effects, and cognitive skills, attributes and abilities. Neither the earnings function models nor the manpower planning models are able to account for the endogenous factors of human capital accumulation and its refraction on to the labour market. In the final instance however the paper suggests that an integrated human capital measurement instrument be formulated to comprehend the nature of the human capital accumulation process and the imperatives of the labour market. Such an instrument would provide the best evaluative tool of the successful transition from education to employment.

# The linkages between education and the labour market: random thoughts on narrowing the mismatch between demand and supply

## Introduction

Ironically, one of the areas that has received little attention in the South African debate, given our ostensible focus on job creation, is that of the link between educational outcomes and employment. More broadly, this can be understood as the relationship between human capital accumulation amongst individuals and the impact this has on their labour market status. While numerous papers have been written in South Africa on the returns to education, in the tradition of the earnings function analysis, this work has been far too confirmatory and sanguine, and less appreciative of the complexities inherent in the linkages between educational attainment and employment. This paper will attempt to deal with this drawback. We will not try to add more controls to the earnings function; rather, we try here to assess the available descriptive data on education and the labour market. This then leads to a more considered understanding of the role of education in determining labour market status. Specifically, we hope to develop a coherent framework within which to deal adequately with the role of education in the labour market.

## The nature of labour demand for educated workers

It is important to provide an overview of the employment and labour force shifts that have occurred within the post-apartheid labour market before proceeding to a more detailed analysis of the role of education in determining employment outcomes. Hence the table below delineates the growth in employment and in the economically active population (EAP) between 1995 and 1999, by race. In this we are measuring the relative performance of labour absorption in the domestic economy.

We see that in the aggregate, employment expanded by about 12 percent over the five-year period, resulting in a creation of about 1.1 million jobs. While the sectoral, skills and racial detail of this growth does, of course, vary, it is clear that the notion of aggregate jobless growth in the South African economy is erroneous. The economy, in the aggregate, has been *creating* jobs rather than shedding them. It is important to try and place this absolute expansion of employment into context. Specifically, it is necessary to assess the number of jobs that have been created relative to the new entrants that have come into the labour market annually between 1995 and 1999. The data in Table 1 indicates that between 1995 and 1999, the number of new entrants increased by about 3.1 million individuals. This has meant therefore that about two million individuals - some of whom were first-time entrants into the labour market - have been rendered or have remained jobless since 1995. The upshot is that while we did not have jobless growth, clearly we have had poor employment growth over the last five years. If all the new entrants since 1995 were to have been placed in employment, employment would have needed to have grown by 33.4 percent over the period instead of by 12 percent. In other words, in order to maintain unemployment at its 1995 levels, employment should have risen by close to three times the existing rate. Ultimately, the aggregate data suggests that while employment expansion has been recorded over the last five years, we need to be mindful that in terms of the economically active population and its growth over time, this job performance has been far from adequate. This data will be critical as a backdrop to examining how these employment shifts have been mirrored by the outcomes in the educational system.

In terms of the employment by race figures, it is evident that for all groups the demand for labour increased. Hence, the highest increase in percentage terms was for coloured workers, followed by Asians, Africans and then white workers. The racial distribution of the total employment shift between 1995 and 1999 therefore indicates that all groups gained from employment. However it is important to present these figures in terms of relative demand shifts. One needs to measure and evaluate the employment shifts relative to the number of new entrants coming into the labour market over the same period.

*Table 1: Employment and EAP changes, by race*

| | Employment | | EAP | | | |
|---|---|---|---|---|---|---|
| **Race** | **Change** | **% Change** | **Change** | **% Change** | **Target Rate** | **Labour Absorption Rate** |
| African | 737 834 | 12.23 | 2 567 538 | 27.17 | 42.56 | 28.74 |
| Coloured | 182 668 | 16.38 | 262 238 | 18.31 | 23.52 | 69.66 |
| Asian | 44 890 | 12.78 | 89 817 | 22.14 | 25.57 | 49.98 |
| White | 148 850 | 7.84 | 199 281 | 10.00 | 10.50 | 74.69 |
| Total | 1 131 647 | 12.04 | 3 140 862 | 23.65 | 33.42 | 36.03 |

Table 1 shows, for example, that while African employment grew by 12.23 percent since 1995, the number of new African entrants seeking employment grew by 27.17 percent. In other words, African employment grew, but not fast enough to provide employment to all new work-seekers. Indeed, in order for all these approximately 2.5 million new worker-seekers to have found employment African employment would have needed to have grown by 42.56 percent since 1995. We have termed this the *target growth rate*, as it summarises the desired employment growth rate for each of the race groups.[10] The *labour absorption* rate is the ratio between the actual employment growth and the desired (or target) rate, and is expressed as a percentage. The closer the employment gap is to 100, the better the actual relative to the desired employment performance. These figures are critical, as they are a predictor of relative employment performance - something that the standard growth rates do not yield.

Using this approach, it is evident that while all growth rates were positive, the relative labour demand shifts, as approximated by the labour absorption rate, yield contrasting results. For example, while the African growth rate was higher than white employment growth, the labour absorption rate tells a very different story. Hence, we see that the relative performance of African employment, when considering the number of new African entrants into the labour market, was actually far worse. While African employment should have grown at about 42 percent to absorb all the new entrants, white employment only needed to expand by 10 percent. The gap between the actual and desired job performance for Africans (28.74) was far wider than that for white workers (74.69). Put differently, employment was generated for only 28.74 percent of all new African entrants into the labour market, relative to 74.69 percent of all new white entrants. The

[10] The target growth rate can be represented simply as : $\frac{EAP_{kt-1} - EAP_{kt}}{L_{kt}}$ where EAP refers to the economically active population for group k and L is the number of employed individuals, by any given covariate. Note that because this target rate captures the growth required to provide employment to only the new entrants since 1995, it is essentially the rate of growth required, independent of the unemployment numbers existent in the base year, namely 1995.

generic point though is that while positive employment growth was reported for all race groups, all races yielded poor or inadequate labour demand growth relative to the growing labour force. Race therefore continues to be an important marker in the South African labour market. However, as we will see below, race is a predictor for the specific labour supply characteristic that has engendered these outcomes - namely education.

Our key focus here is to determine how important educational attainment was in determining employment outcomes. In addition we will attempt to analyse the distribution of educational attainment amongst newcomers into the post-apartheid labour market. Table 2 below provides this breakdown. As a starting point, we have attempted to overview individuals at all levels of education, from no formal education through to individuals with degrees. Aside from the no education result, the labour absorption rate figures tell a powerful story regarding the effectiveness of all tiers of the educational system in preparing its graduates for employment.

Table 2 illustrates that for all individuals with completed primary schooling, incomplete secondary, matric and a tertiary degree the probability of finding employment was not high. For example, of all individuals with primary schooling between 1995 and 1999, about 41 percent found employment. Notably, as we move into the higher educational attainments, this figure decreases. Hence, only 36 percent of all matriculants in the five-year period found employment, while a paltry seven percent of individuals with degrees were able to source a job.

*Table 2: Employment and EAP changes, by education level*

| | Employment | | EAP | | | |
|---|---|---|---|---|---|---|
| | Change | % Change | Change | % Change | Target Rate | Labour Absorption Rate |
| None | 21 611 | 2.83 | 25 471 | 2.23 | 3.34 | 84.85 |
| Primary | 348 561 | 16.27 | 852 733 | 25.68 | 39.80 | 40.88 |
| Incl. Secondary | 269 496 | 9.44 | 993 617 | 22.55 | 34.80 | 27.12 |
| Matric | 345 174 | 16.69 | 961 244 | 34.73 | 46.49 | 35.91 |
| Tertiary | 6 380 | 0.45 | 93 906 | 6.14 | 6.57 | 6.79 |
| Total | 1 131 647 | 12.04 | 3 140 862 | 23.65 | 33.42 | 36.03 |

These figures suggest a serious mismatch problem. Much has been written on changing labour demand preferences in the South African economy. This research suggests that over the short and long run the domestic labour market is exhibiting a high and increasing preference for skilled workers over and above semi-skilled and unskilled employees. This would suggest then that in terms of labour supply attributes, it would be predominantly workers with degrees who would be in great demand by employers. However, as shown in Table 2, this is not occurring. Specifically, of all the workers with degrees recorded between 1995 and 1999, only 6.79 percent in fact found employment. Put differently, of every 100 individuals with a higher education qualification, approximately seven found employment in post-apartheid South Africa. At one level this does reflect the poor employment growth the economy has experienced since 1995 - a point expanded on in detail above. However, and perhaps more critically, the figure is suggestive of the inability of the institutions of human capital to provide appropriate individuals to the labour market. Simply put, employers' labour demand needs are not being matched by the supply of graduates being provided by the higher education system.

The data above is worrying as it appears to be at odds with the widely held assumption that highly qualified workers are finding employment. What Table 3 below does is to attempt a more detailed overview of the employment shifts amongst graduates, splining the figures by race instead. As the table indicates, the picture alters dramatically. Table 3 shows very clearly that the poor employment performance for workers with a tertiary qualification is concentrated solely amongst African individuals.

*Table 3: Tertiary employment growth, by race*[11]

| Race | 1995 | 1999 | Change | % Change |
|---|---|---|---|---|
| African | 651245 | 574124 | -77121 | *-11.84* |
| Coloured | 84032 | 86638 | 2606 | *3.10* |
| Asian | 60623 | 69816 | 9193 | *15.16* |
| White | 634204 | 700945 | 66741 | *10.52* |
| Total | 1430104 | 1436484 | 6380 | *0.45* |

Hence, we see that the demand for tertiary-educated African workers declined by about 77 000, representing an 11.8 percent fall in employment levels for graduates. In contrast however the demand for non-African graduates increased, with white graduates being the primary beneficiaries. Indeed, if we only look at non-African employment growth in this cohort, we find that the growth rate was about 10 percent. The key reason for this decline in the employment of African workers with degrees appears to be the restructuring of the public sector. Hence, in this period the number of African workers with a degree fell by about 45 000 in the community services sector. One would expect that the overwhelming majority of these employees would be nurses and teachers. There is a crucial demand specification issue embedded here as well: that these workers with degrees have been accumulating, and are continuing to accumulate, human capital in fields of expertise not in demand by employers. It does point, provisionally, to the importance of ensuring that the institutions of supply, i.e. the universities and technikons, produce graduates with a skills profile that matches current demand trends. This very tentative data would seem to suggest that this is not occurring at present, and hence marks the beginnings of a graduate unemployment problem.

The evidence of differences between African and non-African higher education accumulation is provided further in the table below. The table suggests that African skilled employees are disproportionately accumulating human capital in areas where labour demand is lower. Using the skilled occupations, and breaking them down beyond more generic categories, Table 4 below illustrates that there has clearly been contrasting patterns of human capital accumulation amongst skilled African and white workers.

11 Again the race figures do not add up to the total for 1999, given the introduction of the 'other' category in the race question.

*Table 4: African and white skilled employment: selected occupations*

| African | % of Total Skilled Share | White | % of Total Skilled Share |
|---|---|---|---|
| **Primary education teaching professionals** | 17.55 | **General managers** | 16.53 |
| **Other teaching associates** | 14.37 | **Finance & sales associate professionals** | 10.23 |
| **Nursing & midwifery** | 10.09 | **Physical & engineering science technicians** | 8.95 |
| **Total** | 100.00 | **Total** | 100.00 |

The table presents the three largest skilled occupation shares for Africans and whites. It is clear that African employees are represented primarily in teaching and nursing occupations. In contrast, white employees are represented in managerial, service professional and scientific professional occupations.[12] Employment trends have indicated an increasing demand for skilled workers - but specifically those in the commerce and science and technical fields. These are precisely the areas of employment (and hence education) where white workers are over-represented and African individuals under-represented.

Final proof of this growing mismatch between suppliers of human capital and employers' needs is provided in the table below. The data is drawn from a World Bank study of manufacturing firms in the Greater Johannesburg region. While the sample size is small and the focus is only on manufacturing, the data is extremely interesting. The data is based on a question in the survey asking firms to individually rank training institutions, in terms of how valuable they found an external training source. The results shed light on how employers perceive the quality and importance of the institutions of labour supply to their internal functioning. Each firm therefore had to rank each institution from the list in Table 5 below as either "most important" or "moderately important".

*Table 5: Importance of outside training sources*

| Institution | Most Important | Moderately Important | Not Applicable |
|---|---|---|---|
| **University** | 16.23 | 22.51 | 61.26 |
| **Business Partners (Other firms)** | 12.83 | 25.67 | 61.50 |
| **Government Institutes** | 12.43 | 22.70 | 64.86 |
| **Vocational/Technikons** | 33.51 | 24.23 | 42.27 |
| **Industry Training Boards** | 34.90 | 22.92 | 42.19 |
| **Private Training Schools** | 41.58 | 29.21 | 29.21 |

[12] The managerial staff refers to general managers in all nine main sectors of the economy. The finance and sales associate professionals refers to individuals such as securities and finance dealers and brokers; insurance representatives; estate agents and so on.

The results are unexpected. In the case of the "most important" ranking, the majority of firms, 41.58 percent, found that private training schools were an ideal source for outside training. Second-ranked were industry training boards, followed by vocational technikons. The biggest surprise from the results is, of course, the fact that universities are only ranked fourth. In terms of the "moderately important" category, private training schools remain the most preferred institution, followed by firms' business partners and then technikons. Although the difference in the last three institutions is marginal, universities are technically rated last. The crucial result from this table then is that universities are in fact perceived by employers to be a far less valuable source of skilled workers than, say, technikons or private training schools.

While the sample only represents manufacturing firms in the Greater Johannesburg region, the results are powerful. They point to the importance of firstly revisiting university curricula and assessing whether they in fact remain relevant to the needs of employers. In short, is the supply of university labour matched adequately to labour demand trends? On the basis of the above, albeit tentative, evidence, the answer is clearly no. The second point to emphasise from the results relates to the financing of higher education - particularly as it pertains to universities as opposed to technikons. The state operates under a different subsidy formula for technikons, with the latter garnering less per student than universities. It would seem from the above that employers value technikon graduates more than they do their university counterparts. In this case, the pricing structure of the state is in disequilibrium. Put simply, the state may be paying technikons less to produce graduates who are more in demand than similar graduates from universities. In doing so, the subsidy formula may be a hindrance to more rapid growth in the provision of skilled workers for the domestic economy.[13] This would appear to be at least one possible intervention required in order to ensure that the institutions of labour supply are in fact being provided with the optimal incentive structure in order to meet ongoing labour demand needs in the economy.

Ultimately then, the collection of data points to a number of important conclusions about the linkages between human capital acquisition and the labour market. Firstly, it is evident that the economy has not been creating jobs at a sufficiently rapid rate. This is manifest in the low absorption rate between 1995 and 1999. It is evident however that African individuals are disproportionately affected by these employment shifts, as the labour absorption rate recorded for this cohort is the lowest amongst the four racial groups. Past analyses, and even more recent studies, would have simply recorded this fact as indicative of low levels of education amongst African workers. However, as the education-employment figures suggest, this is too simplistic. The data suggests that, *despite* the fact that African workers had high-level qualifications, this was not sufficient to ensure employment. This points to a key issue that has often been overlooked: namely that accumulation of higher education is a necessary, but not sufficient, condition for finding employment in the domestic labour market. The result is a powerful illustration of the maxim that education, and higher education in particular, is a heterogeneous product. This heterogeneity ensures that all individuals exiting the higher education system will have different probabilities of finding employment in the labour market. The data from the World Bank survey captures this point from the perspective of employers themselves, where they understand very clearly what type of employees are a useful investment.

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13 This anomaly will become starker with the pending restructuring of higher education, whereby technikon degrees will be accorded the same official accreditation as those in universities. In this scenario, the subsidy formula implicitly becomes more skewed.

The above set of data, though, points to two key sets of analyses that need to be undertaken. In the first instance, there is the real danger that on the basis of the above evidence, policy-makers may assume that an adequate response is to pursue specific targets of employee-types, on the basis of vacancy rates or shortages that exist in the labour market. This manpower planning approach however is fraught with difficulties and we will attempt a careful critique of this approach, as well as that of the standard econometric earnings function models. Secondly, despite the warnings that higher education is a diverse product, we need to define this more carefully and present a counter-factual to the manpower planning model. While this second component is initially tentative, we will attempt to present a more detailed and holistic framework within which human capital accumulation can be more cogently captured and measured.

**Manpower planning and earnings function models**

In the economics and education professions, the two approaches that dominate as a framework for linking educational outcomes to the labour market are the earnings function and manpower planning models respectively. This section will attempt a considered critique of these two approaches. The notion is not to try and claim the complete bankruptcy of these approaches, but rather to show that in a number of different ways these two models may be overlooking various critical issues relating to human capital acquisition and its transmission into specified labour market outcomes.

Earnings function models have for long dominated much of the empirical research in economics into the link between education and labour market outcomes. While these studies in South Africa and elsewhere individually have different specifications, the approach to capturing the education variable and the effect on earnings more generally are very similar across the studies. Hence, in most of the earnings functions run for South Africa, the education variable has been treated in a fairly standard fashion.[14] Hence, the variable enters as a dummy, splines or simply years of education. In each case however education is represented as the number of years of formal education that the individual has completed. The coefficient then represents the returns to the individual of accumulating an additional year of formal schooling. The variable is often combined with a set of other independent variables such as race, gender, age, occupation, sector, experience, location and so on. Despite these attempts at trying to capture holistically what influences an individual's earnings, there are significant factors overlooked in these models. While the absence of additional variables are a result of data unavailability, the literature remains silent on the very presence of these factors and their importance in changing the nature of the education-earnings relationship, as well as adding to our understanding of this linkage.

What, therefore, are some of the key omissions in the South African literature that, despite the data problems, would have to be raised as vital to our understanding of the effects of education on participation, employment and earnings in the labour market? In brief, the following are the list of omitted variables and measures:

- The quality of schooling and higher education accumulated.
- The type of higher education qualification attained.
- Family effects.

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14 We deliberately ignore the two prior hurdle equations that are run before getting to the earnings function. This is purely for ease of explanation in a non-technical paper of this sort. Ultimately though, the arguments about the education variable are equally true for the participation and employment probits that precede the earnings equation.

- Neighbourhood effects.
- Cognitive skills.
- Attributes.
- Ability.

The first omission is partly related to data availability, but also to a serious oversight in the literature, given that it is often assumed that the quality of education is equal across all individuals. This is clearly not the case, with South Africa possessing its usual racial and spatial slant to this differentiation in quality. Hence, despite the fact that two individuals, for example one African and the other white (or one rural- and the other urban-based), both having matriculated, we can be confident that for the mean individual the quality of the human capital accumulation would be different. On the basis of a variety of different quality indicators such as pupil-teacher ratios, salaries of teachers, existence of school infrastructure and so on, it is clear that the nature of an individual's educational attainment is crucially shaped. While we do dwell on this notion of a quality index in detail below, it is evident that one would need to determine the extent to which the quality of the schooling obtained ultimately impacts on labour market performance.

While the quality differential also operates at the higher education level, it is clear that in the case of higher education there remain a variety of different input choices available to individuals entering the system. Hence, while the schooling system is fairly homogenous in terms of certification, this is not the case of higher education. In the latter system, individuals can accumulate human capital in a variety of different fields of expertise. In short, the tertiary certification programme is highly heterogeneous. Individuals can undertake degrees or diplomas in areas ranging from philosophy to physics. The importance of this for the labour market, is that employers do not perceive each higher education graduate as equally beneficial to their firm. Hence, what shows up in earnings functions simply as a positive return to higher educational investment in reality simplifies a series of extremely important messages about the nature of this investment and the variety of different returns embedded within it. The data above has tried to point to the importance of making this distinction within higher education. It is clear from table 4 that African, and white workers, both possessing higher education certification, are in very different positions. This in turn explains a significant component of the large discrepancy between the earnings of African workers with degrees and white workers with degrees. Understanding this heterogeneity in higher education is critical to appreciating the impact of this differentiation on employment and earnings outcomes in the domestic labour market.

This heterogeneity, to use a distinction highlighted by Sen (1999), does two things: it differentiates the preferences that employers have in their demand for skills; it also differentiates the abilities of graduates to access places in the labour market. Within a developing economy context, the inability to do so has implications for the preservation of whatever skills graduates possess, because in the absence of retraining, there is no protection against time-related skills obsolescence. There is an inverse relationship in the length of time spent searching for a job, in relation to the ability to match skills with the job found. The longer this time lasts the less the ability to match skills and available jobs. It tends to contribute to a lack of success in the employment fields in which employment is initially sought. Hence, where the mismatch is evident, the jobs sought are often not obtained. Such a bar to opportunity has a negative effect on the chances for highly qualified but inappropriately skilled labour market entrants to participate effectively in national development and growth activities. From the perspective of recent graduates, this represents a massive failure and a limit to a younger generation's freedom to make choices about the way they wish to live.

Aside from the formal institutional factors raised above, there are a number of household-level variables that are relevant to an individual's educational accumulation. Specifically, we refer to family effects and neighbourhood effects. To some extent, these variables have been captured quite well in the developed country literature and are beginning to be incorporated into the South African work. However they are worth reiterating here. Family effects attempt to capture the notion that the characteristics of an individual's family - usually their parents - help determine earnings and employment outcomes. For example, the education levels of the mother and father of the individual are often seen as significant predictors of the employment status and earnings of an individual. Relatedly, the notion of the language spoken at home is also a critical determinant of labour market outcomes. Given that, in South Africa, the dominant language within the workplace is English, individuals speaking any of the remaining 10 official languages of South Africa would ostensibly be at a significant disadvantage within the labour market. Additional variables that are pertinent to the notion of neighbourhood effects would be, in a developing country context, those factors that complement (or hinder) the accumulation of schooling. These include access to electricity, the distance to the educational institution that the individual needs to travel, the mode of transport used by the individual, the household income targeted for education that the individual can draw on and so on. These are somewhat messy variables but remain crucial when measuring the value of complementary inputs available to the individual in the accumulation process.

The last three factors can all be captured under the umbrella of individual characteristics, and are beyond the standard individual characteristics that are usually modelled such as race, age and gender. Reference is made here to an individual's cognitive skills (as distinct from their formal education), their ability and, finally, the person's attributes. The first is a reference in the main to an individual's functional literacy. We can measure this literacy in three forms, namely prose literacy, document literacy and, finally, quantitative literacy (Pryor & Schaffer, 1999). While not going into any detail here on the precise interpretation of each of these measures, it is relevant to note that each of these sub-measures of literacy are critical adjuncts to quantifying an individual's embodied human capital. A study on the US labour market, utilising the results of a National Adult Literacy Survey (NALS), finds that these cognitive skills are significantly associated with employment probabilities and, in addition, that these skills operate independently from regular years of educational attainment (Pryor & Schaffer, 1999). The study also showed that for any given level of education, those with lower functional literacy were at the bottom of the earnings hierarchy or near the end of the employment queue. Ultimately, any measure of the efficacy of human capital acquisition needs to be aware that measures of years of formal education are inadequate.

Linked to cognitive skills, but much harder to measure, are what we have referred to as the attributes and ability of an individual. In terms of the latter, we know there is a reservoir of internal characteristics that an individual possesses which is extremely difficult to measure. Qualities of an individual such as strength, intelligence, agility, dexterity and so on are often used as markers of their ability, which ultimately are important discriminators used in the decision-making matrix of prospective employers. Unlike the literacy tests mentioned above or the more regular IQ tests, these abilities of an individual are much harder to measure. Yet, they remain critical to understanding, from a labour demand perspective, embodied human capital assets.[15]

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[15] In the international earnings function literature, the notion of "ability bias" is omnipresent. Hence, it is now accepted that the internal rate of return measures would suffer from ability bias. Attempts have been made to correct for ability bias through, for example, studies on fraternal or identical twins.

The notion of attributes does overlap with abilities. The attempt here though is to try and capture those specific qualities that an employer looks for in an employee within the workplace. These are equally hard to measure, but again point to the shortfalls of a paradigm that simply reflects years of education as indicative of skill levels. Recent studies of employers' labour demand needs for example, have suggested that a number of identifiable attributes are important for a prospective hire (Department of Labour, 2001; Van Schoor, 2000). These include:

- Communication skills.
- Computer Skills.
- Problem-solving skills.
- Creativity.
- Learning ability.
- Business skills.
- Planning skills.

These are concepts well-known to all yet very difficult to measure in an individual. How, ex ante, is it possible for an employer to estimate the difference in communication skills of one individual relative to another? Furthermore, it is equally difficult for researchers to begin to measure these attributes. Yet we know that these attributes remain critical to our understanding of what factors determine the employment and earnings of an individual.

It should be evident from the above that within the earnings function model, where in most cases significant attempts are made to capture all the variables that explain the variation in earnings and employment probabilities, the set of issues outlined above render most results to be preliminary at best. In some cases, correcting the earnings functions will not be possible, given that the data is simply not available. Yet the important point from the preceding analysis is that the transition from schooling to the labour market at the individual level is governed by a wide-ranging set of variables that the years of schooling variable simply cannot effectively impart.

The above critique of earnings function models also serves a second purpose. It provides, perhaps more indirectly, for the foundations of the critique on manpower planning. In a very caricatured fashion, manpower planning involves projecting on the growth of labour demand by different occupations and then supplanting these trends on the institutions of supply. Hence, should the manpower planning model that is being utilised indicate that the demand for chemical engineers is likely to increase three-fold over a five-year period, this information would be fed back to educational institutions in order that they ensure that this target of personnel is met. At one level this approach is powerful in its simplicity - a sort of national economic planning approach to matching labour demand and supply. However, it is an approach fraught with difficulties and an attempt is made below to highlight some of these.

Firstly, almost all projection-based modelling is an inexact science. Given the wide range of endogenous and exogenous factors that are constantly shaping economic trends in general and labour market trends in particular, it remains a very difficult exercise to try and predict future employment growth patterns. The manpower planning paradigm ultimately attempts to predict the future, on the basis of past trends. Broadly this is possible: we can say, with a fairly high degree of certainty, that the demand for skilled workers will continue to expand over the medium-term in South Africa. However manpower planning attempts to do much more than this. An attempt is made to predict the growth rates of specific occupations in particular sectors. The problem is that through the model one is trying to explain very detailed future trends on the basis of very limited information. Whether it is an unforeseen event (for example an oil price hike) or

regular changes in variables such as the rate of growth in real wages, population levels and so on - these would all have to be timeously and very precisely accounted for within the projection model. This inexactness is then compounded by the fact that, and this is particularly true for labour demand projections, the data sources used to build the models are incomplete and often based on surveys which contain their own internal biases. Ultimately, the implicit approach of these projection models mean that the estimates derived on labour demand projections are inexact at best and incorrect at worst.

Evidence from Latin America suggests that employment for persons in professional employment is not expected to rise very significantly in the foreseeable future. A number of different reasons are put forward as an explanation of this trend. Among these reasons, often not anticipated in manpower planning analyses, are the blurring between intellectual and manual work and between professional and home-based work. Old professions tend to be replaced by new ones, which require a different set of competencies. Manpower planning analyses are also unable to track elegantly these processes of de-professionalisation and re-professionalisation which are tangential to changes in the organisation and status of work (see Schwartzman, 2002).

This critique on the shortcomings of earnings functions are almost wholly applicable to the manpower planning model as well. At the crux of this critique is the assumption in the manpower planning approach that an increase in the supply of individuals in specific fields would lead to an uptake in demand. Thus, the belief is that it is solely the type of the degree that shapes labour demand patterns. It is clear from the above that this is not the case. The quality of the degree, and the cognitive skills of the individual, their attributes and ability all help shape the nature of human capital that they offer in the labour market. A *dirigiste* approach to predicting labour demand trends that is based on occupational specifics would clearly not necessarily be effective in reducing the mismatch between demand and supply.

In addition, the model does assume a very disaggregated model of the labour market. Hence, the model may reveal a surfeit of teachers in the labour market. Depending on the database that the model draws on, it is likely that the information used would not be able to distinguish between different types of teachers. An oversupply in the aggregate of teachers may thus mask a shortage of science and mathematics teachers at the primary and secondary levels. One can see extended difficulties in the planning approach here as, in this example, there may be a shortage of science teachers in the primary schooling system and not in secondary schools. Indeed, the data provided in the first section is an ideal mechanism for displaying some of the difficulties with the manpower planning approach. For example, table 4 would suggest that there needs to be a move, amongst African graduates, away from teaching and nursing professions into more commercially viable occupations. *In the aggregate*, this is true. However this cannot detract from two caveats. Firstly, the fact that specific types of, for want of a better term, *sub-occupations* are in demand - science teachers or higher-end nurses. Secondly, that the quality of training is important. There may not be a *numerical shortage* of nurses and teachers, but there may certainly be a *quality shortage*. It is this distinction that the planning model (or indeed any other similar empirical model) would find very difficult to account for in its various labour demand projections.

The above critique of both the earnings function models and the manpower planning approach is not intended as a signal that such work is unnecessary. Instead the critique is provided for two reasons. Firstly, to encourage further work in both these modelling exercises in a manner that begins to incorporate these concerns into the modelling approach. It is not beyond the paradigms of both approaches to at least begin to include some of these issues. Through this

process, we can arrive at a much better predictor of the link between educational accumulation and the labour market. Secondly, in cases where such incorporation is not possible because of data constraints or otherwise, the critique should be part of the research within these areas. Failure on this front can result in these models either being dismissed by those convinced of the centrality of variables other than the years of schooling, or marginalised in the education policy debate as being too blunt an instrument from which to derive any useful policy information.

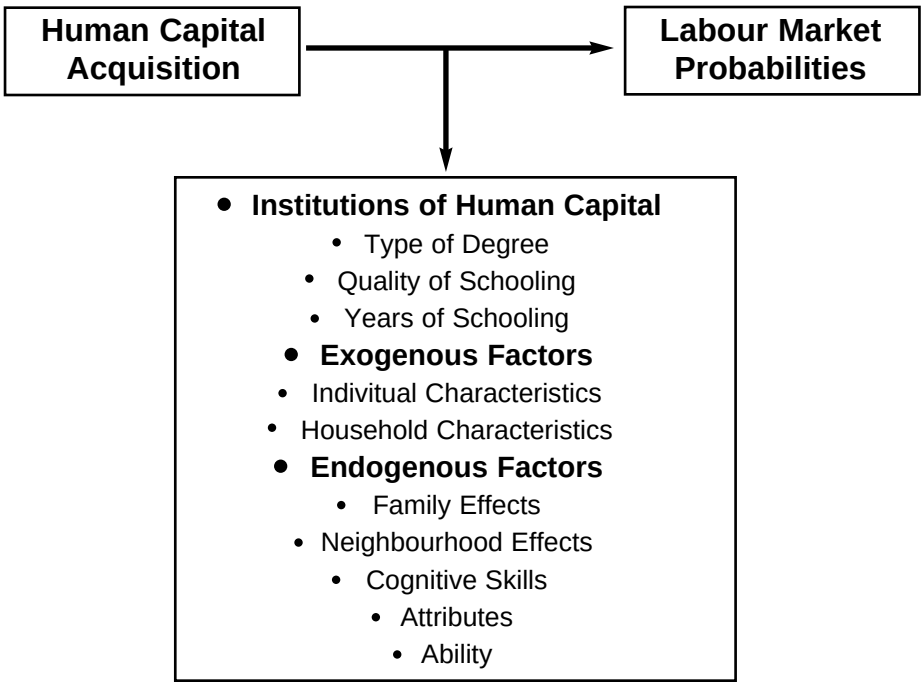
It is important however, given the above criticisms, that a first attempt is made at trying to think of a manner in which these different additions to the human capital model are incorporated into a more extensive appreciation of the links between education and the labour market within a developing country context.

**A comprehensive measure and assessment of human capital**

We have tried to capture the variety of omissions in the earnings function and manpower planning approaches to the education-labour market nexus. They are worth restating here, perhaps in a more cogent manner - given that they may present the building blocks of what could potentially represent a new manner for policy-makers to appreciate and assess the different variables that together account for embodied human capital.

Figure 1 therefore attempts a very sketchy overview of some of the key aspects of the education-labour market linkage that have been raised thus far in the paper. Broadly, the paper has tried to provide some of the key variables that may help explain the transition from education to employment (or unemployment or non-participation) as the primary activity of individuals. Hence, the figure suggests that we can differentiate between three broad categories of influences, namely institutional, exogenous and endogenous factors. Each broad category, as should be clear from the above discussion, contains its own set of sub-influences.

*Figure 1: Factors shaping the linkage between human capital formation and labour market outcomes*



In the case of institutions of human capital, we flag here the relevance, of course, of the number of years of schooling - the standard measure of human capital acquisition. Of course, we also delineate the relevance of the quality of schooling and furthermore the type of degree that is acquired. The exogenous factors refer to those characteristics of an individual that are immutable - usually age, gender, race and so on. In addition, specific household characteristics that we refer to here are size of household, presence of an old age pensioner and so on. The list of the latter is much more open-ended and in addition the variables are arguably not always strictly exogenous. The endogenous variables cover the majority of those variables that neither the earnings function nor the manpower planning models are able to effectively account for. Partly as a function of the difficulty in measuring these variables, we can together refer to these endogenous factors as the "black box" of an individual's human capital asset base.

The importance of delineating these different aspects of the education-labour market linkage is that they represent the key building blocks for a more comprehensive understanding of this relationship. Specifically, we can begin by assessing which aspects of human capital accumulation are adequately accounted for by existing models and which are not. In the second instance, an attempt will be made to determine how, if possible, these excluded variables can be built into a better measure of human capital accumulation.

In terms of the institutions of human capital, the variables that are either wholly excluded or only partially accounted for are the type of degree and the quality of the degree. In the latter case, this calls for a standardised measure of the quality of education at all levels. While we do have individual and irregular measures of, for instance, pupil-teacher ratios, access to electricity, computer usage and so on (through for example the Schools Needs Surveys) - these are either of a low quality or are too irregular. In addition, these quality measures are not cogently captured in a single measure of quality - a quality index of sorts. Furthermore the data are not comparable across different years and of course are not linked to individual-level national survey data. It seems essential to deal with these drawbacks on the quality of education data. If the match can be made, even in a contrived manner, then immediately we can determine the role of quality of education in shaping labour market outcomes. This is clearly not happening presently. In terms of the type of degree, the data is also inadequate. While the later household survey data (specifically the Labour Force Surveys of 2000 and 2001) do differentiate between fields of learning, this remains inadequate for the capturing of very detailed information. For example, it is still difficult to tell whether an education diploma was obtained in the humanities or science fields. Detailed information on the type of degree, at the individual level, built in with the characteristics of these individuals, is the type of information that would greatly improve both the earnings function and manpower planning research.

The endogenous variables remain, as the term "black box" suggests, perhaps the hardest to measure and monitor. While it is possible to capture the family and neighbourhood effects through household survey data, it is the cognitive skills, attributes and ability of an individual that are near impossible to gauge. There would seem to be two possible avenues for measuring these variables. Firstly, the use of literacy surveys, given the US experience noted above, would be a starting point for measuring cognitive skills. In terms of attributes and perhaps ability, an employer needs survey, similar to that undertaken by the Department of Labour, would be useful. Again though, these surveys would need to be run concurrently as well as at regular intervals.

Ultimately, though, what the above is suggesting is that we require an *integrated human capital measurement instrument*. This would ensure that we are capturing all the key elements that link an individual from the human capital growth phase to the labour market. The integration is critical, as it would allow us to assess the different levels of importance to each component of the human capital accumulation process. For example, it may be shown, through this integrated measurement process, that relative to total years of schooling accumulated, it is more an individual's attributes that determines both their employability and occupational mobility when in a job. This would have a fundamental impact on the manner in which educational institutions, for example, train their students, as well as on the nature of training and upgrading of skills that takes place for the unemployed. The implicit point is that we need to be moving towards a measure of knowledge accumulation rather than of years of schooling only.

**Conclusion**

The above paper has illustrated the importance of analysing labour market and education trends. We know that important and relevant information can be gleaned from existing survey and other data sources. These have been used quite legitimately in different analyses of the transition from school to work, most notably in the earnings function and manpower planning models. However, we have attempted to provide a critique of these models, less to denigrate these approaches but more in an attempt to derive a comprehensive understanding of the human capital accumulation process. It is this comprehensive approach that is currently missing from the policy and research work in the fields of labour economics and education. It is in energising a research programme and policy debate around broadening our appreciation of human capital acquisition that we can begin to provide a more accurate assessment of successful transitions from education to employment.

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# Universities and the world of work: a case study on graduate attributes

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## Executive summary

The case study is based on a survey undertaken by the Quality Promotion Unit of the University of Natal during 2000-2001 that canvassed the views of employers on the kinds of knowledge, skills and attributes valued in the workplace. Of interest was to consider employers' views as one form of quality assessment within this institution's comprehensive system of quality assurance. While the data thus generated cannot be generalised to all institutions given the diversity of institutional profiles that make up higher education in South Africa, it nevertheless serves as a barometer of employer views on the quality of graduates and standards more generally.

Small, medium and large organisations in the major industrial centers were targeted and a total of 170 responded to the survey, with 53 percent from the service sector, 28 percent from manufacturing and 19 percent representing the government sector. Two broad themes framed the study: on the one hand, employers' views on standards and quality in general, and on the other, how they rated both the importance of attributes and their satisfaction with graduates' display of these.

Approximately half of the respondents believe that standards have remained the same, while a similar proportion thinks that higher education is equipping graduates only moderately well for the demands of the modern workplace. Yet an analysis of attributes shows a remarkable overlap between the ranking of attributes in terms of importance and those qualities with which employers are most satisfied. This synergy is somewhat tempered in that employers consistently rate the importance of attributes higher than their satisfaction with graduates' display of the same attributes.

Concern about the connections between higher education and the economy are amongst the key issues of debate when systems undergo major transformation, as is the case in South Africa at present where higher education restructuring and multiple policy processes impact on the core business of institutions. While the need for skilled and knowledgeable graduate workers necessitates a close link between higher education and industry, this paper argues that it also compels an accurate understanding of what it is that universities can best deliver.

A common view seems to be that universities have by and large not adapted to the economic needs of South Africa, and are not sufficiently responsive. Although there are various ways in which this claim can be supported or refuted, employers' views on the quality of graduates (albeit from one institution) construct a different image; the data generated in this study predictably underscore both achievement and areas that require greater attention. However, when top-ranking attributes are taken together across clusters of attributes, a more interesting picture emerges that shows the achievement of one institution in producing graduates that meet the demands not only of the workplace but indeed of the 21st century world.

# A case study on graduate attributes*

**Introduction**

We are continually reminded of the changing nature of the world of work, and the demands this places on the role of education, and higher education in particular. The assumption is that links between higher education and industry are necessary in order for work demands to shape the curricula of higher education, and, concomitantly, the kinds of graduates that institutions produce. For some time now concern has been expressed about the relation of higher education to economic growth, given the assumption that higher education must provide a supply-led boost for the economy, even though this human capital notion of the role of higher education has not gone unchallenged (Harvey & Knight 1996).

While there has always been some form of relationship between higher education and the economy, this has recently been sharpened by a renewed sense of accountability and relevance on the part of institutions, and by the pervasive view that higher education does not produce the right kinds of graduates to meet changing workplace demands (Brennan *et al* 1996). A central question becomes what higher education is expected to deliver, and how it should and does respond (Teichler, 1998). On the one hand, the traditional role of universities is being challenged and notions of academic liberalism are viewed as outdated (Jones 1996). On the other, the view is expressed that the growth of mass higher education has had as consequence a situation where graduate status increasingly becomes the "principal signifier of cultural capital" with universities producing - not simply reproducing or reflecting - social hierarchies (Scott, 1996: 47).

In the South African context these realities and debates are overlaid by the dual imperatives of reconstruction and development, given the deep-rooted consequences of apartheid and the demands for equity, redress and reconstruction, and, simultaneously, the need to position this society in line with the demands of a global knowledge society and economy. As Teichler (1998) points out, the connections between higher education and the world of work are amongst the key issues of debate whenever challenges for innovation in higher education are at stake, a situation which is clearly the case in the present context where higher education restructuring and multiple policy imperatives, deliberately designed to steer the transformation of the South African higher education landscape, shape the current agenda of institutions and the system as a whole.

While the need for skilled and knowledgeable graduate workers necessitates a close link between higher education and industry, this paper argues that it also compels an accurate understanding of what it is that universities can best deliver. What are the qualities we expect from, or require of, graduates; and in what ways do notions of graduateness mesh with the expectations of employers? If the employability of a university graduate relates to "the propensity of the graduate to exhibit attributes that employers anticipate will be necessary for the future effective functioning of their organisation" (Harvey 2000: 2-3), then it seems obvious that universities need to take heed of employers' views, and, perhaps more importantly, the demands the future places on the development of university curricula in the present.

* The contributions of Denyse Webbstock and David Maughan-Brown to the concept and implementation of the study on employers' views are gratefully acknowledged.

Yet we are also alerted to the danger of assuming a causal link between the efforts (or lack thereof) of HEIs and the extent and type of employment of graduates. As Harvey (Ibid.) points out, a causal link implies that HEIs "should be able to provide graduates with some sort of package of attributes that meshes with what an employer is looking for". While this demand seems to be a common perception, two realities need to be kept in mind: first, qualities or attributes displayed in the workplace may have more to do with the individual's socio-cultural circumstances than with what a specific institution can impart through its curriculum; second, what is increasingly accepted as the ideal qualities of graduateness might be different from the reality of employment practices. For example, the demands of an industrial and developing context such as South Africa may be different from what has come to be taken for granted in the discourse about global imperatives that drive new modes of work and knowledge production.

The study on which this paper is based was undertaken by the Quality Promotion Unit of the University of Natal during 2000-2001. Following the examples of similar studies in the UK, New Zealand and Australia, the aim was to provide employers with the opportunity to comment on the quality of university graduates, and the kinds of knowledge, skills and attributes they value in the workplace. Of interest was to consider employers' views as one form of quality assessment within a particular institution's comprehensive system of quality assurance, and to use the feedback thus received as a source of data in the ongoing processes of curriculum planning and development. As Harvey & Knight (1996: 42) point out, employers as end-users of higher education "are a major, but by no means the only, external stakeholder concerned with the quality of higher education", and provide a useful reference point from which to assess the role and relevance of higher education, specifically with regard to the quality of graduates that are produced. In this sense, employers' assessment of graduates can be viewed as a barometer of an institution's quality and its responsiveness to the demands of the workplace.

The paper presents in overview the results of the survey and, in more detail, an analysis of attributes. It concludes with a discussion on what universities are most probably best positioned to deliver - flexible, adaptable and intellectually talented individuals with a sound knowledge foundation and skills appropriate to the demands of the 21st century world.

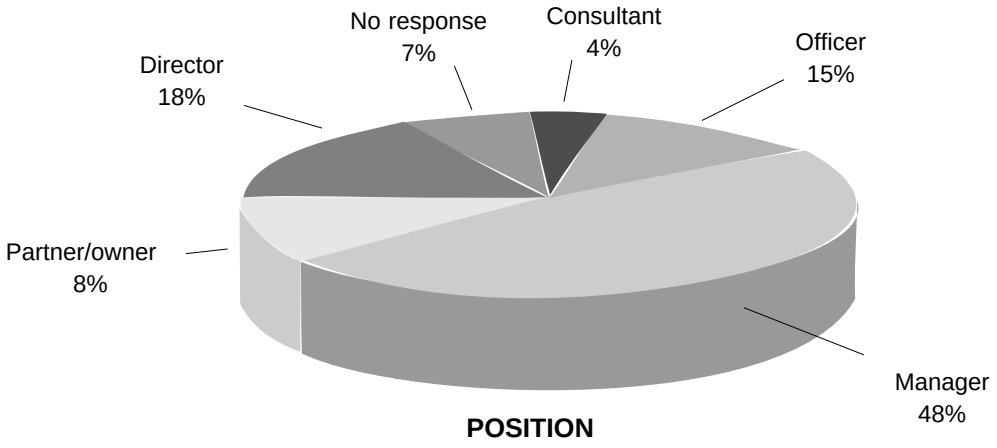
**The views of employers**

The study was intended to capture both what employers consider to be priority attributes and their satisfaction with the degree to which graduates display these attributes, and more generally, employers' views on the role of higher education in preparing graduates for the changing needs of the workplace. A total of 170 employers responded to the survey that targeted small, medium and large organisations in the major industrial centres of South Africa. The majority of respondents was from the service sector (53 percent), with 28 percent from manufacturing and 19 percent representing the government sector.

The gender breakdown of respondents was uneven - 37 percent female and 59 percent male (with 4 percent no response) - which may in part be a reflection of the under-representation of females in management positions. Senior personnel were deliberately targeted, and specifically from human resource divisions, the assumption being that they would be in a strong position to evaluate both the priority attributes in the workplace, and the degree to which graduates display such attributes. Table 1 below provides a breakdown of the position of employers who participated in this study, and the pie chart shows graphically the same data.

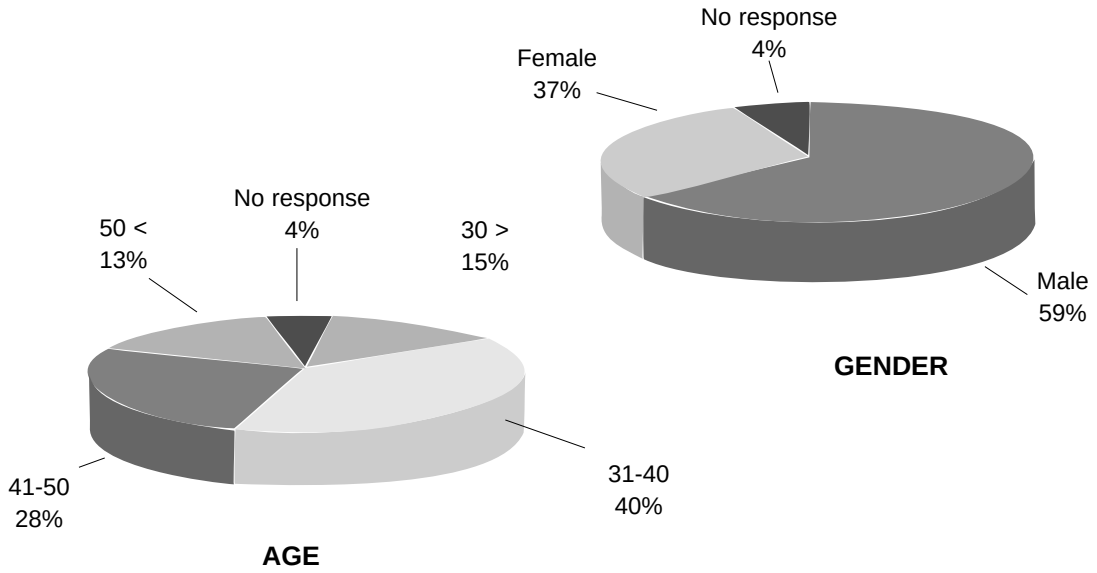
*Table 1: The position of respondents*

| Position | % |
|---|---|
| Manager | 49.4 |
| Director | 17.6 |
| Officer | 14.7 |
| Partner/owner | 7.6 |
| Consultant | 3.5 |
| No response | 7.1 |




The age categories of respondents also mirror what can perhaps be anticipated in terms of the time it takes to be represented in an organisation's senior management structures: 40 percent of the respondents fell in the 31-40 years age group and 28 percent in the 41-50 years group, 15 percent was 30 years and below, and 13 percent 51 years or more (with 4 percent no response). The figure below presents the age and gender breakdown of the sample.

*Figure 1: Age and gender*



**Method**

There are a number of methodological approaches to the study of employer views and the role of higher education, with surveys and the use of questionnaires representing one approach with obvious limitations which are well documented. The most important critique is that questionnaires as a survey tool are better suited to specific areas of investigation and do not allow for an in-depth analysis of the meaning of issues or phenomena, hence the value of including open-ended questions in order qualitatively to probe the meaning of responses.

A distinct limitation with the focus on graduate attributes is the difficulty in knowing what is meant by qualities or attributes that entail a range of competencies and abilities - knowledge, skills, approach, intellect and attitude - and which have come to be variously labelled by employers and educationists alike. Harvey *et al* (1997: 7) illustrate the difficulty of terminology with the example of "communication skills", and point out that what one organisation means "may be entirely different from another, which in turn may differ substantially from what a teacher in higher education implies by the term".

This example also demonstrates that the attributes individuals develop are context-bound in the sense that they become instantiated in a specific community or context of meaning and practice. The question or challenge becomes the degree of fit that can be effected between the demands of a particular learning context (e.g. higher education) and the demands of the context/s which we consider to be a continuation of individuals' life trajectories (i.e. the world/s of work). In different terms, do universities develop attributes that fit the demands of the workplace, given the obvious assumption that institutions will in varying ways endeavour to align curricula with what we have referred to as the demands the future places on education in the present? And what are these attributes that are applicable to what is also referred to as 21st century knowledge demands?

Related to the point Harvey has made, a review of the literature shows a variety of lists and categories of qualities or attributes which authors consider to be important and indicative of what higher education ought to deliver. Yet the assumptions or theories which frame such claims invariably remain implicit. This problematic in part relates to the very nature of attempting to list, classify or group attributes or qualities on the basis of views or opinions, be these of employers or educationists. It seems that in order to create a common discourse and shared understanding about the role of higher education, attributes are of necessity labelled in what amounts to an everyday discourse informed by opinion.

It is therefore not a straightforward matter to move beyond a mere description of attributes and qualities, and to classify or group attributes in order to determine the importance and employers' satisfaction with the attributes that graduates display. The questionnaire used in the study was based on a similar questionnaire developed in the UK (*cf*. Harvey & Green, 1994), while care was taken to adapt concepts and wording to the South African work and higher education contexts. In addition to attributes, the questionnaire focused on employers' views regarding the issue of standards and quality in general, given the dramatic change imperatives that have characterised South African higher education over the past decade.

Further, four overarching or framing categories and questions guided the construction and grouping of attributes:

- *Basic skills and understanding*
  Do university graduates display the necessary know-how to meet workplace expecta-

tions, i.e. can they "hit the deck running"?

- *Knowledge and intellectual ability*
  Do they display intellectual ability and sufficient specialist/discipline knowledge to perform well?
- *Workplace skills and applied knowledge*
  Do they have sufficient skills, ability and understanding to adjust to the demands of the modern workplace?
- *Interactive and personal skills*
  Do they have appropriate skills, values and attitudes to be well-regarded and successful employees, and to ensure their progress?

The generation of these categories was informed by a review of the relevant literature and an analysis of the meaning of attributes often mentioned, as well as reaching consensus amongst a group of specialists as to the most appropriate clustering. The challenge precisely to disaggregate the meaning of specific attributes and appropriately cluster a range of skills, attitudes, values and competencies may well not have been completely met.

We maintain however that a well-designed questionnaire presents a useful starting point that makes possible the mapping of employer perspectives. The study generated rich data on employers' response to both the structured and open-ended questions. For the purposes of this report only the most salient outcomes are summarised in terms of the broad themes that framed the investigation.

**Results**

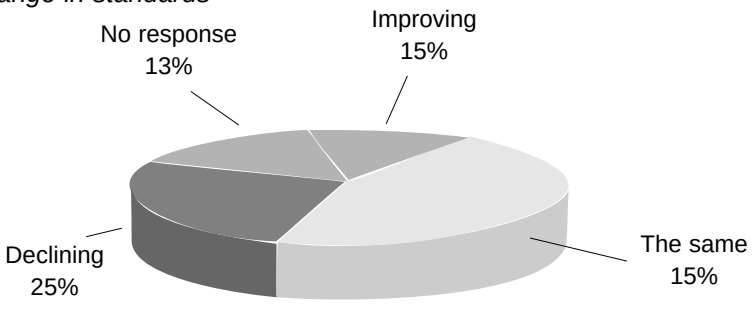
Standards and quality in general

Concerns about standards are particularly in the foreground when systems undergo major transformation, as has been the case with higher education in South Africa. It was thus considered important to establish the views of employers regarding a) standards in general; b) the importance of factors in assessing standards; c) the desirable balance between specialised knowledge and general or transferable skills; and d) whether graduates are considered to be equipped for the demands of a modern organisation.

*Views on standards*

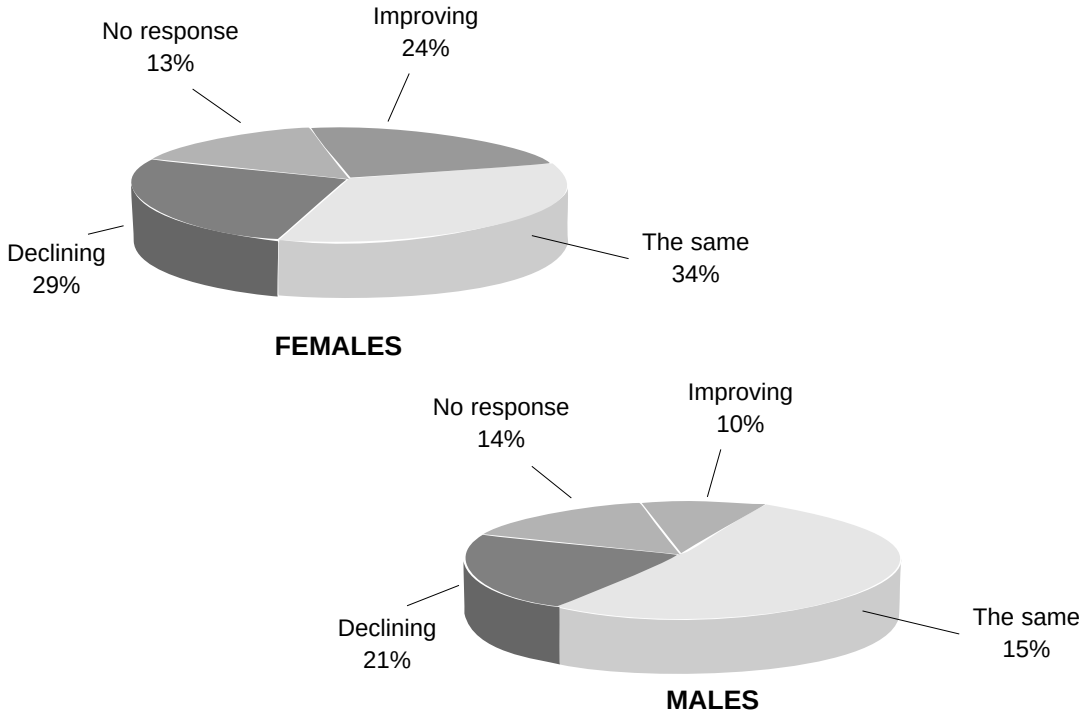
In response to whether the standards of graduates have changed over the past three to five years, the view of the majority of respondents (47 percent) was that standards have remained the same; 25 percent however thought that they have declined, while 15 percent said that standards have improved (13 percent or 22 did not respond). The pie chart below presents a graphic illustration of the data.

*Figure 2: Views on change in standards*



It is interesting to note that there was no marked difference in view between the service, manufacturing and government sectors, and neither between age groups. The gender difference is shown below.

*Figure 3: Gender differences in views on standards*




The majority of men (55 percent) believed that standards have remained the same. For women, on the other hand, similar proportions thought that standards have remained the same (34 percent), have declined (29 percent), and are improving (24 percent). Reasons for this difference in view, either between men and women, or amongst women, are not immediately obvious and most probably relate to women's position in organisations and the extent of respondents' contact with new graduates.

*Importance of factors*

In terms of rating graduate attributes that influence employers' assessment of standards, the following three ranked the highest:

- The desire and ability to learn.
- Attitudes to the work situation.
- Knowledge, conceptual skills and understanding.

The extent of job-relevant specialist knowledge, the social class and ethnic background of graduates were considered least important.

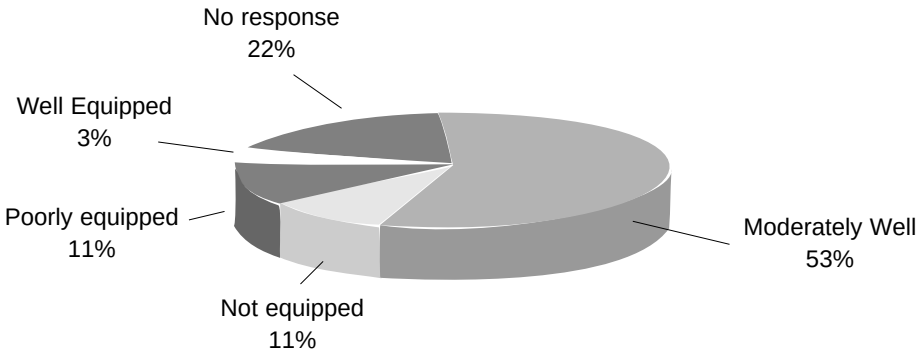
*Balance between knowledge and skills*

In terms of the balance between specialist knowledge and transferable skills, the view in part was that the balance was right (35 percent), with approximately a third not responding to this question, and a relatively smaller proportion believing that there is too much emphasis on knowledge (19 percent). The high non-response might in part be due to the lack of clarity as regards the meaning of "transferable skills", as some indicated in their response to the related open-ended question.

*Demands of a modern organisation*

In response to whether higher education has equipped recent graduates to work effectively in a modern organisation, about half of the respondents (53 percent) believed that higher education equips graduates *only moderately well*, while 11 percent thought that graduates were *well equipped*, and an equal proportion that they are *poorly equipped* (11 percent). A small percentage (3 percent) expressed the view that higher education *did not equip graduates at all* for the demands of the modern workplace. The figure below illustrates.

*Figure 4: Graduates being equipped to work in a modern organisation*




Even though approximately half of the respondents believe that standards have remained the same (i.e. 47 percent, see Figure 2 above), a similar proportion (53 percent) thinks higher education is equipping graduates only moderately well for the demands of the modern workplace. This seems to confirm the view that there is not a sufficiently strong fit between graduate attributes (i.e. what higher education delivers) and the demands of the workplace. In order to explore this apparent reality in greater detail, we turn to employers' views on the importance of attributes and their degree of satisfaction with graduates' display of these in the workplace.

*Analysis of Attributes*

As already mentioned, the most frequently cited attributes were clustered into four groups: a) basic skill and understanding; b) knowledge and intellectual ability; c) workplace skills and applied knowledge; and d) interactive and personal skills:

- As a first layer of analysis, the mean rating and the rank position of each attribute are given, in relation to employers' views of the importance of, and their satisfaction with, attributes. The rating is based on a five-point scale with five being the highest rating.
- A more instructive analysis, especially for curriculum planners and developers, is given in the graphic comparison of the relation between importance and degree of satisfaction as this highlights the attributes that employers regard as important yet with which they are dissatisfied. The attributes that fall below the average rating can readily be identified in the figure presented for each cluster of attributes.

**A Basic skills and understanding**

IMPORTANCE

| Attributes[16] | Mean rating | Rank |
|---|---|---|
| 4. Ability to use new information | 4.39 | 1 |
| 7. Written communication skills | 4.39 | 1 |
| 11. Computer literacy | 4.35 | 3 |
| 10. Ability to use information technology | 4.26 | 4 |
| 3. Ability to find and access information | 4.23 | 5 |
| 6. Oral presentation skills | 4.13 | 6 |
| 5. Ability to handle large amounts of information | 4.07 | 7 |
| 9. Technical ability | 4.05 | 8 |
| 8. Numeracy | 4.04 | 9 |
| 2. Knowing the organisation | 3.21 | 10 |
| 1. Prior work experience | 3.21 | 10 |

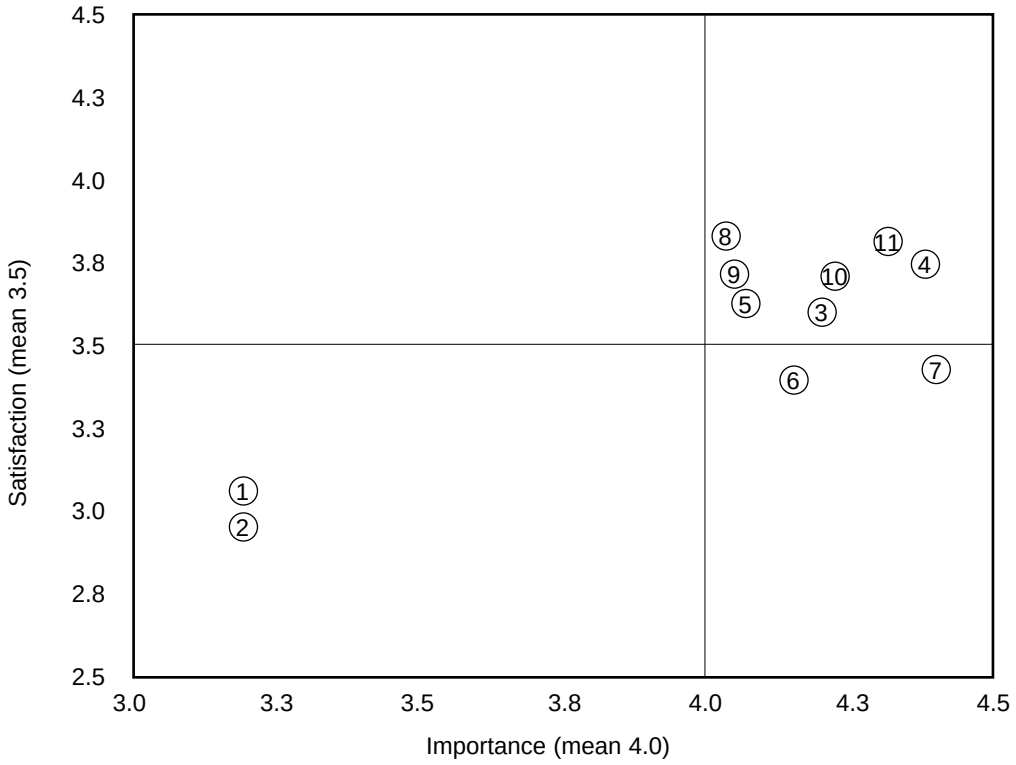
SATISFACTION

| Attributes | Mean rating | Rank |
|---|---|---|
| 11. Computer literacy | 3.78 | 1 |
| 4. Ability to use new information | 3.74 | 2 |
| 8. Numeracy | 3.72 | 3 |
| 10. Ability to use information technology | 3.72 | 3 |
| 9. Technical ability | 3.62 | 5 |
| 3. Ability to find and access information | 3.60 | 6 |
| 5. Ability to handle large amounts of information | 3.56 | 7 |
| 7. Written communication skills | 3.43 | 8 |
| 6. Oral presentation skills | 3.41 | 9 |
| 1. Prior work experience | 3.06 | 10 |
| 2. Knowing the organisation | 2.97 | 11 |

Two observations are immediately obvious: first, the mean rating of the importance of attributes is higher than employers' satisfaction with graduates displaying these attributes. Second, the rank orders of the importance of attributes and employers' satisfaction are noticeably different. The latter can more usefully be explored in the figure below.

[16] Note that the number allocated to attributes corresponds with the order in which they were listed in the questionnaire.

*Figure 5: Relationship between satisfaction and importance - basic skills and understanding*




Contrary to received wisdom, prior work experience (#1) and knowing the organisation (#2) are unimportant and employers are also not particularly satisfied with the degree to which these attributes are displayed. However, employers consider both oral presentation skills (#6) and written communication skills (#7) relatively important yet are not satisfied with graduate competence in these skills. The attributes considered important and with which employers are most satisfied are computer literacy (#11) and graduates' ability to use new information (#4). The latter signals that graduates from this institution demonstrate skills in line with what is commonly perceived to be vital in a 21st century information society. Further, it could be extrapolated that they are independent learners who have learned to learn in the sense of being able to make use of new information. However, the commonly perceived importance of developing oral and particularly written communication through the curriculum is not satisfactorily demonstrated in the job performance of new graduates.

**B Knowledge and intellectual ability**

IMPORTANCE

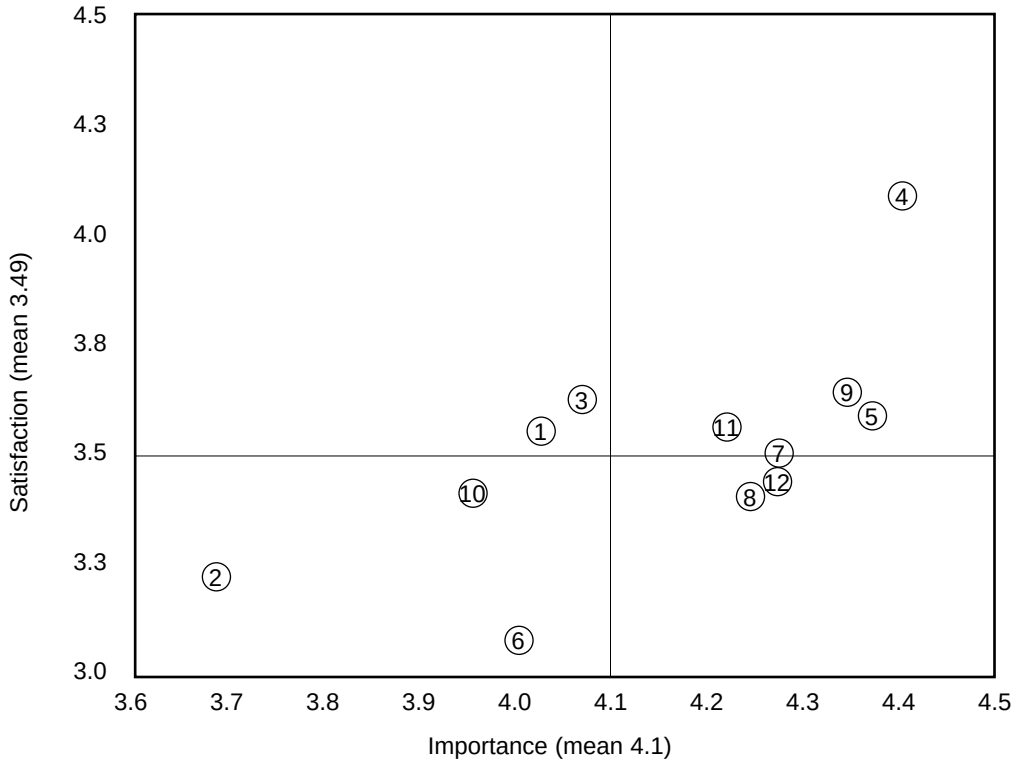
| Attributes | Mean rating | Rank |
|---|---|---|
| 4. Interest in ideas and desire to continue learning | 4.39 | 1 |
| 5. Understanding of core principles & processes | 4.36 | 2 |
| 9. Critical and analytic ability | 4.35 | 3 |
| 7. Ability to summarise key issues | 4.25 | 4 |
| 12. Rapid conceptualisation of issues | 4.25 | 4 |
| 8. Ability to establish part-whole relations - i.e. to relate a specific issue to the broader whole | 4.24 | 6 |
| 11. Ability to follow and construct logical argument | 4.22 | 7 |
| 3. Enquiry and research skills | 4.06 | 8 |
| 1. Specialist discipline knowledge | 4.02 | 9 |
| 6. Understanding of economic realities | 4.00 | 10 |
| 10. Ability to formulate and check hypotheses and assumptions | 3.95 | 11 |
| 2. General knowledge about local and global affairs | 3.68 | 12 |

SATISFACTION

| Attributes | Mean rating | Rank |
|---|---|---|
| 4. Interest in ideas and desire to continue learning | 4.01 | 1 |
| 3. Enquiry and research skills | 3.64 | 2 |
| 9. Critical and analytic ability | 3.61 | 3 |
| 1. Specialist discipline knowledge | 3.57 | 4 |
| 11. Ability to follow and construct logical argument | 3.56 | 5 |
| 5. Understanding of core principles & processes | 3.55 | 6 |
| 7. Ability to summarise key issues | 3.49 | 7 |
| 12. Rapid conceptualisation of issues | 3.45 | 8 |
| 8. Ability to establish part-whole relations - i.e. to relate a specific issue to the broader whole | 3.42 | 9 |
| 10. Ability to formulate and check hypotheses and assumptions | 3.37 | 10 |
| 2. General knowledge about local and global affairs | 3.20 | 11 |
| 6. Understanding of economic realities | 3.11 | 12 |

With this, as with the previous cluster of attributes, the mean rating of the importance of attributes is higher than the level of satisfaction. In the case of this group of attributes there seems a strong correspondence between the ranking in terms of importance, and employers' satisfaction. Again, it is useful to consider the relation between importance and satisfaction in the figure below.

*Figure 6: Relationship between satisfaction and importance - knowledge and intellectual ability*




Interest in ideas and the desire to continue learning (#4) rates highest in terms of importance and satisfaction and is certainly a strong quality indicator for this particular institution as it could be argued that a university education is exactly about stimulating ideas and the desire to continue learning. However, in tension is the high in importance rating of critical and analytic ability (#9), and the understanding of core principles and processes (#5) - both attributes that are rated lower in terms of employers' satisfaction with graduates exhibiting these qualities, even though both are still rated well above the mean in terms of satisfaction. The attribute that stands out as important in terms of this level of analysis, but with which employers are not sufficiently satisfied, is graduates' understanding of economic realities (#6). While it has a relatively low ranking in terms of priority, this attribute nevertheless has a mean rating of 4.0 in closely clustered scores while employers' satisfaction only rates 3.11.

## C Workplace skills and applied knowledge

IMPORTANCE

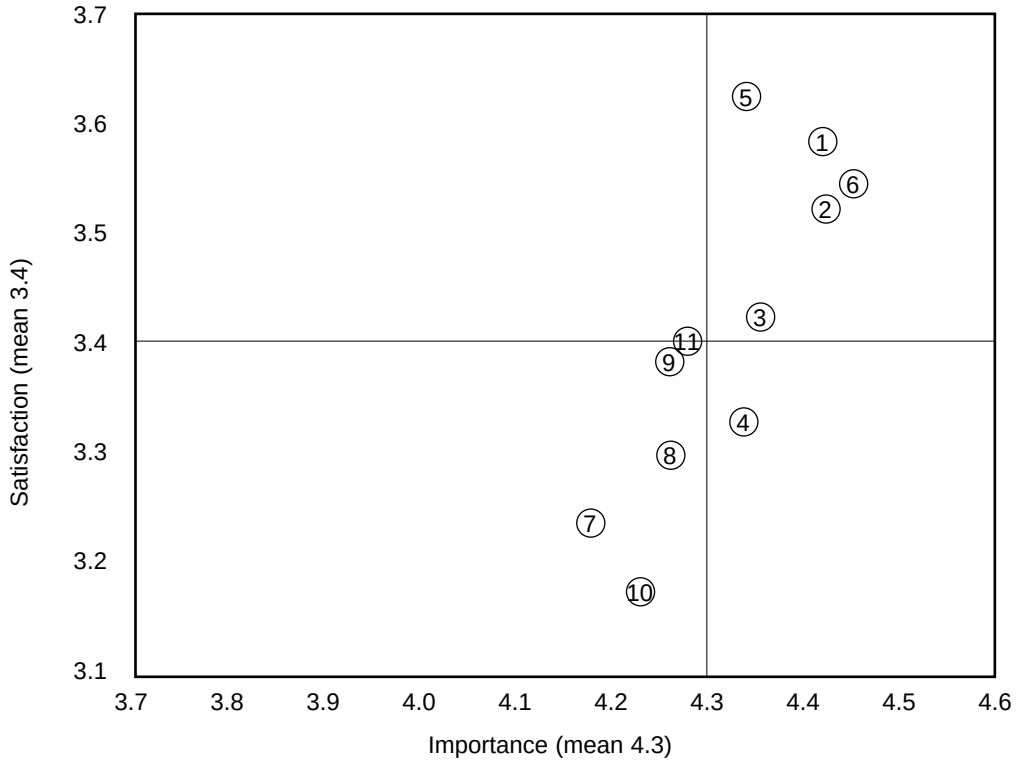
| | Mean rating | Rank |
|---|---|---|
| 6. Ability to plan and execute tasks independently | 4.47 | 1 |
| 2. Ability to recognise a problem situation | 4.45 | 2 |
| 1. Ability to apply knowledge to new situations | 4.45 | 2 |
| 3. Ability to choose appropriate information to address problems | 4.37 | 4 |
| 5. Intellectual flexibility and adaptability | 4.36 | 5 |
| 4. Appropriate approach to problem-solving | 4.33 | 6 |
| 11. Ability to deal with different cultural practices | 4.29 | 7 |
| 9. Ability to devise means to improve on actions | 4.28 | 8 |
| 8. Ability to monitor and evaluate own work-related actions | 4.27 | 9 |
| 10. Understanding of modern workplace demands | 4.23 | 10 |
| 7. Ability to relate specific issues to wider organisational context | 4.19 | 11 |

SATISFACTION

| | Mean rating | Rank |
|---|---|---|
| 5. Intellectual flexibility and adaptability | 3.60 | 1 |
| 1. Ability to apply knowledge to new situations | 3.57 | 2 |
| 6. Ability to plan and execute tasks independently | 3.52 | 3 |
| 2. Ability to recognise a problem situation | 3.51 | 4 |
| 3. Ability to choose appropriate information to address problems | 3.42 | 5 |
| 11. Ability to deal with different cultural practices | 3.40 | 6 |
| 9. Ability to devise means to improve on actions | 3.38 | 7 |
| 4. Appropriate approach to problem-solving | 3.34 | 8 |
| 8. Ability to monitor and evaluate own work-related actions | 3.26 | 9 |
| 7. Ability to relate specific issues to wider organisational context | 3.21 | 10 |
| 10. Understanding of modern workplace demands | 3.16 | 11 |

In this cluster of attributes there is a strong overlap between the ranking in terms of importance and satisfaction, but a close to one point difference in the mean rating (.9) as the figure below illustrates.

*Figure 7: Relationship between satisfaction and importance - workplace skills and applied knowledge*




The attributes that employers are most satisfied with, and which are also considered to be important, are intellectual flexibility and adaptability (#5), and the ability to apply knowledge to new situations (#1). Again, it is worth highlighting that to develop intellectual flexibility and adaptability is perhaps one of the primary educational tasks of universities, and, similarly, to instil in learners the ability to apply knowledge to new situations - again a learning to learn attribute that this university has succeeded to inculcate.

However, an understanding of modern workplace demands (#10), even though low in the rank order, has a 4.23 mean rating in terms of importance, and only a 3.16 rating in terms of the level of satisfaction. Similarly, the ability to relate specific issues to the wider organisational context (#7), to monitor and evaluate own work-related actions (#8), and to devise means to improve actions (#9) are all attributes that fall below the mean rating in terms of employers' level of satisfaction.

**D Interactive and personal skills**

IMPORTANCE

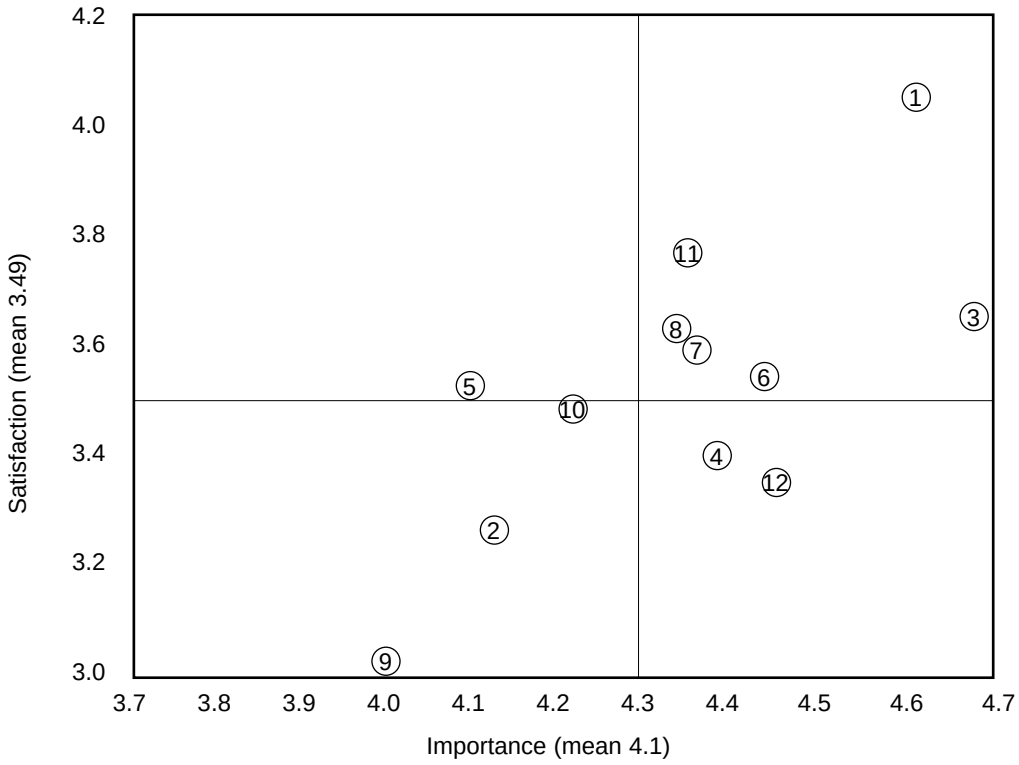
| | Mean rating | Rank |
|---|---|---|
| 3. Self-motivation and initiative | 4.67 | 1 |
| 1. Willingness to learn | 4.62 | 2 |
| 6. Contribution to team-building and work | 4.45 | 3 |
| 4. Creativity and innovation | 4.39 | 4 |
| 7. Ability to relate to a wide range of people | 4.38 | 5 |
| 11. Sense of identity and self-confidence | 4.37 | 6 |
| 8. Openness and flexibility | 4.36 | 7 |
| 10. Ability to network | 4.23 | 8 |
| 2. Leadership ability | 4.14 | 9 |
| 5. Appreciation of different cultural contexts | 4.13 | 10 |
| 9. Negotiation and mediation skills | 4.01 | 11 |

SATISFACTION

| | Mean rating | Rank |
|---|---|---|
| 1. Willingness to learn | 4.03 | 1 |
| 11. Sense of identity and self-confidence | 3.70 | 2 |
| 3. Self-motivation and initiative | 3.65 | 3 |
| 8. Openness and flexibility | 3.57 | 4 |
| 7. Ability to relate to a wide range of people | 3.56 | 5 |
| 6. Contribution to team-building and work | 3.54 | 6 |
| 5. Appreciation of different cultural contexts | 3.53 | 7 |
| 10. Ability to network | 3.49 | 8 |
| 4. Creativity and innovation | 3.40 | 9 |
| 2. Leadership ability | 3.27 | 10 |
| 9. Negotiation and mediation skills | 3.02 | 11 |

In terms of the ranking of the importance of attributes and satisfaction with these, there appears again a strong overlap in the top rankings, even though there is again a noticeable difference between mean ratings. Figure 8 below illustrates the relationship between satisfaction and importance.

*Figure 8: Relationship between satisfaction and importance - interactive and personal skills*




The attributes that employers consider to be most important, and with which they are also most satisfied, are graduates' willingness to learn (#1), their self-motivation and initiative (#3), their sense of identity and self-confidence (#11), and their contribution to team-building and work (#6). These appear to be an important indication of an institution that has succeeded in developing well-rounded graduates. Three attributes fall below the average rating in terms of satisfaction and importance: employers are least satisfied with graduates' negotiation and mediation skills (#9) but consider this also least important in terms of the 11 attributes in this cluster. Related is the relatively low rating they give to graduates' leadership ability (#2), and their ability to network (#10). The case could arguably be made that these competencies are not priority areas in a university curriculum where the focus is first and foremost on developing conceptual and enquiry skills within specific disciplinary domains.

In summary, three trends are evident in the analysis of employers' rating of graduate attributes:

- First, the most visible trend is that employers' rating of the importance of attributes is consistently higher than their rating of the degree to which they are satisfied with graduates' demonstration of these.
- However, the analysis of the relationship between satisfaction and importance also shows high levels of overlap with few attributes falling below the mean in terms of employers' degree of satisfaction.
- A third and related trend is the overall synergy between the ranking of attributes in terms of importance and those qualities with which employers are most satisfied in the work-related performance of graduates.

These three trends seem to suggest that even though this particular university is on the right track in terms of the alignment between curriculum and the demands of the workplace, the

degree to which students demonstrate certain skills, qualities and abilities in the workplace must be strengthened. As alluded to earlier, it however remains debatable whether the demonstration of particular attributes is the product of individuals' socio-cultural circumstances and personal traits, or indeed, whether universities have a particular responsibility to instil qualities that are valued in the workplace but which may not necessarily dovetail with disciplinary demands. These problem areas, and the balance that must obtain between external demands and the internal logic of university curricula, are returned to in the discussion which follows.

**Discussion**

The impact of globalisation has become common discourse, as has the development of knowledge-based economies that make higher education increasingly important to the economic viability of nations and indeed regions. In order to make higher education an economic resource, partnerships are being forged between government, business and higher education, and the often explicit demand is for institutions to develop curricula that are responsive to the needs of the economy. At a recent round-table discussion that the Centre for Development and Enterprise convened on the role of business in relation to the future of universities, the view was expressed that "South Africa's universities have by and large not adapted to the economic needs facing South Africa, and are not sufficiently responsive to business's needs" (Centre for Development and Enterprise (CDE) 2000: 4). There are various ways in which this view may be supported, one being in terms of the efficiencies of graduate output, especially in key fields of study, and another, the relatively low participation rate compared to developed post-industrial societies. But this is not the primary focus of the study reported on here.

The intensive higher education policy development era of the past decade culminated in February 2001 in the Ministry of Education's *National Plan for Higher Education* that provides "the strategic framework for re-engineering the higher education system for the 21st century" (Foreword). An objective and key priority is to produce graduates with the skills and competencies required to meet the human resource needs of the country, and to participate in the modern world in the 21*st* century (2001: 16). An important outcome is anticipated to be "enhanced cognitive skills of graduates", and, following Gibbons (1998), this is given as entailing "computer literacy, knowledge reconfiguration skills, information management, problem-solving in the context of application, team building, networking, negotiation/mediation competencies and social sensitivity" (*Ibid*.: 31). The national plan poses the question whether higher education is indeed geared towards addressing these skills and competencies and to supplying the human resource requirements of the country.

The most obvious critique of the above description of skills and competencies is that it lacks an explicit framework of individual (cognitive) development and change, and leaves open what a university education can best deliver. Part of the problem relates to the different conceptual frames and taxonomies that are either explicit - or more often implicit - in the pronouncements of industry, policy-makers and curriculum developers within higher education. On the one hand the concern of both industry and higher education is that education systems are not changing fast enough to match the rapidly changing labour market. Yet as De Weert (1997) comments, the signals given are often ambiguous and diffuse, which makes a systematic response difficult. On the other hand, universities have become diverse and differentiated with "splintering zones of knowledge" which means there can be no single "grand organising principle" that will clearly delineate the role and idea of a university (Smith & Webster, 1997: 3), nor the kinds of knowledge, skills and competencies that ought to be developed.

There is thus no single discourse or grand narrative either of what universities are best able to produce, or of the attributes that best fit the demands of the world of work. Scott (1997: 41) talks of the "sociologically opening-out of the modern university" and of the growth of mass higher education not being an isolated phenomenon; "knowledge" means information, and information technology is seen as a fundamental resource in a global knowledge-driven society.

At the level of curriculum Smith & Webster (1997: 18) point out that a university education is "a great deal more than transmission of knowledge and techniques which would allow those who have mastered them to perform a given occupation", and cite qualities that may be hard to measure but that are indisputably cultivated within universities; for example, the conduct of critical enquiry and rational debate, the ability to distinguish opinion from evidence, to evaluate an argument dispassionately, to present coherent arguments, to think conceptually, and so on. Similarly, Brennan *et al* (1996: 15) comment that while there is an increased urgency for higher education to focus on dimensions other than the transmission of knowledge - for example, communication skills and the ability to cooperate with others - it seems obvious that universities are less equipped "to steer these processes systematically than (they are) to shape the cognitive domain of academic learning".

In the South African context and at the level of curriculum, Ensor (2002) juxtaposes two discourses that are currently evident in higher education policy and have shaped the structuring of curricula: the credit accumulation and transfer or credit exchange discourse that has more recently dominated higher education curriculum practice, particularly through the implementation of the National Qualifications Framework (NQF); and the second, the traditional disciplinary discourse. Both present strong proponents and are, she argues, essentially about different assumptions about knowledge and ways of knowing, and about the nature of the educational process or pedagogy. The first is articulated by those who advocate the role of higher education in producing skilled graduates for the workplace, while the second is promoted by those who argue that a university education should be "an apprenticeship into powerful ways of knowing: of modes of analysis, of critique and of knowledge production" (2002: 274-5). It is to be anticipated that institutions have responded in varying ways to these dual pressures in order to become or remain responsive. However, as Ensor points out in relation to institutions' attempts to be responsive to the world of work, programme titles may have changed to signal an explicit link, but this relevance seems to be achieved more in terms of rhetoric than in practice. And this may not be entirely negative.

The data generated in this study on employer views underscore both achievements and areas that require greater attention in one institution, and perhaps in higher education in South Africa more generally. If the top ranking attributes across the four clusters are taken together - in terms of the relationship between importance and satisfaction - an interesting picture emerges that seems to highlight the role of universities in producing graduates that meet the demands not only of the world of work but indeed of the 21st century world. The table below illustrates this by combining top ranking attributes across the four groupings.

*Table 2: Top ranking attributes in terms of importance and employer satisfaction*

| |
|---|
| **Basic skills and understanding-** |
| The ability to use new information |
| Computer literacy |
| Ability to use information technology |
| **Knowledge and intellectual ability-** |
| Interest in ideas and the desire to continue learning |
| Critical and analytic ability |
| Understanding of core principles and processes |
| **Workplace skills and applied knowledge-** |
| The ability to apply knowledge to new situations |
| Intellectual flexibility and adaptability |
| Ability to plan and execute tasks independently |
| **Interactive and personal skills-** |
| Willingness to learn |
| Self-motivation and initiative |
| Sense of identity and self-confidence |

Given the deliberate targeting of senior personnel in the human resources divisions of organisations, it is perhaps predictable that the emphasis in the main would be on applied competencies, as the table above shows. However, it also seems feasible to conclude that the attributes that are considered both to be the most important and with which employers are most satisfied illustrate that curricula in the example of one institution have already shifted (or perhaps have always been) in line with the demands of the broader context in which universities are situated, even though areas of weakness will invariably remain.

As Harvey *et al* (1997: 63) comment in relation to a similar study undertaken in the UK, a degree may be necessary or desirable but employers are looking for a range of attributes that include intellectual ability, a willingness and ability to learn, flexibility and adaptability, self-regulation, motivation and self-assurance, and knowledge - "in many organisations knowledge of something is much less important than the ability to acquire knowledge". Similarly Jones (1996: 143) refers to curriculum relevance being tested against the development of "personal transferable skills" and students' ability to learn to learn, given the recognition that becoming a lifelong learner is perhaps the most important asset of a flexible graduate in a changing world of work.

**Concluding comment**

The views of employers on the quality of graduates are but one form of data in exploring the relationship between universities and the world of work, and the degree of fit between expectations and what is or can be delivered in the form of graduates who need to demonstrate a range of attributes in the workplace. In this case study one institution served as catalyst and the data thus generated cannot necessarily be generalised to all institutions given the diverse range that make

up the South African higher education sector. It nevertheless presents a useful stock-take of employer views that may cast some light on debates related to the responsiveness of universities.

This study can usefully be complemented by an analysis of graduate employment and institutions' enrolment and graduation patterns; the first could be considered a form of quality assessment, while the second underscores the degree to which institutions have met their educational task and the system as a whole is responsive to the needs of society. Perhaps most important in understanding the educational task of institutions is to analyse and explicate the content and form demands (or the knowledge and modes of production) that characterise university studies, and the degree to which these are in line not only with South African imperatives but importantly also with the 21st century global world.

It is clear that the relationship between higher education and employment will remain a prevailing theme, and especially so in periods of rapid change. However, it also seems appropriate to focus the debates on the kinds of attributes that universities as particular kinds of institutions are best geared to develop. The challenges that confront institutions must simultaneously be situated within the socio-historic realities of our South African context and allow for responsiveness to the demands the future places on curricula in the present.

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# Employment and employability: expectations of higher education responsiveness

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## Abstract

The study aims to develop insight into the challenges faced by the higher education sector by accessing the expectations of responsiveness of five distinct constituencies, each central in its own way to the contribution of higher education: the public sector, the private sector, professional associations, SETAs, and higher education providers, both public and private, university and technikon. In this way, the study aims to inform the development of substantive policy and practice to achieve the broad symbolic policy goals that have been established in the *White Paper on Higher Education* of 1997.

Through a series of focus group and individual interviews, the study illuminates divergence and convergence in the expectations of the five constituencies, which are elaborated in the paper.

At the core of new conceptions of responsiveness is an emerging new model of the link between higher education and the workplace. Increasingly, HEIs are expected to prepare graduates who will be directly employable and ready to enter the labour market as highly skilled employees. Higher education programmes are expected to include new elements to ensure that graduates are equipped with the tacit experiential knowledge, high-level skills and attitudes required by the labour market, alongside general and specialist academic knowledge. This trend dominates the ideal expectations of higher education of all constituencies, but can be traced in complex and uneven ways.

For it became evident that the five constituencies mediate new policy in different ways to legitimise the call for responsiveness. The private and public sectors and the professional associations and SETAs as intermediary organisations tend to frame their expectations primarily in terms of one of three labour market discourses - national economic and social development, global competitiveness and the knowledge economy, or narrow vocationalism. HEIs tend to frame their expectations in terms of a classical liberal education discourse, articulated in different ways and to different degrees with these three labour market discourses. The dominant trend is that all frame the new model of direct employability in their expectations of higher education responsiveness.

In practice, it is evident that HEIs differ internally and with each other, in the extent to which they continue to promote the models of the past, and the extent to which they have begun to change their curricula, teaching and learning in line with the new expectation of direct employability. The relationships, strategies and mechanisms established by the public and private sectors, by pro-

fessional associations and by SETAs likewise differ between and within institutions. Nevertheless, there is strong evidence that a model of direct employability is coming to prevail in practice, albeit unevenly.

In developing these insights, the paper opens up ways for the higher education sector to mediate symbolic higher education policy in a more rigorous, strategic manner, to actively negotiate the terms of its engagement.

# Employment and employability: expectations of higher education responsiveness

**Introduction**

In the late 20th century, higher education across the world has come to face a series of fundamental changes arising from the forces of globalisation, the growth of the knowledge society and a competitive higher education market. The changes are seen variously as crises, challenges and opportunities for transformation of the traditional roles of higher education (Scott 1998, Hirsch and Weber 1999, The Futures Project 2000, Jacob and Hellstrom 2000).

It has been argued that an academic revolution is in process, whereby the traditional mission of the university is fundamentally changing to include economic development alongside its traditional roles of teaching, research and service (Etkowitz *et al* 1998). The focus for research is increasingly and more intensely on the "translation of research into products and into new enterprises" (Etkowitz *et al* 1998: 1; see also Jacob and Hellstrom 2000). The focus for teaching is increasingly on the preparation of a highly skilled, flexible, adaptable labour force to meet changing economic and social needs (Brown 2001).

The present paper concentrates on the shifting education and training role of higher education, in a changing national and global economic context. The knowledge production and knowledge transfer dimensions of the new economic role of the university is not included specifically.[17] Instead, the focus is on the global demand that the education and training offered by higher education should become more responsive to the needs and expectations of industry, the state and society in general, to ensure economic and social prosperity.

Education policy in South Africa since 1994 has absorbed and been strongly influenced by international trends. The development of a highly educated workforce is a priority for the new goal of a knowledge-based economy, to provide education and training to a larger number of citizens than in the past. There has been a call for higher education in South Africa to become more responsive to societal and economic needs. Until very recently, this has taken the form of symbolic policy that articulates the values, goals and frameworks for a desired future scenario. As such, new policy has been open to competing mediations on the part of the state, business and industry, and HEIs themselves. An often polemical debate has emerged, around whether higher education should become more responsive, what it should become more responsive to, and how it should become more responsive. Indeed, there are diverse mediations of the very concept of responsiveness, and whether it encompasses only economic dimensions or social, cultural and political dimensions as well. (Singh 2001)

For higher education policy-makers, institutions and their leaderships, in order to engage with the challenges and demands of their changing role, it becomes important to understand the complex, multiple expectations of responsiveness.

The study aimed to develop insight into these competing expectations, by attempting to access the expectations of responsiveness of five distinct constituencies, each central in its own way to

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17 The HSRC is conducting an empirical study of higher education-industry innovation partnerships that will focus on the research and knowledge production dimension.

the contribution of higher education: the public sector, the private sector, professional associations, Sectoral Education and Training Authorities, and higher education providers, both public and private, university and technikon. In this way, the study aimed to inform the development of substantive policy and practice to achieve the broad symbolic policy goals that have been established in the *White Paper on Higher Education* of 1997.

A series of focus group interviews generated a wide array of expectations of higher education responsiveness. The initial impression was of a great deal of convergence between the five constituencies, though subtle but distinct differences were also apparent. In the course of analytical engagement with the data, it became evident that the constituencies share a common logic underpinning their expectations of responsiveness.

At the core of new conceptions of responsiveness is an emerging new model of the link between higher education and the workplace. Increasingly, HEIs are expected to prepare graduates who will be directly employable and ready to enter the labour market as high-level skill employees. Higher education programmes are expected to include new elements to ensure that graduates are equipped with the tacit high-level knowledge, skills and attitudes required by the labour market, alongside general and specialist academic knowledge.

The expectations of responsiveness may not be narrowly confined to an economic relation, and may include social, political, cultural and moral dimensions. For it is evident that the five constituencies mediate new policy in different ways to legitimise the call for responsiveness. The private and public sectors, and the professional associations and SETAs as intermediary organisations, tend to frame their expectations primarily in terms of one of three labour market discourses - national economic and social development, global competitiveness and the knowledge economy, or narrow vocationalism. HEIs tend to frame their expectations in terms of a classical liberal education discourse, articulated in different ways with these three labour market discourses. The dominant trend is that all of these broad discourses frame the new model of direct employability in their expectations of higher education responsiveness.

In practice, it is evident that HEIs differ internally and with each other, in the extent to which they continue to promote the models of the past, and the extent to which they have begun to change their curricula, teaching and learning in line with the new expectation of direct employability. The relationships, strategies and mechanisms established by the other four constituencies likewise differ between and within institutions.

The paper will build a case to support this argument. It begins by developing an analytical framework to conceptualise responsiveness, by drawing a distinction between employment and employability. It goes on to describe national policy expectations of HEIs since 1994, and then the method used in the study to access mediations of responsiveness. The fourth section examines the expectations of the public and private sectors, the fifth section focuses on professional associations and the sixth on SETAs, while the seventh section focuses on HEIs themselves. A short section then considers current selection preferences of employers and students. In concluding, the paper discusses the kinds of engagement made possible for the higher education sector by the insights developed through the study.

**Employment and employability: higher education and the labour market in the past**
At the heart of responsiveness lies a new relationship between higher education and the labour market - the key for analysis.

Brown (1996) provides a useful analysis of education and economic development in the current global context. He makes the critical point that instead of guaranteeing employment, the role of the state now is to invest in education and training to enable workers to become fully employable. He has made a critical distinction between the goal of *employment*, where skills are linked to specific occupations and economic trajectories, and *employability*, where the focus is on skills formation to develop a highly educated workforce that is equipped for greater occupational mobility and flexible work patterns.

The analytical distinctions that can be drawn from a consideration of this relationship will be illustrated by means of a consideration of the models that operated in the past, which proved to be critical for understanding the present.

*Universities and the labour market in the past*
Until recent changes in higher education across the globe, universities' education and training role had two mandates - the core focus on general education, and a secondary focus on professional education. Hirsch and Weber have succinctly summarised the ways in which the obligations of the university have been met traditionally:

> Contributions to knowledge and to the economic well-being of society are accomplished chiefly at the graduate/professional level; production of educated citizens is accomplished chiefly at the undergraduate level; and production of future leaders of society, encouragement of productive interactions amongst persons of diverse backgrounds, and appreciation of the value of the pursuit of knowledge are accomplished at all levels. (1999: viii)

How were these roles linked with the labour market?

> To teach people to think and explore the unknown.[18]

The model of the relationship between higher education and the labour market underpinning the general education focus of undergraduate qualifications such as BA, BSc and B Soc Sci, was one of *employability* with an indirect link to the labour market. The model may be represented graphically as in Figure 1.

In a context where there were many jobs available, even if in South Africa this was a racially segmented labour market, higher education's key role was to ensure that the majority of graduates were employable on leaving the institution. The degree provided general formative grounding on a broad disciplinary base, to prepare educated citizens.

[18] Interview, Pistorius 14 April 2002.

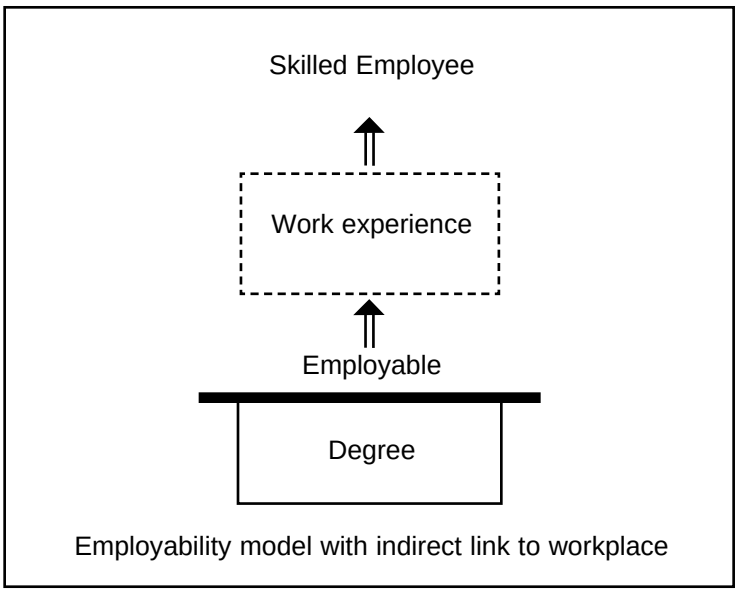


*Figure 1*

Note the solid line on completion of the degree or diploma, which represents the end point of formal education and training. A degree prepared graduates *indirectly* for employability. This model assumed that graduates would proceed immediately upon qualifying to the workplace. Work experience and occupational specialisation were the preserve and domain of the employers, who would build on the general foundation laid by HEIs to develop the requisite specialised skills, knowledge and dispositions to produce skilled employees.

*Deferred employment pending professional education and training*

In contrast, the model underpinning professional and graduate education was one of *employment*, with an indirect link to the labour market. That is, higher education indirectly prepared graduates with general and specialist technical knowledge for professional employment, which was completed by professional associations in cooperation with employers in the workplace.

Once a graduate had a degree, professional specialised knowledge was provided through mentored work experience, controlled, regulated and accredited by professional associations, in their capacity as statutory bodies. The employer focused on providing the specialised practice and experiential knowledge required. Only then was the graduate professionally ready for the labour market. Employment in the occupational role was virtually guaranteed with the achievement of the professional qualification.

The model is graphically represented in Figure 2. Note the perforated line between the degree and work experience, which represents that formal education and training and accreditation were only completed after the professional workplace-based training.

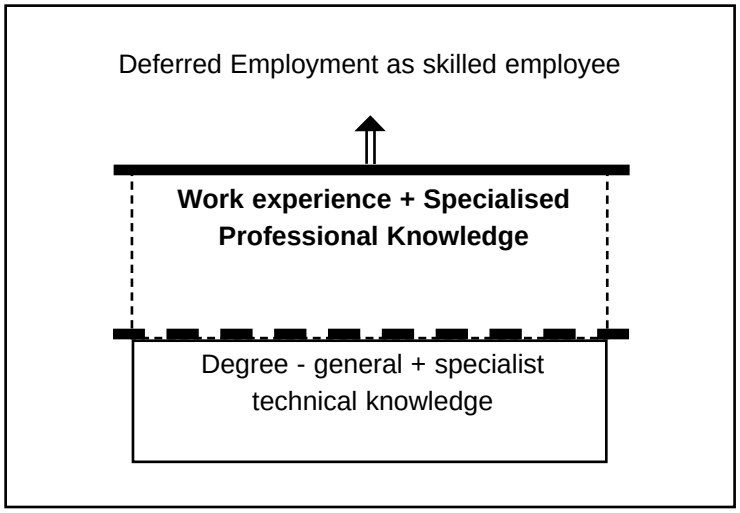


*Figure 2*

Higher education was responsible for preparing graduates indirectly, for deferred employment pending professional specialisation.

*Technikons and the labour market in the past*

In the past, university education was expected to prepare graduates indirectly for the labour market, in general, in terms of employability, and for the professions, in terms of deferred *employment*. Technikons were established with a distinct mission and mandate.

> We only offer programmes whose title has a job.[19]

Technikons, in contrast, were mandated to prepare graduates *directly* for employment as represented in Figure 3. Students were provided primarily with specialised training preparing them for technical and technological competence. A crucial component of this training was experiential

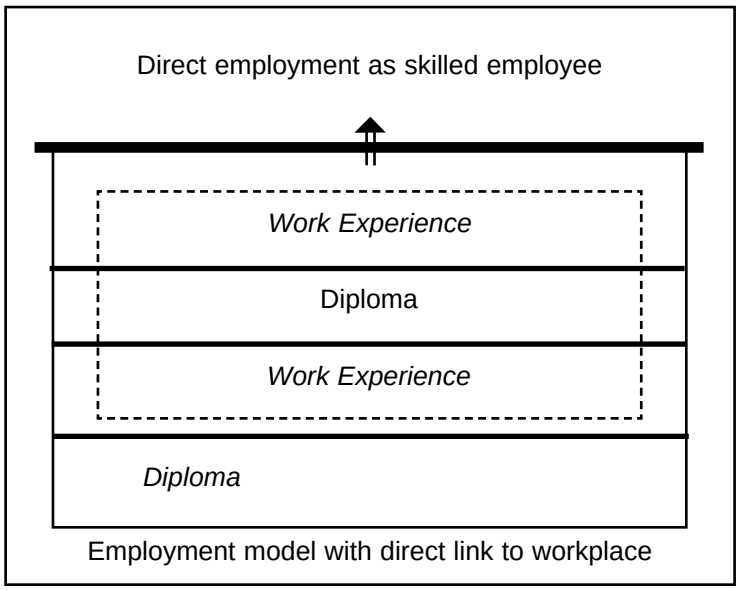


*Figure 3*

[19] Individual Interview, B. Figaji 17 April

learning, structured in blocks of work experience as an integral part of the programme. The technikons provided the specialised technological theory, and the workplace provided the technological practice. When graduates left the technikon with their diplomas or, latterly, degrees, they could proceed directly to employment ready for work as skilled employees. Again, achievement of the qualification virtually guaranteed employment, often by the company that had provided workplace experience.

**Analysing responsiveness**

An analytic frame was thus developed to describe and analyse the expectations of responsiveness. Firstly, a distinction was made whether a direct or indirect link with the labour market is proposed, implicitly or explicitly. Secondly, a distinction was drawn as to whether HEIs are preparing for employment, with knowledge, skills and attitudes required for specific occupational roles for which jobs are virtually guaranteed, or for employability, with the knowledge, skills and attitudes required generally in any number of possible occupational roles. This analytical distinction may be represented graphically as in Figure 4.

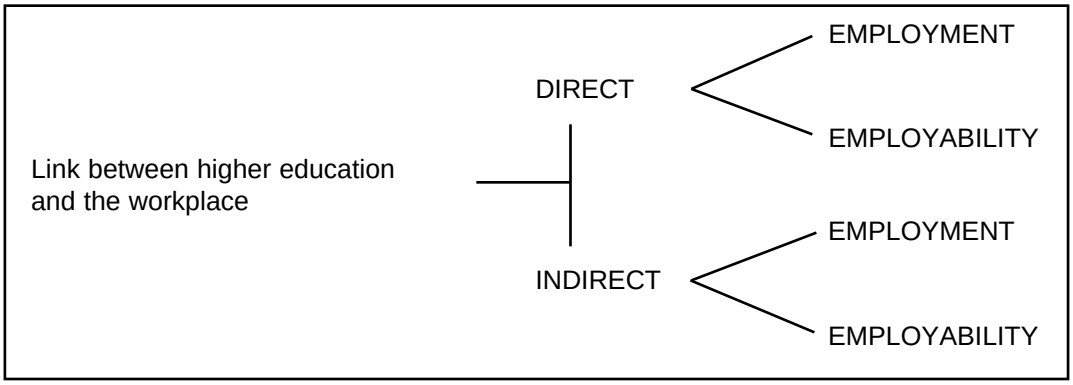


*Figure 4*

This analytical framework was used to engage systematically with expectations of responsiveness generated in the study, in order to explore the convergence and divergence within and between the five constituencies implicated in higher education.

*Shifting contexts*

With globalisation and marketisation, and the advent of democratic government in South Africa, higher education policy now expects institutions to become more directly responsive to the labour market. The following section explores the new expectations of the role and relationships of HEIs developed in state policy since 1994, before going on to explore the models of the present link between higher education and the labour market.

**Responsiveness: expectations of the new higher education policy framework**

*Economic growth and equity*

Kraak (2000) argues that new higher education and training and science and technology policies in South Africa have been profoundly influenced by the Mode 2 thesis of Gibbons (1994) and Scott (1995). The Mode 2 thesis argues that globalisation and democratisation - in the form of massification of access to higher education - have given rise to fundamental changes in the

functioning and structure of HEIs across the world, towards more open and responsive systems of teaching and learning, and to the emergence of a new mode of knowledge production that is trans-disciplinary, trans-institutional and heterogeneous, characterised by problem-solving.

Global economic changes - the requirement of flexibility, adaptability and innovation, the development of information technology and the emergence of the networking firm collaborating to enable competitiveness - have all led to new education and training demands (see for instance, Delanty 2000; Altbach 1991). Most significant is the need for a highly skilled labour force able to employ new technologies and add value to existing goods and services. Critically, these generalised skills and capabilities are developed in a good general education, and are not developed in a narrow, enterprise system of training.

Key recommendations in South African higher education policy reflect this scenario for change:

- A shift to a more open and responsive HET system.
- Greater emphasis on programmatic rather than disciplinary-based provision.
- The adoption of a single coordinated national system of HET that emphasises homogeneity in the regulatory environment and pluralism in the institutional missions of diverse HET providers.
- The creation of an enabling environment in which Mode 2 research will flourish.

The influence was first evident in the analysis and recommendations of the National Commission on Higher Education (Kraak 2000). The NCHE proposed three pillars of HET transformation: increased participation, responsiveness and partnerships. Increased responsiveness indicated a shift away from "academic insularity, a closed system governed primarily by the norms and procedures of established disciplines, towards an open higher education system which interacts more with its societal environment" (NCHE 1996:76):

> HEIs will increasingly have to offer a greater mix of programmes, including those based on the development of vocationally based competencies and skills needed in the workplace. (NCHE, 1996:6-7)

The NCHE supported the dual emphasis in the Department of Arts, Culture, Science and Technology's (DACST's) *White Paper on Science and Technology* (1996) on "maintaining cutting edge global competitiveness and on addressing the urgent need for reconstruction and development" (NCHE 1996:127). As the Minister of Education succinctly phrased the dual emphasis, the challenge facing higher education "is how to ensure that it simultaneously develops the skills and innovations necessary for addressing the national development agenda, as well as for participation in the global economy" (Asmal March 2002).

Based largely on the recommendations of the NCHE, the *White Paper on Education and Training 3: A Programme for the Transformation of Higher Education* (1997) (WPET 1997) set the parameters for developing national higher education policy in the new global context, taking into account the pressures for socio-economic change in the national post-apartheid context, by defining a three-fold role for institutions:

- Human resource development: the mobilisation of human talent and potential through lifelong learning to contribute to the social, economic, cultural and intellectual life of a rapidly changing society.
- High-level skills training: the training and provision of personpower to strengthen this country's enterprises, services and infrastructure. This requires the development of

professionals and knowledge workers with globally equivalent skills, but who are socially responsible and conscious of their role in contributing to the national development effort and social transformation.

- Production, acquisition and application of new knowledge: national growth and competitiveness is dependent on technological improvement and innovation, driven by a well-organised, vibrant research and development system which integrates the research and training capacity of higher education with the needs of industry and of social reconstruction. (1.12)

The WPET (1997) emphasises a commitment to dual policy goals of equity and development, and attempts to provide a policy framework that balances equity responsiveness concerns with economic development responsiveness concerns. It proposes the need for policy to promote responsiveness to societal interests and needs, by restructuring the higher education system in order to:

> Deliver the requisite research, the highly trained people and the knowledge to equip a developing society with the capacity to address national needs and to participate in a rapidly changing and competitive global context. (1.13)

The *National Plan for Higher Education* (2001) set out to develop instruments for implementing this vision. It emphasised the need for a systemic and coherent approach with greater responsiveness of HEIs to national needs, broadly defined. The plan puts in place measures to ensure that the higher education system will produce the graduates needed for social and economic development, such as shifting the balance of fields of study towards the science, engineering and technology fields, and using graduate outputs as measures of efficiency.

**Responsiveness: why, why not and how?**

Alongside such policy developments, a substantial debate on responsiveness has developed in the international and national literature. In an earlier study on higher education-industry partnerships, Powell (1998) has argued that studies on the relationship between higher education and industry either argue for the economic necessity of such relationships, in which case they present arguments about why it should be done and how it should be done effectively, or they argue that higher education should not compromise its traditional roles, and should not enter into such partnerships at all. This proved to be an accurate assessment of the related literature on higher education's role in developing responsiveness to the labour market.

At the critical end of the spectrum, the critique of writers like Slaughter and Leslie (1997) of what is perceived to be a new economic rationalism affecting higher education has been influential in South African debates. They argued that globalisation has led to the subjugation of education processes to the dictates of the market, and the accentuation of existing social inequalities in education. Some academics have argued that the increasing dominance of the discourse of the market has reduced the traditional, complex notions which defined higher education responsiveness in terms of social, political, intellectual, moral, cultural and economic dimensions, to a narrow notion of market economic responsiveness (Singh 2001). In a similar critical vein, Muller (2001) criticised the imperative of what he terms responsivity for its potential negative effects on knowledge growth in higher education research and curriculum. He drew on Polanyi to criticise the tendencies for the exogenous, in the form of market- or equity-driven policies, to attempt to direct the endogenous, the nature of research activities and science. Muller expressed a com-

mon concern, that the imperative of responsiveness may lead to the demise of entire areas of learning that are not seen as relevant or of immediate utility.

At the supportive end of the spectrum, the economic necessity of increased higher education responsiveness in the light of global market challenges and regional or national economic trends, have been emphasised by, amongst many others, in a range of international contexts, Santillanez (1995), Bengtsson (1993), Cheung (1996) and Imrie (1995). In the South African context, Creamer, Van Schoor (2000) and Bruwer (1996) reflect the argument that there is a growing need for HEIs to ensure that they prepare their students to become employable.

An instance of the how-to trend in the literature is the work of Maginn and Dench (2000: v) who have prepared a comprehensive Labour Market Information Guide to assist higher education planning to become more responsive to the needs of employers, as part of a project of the Department for Education and Employment in the UK, because "society expects an economic dividend for its major investment in the recent expansion of the UK higher education". (See also Phillips 2000 and Education Commission of the States 1998.)

There are those who have attempted to develop the notion of responsiveness in relation to high-level skills needs in South Africa. At the heart of the higher education curriculum debate, according to Cloete and Bunting (1999), is determining exactly what skills a modernising economy requires, and specifically, the balance between high-level generalisable cognitive skills, and specialised skills, concretely acquired. The Centre for Development Enterprise (2000) similarly distinguishes between meeting the specific short-term training needs of business and industry, arguing that the role of higher education lies instead in developing the critical thinking and generic skills required in a knowledge-based economy in South Africa. In line with this trend, debate at a recent higher education conference engaged with questions of disciplinarity, with the notions of programmes, general formative education and competence in higher education and with principles of curriculum design and restructuring (Du Toit 2001, Luckett 2001, Gevers 2001 and Moore 2001).

This critical debate provides a significant backdrop for considering the ways in which a higher education policy centred on responsiveness has come to shape expectations and practice in the South African context.

*Symbolic policy and mediation*

Until the National Plan 2001, higher education policy largely took the form of symbolic policy. That is, it proposed policy frameworks, set policy goals and enshrined values to underpin policy. As Samoff (1996) has noted, a great deal of education policy-making in South Africa has taken the form of policy frameworks, as opposed to substantive policy documents. The NCHE, the White Paper and the Higher Education Act have only set the symbolic framework for new higher education policy (see Cooper 2001). While a commitment to responsiveness lies at the heart of higher education policy, there are few substantive policy statements to direct what form responsiveness should take, or how it should unfold, or what policy mechanisms can be put into place to promote responsiveness.

Symbolic policy texts are by their very nature potentially contradictory, ambiguous and open to multiple mediations and interpretations. It is evident that there are discourses held in tension within these higher education policy frameworks that are potentially contradictory and ambiguous. Kraak (2001) has traced ways in which a discourse developed around global competitive-

ness and economic development has been in tension with a popular democratic discourse of equity and redress and a residual discourse of a functionally stratified higher education system. Policy ambiguities and contradiction give rise to contestation and competing interpretations as policy moves to the institutional level and the level of practice (see Kruss 2001).

Thus, responsiveness is strongly promoted as a policy goal, but is widely open to mediation by different constituencies and interest groups in different contexts. In the absence of substantive policy guidelines between 1996 and 2001, responsiveness has been contested, mediated, promoted and given form in different ways, on the part of government, business and HEIs. These mediations take on a force of their own. They become critical for attempts to develop substantive policy on the part of the state, or attempts by HEIs to position themselves in the new context.

The mediations of five key constituencies of new responsiveness policy are the focus of this paper. The following section will describe how the study accessed the ways in which responsiveness has been mediated by different higher education constituencies since 1994.

**The study: accessing expectations**

Elucidating the positions of five broad, sizable and loosely defined constituencies is a difficult task. A study by Immerwahr (1999) of higher education managers', government officials' and business leaders' expectations of higher education took the form of a quantitative survey. The method adopted for the present study was to select key representatives of each constituency for focus group interviews, complemented by interviews with key individuals, because the concern was to distinguish divergence and not simply convergence.

Selection was based on different criteria for each constituency, but shared a focus on the high-level skill segment.[20] It became clear that each constituency itself reflected internal contestation and potentially contradictory competing positions, and an attempt was made to select organisations that would cover a wide spectrum. A full list of organisations that participated in the study is presented in Appendix A.

For the public sector, officials from selected key national departments representing and working with high-level skill sectors of employment were identified, such as DACST, and the Departments of Trade and Industry, and Public Service and Administration. In addition, bodies such as the National Productivity Institute were included. A number of departments invited were unable to participate.

Private sector business and industry leaders were accessed through a range of national business organisations like Business South Africa, NAFCOC and SACOB, BRAIN (working with SMMEs) and other regional chambers of commerce to cover a range of fields of high-level skill employment and interests.

A range of business and industry SETAs operating in fields of high-level skills employment, and reflecting sectors with and without established industrial training boards, were included, such as

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20 The willingness of individuals in each constituency to participate in the focus group interviews is gratefully acknowledged. The study would not have been possible without their giving generously of their time.

MQA, Merseta, FASSETT and ISETT.[21] The 25 SETAs were formally established only a year ago, and many are still developing their structures, and employing and training their staff. Simultaneously, they have been placed under pressure by the Department of Labour to deliver a range of critical outputs, including their first sector skills plans, business plans and so on.[22]

Professional quality assurance bodies and boards were included, both statutory and long established, such as ECSA and SAICA, and newly established black empowerment bodies such as the Association of Black Accountants of South Africa and the Association for Black Securities and Investment Professionals.

Higher education providers were selected using a typology developed by Bunting and Cloete (1999). The five categories they suggested were entrepreneurial expanding institutions, stable emerging institutions, traditional elite, unstable-uncertain and crisis-ridden institutions. In addition, two private providers, one representing transnational type institutions and the other representing franchising college type institutions, were selected (Kruss 2002).

Five universities and three technikons in the Gauteng region were included in the focus group interview, represented by senior or middle management staff.[23] It transpired that these were all urban HAIs.

CEOs and director generals were invited to attend the focus group interviews. In some cases, notably the public and private sectors, middle to junior management figures directly responsible for links with higher education were mandated to attend. More nuanced positions were obtained from those in senior management positions, a feature that marked the interviews with the SETA, higher education and professional association interviews.

Individual follow-up interviews were held in a number of cases, where a representative was not able to attend the focus group discussions. A second set of individual interviews was held with high profile leadership individuals in higher education and business. This included the vice chancellors of the University of Pretoria and of Peninsula Technikon, as well as the CEO of the Committee of Technikon Principals (CTP).

The interviews were structured by five sets of questions:

1. Understandings of higher education in the past, present and future.
2. Interpretations of responsiveness.
3. Expectations and examples of the relationship between higher education and employers.
4. Conceptions of the nature of high-level skills.
5. Graduate selection preferences.

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21 Three SETAs included have no former ITB in their sector, five have former ITBs and two have two former ITBs incorporated in their sector.

22 It was notable that under such intense pressure, six CEOs and two learnership managers agreed to individual interviews and participated with some vigour. Attempts to convene a focus group were not successful, perhaps because a SETA forum meeting was scheduled for the same time. Each participant was interviewed individually in his or her workplace.

23 This was done for ease of access on the grounds of proximity.

At first sight, there appeared to be a bewildering array of different positions and interpretations of what the new role of higher education should be, and consequently, what responsiveness should mean, and yet, at the same time, there appeared to be a great deal of convergence and similarity between the positions of different constituencies.

Analysis of these mediations identifying the models of the relationship between higher education and the workplace in comparison with the models of the past in the manner suggested in Figure 4 above, provided significant insights. The following sections will explore how the five constituencies may be positioned in relation to the models of direct or indirect employment and employability they promote.

**Variations on a theme: expectations of the private and public sectors**

*The public sector: 'the product that walks out must meet the needs of the economy'*

As representatives of government policy, the public sector reflects a commitment to national economic and social development, with an emphasis on equity as redress of past inequalities, in their mediation of policy.

What stood out most strongly from discussions with these officials was the unquestioned assumption that there is, or should be, a *direct* relationship between HEIs and the labour market, in the current context. As one official phrased it, higher education's responsibility is "to feed the economy with people who make the difference" (Individual interview 15 April 2002). Officials stressed higher education's role in economic development, to produce the skilled human resources required by the economy.

> Now if you have a higher education sector that is not able to produce, first in terms of quantity and also in terms of skills, the necessary human resources, that's the bottleneck of the economy. (Individual interview 18 April 2002)

Some, notably representatives of DACST, emphasised higher education's dual role, stressing its role in research, knowledge construction and innovation, but this too, was seen in terms of economic development:

> I think the main responsibility is to develop human resources and to develop knowledge that has got relevance and has got direct and immediate impact on economic development. (Individual interview 18 April 2002)

In explaining the new ideal role of higher education, public sector officials thus drew on a discourse of national economic and social development, stressing the need for transformation "to meet the needs of this country, to build a competitive economy" (Individual interview 15 April 2002).

In particular, public sector officials focused on the notion of scarce skills, arguing that HEIs need to expand their existing focus to prepare graduates for new forms of employment in new economic areas where there is little existing expertise in South Africa, but which are significant for national economic development and global competitiveness. An example cited in the arts was the creative industries. A criticism of current institutions was made, that in order to survive many institutions pursue high total numbers of students, at the expense of a focus on programmes and fields that can meet strategic economic needs.

Underpinning this notion of expanding the traditional fields of higher education is a model that higher education should be developing skilled graduates who are *directly employable* in the labour market. The point was typically made that training should not be done for its own sake, but to address social and economic needs, or the consequence would be "producing lots and lots of people with the same skills who cannot really be employable in the labour market" (Focus group interview 11 March 2002).

Officials continually referred to scarce skills, particularly in new occupational fields opened up by economic changes and competitiveness, which institutions were not providing. One department explained how it encouraged institutions to develop new programmes to focus on specific areas to develop skills to expand the pool of professionals in new occupational fields required by the economy.

The assumption of a new direct link, as opposed to the indirect link of the past, is evident in the criticism that while it may be possible to find sufficient numbers of graduates, they do not have the right kind of skills, and employers have to spend time training graduates:

> So it means that when you left the higher education system, you were not prepared for what you ultimately do. So it means the activities of higher education are not preparing you to be responsive to the challenges of work … The product that walks out does not meet the needs of industry, so higher education is not responding to the needs of industry, be it in numbers, be it in knowledge or skills. (Individual interview 18 April 2002)

This reflects a major shift from the past model of the link between higher education, work experience and the workplace. Officials interviewed expected HEIs themselves to undertake the development of graduates that was previously achieved by work experience immediately after graduating from higher education. The explicit claim was made that HEIs are responsible for ensuring that graduates are ready to operate as skilled employees in the workplace, rather than employers being required to invest in the tacit knowledge, skills and dispositions that will make them directly employable, as in the past:

> There is no purpose to develop people for three years, only to find that even still they are going to spend two years at the place of employment before they become productive - it's actually a waste of time. (Individual interview 18 April 2002)

Similarly, some programmes were criticised, that while they may be specialised in terms of providing core skills for a profession, they are not "providing their graduates with the skills to actually operate within those economic areas" (Focus group interview 11 March 2002).

The relationship was articulated in a nuanced way, and not in terms of a narrow vocationalism. Thus, officials argued that higher education should not lose its focus on generic, traditional higher education skills. Rather, higher education should broaden and expand its traditional scope. These skills, such as critical and analytical skills and problem-solving, should be better focused in areas directly relevant to economic needs. Work readiness skills were a key concern - management, people skills and values and dispositions such as creativity and the ability to work independently.

Moreover, it was argued that in a context of job losses, students might have to create their own

jobs, and should be prepared with the relevant skills. The argument was made with regard to arts and culture programmes, for instance, that students need more options to prepare themselves as economically viable citizens:

> They need to be trained to work in training, they need to be given the necessary management skills to manage themselves, to market themselves that they can actually exist outside. (Focus group interview 11 March 2002)

The missing skills were, in general, identified as transverse skills such as business and project management, people and entrepreneurial skills.

Officials in the public sector do not promote a narrow technicist vocationalisation of programmes, but instead promote an integrated package of specialised core and general skills. For instance, it was argued that institutions in arts education continue to offer generalised soft arts programmes with specialised core skills, but these are not at all responsive to the needs of the economy in terms of providing for the cross-cutting skills needs that will make graduates employable. This is a crucial distinction, as public sector leaders are not arguing for specialised skills only, to prepare graduates for employment directly. They are concerned that higher education should develop the flexible, adaptable high-level skilled worker.

The model of direct employability was strongly evident in the claims that in the labour market it is no longer simply the qualification or the reputation of the institution that granted a qualification that counts. Now, to be employable, graduates need work experience, which makes the institution's role in preparing for the workplace critical, in the form of placements and internships, even learnerships, in degree programmes. Asked what they would keep as the core function of the university, participants emphasised the traditional high-level skills - rigorous academic and research skills. Asked what they would change, they emphasised work experience and imparting of core management skills.

This model of the relationship between higher education and the workplace draws on the past models of the professions and of technikon training, but modifies them in significant ways. Firstly, it extends the models to apply to new vocational and professional categories, as well as to existing professions, and even to higher education in general. Second, whereas in the past professional model the link between higher education and the workplace was viewed as indirect, now it is expected to be direct, as in the technikon model of the past. Third, the technical or professional specialised education that occurred in the workplace and under the guidance of the professional associations is now expected to be included within the HEIs' programmes themselves. In particular, the tacit skills, knowledge and attitudes developed in the workplace in the past should now be developed within higher education programmes.

Graduates are expected to leave the institution employable, directly prepared for jobs in areas of current scarce skill, with the right kind of high-level generic skills alongside specialised skills, to be immediately effective in the workplace.

*Relationships between public sector departments and higher education institutions*

Thus, public sector officials assume that there should be a close, strong, direct relationship between HEIs and themselves as government departments shaping human resource development needs for specific sectors. As one senior official claimed: "I suspect that we need to be much more proactive, about what should be the focus of higher education" (Individual interview

18 April 2002). Higher education programmes in areas of scarce skills are being mediated through the public sector, and there are individuals whose line function is to intervene directly with HEIs.

In line with the discourse of national economic and social development, there is a strong equity dimension evident in the way the relationship is framed. Officials expressed concern that higher education should be extending access to fields of study leading to employment in occupational fields not traditionally entered by black people in South Africa. Some departments have programmes to work with students to influence career choices to meet scarce skills needs, particularly to increase black participation in new occupational fields:

> We've decided to take it upon ourselves as the national department to reach out to the historically disadvantaged tertiary institutions to tell them what it is all about, and what are the possible skills areas which the historically disadvantaged could penetrate. (Focus group interview 11 March 2002)

There is also a concern to work with HDIs to ensure that they too meet new demands by developing programmes in these new fields, to overcome "the legacies of the past". Institutions are expected to identify potential skills gaps and train for potential opportunities that exist, particularly to develop capacity in historically disadvantaged communities.

A number of departments have adopted a strong interventionist approach, to ensure that responsiveness develops in the direction they identify for skills development in their specific sector. As one official explained the direct and close relationship of her department with institutions:

> So we are able to say to them, no, this is how we would like things to operate in terms of government legislation, please try to build it in, in your academic process. (Focus group Interview 11 March 2002)

Other department officials lamented that despite their efforts at intervention, institutions are failing to respond and are falling behind what is needed for economic and social development as identified by departmental audits. Collaboration tends to be initiated in small pockets by proactive institutions, and departmental attempts to innovate and communicate new skills and programme needs to institutions have met with a negative response.

These departments see themselves as playing a developmental role to assist institutions - universities *and* technikons - to play the desired role. To this end, they have established mechanisms and strategies for intervention, to structure their relationships with HEIs. Foremost amongst these is the Foresight Programme of DACST, which attempts to identify technologies that will enhance competitiveness in strategic areas of the economy, to provide a basis for developing human resource capabilities. The road map that is the intended outcome of this programme can be used by HEIs to determine skills requirements in particular areas, and to inform programme planning. The Department of Transport has a framework agreement with HEIs, and is developing regional centres of development, aimed at ensuring that institutions initiate and strengthen programmes to build a pool of transport professionals. The Departments of Communication and Education have developed an ICT strategy to facilitate the development of ICT capacity in educational institutions, beginning at the school level (Asmal 2002).

Mechanisms and strategies include funding programmes, funding bursaries, promoting curricular and programme focus and direction at institutions, encouraging consortia of institutions to offer new programmes in partnership, advocacy work amongst institutions and amongst potential students. Quality assurance and monitoring of equity criteria is part of many programmes. Some public sector departments are considering establishing their own dedicated training institutions to meet the demand for scarce skills that public HEIs are not meeting. An example cited was the field of export and investment skills.

*Preparing the historically disadvantaged to become directly employable*

Thus, the public sector tends to mediate responsiveness in terms of a policy discourse that higher education should contribute to national economic and social development. Responsiveness means primarily that HEIs should be making graduates directly employable, which they have not done by expanding in relation to new scarce skills areas. Nor have they changed and adapted traditional fields by incorporating work experience, tacit knowledge, skills and dispositions in their programmes to develop general and specialised high-level skills as expected. And they should particularly be assisting HDIs to prepare historically disadvantaged individuals to become directly employable in new occupational fields arising out of, and leading to, economic development.

**Business and industry leaders: high-level skills for global competitiveness**

*Narrow vocationalism?*

There is a widespread conception, particularly on the part of research universities, that business and industry have a short-term, narrow technical vocationalist understanding of higher education, in expecting institutions, as their sole responsibility, to become directly responsive to the labour market in terms of a human capital notion of preparing "the right kind of workers for the right kind of job at the right time". For instance, Jansen (2000) has argued that responsiveness policy is leading to a narrowing of the project of higher education and to the vocationalisation of curricula. There is a perception that vocational qualifications are privileged over formative general academic courses by the market.

In such a conception, the higher education institution has to prepare graduates who can be directly prepared for employment to meet the immediate, short-term needs of business and industry, and by implication, the demands of the market. This is most like the past model of the technikon, or more accurately, an adaptation of the past model of professional education, but modified by the expectation that the degree or diploma can directly prepare a work-ready graduate to meet the immediate needs of the market.

This narrow technical vocationalist view of responsiveness was not strongly evident amongst the representatives of business and industry interviewed. This does not mean that such expectations do not exist, but rather, that the expectations represented in the study are not the only way in which business and industry leaders - a disparate and amorphous constituency - mediate policy. A further caveat is that the focus group discussion tended to be dominated by the views of mainstream business and industry leaders as represented by one powerful, well-connected individual. While representatives of black business associations present tended to agree with the position put forward, they also presented alternate perspectives, subtly framed in terms of a national development discourse, evident in concerns expressed for "our communities" or for "black students/graduates".

*Global competitiveness and the knowledge economy*

The business and industry leaders interviewed tended to have a highly sophisticated view of responsiveness, legitimised primarily in terms of its significance for ensuring global competitiveness and development of a knowledge economy, although recognising the demands of national development in South Africa. This position was most succinctly framed by Johan Van Zyl of Santam, who argued that the ideal role of higher education would be:

> To get people within our business that will allow us to compete internationally in a broader context, the quality of the people with skills and also with enquiring minds that will allow you to get there, with a broader ethic and a way of going about problems and problem-solving, but also to become actively engaged in problems of the society that we're dealing with, because we can't walk away from social problems and responsibilities. (Individual interview 15 April 2002)

One leader from a small business development organisation emphasised the importance of graduates who "will also be creative, innovative as we move into competitiveness by virtue of being part of the global society" (Focus group interview 13 March 2002). Another prominent industry leader explained it thus:

> Every time we as business generally express our need for higher education we express it in terms of societal needs and economic needs, and ultimately in South Africa we're trying to prepare ourselves for competitiveness in a global context and that it's about economic growth. (Focus group interview 13 March 2002)

The claim was made that a pool of highly skilled workers attract investors to a country, thus leading to economic growth, and conversely, that labour market issues (principally, inflexibility and an inadequately skilled labour force) are seen as a key obstacle for investment in South Africa. Hence, business supports a "quest for a high-level skills base at a high level", and, as investors enter, specific sectoral needs for education and training will become apparent.

These leaders tended to define the ideal role of higher education primarily in terms of its knowledge function, of adding to the body of knowledge:

> The area in which you begin to build new knowledge in a knowledge-based economy and society, where you're not only applying technology and you're beginning to develop new technology and develop applications for new technology and you develop new knowledge, and that's where the concept of research comes in. (Focus group interview 13 March 2002)

Universities and technikons were distinguished similarly, in terms of their knowledge component. The argument was made that in a university,

> you learn the theories, you learn how to solve problems, you learn how to diagnose at a high level, you learn how to question and research and then you can apply that in the workplace in a more holistic and systemic way than a technologist who often has just applied his technology. (Focus group interview 13 March 2002)

While the division between universities and technikons was seen to be blurring with the new programmatic focus of policy, the contribution of universities to strategic areas was seen as crucial.

The expectation of higher education then, is that it does more than narrow vocational education and training:

> To produce people with degrees is the easiest thing. To produce people who can really make a contribution to society both in terms of their problems or in terms of getting the economy to grow that will indirectly get the society to benefit, that's where the real trick comes in and that's where we are failing. (Individual interview, Van Zyl, 15 April 2002)

The point was reiterated that responsiveness referred "to society, not just the economy, but the needs of the community outside of the university". In this light, it was claimed that higher education needs to "look at the people as a whole, and not just the technical", paying attention to the "softer issues, for instance, management, dealing with people, things you need in the business world" (Focus group interview 13 March 2002).

The expectation here was that higher education needs to take a long-term view, to sustain itself to perform this knowledge-generating role. Thus, it was argued that HEIs should not be responsive at the expense of academic freedom, because this would impact negatively on the knowledge generation function of higher education:

> It's good to hear the top business leaders in South Africa not responding like that, but I think its irresponsible of business people to say, 'universities must become totally responsive to industries needs'. (Focus group interview 13 March 2002)

Business leaders warned that were higher education to operate according to the short-term cycles of business, it would have disastrous long-term consequences for innovation, development and economic competitiveness. The short cycle of business, the conditions, technologies and demands of which change so quickly, would be anathema to a knowledge-generating institution, where research has longer cycles. It was argued that it is more appropriate for technical colleges, and lower levels of qualifications, to become responsive to the needs of business in this manner.

These private sector leaders did not emphasise strongly issues of equity or redress. Their primary reference point tended to be outward, to the global economy, and equity issues were reflected in that light:

> We need to look at global best practice. But then, we can't leave our traditionally black universities behind, so somehow you've got to get them up to speed, plus you mustn't lag behind the rest of the world. (Focus group interview 13 March 2002)

There was a pragmatic sense that were broader social problems not addressed, if there were no social and environment responsibility, the long-term interests of the private sector could not be met. The shortsightedness of many in the private sector, including some from disadvantaged backgrounds, was criticised, reflecting this pragmatic commitment to social responsiveness. Similarly, HEIs were criticised for failing to supply the labour market with enough black graduates to change demographic inequalities, "because we are in a country where the transformation cannot be ignored" (Focus group interview 13 March 2002). The schooling system was criticised heavily for failing to supply enough matriculants with the right subject choices and grades to enter university programmes. The point was made:

> The majority of people who go to these higher education institutions are really not that well prepared for the challenges of that higher education and that is why you have a situation where quite a number of graduates are unemployable. (Focus group interview 13 March 2002)

This problem was not seen to be racially exclusive, but applied across the board, particularly in relation to the key skills for a knowledge economy: writing and communication skills. Higher education was seen to have a role in trying to intervene at this level, to initiate bridging programmes more widely, across disciplines.

Representatives of black empowerment business organisations tended to raise equity issues at appropriate points, but they did not disagree with the core position espoused by the mainstream business associations. For instance, they raised as significant the issue of recognition of prior learning for those denied formal education in the past. One woman from such an organisation noted with concern the lack of willingness in industry to engage in skills training in terms of the Skills Training Levy, arguing that "in every single corporation, there will always be a need to develop black skills".

These equity concerns were typically expressed in terms of a responsiveness that includes "community" concerns. Black business leaders highlighted more strongly than the others the contribution higher education and graduates should be making to social development. One leader criticised higher education for failing to "embrace the softer science, the societal inputs and expectations", and argued that students come from a community to higher education, which is responsible to supply skills in a specific field, but which fails to deal with the soft issues so crucial for community development:

> It is expected now that you go back to the community, if you were interactive within the community, that's where issues of softer skills come in. (Focus group interview 13 March 2002)

As a result, it was noted disapprovingly that unemployed graduates display a lack of initiative and willingness to contribute to socio-economic development by using their education in socially necessary ways, whilst looking for appropriate employment and placement. For these business leaders, higher education is failing to provide the new high-level skills of initiative and creativity, where the individual is expected to take responsibility for their own employment (Brown 2001).

While there was a sophisticated understanding of the ideal role of higher education, and the reasons why responsiveness is crucial, when it came down to expectations of the link between higher education and the labour market, there was strong convergence with what the public sector expects HEIs to do.

Private sector leaders also espoused a direct link between higher education and the job market. For instance, Van Zyl claimed that 95 percent of research published by HAIs is worthless:

> It's not responsive to the needs of the country, to the people who eventually have to use it. And the same goes with respect to a large number of graduates that we deliver in the non-professional world. (Individual interview 15 April 2002)

Business and industry leaders expect higher education to directly prepare young people with skills to make them employable. This was evident most strongly in criticisms of institutions for producing graduates who are "unemployable or under employable", exacerbating unemployment:

> The type of education that they've gained, does not prepare them for the challenges that they face after graduating. (Focus group interview 13 March 2002)

It was argued that institutions are not supplying the right numbers of graduates in the fields required for development, such as health, education, science, architecture and construction, and engineering. They are seen to supply too many graduates in the wrong kind of fields, such as humanities. The generalist approach of the BA degree at most institutions was criticised for failing to provide general and specialised skills to meet the needs of a defined group of clients, and thus failing to create an employable graduate with the requisite skills for the workplace. This means that currently many companies regard the degree only as an indicator of potential, and leaders expressed resentment that they have to provide training in skills that should have been developed as part of the degree. For example, Van Zyl explained how his financial company is forced to retrain new recruits on a two-year programme, partly in a way that is company-specific, but:

> In many instances we start from scratch again. We use part of the platform, but it's not that they've been building the walls and now we just put the roof on. In several places we say, 'no, we need a window here or there' so we break down part of the wall, provide some different skills. (Individual interview 15 April 2002)

The degree is now expected to include the tacit knowledge, skills and attitudes that were provided through work experience in the past, as a structured component of the programme.

In particular, HEIs were criticised because they do not offer adequate soft skills - "generic skills that you need to learn across any walk of life" (Focus group interview 13 March 2002). Others criticised institutions for failing to impart "the necessary business and economic information", implying that they are not sufficiently up to date with the technical, and specialised skills demands of the workplace.

One leader involved with SMMEs promoted a DACST programme that creates links between technikons and business on a regional basis that "brings business closer to the technikons" and allows students to see income-generating activities as a viable alternative to employment in large companies. The model underpinning his expectation is one that assumes universities and technikons will take on the role of directly preparing graduates with the skills to be employable:

> They take the problems of industry and turn them into projects for students to interact in, so they are really solving life problems as opposed to educational projects. (Focus group interview 13 March 2002)

Here again is the expectation that what was formerly the preserve of the workplace, direct work experience, should now become drawn into the essential functions of higher education.

Similarly, another leader reflected the changed expectations of the degree programme when he argued:

> We encourage students to go to institutions that endeavor to reflect the demographics of this country. For one reason, because we have underlying investments where we have to accelerate transformation within those investments very, very quickly. And we say to them, to understand diversities of communities, so that once you get out of that institution, we are expecting you to hit the ground running. (Focus group interview 13 March 2002)

Thus, despite the sophisticated discourse legitimising the demand for responsiveness, the expectation of responsiveness, and the underlying model of direct employability, is the same as that of the public sector. The expectation is that higher education needs to ensure that the majority of graduates are employable, in the sense that they are prepared with the general and specialised high-level skills required to be directly employable upon leaving the institution.

*South African institutions are not responsive to 'what we would like to see'*
It is evident that while there was a very sophisticated, positive vision of the role higher education could and should play, there was a very negative assessment of the role HEIs in South Africa are currently playing, by remaining in "their silos" and not becoming connected to society:

> Often when people talk about historically advanced institutions and how well they've responded to the challenges, what they talk about is those areas where an outside body, a professional body, has imposed certain rules and they've changed their curricula and it wasn't done from inside. Where the reliance was on inside changes themselves, not much has been forthcoming. (Individual interview, Van Zyl, 15 April 2002)

This perception echoes the findings of a recent world competitiveness report that, amongst others, rated the extent to which the education system is seen to meet the needs of a competitive economy. South Africa was rated 46 out of 47 countries (World Competitiveness Yearbook 1999).

However, a strong sense was conveyed that not all higher education is the same, that the sector is not uniform, and that individual faculties and departments within different institutions are responding in desirable ways.

While espousing the need for higher education to maintain a long-term view and focus on their unique knowledge creation role, private sector leaders emphasised that institutions should interact with business to identify their needs. New policy structures and bodies such as SETAs were seen as providing a number of mechanisms for communication of needs. In some cases, advisory councils have been set up to communicate industry needs to higher education, conditional on the funding of bursaries, posts or programmes, for example.

There was a strong emphasis on the necessity for, and inability of, institutions to be proactive and take initiative.

> There are umpteen examples and opportunities for higher education to go and find out what the needs are. (Focus group interview 13 March 2002)

Institutions were strongly criticised for failing to be innovative, to identify opportunities or to take the gap to develop commercial ventures. An example was made of German, commonly viewed

as a dying language department in HEIs, which ignores a high, well-paid demand for skilled interpreters for tourism and technical industry exchanges. The problem was attributed to the academic isolation of most academic staff who have "never in their lives interfaced with business".

On the one hand, it was proposed that state funding policy should intervene more strongly, by providing incentives or penalties for institutions, to pressurise them to become more responsive. On the other hand, marketisation and competition between institutions was encouraged. Some leaders claimed that "universities should endeavour to run along commercial lines". Examples of departments and faculties within institutions that have established commercial ventures to raise funds through research and consulting work were lauded.

There are pockets of excellence where institutions have entered into collaborative partnerships to meet strategic sectoral scarce skills needs, responding directly to industry need. These were held up as cases of best practice to be emulated, for instance an entrepreneurship department at a technikon to teach students to "create some commercial venture out of whatever you've learned at the technikon" (Focus group interview 13 March 2002). Institutions were encouraged to collaborate to become centres of excellence in response to their "own communities". Partnerships with institutions, and not with individual academics, were seen as a critical mechanism to interface between institutions and the private sector.

Thus, private sector business and industry leaders in the study tended to mediate responsiveness in terms of a discourse of national development for global competitiveness and facilitation of a knowledge economy. At the same time, there was convergence with the model underpinning the public sector's mediation, that higher education should prepare young people directly with high-level skills to be employable, to "hit the ground running".

**Employability: graduates directly prepared for the workplace**

Analysis reveals a new model of the link between higher education and the labour market that underpins the expectations of responsiveness of the two key constituencies, the private and public sectors. This model is graphically presented in Figure 5. What is marked is that experiential knowledge and tacit skills are now drawn downwards as a component of the degree programme, ensuring that the graduate is employable and can proceed directly to the labour market as a skilled employee. This section will briefly consider the pressures that shape the growing dominance of a model of direct employability.

The emergence and influence of the knowledge-based economy in South Africa, in line with global trends, has meant that higher education becomes more important for economic growth and development. Castells (1996) maintains that at the heart of capitalist production under new economic conditions now lies a network logic. The hallmarks of economic success lie in the capacity to generate and continuously reconfigure knowledge and information, in pursuit of ongoing innovation, which requires cooperation and networks. The application and reconfiguration of increased knowledge intensifies and changes the requirements of the labour market.

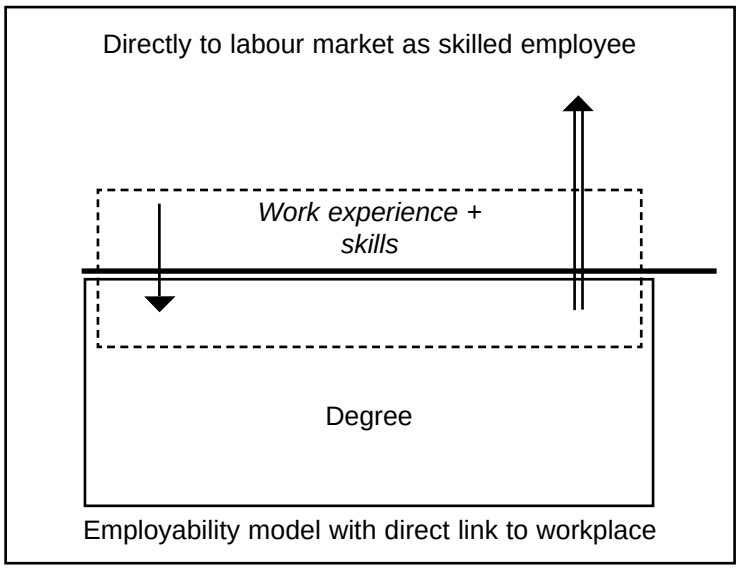


*Figure 5*

High levels of general education, multi-functional skill competence and high-level tacit-knowledge formation are now critical. Ball (1985:232) has identified some of the higher level cognitive skills typically regarded as essential for skilled employment in the new knowledge economy:

> The ability to analyse complex issues, to identify the core problem and the means of solving it, to synthesise and integrate disparate elements, to clarify values, to make effective use of numerical and other information, to work co-operatively and constructively with others and above all, perhaps, to communicate clearly both orally and in writing.

The knowledge society thus requires graduates who are "well-educated more than people who are specifically trained" (Hirsch and Weber 1999:9) and not with narrow vocational and technical specialisation.

In a context of the pressures of a global, high technology, high-level skill, low employment economy, particularly in South Africa with its uneven development, there are fewer jobs, of a new sort, than there were in the past. These economic pressures take a specific form in the South African case, given the demands of social transformation and for increased access to education. The historical problems of black schooling have created barriers to access to higher education, both in numerical and quality terms, which increasingly places institutions at the interface of schooling and higher education. Taken together, these economic, political, educational and social pressures can begin to explain the shift in the desired link between higher education and the labour market.

No longer do the public and private sectors expect higher education to prepare young people *indirectly* for employability in general degree courses. As Brown *et al* (2001:258) have summed up:

> The volatile nature of consumer markets, the challenge to assumptions about lifetime employment, and the pace of technological innovations with built-in occupational obsolescence that demand regular periods of retraining, are central features

> of the labour market changes leading to a new emphasis on 'employability'. The new worker is required to be flexible and adaptable and able to learn rapidly.

In this light, public and private sector leaders in South Africa now expect higher education to ensure that the majority of graduates are employable in a new sense, that they are *directly* prepared to become skilled employees, with the kind of high-level skills and tacit knowledge needed for employability in a changing labour market.

This model is informed by the traditional employment model of the professions, but assumes a direct link to the labour market, more akin to the direct employment model of the technikons in the past. Young people are expected to proceed directly to the workplace.

They need to be employable in the sense that they are directly prepared to become skilled employees, unmediated by the specialised education and training offered by the professional associations, or by the professional experience offered by the employer mentors of articled clerks or medical interns, or by the work experience component of technikon programmes as in the past dominant models.

This, in addition to transmitting traditional academic knowledge, now becomes the task of higher education. Higher education needs to provide the general high-level soft skills that were tacitly developed experientially in the workplace in the past. In this sense, workplace skills and experiential knowledge are pulled backwards as a central requirement of degrees and diplomas. This relationship is graphically illustrated in Figure 5.

Skills such as communication and writing used to be developed largely through general education in the schools. The widespread lament that schools are not preparing young people adequately for higher education is testament to the trend that these fundamental skills are now being pushed upward as central to higher education's task. This trend is related to the massification of higher education, and the opening up of opportunity and labour markets. Young people, particularly from historically disadvantaged schools, come to higher education without the requisite tacit knowledge, skills and dispositions. Hence, public and private sector employers' concern is now that higher education itself should provide such soft skills so that graduates are directly prepared to enter the workplace.

This model provides the underlying logic of responsiveness in the current context, proposing a new role for higher education, and a new relationship with the economy and the labour market in particular, and society in general. The failure (or success) of higher education responsiveness is posed as critical for economic growth, development and redress of the past.

Thus, in the South African context, while mediations of responsiveness articulated by public and private sector employers appear to vary widely, they can be interpreted as variations on a theme. There are differing discursive motivations for the new relationship. The public sector expectation is grounded in an appeal to national economic and social development, emphasising scarce skills, particularly as a means of redress of inequalities of the past. The private sector expectation is grounded in a sophisticated set of claims related to global competitiveness and the knowledge economy, emphasising high-level skills. Ultimately, these are different ways of legitimising the demand for responsiveness, and the core model tends to remain common to key figures in the public and private sectors.

The following sections will explore the ways in which the professional associations and the SETAs, as bodies operating between higher education and employers, and HEIs themselves, mediate responsiveness. They will demonstrate the growing dominance of the model of direct employability in all sectors, despite discursive variations.

New political imperatives: professional associations 'prepare for employment'

In the past, the professional associations operated with a model where HEIs prepared graduates indirectly for the labour market, for deferred employment. How have the professional associations mediated responsiveness in the new context?

There are now two distinct sets of interests, represented by the statutory, long established professional associations on the one hand, and by recently established black professional associations that play an advocacy role on the other hand. While the new associations primarily focus on promoting black empowerment, equity and redress, the established associations continue to play a regulatory role in assuring standards and qualifications. This distinction leads to variations in the formulation of responsiveness.

*The traditional model continues to dominate*

In the context of professions such as accountancy and engineering, with well-defined and long established education and training needs, with structured mechanisms between HEIs and professional associations as statutory bodies, responsiveness is mediated in a very specific manner. That is, the traditional notion of responsiveness of the past largely continues to operate, where there is a clear division of responsibility between higher education and the professional associations. As an employer member of the professional association for the engineering industry phrased their no-nonsense pragmatic approach:

> Now the feeling of employers about responsiveness is kind of, it becomes, a non-issue because the profession itself has decided on the level on which that education would be, the breadth of that education and also the composition of what should be in it. So as an employer, we start life knowing what's going to come out the other end, if this professional body has accredited that particular programme. (Focus group interview 2, 19 March 2002)

The established professional associations promoted an ideal notion of the university as playing a role in "the development of the mind". However, participants were against the notion of ivory tower autonomy, where academic institutions teach whatever they deem important. This reflects the existing relationship with institutions, where there is a long tradition of control and accreditation of higher education curricula, programmes and personnel by the professional associations.

Their emphasis for undergraduate education is on higher education's ideal role in moulding young people in an indirect way, rather than training them directly for employment. All agreed that ideally, higher education should mould young people in response to what society generally and specifically needs. In practice, these associations operate with the assumption that higher education, and universities specifically, have a role in the intellectual preparation of new professionals, not simply in training technical knowledge. Technikons, by contrast, were seen to focus on technical training and the imparting of particular skills.

The case was made that higher education should be "training the mind of young people to be independent thinkers, so that when they enter the workplace, they are able to think for themselves" (Focus group interview 12 March 2002). Participants were clear that higher education programmes should be structured in such a way that they provided students with minimum specialised professional knowledge that often took time to be translated into usable skills in the workplace. As an employer representative on one professional association claimed:

> Our challenge to the higher education system is to produce those graduates with that knowledge with the maximum of skill to use the knowledge, and that means being able to read and write, to communicate and do things like that, which are not the contents of technical subjects. (Focus group interview 2, 19 March 2002)

The post-higher education professional development process is the joint responsibility of employers and the professional bodies who build on the basis laid by higher education at undergraduate level, to provide specialised knowledge and train young people to become professionals. An executive member of the engineering professional association explained:

> The first usable level at professional engineering is a first degree accredited and then honed by at least three years of appropriate experience, including the ability to make mistakes and learn from them - you know, the first three years you're paying money for nothing as an employer virtually. (Focus group interview 2, 19 March 2002)

Knowledge is acquired in higher education and practical technical skills are acquired in the workplace. High-level skill in this profession means having the competence to apply knowledge in a relatively short space of time to "actually exercising specific skills" (Focus group interview 2, 19 March 2002).

Thus the close link between higher education and the workplace continues to be strongly mediated by the professional associations, as in the past. One professional association described the role of higher education as that of an interface:

> It interfaces with the raw material from schools coming to it, but it also has to provide an interface with the period of pre-professional experience. So it's in a sense the intermediate stage, the pre-registration experience stage, when the young graduate is gathering the experience that is appropriate and building up his theoretical knowledge. (Focus group interview 2, 19 March 2002)

Mechanisms whereby this link is mediated include quality assurance of minimum standards and requirements, through the accreditation of higher education programmes, the benchmarking of programmes against international standards, the training of academics in specialised subjects, departmental visits and the organisation of forums of deans and heads of departments across institutions. In the accounting profession, the professional association also accredits and regulates the employers who register as training providers of articles, the three-year training contract that turns graduates into accountants. Professional associations facilitate relationships between HEIs and employers, and are active in standards generating bodies.

The accounting profession has a system of paying subventions to academics in university

departments, to make their salaries competitive with industry, in order to retain expertise and ensure the quality of education. As one participant explained:

> We have taken it upon ourselves to fight with the principals, deans … Otherwise you cannot keep quality people within that environment. It's a bread and butter issue … I don't believe that the higher education institutions are adequately resourced. (Focus group interview 1, 12 March 2002)

The implication of these mechanisms for the labour market is clear for indirect employment:

> The accreditation process almost guarantees, and I use the word very loosely, employability. Because if you're a graduate of one of the accredited programmes, it means that you're at least a minimum quality level graduate. You always will have the exceptional, middle and mediocre, but even the mediocre graduate will be at some level which is acceptable to our marketplace. (Focus group interview 1, 12 March 2002)

*The traditional model adapts to new imperatives*

While the traditional establishment model largely continues to operate in the new policy context, there have been adaptations. It is evident that these are driven by new political imperatives, and vary depending on the position of the professional association, with the establishment professional associations differing markedly from the black empowerment professional associations.

The statutory professional associations tend to adopt a stance of defending their territory. They continue to do what they do best, but have adopted aspects of new policy discourses, drawing on a discourse of national economic and social development in a very specific way. They acknowledge that change has and must occur, but they appear to have adopted an evolutionary model of development, which assumes that those with the standards and expertise must work with others to bring them up to the same level or standards.

Change is distinct in two ways. Firstly, there is a call for the broadening of the professional curriculum within higher education, beyond a technical knowledge approach. Participants agreed that there should be a broad link between higher education and economic development, not a narrow one. General formative education is seen to be important at the undergraduate level. An argument was made that curricula need to be broadened to include soft skills and traditional soft fields such as languages and social sciences, which contribute to the "development of the mind":

> I think we've got to bring in philosophy, history … even our own degree, we're looking at opening it up, it's just too narrow, so they don't have that broader and wider exposure that's crucial in moving forward … we are years away from that, but we're trying to find some way of slowly working our way towards a broader, more general undergraduate education. (Focus group interview 1, 12 March 2002)

Part of the minimum requirements for engineering is now a humanities component or "complementary studies" alongside the core component of a basic undergraduate degree. Professional associations stressed intellectual (problem-solving and analytical), communication and negotiation skills as key high-level skills that are lacking and need to be promoted as part of the undergraduate programme. Another common concern was the lack of management skills, of people

skills in the graduates entering the workplace. Concern was expressed at the low level of writing and reading skills even of first language speakers. Subjects from the humanities are considered to be ideal for the development of these high-level, general formative skills. There is convergence between this emphasis on high-level skills and that from the public and private sectors.

Secondly, there is a call to open up the profession from the racial hierarchies of the past. Participants acknowledged that the professions are too pale and male and that they need to change their profile.

There are a number of mechanisms that have been put into place to ensure that such development of the profession takes place. Thus, one professional association accredits 14 of the 21 universities, with primarily HDIs excluded because they are not able to meet the exacting standards set by the professional association. As one executive claimed:

> In the end of the day, our main concern is for the student, they're suffering and they're paying good money thinking that they're getting a quality education when its just not happening. (Focus group Interview 1, 12 March 2002)

This association has an extensive development programme, including monitoring site visits and assessments, to work with HDIs (those with strong supportive management) to prepare them for accreditation. The association plays a strong regulatory and development role (sometimes in tension with one another), to control standards in the profession. Institutions are monitored in relation to one another, strong inter-institutional collaboration is encouraged, and specific programmes at an institution may be accredited, while others are not:

> It tells us what we know, where we know are our strong departments, where we know we have adequate resources, be it human or financial. (Focus group interview 1, 12 March 2002)

*Challenges to the traditional model*

Those professional associations operating from a black empowerment perspective are challenging the evolutionary model of change that is notoriously slow, calling instead for transformation, and in effect, challenging the control of the profession by the statutory bodies. As a representative of one group explained, they focus primarily on social issues often ignored or underplayed by the statutory professional association.

The challenge is framed in terms of a discourse of national economic and social development, but here, stressing policy values of equity and redress. Participants stressed the imperatives of national economic and social development, arguing that higher education should prepare individuals to contribute to the development of society, particularly from an economic point of view, and that there should be greater synergy between what higher education offers and critical national needs.

The political imperative is manifest in calls for developing indigenous knowledge and acknowledging the African context in professional education:

> We don't want a situation where simply because Oxford University focuses on this type of curriculum that in South Africa we simply do that. (Focus Group Interview 1, 12 March 2002)

This participant argued that higher education should be informed by "people's everyday experience, for students to actually begin to understand management and to understand the tools" (Focus group interview 1, 12 March 2002).

Questions were raised about whose standards are being maintained in higher education and the professions. Participants stressed that higher education needs to focus on local experience, content and environment in developing programmes, in order to contribute to national economic development:

> So for us as a country to become effective and to compete, we need to understand what makes us different and to actually exploit those differences and bring those differences within a global context as opposed to want to promote sameness. So that's a point on responsiveness that we would want to support. (Focus group interview 1, 12 March 2002)

Black empowerment associations emphasised calls for equity and redress. One participant argued that:

> We don't seem to have in this country strong and well-known black academics, people who are known as fundis in this type of areas, black people are extremely scarce, and that is a concern for us. (Focus group interview 1, 12 March 2002)

Another participant emphasised that higher education should be made more accessible to groups of students who were denied access in the past. His association focuses on black graduates of HDIs who struggle to find jobs because of the quality of education they receive. The association's focus and mission is for the transformation of HDIs "in order to make it easier for students from these institutions to enter the market with ease" (Individual interview 22 March 2002). The statutory professional association pointed out that employers are reluctant to enter into training contracts with students from institutions that are not accredited, as their study programme is then prolonged, costing the firm more. One participant was critical of a lack of government strategy to provide funds to train black accountants, given that the cost of higher education is prohibitive for many black students.

These empowerment professional associations have developed mechanisms to improve access, such as bursary funds. One association, established 10 to 15 years ago as a lobby group, intervenes through mentorship and tutorship programmes for black students in HDIs. Another association has student branches at HEIs, which attempt to prepare students for the work environment.

*A resilient model of responsiveness*

The traditional model of responsiveness as preparation for deferred employment remains dominant amongst professional associations, modified by two distinct political imperatives. The professional associations have adapted the traditional model in attempts to broaden the curriculum to include high-level skills and development programmes to open up the profession in line with employment equity requirements.

While the black empowerment associations call for redress and equity in opening up access to the professional labour market, challenging dominant standards and calling for greater responsiveness to socio-political realities, they nevertheless accept the traditional model of the close

relationship between higher education and the professions, based on the assumption that higher education indirectly prepares graduates for employment.

**SETA expectations: preparing for national skills development**

The SETAs have only recently been established as key vehicles of the National Skills Development Strategy. At this stage, SETAs are still establishing themselves and their reputation in relation to education and training, operating under a great deal of pressure to meet national targets, with varying degrees of success. Many SETA leaders interviewed described contestation around division of roles, functions and responsibilities. HEIs have expressed concern that SETAs are helping to drive qualifications to become more narrowly vocationalist and oriented to the workplace (Department of Education and Department of Labour 2002: 28). These concerns shape the SETAs' often contested relationship with higher education structures such as the CHE, and with individual institutions.

Given that SETAs are stakeholder organisations representing business, labour and in cases where it is a significant employer, the state, with complex governance structures, it must be borne in mind that the views represented here reflect the position of key SETA staff members and not necessarily SETA boards.

For most SETAs, as intermediary organisations, their main priority and focus is workplace training and the further education and training band. Their interest in higher education lies in its role in achieving the objectives of the National Skills Development Strategy. These concerns shape the way SETAs view higher education responsiveness.

*Three framing discourses*

The SETAs have diverse perceptions of the role of higher education. There is marked evidence in this constituency of all three discourses that legitimise the demand for responsiveness amongst the public and private sectors. However, the discourse is shaped by the specific concerns of SETAs with workplace skilling and training at levels 4 and below. Little emphasis is placed on higher education's role in the generation of knowledge, research and development.

First, the expectations of four of the SETA leaders in the study are strongly influenced by, and framed in terms of, the national policy discourse of economic and social development, in line with the National Skills Development Strategy, with a strong emphasis on equity and redress. For some, this was largely implicit, for instance, framed in terms of an ideal of stimulating and providing opportunities for lifelong learning, to address educational inequalities of the past, or in terms of the need to produce the higher level of skills needed by the country. For others, the discourse was framed explicitly in terms of a commitment to the "RDP mode", with one CEO suggesting that there is a powerful role for higher education to address the new goal of preparing people for the reconstruction and development of South Africa, to improve the quality of life for all.

The role of higher education is defined generally in terms of national demands, particularly in terms of economic development in an Africa-wide context.

For these CEOs, a nuanced understanding of the role of higher education in economic and social terms is possible. They would generally agree with the claim that higher education has two distinct functions, in that "labour market, economic growth and productivity is key" (Individual inter-

view 17 April 2002), but at the same time, this is not divorced from the function to meet individual needs, to "develop and advance the intellectual capital of people in the public in general" (Individual Interview 16 April 2002).

There is also a second trend evident, of two SETA leaders who frame their expectations more strongly in terms of a discourse of narrow vocationalism. Thus, one CEO suggested that the only role of higher education was to provide skilled workers in line with industry needs, and that their contribution should be located within the vocational context, with vocational linkages to every programme. These leaders typically criticised current higher education for being too academic, with no focus on "the how to do part" (Individual interview 24 April 2002).

The argument of one CEO, that there are two higher education groupings with distinct schools of thought, typifies such a vocationalised discourse:

> The one grouping is still formative and still classical for the sake of being classical and formative, i.e. academic knowledge for the sake of knowledge, and the other group is justifying linkages and starting to become proud of linkages … rather than saying 'well, we're somehow prostituting the clear, clean classics of our qualification into the vocational context'. (Individual interview 22 April 2002)

The contestation between academic and vocational education and training in terms of status is evident in the positions of these leaders, who display a deep pragmatism in their approach.

A third group of two SETA leaders in the study tended to frame their discussion in terms of a discourse of international competitiveness and knowledge creation, stressing that the South African industrial economy is being mediated by the information economy, because of international trends and global activity. In this regard, one CEO concluded that "therefore, the role of higher education is to be first and foremost an integral partner of the business environment" (Individual interview 15 April 2002). Higher education, in this discourse, has a key role to play in innovation, leadership and co-ordination with business and the economy, as, in the words of another CEO, "we are still very much dependent on the outcomes of higher education in terms of our competitiveness in general" (Individual interview 18 April 2002).

*'When they walk in they can immediately start adding value*

However, as in the case of the public and private sector leaders, there was a great deal of convergence between the SETA leaders as to the model of employment/employability.

The majority of the SETAs share the new model that expects higher education to produce directly employable graduates. This was evident in the strong concern of all SETA leaders about the extent to which higher education graduates and diplomates are work ready. For instance, there were complaints that "it's taking on average a year to operationalise what these people have acquired at university" (Individual interview 22 April 2002).

They concur that higher education should produce graduates who will be prepared to add value to the businesses they join. It was generally argued that institutions need to "align what they are doing with what industry needs" in terms of incorporating workplace experience into degree programmes. The typical position was summed up by one CEO,

> that if their students go out into the working environment, they're not only well

> trained theoretically but also that the theoretical training can be underpinned by practical aspects, so that when they walk in they can actually immediately start adding value. (Individual interview 18 April 2002)

For one SETA that has a framing discourse of vocationalism, responsiveness was very narrowly defined in terms of responsiveness to the needs of the specific sector, and these criteria were applied to higher education as well.

One SETA with a strong professional association active in a high-level skill sector was strongly influenced by the deferred employment model, with higher education responsible for the necessary academic input for a skilled person, and with the business sector to take responsibility for further workplace education. At the same time, the CEO also expected higher education to develop the knowledge, skills and attitude that in the past were developed in the workplace. She was not alone in criticising HEIs for producing graduates with internationally top-class technical skills but without the critical soft skills that create "well-rounded individuals" who "give the countries the edge":

> The minute they get into articles, the first thing that the big firms do is send them on life-skills courses. Teach them to talk to people, teach them to do a presentation. (Individual interview 16 April 2002)

This reflects a trend towards an expectation of direct employability, held in tension with the expectation of indirect employment of the past.

*A contested relationship*

In this light, many of the SETAs have a negative or non-existent relationship with HEIs, with a great deal of contestation evident. The claim was generally made that higher education in South Africa needs to become less academic or theoretical, and more practical. Higher education was criticised for being too inflexible, slow to change, or changing too slowly. There was also a perception that the curriculum is often outdated, developed by academics and then replicated annually, without taking cognizance of the changing world of work. New curricula are not being developed, and the format in which content is presented is seen as problematic.

In particular, institutions were criticised for focusing too much on the supply side, and failing to take up the opportunities identified by sectoral skills plans, to develop new programmes in areas of scarce and new skills.

SETA leaders emphasised the significance of life skills, indicating that there is a component missing from the current higher education offerings:

> If you look at the fundamental components of qualifications the majority of those should not have to be developed in the working environment, they're life skills. (Individual interview 22 April 2002)

This emphasis on generic skills that need to be drawn down into higher education programmes reflects strong convergence with the dominant model of direct employability also expected by the other sectors.

*Partnerships and linkages - 'where's the new money sitting now?'*
There was general agreement that partnerships and linkages are crucial. Presently, there appear to be very few partnership mechanisms to structure relationships between SETAs and institutions, other than bursary schemes, and those developed traditionally by the professional associations.

CEOs agreed that the core of such relationships should be sector skills plans, particularly provincial skills plans that have identified demand, scarce skills and shortages in black leadership skills within each sector. HEIs were criticised for failing to develop strategic linkages, in a changed context:

> They're not chasing the dollars, the rands, where they are at, and actually bringing them in. (Individual interview 17 April 2002)

One CEO pointed to the significance of partnerships where institutions could provide training to meet sectoral training needs that are no longer being met in apprentice structures. He cited the example of tractor mechanics, traditionally trained in cooperative workshops funded by new tractor sales, which are now drastically curtailed in a tight economy. While the need for maintenance of old tractors grows, most mechanics are now self-employed entrepreneurs and unregulated, leading to a training crisis. Partnerships with higher education were seen as a potential way out of this impasse.

Another CEO said universities should respond to the SETAs' priorities and needs and play a more active role in driving processes. He cited standards generating bodies establishing standards for the professions in the sector on the higher education band. Incredulously he said that trade unions are leading this process, with minimal involvement of HEIs even for programmes at Masters level. Professional and employers' associations, manufacturers of equipment, government representatives and trade unions participate, but only very few public providers are involved, which he attributed to a lack of capacity and constraints on time.

Another CEO argued that institutions are hampered by funding concerns, and the pressure to increase total student numbers to pursue state subsidies, exacerbated at HDIs by lack of capacity. This impacted negatively on the possibilities for engagement, and highlighted the need for structured mechanisms of participation and linkages.

The communication and coordination gap between institutions and SETAs was widely criticised. For instance, one SETA has funds for bursaries, particularly for women and black students, while universities have such students studying without bursaries. The Services SETA was most critical of the current relationship with HEIs. The SETA perceived itself as ignored by HEIs, who are too inflexible to respond to their requests:

> When we go to higher education institutions and say, 'take the qualifications, modularise it so that as skills programme it can be offered to our members in the workplace'. The answer is 'we have our funding policy, we have our rules and strategy, which doesn't allow us to be that flexible.' (Individual interview 22 April 2002)

Many CEOs echoed this call for institutions to modularise their courses into skills programmes in line with the NQF.

Ideally, many CEOs envisage a direct linkage between the SETA and the HEIs, governed by formal contracted Memorandums of Understanding. Some CEOs acknowledged, however, that, given their myriad demands, linkages with higher education are not yet a priority.

There was concern at the lack of engagement between the SETAs on the one hand, and the CHE and Department of Education in its higher education capacity on the other. A number of leaders suggested that there could be valuable linkages in the form of Memorandums of Understanding between the CHE, GENFETQA and the SETA ETQAs, "to divide the work that needs to be done" (Individual interview 24 April 2002). The linkages between SETAs and technikons, forged through the CTP, were lauded. These concerns echo those raised in a recent review of the NQF, which highlighted the need to clarify the roles and relationships of these bodies, to "bring coherence into the system" (Department of Education and Department of Labour 2002: 24).

*Employability - directly developing sectoral skills*

For the SETAs, although higher education is not always their immediate priority it is identified as a key partner in preparing human resources to meet national skills development needs.

The SETA constituency reflects the full range of views, with some drawing on a discourse of narrow vocationalism, others on a discourse of the knowledge economy and many on a discourse of national economic and social development, mediated in terms of their direct workplace training concerns.

They mediate policy to emphasise a model of employability that assumes higher education should directly prepare graduates for the workplace, in terms of directly developing general and specialised knowledge, and especially generic high-level soft skills, so that graduates are work ready in a short period of time, to meet sectoral employment demands.

**The long-term view of societal needs: expectations of the higher education sector**

Thus far, the focus has been on the demand side, on the expectations of responsiveness of employers, professional associations and intermediary skilling agencies. Employers and agencies on the demand side have expectations that higher education ideally should prepare graduates directly to be employable in the labour market, and the sections above have explored their views on whether HEIs currently are actualising that vision of responsiveness. Their expectations are framed in terms of three distinct discourses, all labour market related discourses, with a common underlying model of direct employability. The professional associations alone continue to promote a model of indirect employment, with some modifications towards employability.

The focus now shifts to the supply side, to explore the expectations of HEIs themselves. HEIs have tended to mediate policy in a manner that extends their ideal role far beyond labour market responsiveness, largely framed in terms of an educational, and not labour market related, discourse.

Universities are experiencing the tension between promoting the model of indirect employability of the past and developing a new model of direct employability in relation to their general programmes. Their professional programmes continue largely to operate in terms of the past model. Institutions have put in place, to differing degrees, new strategies and mechanisms that promote a model of direct employability congruent with that of the other constituencies, but large swathes

of their educational activity continue to be driven by the traditional model of indirect employability.

The technikons have made discursive shifts in terms of locating themselves alongside and equivalent to universities, while shifting to a model of direct employability. They are in a process of implementing a new model of direct employability but again, much of their activity, to differing degrees, continues to be driven by a model of direct employment. This section will explore these claims in detail.

*Higher education's mandate: the labour market and society*

HEIs tend to frame their vision of the new role of higher education and its relationship with the workplace in terms of a classic liberal education discourse, which articulates to differing degrees with the three labour market discourses mediated by the other constituencies.

While higher education leaders acknowledged that there should be a close relationship with industry, many did not see it as a direct, exclusive one. Institutional leaders, particularly from technikons, stressed the significance of their role in the preparation of mature, highly skilled human resources, but pointed out that this should be relevant to the needs of industry and society.

Thus, there has been a reassertion of the liberal ideal of producing active citizens, critical citizens, and core social values. The dimension of individual growth, creative thinking and development was stressed:

> The purpose is to provide the country with mature people, educated people, civilised people, people with certain values … in terms of lifting the whole country to a level which you find in developed countries … So I think we shouldn't underestimate, apart from getting a job, the role that really educated person will play in the society in terms of uplifting themselves. (Focus group interview 15 March 2002)

The classic liberal conception that education contributes to the moral fibre of a society was reflected by Professor Callie Pistorius, Vice-Chancellor of the University of Pretoria:

> Very often … they meet somebody and they get married and they start a family and then people say, 'well, the degree is wasted because they're not using it'. That's not the case. That is a better educated person in society who's contributing to society in another matter. (Individual interview 12 April 2002)

Professor Brian Figaji, Vice Chancellor of Peninsula Technikon, speaking about the HEI-industry relationship, claimed that industry often believes that:

> Because we're a supplier, that we should supply in terms of their specification. But we're dealing with something that's not a commodity, that's a human being. (Individual interview 17 April 2002)

Investment in the arts, in culture and aspects that are not "identified as a skills shortage" was seen as an essential contribution of the HEIs.

Representatives of HEIs stressed the indivisibility of economic and social needs. Their role is to

prepare graduates for employability so that they can enter the labour market and at the same time assume active citizenship in society at large. In the South African context, this means that citizenship often has a development dimension. Figaji said the role of higher education is to develop a society, and responsiveness is about the needs of society:

> It's not just preparing people for a labour market, it's about preparing people to perform within a society and the society we want. (Individual interview 17 April 2002)

This is evidence of a discursive shift amongst technikon leaders, to promote an emphasis on the whole person able to contribute to change, as opposed to someone with limited technical skills.

HEIs in the focus group stressed repeatedly that higher education is not homogenous, that there are multiple and complex roles played by different institutions and within the same institution. These differences impact on the ways in which they mediate policy and their expectations of responsiveness.

There is evidence that individuals and institutions articulate the three labour market-related discourses to varying degrees with the classic liberal education discourse in their mediation of policy. Some leaders stressed national economic and social development issues, and others stressed global competitiveness as framing the goals and purposes of responsiveness. Pistorius stressed the importance of responding to national policy goals, and at the same time, his institution framed its task in terms of delivering world class people who are able to be internationally competitive:

> We've actually branded these people. The university has registered a trademark, we call them the Innovation Generation, a trademark of this university. (Individual interview 12 April 2002)

*'Not just to the now, but also to the future'*

Not surprisingly these leaders emphasised that HEIs have a dual role as providers of human resources and creators of knowledge. Consequently, HEIs insisted that responsiveness is "not just to the now, but also to the future". In this light, several leaders criticised a tendency to blame higher education for the ills of the economy. They emphasised that higher education cannot take a short-term view in responding to employer or student demand, but has to take a long-term view to identify and prepare for long-term needs and demands. As one university leader explained:

> We are for milking the knowledge cow, but very few people are putting something back, and you easily lag behind if you do that. (Focus group interview 15 March 2002)

The cyclical nature of industry was seen as incompatible with the academic cycles of developing new area and disciplinary focus. University and some technikon leaders repeatedly stressed the significance of basic research for knowledge generation, which provides the foundation for future education and training. Moreover, university representatives stressed the demands of a core specific scientific discipline that an academic needs to respond to:

> I'm looking at the discipline, I'm looking at the lapse of knowledge in that discipline, at the problems that can't be solved in that discipline. And I don't apologise if any-

> body asks me 'Why do you ask these questions?'. (Focus Group Interview 15 March 2002)

The academic autonomy of institutions was particularly emphasised in this regard. Autonomy was seen to have been somewhat compromised by recent policy developments that expect institutions to become more accountable and transparent. While some saw state regulation as a crucial interim measure to ensure access and quality, others were critical of over-regulation, arguing for non-intervention.

Some institutions have made a call for more substantive national policy, structures and mechanisms to drive responsiveness, which would cascade down to institutions. Others have argued that no country in the world has been able to compel higher education to respond to the needs of society. Pistorius argued strongly against micro-management of the internal processes of institutions by central government (Individual interview 12 April 2002). Dr Nick Segal, director of the Graduate School of Business at the University of Cape Town (UCT), has pointed out that in Europe, the successful responsiveness initiatives have been championed from the top, by government or central agencies, but driven by institutions themselves, taking into account the needs of their regions and their own academic strengths (individual Interview 2 May 2002).

There was a degree of animosity expressed towards the SETAs, who with their new funding advantage are seen to be attempting to dictate to HEIs, but who are seen to have a limited emphasis on technical skilling to meet short-term needs, as opposed to broad education.

**Indirect and direct employability**

These reflections make it evident that many HEIs continue to mediate responsiveness in terms of the general model of the past, for large parts of their activity. In the new global, national and policy context, with myriad often conflicting demands, HEIs experience increased complexity and increased responsibility.

Many universities have responded by developing a more nuanced adaptation of the traditional model of the relationship between higher education and the workplace. Most universities expect that the degree will continue to prepare students indirectly for employability in the sense that universities will provide a broad solid undergraduate education, with a good general knowledge, some depth in disciplines and competence in core skills. As Pistorius neatly phrased it, "once you have a university education it is not that you can only do a specific job" (Individual interview 12 April 2002). One graduate recruitment officer at a university described the intense competition for students on general programmes

> who have a strong core competency, leadership, communication, analytical skills and I still find that students are not sufficiently equipped in those areas to either meet the needs or their aspirations in many ways. (Focus group interview 15 March 2002)

Universities have traditionally offered, and continue to offer, professional education for engineers, accountants, lawyers, doctors and so on. Hence, they continue to expect that some of their activities will be structured in accordance with a model of indirect employment. An example was given from electrical engineering, that whereas a college or technikon will train a graduate to work with coaxial cables, a university teaches its graduates the set of natural laws governing the operation of cables:

> We have to get people to understand how things work and how to apply them, because had we started with a coaxial cable and in 15 years time it's not necessary, who will be able to think about the new things that need to come? (Individual Interview, Pistorius, 12 April 2002)

Professional academic education is structured to teach the principles and their application, and the technical skills are learned on the job through professional training and work experience, as in the past.

While the majority was critical of a utilitarian view of higher education, it is evident that some universities, particularly those that may be categorised as entrepreneurial expanding types of institution, and the private institutions have adopted a model of direct employability for some of their operations. Pistorius[24] stressed the skills that are required to become internationally competitive which are being structured through programmes in his institution:

> We already have programmes in place where all the students will be computer and information literate, irrespective. I think we need to add cognitive thinking skills and creativity, communication skills, networking skills, negotiation skills, entrepreneurial spirit and a wealth-creating mindset … And we think that it's extremely important that these world class people that we will deliver have a personal value system when they leave this institution. (Individual interview 12 April 20002)

Here he talks of a mixture of skills traditionally provided by higher education such as cognitive thinking skills, and new high-level skills that were in the past developed through work experience, but that must now be provided as part of degree programmes, such as negotiation skills.

It was evident that the private HEIs are not subject to the same competing demands, and they differed markedly from the public institutions. They tended to challenge the classic liberal education discourse, instead arguing for new sites of knowledge production, drawing on a discourse of the knowledge economy and the Mode 2 debate to motivate for deregulated, private provision that is more able to be rapidly responsive to the needs of industry. The head of a transnational institution, previously a senior academic in the public sector, argued:

> So there's a new sort of higher education level which does not necessarily meet our own value system but is beginning to get established in terms of generating and guaranteeing work, because in the end, that's what the graduates want. Mature or immature, they want a job. (Focus group interview 15 March 2002)

Unlike their public counterparts, private HEIs unequivocally promoted a model of direct employability. They were careful to emphasise that they do not train people for employment, but rather that their goal is to produce graduates who are employable:

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[24] It is notable that although he predominantly expressed expectations that promote the traditional general model framed in terms of his commitment to a classic liberal education discourse, this is in tension with strands of the new employability model. This suggests that the tensions evident between and within institutions, which will be explored below, may be evident in the thinking of key individuals as well, as they grapple with a changing context.

> Even if they do English as a major, they have to do at least six weeks internship as one of their final papers. Now this means that this particular student can go and work with a publisher, or something like that, but it's not for specific employment. (Focus group interview 15 March 2002)

The assumption, however, is that the degree or diploma programme will include processes to provide the kind of tacit knowledge, skills and dispositions that were developed through work experience in the general model of the past, or through professional associations and workplace mentors in the professional model of the past.

Technikons display evidence of continuing to operate with the model of direct employment of the past. They are still seen as more applied, vocational and market driven.

There is however a discernible shift in many technikons. They now expect to expand their traditional role to prepare for employability in the sense of a technically competent and well-rounded person, rather than for employment in a narrow, career-focused way.

This is evident in Figaji's claim that one of Peninsula Technikon's primary roles is to inculcate core values in its students; this does not exclude students' demand for particular knowledge and skills that will equip them to find a job, but equally, the technikon cannot supply "this narrow technologically focused person". Another senior technikon manager said they had to educate graduates who are able to "hit the ground running", prepared directly for the labour market, but there is an awareness that this implies someone who is able to understand the social environment and development needs. The representative of one of the largest, most entrepreneurial technikons argued that higher education has a responsibility to deliver competent workers to a specific market, but that institutions need to keep track of change and development to raise critical questions about the extent to which they are equipping graduates to deal with a changing, globalising world.

There was thus consensus that the gap between universities and technikons is narrowing considerably (see Huisman and Kaiser 2001 for comparative discussion). Technikons traditionally have a mandate to provide specialist technological knowledge, and the university has a mandate to provide the broader thinking stuff. The distinction between a career focus and research focus is blurring. The major distinction between universities and technikons now seems to be the degree to which preparation for employability and critical citizenship are seen as indivisible. The indivisibility is starkly and unequivocally posed for universities, while for technikons, preparation of critical citizens is often seen as less primary to their central function. And of course, technikons continue to function in whole or in part in terms of a model of employment.

There was also consensus that all higher education should provide the high-level analytical and cognitive skills required to undertake higher-level skilled work, again, signaling a shift to a model of employability on the part of technikons, and a shift to a model of direct linkage on the part of universities. The imperatives of responding to societal need leads to a growing convergence around a model of employability as opposed to employment, and means that the distinction between universities and technikons is blurring increasingly.

At the same time, a degree of competitiveness is evident between technikons and universities. Leaders in the focus group stressed that technikons are "vying for university status" and universities are borrowing "the more applied approach". Universities urged that technikons should "be

proud of what they do and they should not try to emulate universities" on the grounds that a diversity of institutions are required to develop different types of skill at different levels (Individual interview, Pistorius, 12 April 2002).

Roy du Pré, head of the CTP, has argued that universities are beginning to drift towards the technikons, emulating their most successful dimensions by taking on board notions of experiential training and learnerships, because "that is what business and industry wants" (Individual interview 18 April 2002). He has argued that there is an inverted pyramid in South Africa, with massification at the university level instead of across the higher education spectrum, and that technikons should rather focus on medium- to high-level technological skills while universities should "train the leaders, they train the critical thinkers, they train people in logic and so forth".

The focus group interview made it evident that many leaders have a tendency to dichotomise, to see higher education's role in either-or terms, *either* knowledge creation *or* development of human resources, knowledge creation *either* inside *or* outside the university, *either* a career *or* research focus and so on. Some participants stressed the need to strike a balance between the multiple complex roles of the university, and to recognise diversity between and within universities that creates room for multiple possibilities and avoids dualism and exclusion.

**The past model prevails, the new employability model emerges**

In practice, there is some tension between the past models and the increasing dominance of the new model of direct employability. It was stressed that institutions are required to meet myriad demands in a climate of increased competition and survival in an economically tight climate, and that they are differentially equipped to do so. All institutions in the focus group expressed a desire to become more responsive, but some expressed uncertainty as to appropriate mechanisms and structures.

An important new claim is that in order to become more responsive, higher education should develop communication and feedback loops. Some entrepreneurial expanding institutions propose close feedback loops with business and industry and SETAs to communicate short-term skills needs, given institutional dependence on external funding from industry, and the fact that industry is now seen as a "client" to whom a relevant "product" must be delivered. These institutions created structured mechanisms, a supportive culture and incentives for individuals, to ensure that such partnerships with industry are facilitated.

Others propose feedback loops with the state to communicate longer-term development needs, and with the community or society in general to communicate societal needs:

> There needs to be feedback that goes back into the curriculum and back into the way in which the students are delivering a service, that needs to be a reflective, circular process between them. (Focus group interview 15 March 2002)

Some HEIs, especially technikons, are grappling to find innovative mechanisms to implement their expectation that students can be prepared for a job in such a way that they also acquire core social values. Figaji described attempts at Peninsula Technikon to re-evaluate curricula to insert key social issues such as AIDs, to stimulate a broader consciousness and social awareness, because "you can't send out engineering students who are not environmentally conscious and don't understand the AIDS issues" (Individual interview 17 April 2002). Others claim that

they have attempted to create an institutional culture that is value-driven and that they have structured programmes so that graduates will leave prepared with a value system.

Many institutions are developing mechanisms to ensure that they meet national needs for social development and equity. Institutional leaders expressed concern at the problems they inherit from the secondary school system: a small pool with matriculation exemption and poorly prepared learners. They described mechanisms to address this such as equity access programmes, bursary programmes, foundation year and bridging programmes.

In practice, the pressure is such that the dominant new model, of higher education preparing directly for employability, taking into itself many of the tasks of the workplace to develop tacit knowledge, skills and attitudes, is becoming prevalent in some parts of some institutions.

This was evident in new trends to develop student work placements and internships as part of degree programmes, to develop independent project work, to include experiential learning in the curriculum and to develop new vocational career-focused programmes such as a BA Tourism.

One traditional elite university has introduced a "service learning experience" as a component of every degree programme to equip students with the high-level soft skills that will make them employable:

> It's credit-bearing and it's similar to professional courses but it's now across all faculties, so it gives them the training in context and it gives them skills that are required, teamwork and application. (Focus group interview 15 March 2002)

Other institutions gave examples of attempts to integrate the economic and social role of higher education, stressing that their internships have a social responsibility dimension through the development of partnerships with NGOs and community organisations. One institution stressed that "a large part of the university's activities are actually directed towards entrepreneurship, creating people who can create new opportunities in themselves, become self-employed" (Focus group interview 15 March 2002). Research projects in partnership with industry were also seen as an important mechanism for student training.

Technikons have long had such systems of compulsory experiential training through the structure of co-operative education in partnership with industry, which, along with advisory committees for every programme, were cited as critical. Du Pré explained the advantage this affords to technikons:

> The way the technikon programme is set up meets the needs of the economy better now than the university. The universities were at an advantage previously, but at the moment the pendulum has swung and industry would rather have a student graduate and come to them and hit the ground running. (Individual interview 18 April 2002)

The CTP attributes the fact that 82 percent to 92 percent of technikon graduates are employed in the first year to the experiential workplace training incorporated in the programme prior to graduation.

Some technikon and private institution leaders identified the use of lecturers from industry and the corporate world as an important strategy in preparing students directly for employability. Technikons are more likely to have placement mechanisms and graduate tracking systems in place to inform their planning.

The higher education sector is complex, displaying a number of models of responsiveness. Technikons now display evidence of both the direct employment model of the past, and an emergent direct employability model. Public universities display evidence of the general indirect employability model of the past, alongside the professional model of indirect employment, and with an emergent model of direct employability. Private institutions unequivocally mediate policy to promote a model of direct employability. How does this correspond with the choices of employers and students?

**Student demand and employer selection preferences**

The study attempted to identify trends in employer selection preferences of higher education graduates. The expectations of all five constituencies were tapped through the interviews. While some were reluctant to name specific institutions, fearing a league table that disadvantages, the majority was vocal in their broad and specific preferences.

In addition, a study of student preferences, of their intended choices of study post-schooling, was drawn on to illustrate patterns of student demand.

A number of clear trends were evident, that reinforce the argument of the predominance of a model of direct employability.

*Top students from historically advantaged institutions preferred*

Firstly, it was strongly evident that the HAIs, both universities and technikons, continue to enjoy a good reputation, and are the first choice of employers in all constituencies. For instance, the private sector leaders were very upfront that they prefer students from UCT, Wits, Wits Tech, Vaal Tech, University of Pretoria, and RAU - all HAIs.

Again and again, leaders referred to a kind of pecking order of institutions. Their prime concern was the quality of the graduates, and most were concerned to recruit only top students, because of a desired return on the investment they have to make in further training. As employers, they claimed to find that these HEIs expose the students to the diversity of communities, and as a result they are better able to manage in the world of work. That is, employers from the public and private sectors were concerned to employ those graduates who were most directly employable.

In many cases, concern was expressed at the poor quality of graduates from HDIs in every dimension, leading to an unwillingness to employ them.

> I know what happens in black universities. They are miles behind what happens in white universities, sad state of affairs, but I mean, that's a fact of life. (Individual interview, DACST, 18 April 2002)

There is a strong perception that most HDIs are not displaying the characteristics of responsive institutions, such as attending meetings, responding to the needs of government, being aware of policy developments and staying involved in debates on the science system.

Some constituencies saw it as their role to develop HDIs, particularly the public sector, where there was a reluctance to name specific institutions or even specific types of institution. Some black empowerment business leaders involved in development programmes nevertheless admitted that in their professional life, they would employ graduates from HAIs, because of the cost to the company.

Other constituencies felt guilty that they had not made systematic efforts to include HDIs. One SETA CEO, for instance, acknowledged that attempts to strengthen linkages with institutions have disadvantaged traditionally black institutions:

> I've taken the traditionally main players and moved with them. I have not taken a step back to say, 'pull the other ones that have been traditionally disaffected from mainstream discourse and mainstream processes'. (Individual interview 17 April 2002)

A number of leaders mentioned the large pool of unemployed graduates from HDIs, whose selection of subjects such as biblical studies for their degrees was believed to make them unemployable. The implication is that if higher education were more responsive and doing a better job, then these graduates would be employed. This typifies an underlying logic that blames the higher education system as the cause of unemployment, ignoring macro-economic structural forces. It is also evidence of the strength of the mediation of responsiveness in terms of a model of direct employability.

Secondly, there was consensus that while the higher education system as a whole is not responsive, there are pockets of excellence in specific departments, faculties or institutions, and in many cases, in the form of individuals doing excellent research or teaching in areas relevant to a specific field.

Thirdly, related to this, there was wide divergence as to preference for graduates from universities or technikons, based on past experience and evidence of responsive programmes or research in their specific field. For example, private sector leaders in the focus group interview agreed that in general, technikons are most responsive and innovative, in the current context, but an individual leader, with a background in university education, was strongly critical of technikons.

Likewise, the SETA constituency displayed a wide range of views. FASSET, for example, indicated that SAICA has only accredited the historically white universities. SETASA, interestingly, found the universities more responsive than technikons in putting together and offering short courses needed by the secondary agriculture sector. CHIETA and SERVICES reported more successful relationships with technikons than with universities. ETDP SETA indicated concern that the universities continued to offer whole qualifications that were not unit standards-based, while technikons appeared to engage more effectively with the NQF.

Public universities indicated that they tend to employ graduates from either their own or other public universities, while private institutions indicated that they tend to employ from the public university sector. As one of the representatives acknowledged: "We poach them from public education: Wits, Rhodes, Natal, UCT, Tukkies and Potch" (Focus group interview 15 March 2002). The technikons indicated that they employed from either the university or technikon sector. They noted a problem of staff retention, as staff tend to regard employment in the technikon sector as

a stepping stone to employment at a university.

In general, it can be concluded that a model of direct employability was evident in selection processes, rather than a model of direct employment, but it is difficult to ascertain whether graduates who are indirectly employable were advantaged or disadvantaged.

*Student choice: increasing employability*

A recent Human Sciences Research Council (HSRC) study of student choice suggests that students themselves are primarily concerned with obtaining a qualification that will prepare them for employment (Cosser 2002). A survey was conducted amongst 12 204 Grade 12 learners in 288 schools, stratified by province, previous departmental affiliation, and previous pass rate.

Almost three quarters of the sample intended to enter higher education, and almost 90 percent of these gave the reason that higher education increases chances of employment, testament to the discourse of massification and the extent of expectations of opportunity in South Africa. This resonates with the experience of one higher education leader involved in careers development, who lamented:

> I've found the students are not fully awake to the needs of society and industry. They walk around in a little world thinking 'I've got this diploma or degree, now I will get a job'. (Focus group interview 15 March 2002)

Significantly, the majority of learners intending to enter higher education plan to study at a technikon (55 percent). Thirty-five percent of learners intend studying at a university, while 10 percent are undecided. Interestingly, given a list of institutions, learners selected Technikon Pretoria as the single most popular choice for future study (16,6 percent).

Here again a complex racialised dimension is evident, with Africans and coloureds more likely to select a technikon rather than a university, and the opposite for Indians and whites. Other institutions, defined as private institutions or institutions abroad in the survey, constituted the first choice of white learners. Technikon study was most popular amongst Africans, featuring four times in the top five most popular institutional choices for Africans, but only once for the rest. Significantly, those who perform poorly in the Grade 11 examinations, and who by implication, are unlikely to achieve matriculation exemption, are more likely to select a historically advantaged technikon than any other form of institution. Technikons are the institutions most expected to promote responsiveness in terms of direct employment and direct employability.

In general, African and coloured learners are far more influenced than Indian and white learners to choose a field of study on the basis of the opportunities it offers for finding a job in South Africa after graduation. Their inadequate schooling performance is likely to impact significantly on the expectations of responsiveness of technikons, on curriculum and pedagogy. Technikons will be expected to teach and formulate the tacit skills and subject knowledge that schools have failed to, in addition to their own programmes, if they are to meet the demand of industry and business to produce employable graduates.

**Conclusion: active negotiation**

At a recent international conference debating the changing nature of higher education, aptly entitled *Privileges Lost, Responsibilities Gained*, Mala Singh has claimed that for higher education to avoid becoming reduced to "the handmaiden of the economy" requires

> a more active negotiation or renegotiation about the nature of higher education institutions and their special contribution to social and economic development, as well as the terms of their insertion and functioning within the economy. (2001:1)

In this regard, she points out that, alongside identifying policy shifts and the conditions to negotiate this new more complex and nuanced socio-economic role, it will be important for higher education to identify with whom it has to engage, and what arguments it can make to convince other social players.

This paper has contributed to such a task. It has elucidated how key players in the public and private sector, in the professional associations and in the skills development authorities understand the nature, role and contribution of higher education in South Africa, both in ideal desired terms and in terms of current practice.

*Divergence and convergence in the mediation of policy*

It has demonstrated that policy is mediated differentially by each constituency, framed in terms of four discourses, of globalisation and the knowledge economy, of national economic and social development, of narrow vocationalism and of classic liberal education. The distinctions and convergence between the constituencies is summed up in Figure 6.

Despite clear differences between constituencies in the way they frame and legitimise the call for responsiveness, there is strong convergence around a fundamental logic underpinning the expectations of each constituency. A new model of employability that assumes a direct link between higher education and the labour market is emerging, strongly in expectations of institutions, and differentially in their changing practice.

| **Public sector** | **Private sector** | **Professional Associations** | **SETAs** | **Higher Education** |
|---|---|---|---|---|
| Higher education should ideally contribute to national economic and social development, and redress the inequalities of the past | Higher education should ideally contribute to global competitiveness and development of a knowledge economy, recognising the demands of national development | Higher education ideally should mould young people in response to what society generally and specifically needs | Higher education should ideally be a partner contributing to national skills development | Higher education should ideally meet long- term economic and social needs, particularly knowledge production, to contribute to national economic and social development and global competitiveness |
| A direct relationship between higher education and the labour market | A direct relationship between higher education and the labour market, taking into account the knowledge production role of higher education | An indirect relationship between higher education and labour market, mediated by professional associations and employers in a structured process | A direct relationship between higher education and the labour market | A close but not direct, exclusive, unilinear relationship with the labour market in tension with pressures for a direct relationship |

| Public sector | Private sector | Professional Associations | SETAs | Higher Education |
|---|---|---|---|---|
| Graduates should be directly prepared for jobs in areas of current scarce skill, with the right kind of high-level generic skills alongside specialised skills, to be immediately effective in the workplace, particularly HDIs and individuals. | Graduates should be directly prepared with the right kind of soft generic skills, to be immediately effective in the workplace, and equipped to create their own employment | Curricula should be broadened to include soft skills, and the professions should be opened to promote equity and access, but contestation whether this should be an evolutionary or transformatory process in relation to socio-economic realities | Graduates should be prepared with life skills to enter the world of work with ease and become productive rapidly | Graduates should be prepared for employability so that they can enter the labour market and at the same time assume active citizenship in society at large, and ensure future knowledge generation |
| Internships and placements critical to prepare for employability | Collaborative institutional partnerships with industry to ensure employability | Accreditation by professional association critical to prepare for employment | Consultation of sectoral skills plans critical to prepare for employability | Internships and work experience to prepare for employability in tension with traditional academic/ technological roles |
| Public sector has direct mechanisms for intervention to develop institutions | Institutions should take initiative to determine demand | Professional associations have direct mechanisms for intervention to develop institutions and ensure the profession opens up | Structured partnerships and linkages with SETAs are desirable and necessary | Sector grappling with change and building partnerships unevenly between and within institutions |

*Figure 6*

There is tension within and between HEIs around this model, and the models of indirect employability, direct and indirect employment expected in the past. The professional associations continue to promote a model of employment with an indirect link to the labour market, as in the past, modified by new political imperatives. But the overwhelming trend is that business, the public sector, SETAs and segments of higher education expect responsive institutions to ensure that graduates are employable, in the sense that they are directly prepared to enter the labour market and make a contribution as high-level skilled employees. The tacit skills, knowledge and attitudes formerly developed through work experience are now expected to be an integral part of higher education programmes and curricula, to provide the soft, transverse, life or high skills - as they are variously termed by different sectors.

**Engaging with the challenges**

In so doing, the paper provides a basis for HEIs to identify who they have to negotiate with, and what positions these constituencies promote, in order to identify the potential arguments HEIs can make to convince government, business, other institutions and society in general of their vision of a transformed higher education in a new national and global context. In short, the study provides insights to inform active negotiation by HEIs of their role and function in a changing, challenging context.

Insight into the expectations of responsiveness and the model of direct employability opens up a range of possibilities for individual HEIs and for organisations like the CHE to debate the terms of their engagement.

Some may choose to question fundamentally the very model of direct employability invoked in the expectations of responsiveness. And indeed, many individual academics and institutions have effectively done so. In contrast, some may choose to engage with the model of employability and contest the terms of the new roles assigned to higher education. Others may choose to engage with those who propose a narrow vocationalised mediation of this model, to encourage more nuanced mediations. Or they may choose to elaborate the implications of a mediation of responsiveness in terms of national economic and social development or global competitiveness. This implies the elaboration of opportunities and mechanisms for partnerships and linkages, many innovative examples of which have been raised in the course of the study.

The paper opens up ways for the higher education sector to mediate symbolic higher education policy in a more rigorous, strategic manner. On the basis of understanding the expectation that responsiveness to the labour market fundamentally implies preparation for direct employability, meaningful engagement can proceed.

# APPENDIX A: Organisations participating in interviews

## 1. Individual interviews

Prof. Callie Pistorius (Vice-Chancellor, University of Pretoria) - 12 April 2002
Prof. Brian Figaji (Vice-Chancellor, Peninsula Technikon) - 17 April 2002
Dr. Nick Segal (Director, Graduate School of Business, UCT) - 2 May 2002
Prof. Roy du Pré (CEO, Committee of Technikon Principals) - 18 April 2002
Prof. George Subotzky (Director, Education Policy Unit, University of the Western Cape (UWC)) - 2 May 2002
Dr. Johan van Zyl (CEO, Santam) - 15 April 2002

## 2. Public sector constituency

**Focus group interview, 11 March 2002, HSRC Building, Pretoria**
DACST
Department of Transport
Department of Public Service and Administration

**Individual interviews**
DACST - 18 April 2002
DTI (Trade and Investment South Africa) - 29 April 2002
National Productivity Institute - 15 April 2002

## 3. Business and industry constituency

**Focus group interview, 13 March 2002, HSRC Building, Pretoria**
Business Referral and Information Network (BRAIN)
South African Chamber of Business (SACOB)
Foundation of African Business (FABCOS)
Business S.A.
National African Federated Chambers of Commerce (NAFCOC) (three representatives)

## 4. SETA constituency

**Individual interviews**
Information Systems, Electronic and Telecommunications SETA (ISETT) - 15 April 2002
Finance and Accounting SETA (FASSET) - 16 April 2002
Mining Qualifications Authority (MQA) - 17 April 2002
Secondary Agriculture SETA (SETASA) - 18 April 2002
Chemical Industries SETA (CHIETA ) - 19 April 2002
Public Services SETA (SERVICES SETA) - 22 April 2002
ETDP SETA - 23 April 2002
Energy SETA (E-SETA) - 24 April 2002

## 5. Professional associations

**Focus group interview 1 - 12 March 2002, HSRC Building, Pretoria**
Black Management Forum (BMF)
Steel and Engineering Industries Federation of SA (SEIFSA)
SA Institute of Chartered Accountants (SAICA) (three representatives)
Association for Black Securities and Investment Professionals (ABSIP)

**Focus group interview 2 - 19 March 2002, Bruma**
President, Engineering Council of South Africa (ECSA)
Registrar, ECSA
Consultant and representative of providers, ECSA
Chair, Education portfolio, ECSA

**Individual interview 22 March 2002, Woodmead**
Association for the Advancement of Black Accountants of South Africa (ABASA)

### 6. Higher education constituency

**Focus Group interview, 15 March 2002, HSRC Building, Pretoria**
Witwatersrand University (two representatives)
Witwatersrand Technikon
Midrand Graduate Institute
Bond
Vaal Triangle Technikon (two representatives)
Pretoria University
Pretoria Technikon (two representatives)

**Individual interview 15 April 2002**
University of South Africa (UNISA)

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# Intellectual property management in South African higher education institutions: some policy issues

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**Executive summary**

By assessing the status quo in South Africa and examining international practices in this regard, this paper aims to stimulate debate on how exploitation of intellectual property in South African academic research institutions might best serve the public good, taking into account the constraints imposed by our status as an emerging economy and as a strikingly unequal society.

The new focus on the role of intellectual property in today's technology-driven knowledge economy has created new stakeholders in what was once an esoteric field confined mainly to inventors and patent attorneys. Amongst these stakeholders are academic research institutions, who, as creators and custodians of intellectual property, are under pressure to manage it appropriately and effectively.

Universities around the world are facing pressures, both internal and external, to re-evaluate their role in society. In response to these pressures, and in particular to funding constraints, linkages with industry have multiplied and many universities are becoming increasingly entrepreneurially-minded. This approach has had beneficial spin-offs from the additional income generated, and allows institutions to demonstrate their responsiveness to society, but also brings with it risks, neatly summarised in an article entitled "The Kept University". These risks are particularly relevant to developing country universities, which may not be in a position to turn down funding opportunities which come with less than favourable conditions attached. Related pressures on the research enterprise must also be taken into account.

While in certain respects the South African intellectual property system is well developed, intellectual property management generally remains unsophisticated when compared to industrialised countries. Awareness is however increasing, including amongst HEIs, some of which have put in place structures to manage intellectual property and related activities in support of innovative research. One aspect of this concerns the negotiation of rights of ownership and use, both internally (i.e. the university's rights and obligations in respect of staff and students) and externally (i.e. the university's rights and obligations vis-à-vis third parties, especially funders, both public and private). Another aspect is the promoting of the exploitation of university intellectual property. The objectives of the university intellectual property management function generally include some combination of generating income, providing a service (to researchers, industry and/or the community) and promoting economic development.

Examples of relevant legislation overseas are discussed, particularly the US Bayh-Dole Act, considered to be the catalyst for this activity, as well as policies inspired by Bayh-Dole in Japan and Brazil.

South African institutions engaged in intellectual property management have experienced a steep learning curve, and numerous barriers have yet to be overcome. But experience is accumulating and small income flows are beginning to trickle in.

The policy priority must be to strengthen the national R&D system, which will entail some sensitivity towards the reliance of universities on funding from industry. Policy dealing with intellectual property management should be focused on how it can best assist in accomplishing this goal. An enabling policy framework at the national level will lay the groundwork for the exploitation of university intellectual property, but will take time to bear fruit. In the meantime, institutional efforts will be vital to build on existing expertise and capacity. The recent establishment of the Southern African Research and Innovation Managers' Association (SARIMA) offers opportunities for so doing.

# Intellectual property management in South African higher education institutions: some policy issues

**The context**

Intellectual property is attracting unprecedented attention in the new technology-driven "knowledge economy", which has seen intellectual capital replace physical capital as the key source of wealth. Intellectual property issues dominate or feature strongly in several global debates on topics such as international trade, sustainable development, access to drugs, food security, technology transfer and the conservation and exploitation of biodiversity, evoking fervent discourse. While some believe a strong intellectual property regime is a prerequisite for any country to become and remain competitive and successful, others point out the ways in which such a system impedes the development efforts of poor countries. One thing is clear: whether one supports or opposes the growing entrenchment of intellectual property rights, they cannot be ignored. A thorough understanding of how they operate and how they can be used as a tool is necessary to empower individuals, organisations and nations to engage with the issues in a way that allows them to advance their respective causes.[26]

Whereas, in the past, experience with intellectual property was confined to a limited realm, primarily that of inventors and patent attorneys, under globalisation the impact of intellectual property is being felt by many additional constituencies, each of whom must determine how to maximise the benefits and minimise the costs of this impact. Methods of achieving this will of course vary for different role-players with diverse circumstances, objectives, needs and mandates. As creators and custodians of a significant mass of intellectual property, academic research institutions are one such constituency under pressure to get to grips with the demands placed upon them to manage their intellectual property appropriately and effectively.

Universities around the world are facing pressures, both internal and external, to re-evaluate their role in society. Public funding of research has been shrinking steadily in real terms over the years, as a result of which universities have become increasingly dependent on contract research to supplement government research support. Available funding from both public and private sources must now more frequently be accessed on a competitive basis and is more likely to be granted with strings attached. In the case of public funding, these strings might involve alignment of research with nationally-defined priorities, while private funding might entail restrictions on publication and surrendering of intellectual property rights. In response to these pressures, universities have been forced to seek alternative sources of discretionary research funding, which has led to the establishment of new forms of partnerships and strategic alliances, both within and between organisations, and the evolution of new forms of research output (or new emphasis placed on outputs seldom acknowledged in the past, such as patents). Closer ties with business and the adoption of an entrepreneurial spirit by universities have become more and more common, and this approach is hailed in many quarters for its beneficial spin-offs. Income generated can be used to cross-subsidise other research projects, support postgraduate stu-

[26] It is beyond the scope of this paper to assess the advantages and disadvantages of a strong international intellectual property regime. While acknowledging that international debates continue in this regard and that the situation is therefore not settled, the paper assumes that the trend towards strengthened intellectual property protection will continue for some time to come and seeks solutions which will be compatible with this assumption.

dents or provide equipment and improved facilities. Students receive broader training as a result of exposure to real world problems. There is even evidence that researchers who work closely with industry are often those whose papers are most cited in scholarly publications. Furthermore, universities can demonstrate that they are making a positive contribution to society and to the local economy by generating opportunities for the establishment of new businesses, the creation of employment opportunities, and the development of new products which improve the quality of life of citizens and/or which can be exported, thus promoting competitiveness.

**The Kept University**

However, the concept of the "entrepreneurial university" has not been unanimously accepted. The engagement of public universities in commercial activities raises several fundamental questions, which continue to be debated. This controversy was encapsulated in a much-discussed article entitled "The Kept University",[27] which questioned the impact of the ever-growing linkages between universities and industry on research performed in the US public higher education system. The article centred on a strategic alliance established in 1998 between the University of California at Berkeley's Department of Plant and Microbial Biology and Novartis, a Swiss-based life sciences multinational (now Syngenta). In exchange for providing $25 million of funding for basic research in the department over five years, the company is entitled to review all departmental publications prior to their submission and has first right to negotiate licences to commercialise a large proportion of the department's research results (including results arising from projects which receive public funding). The authors argue that:

- The trend towards commercial activity occurs at the expense of the educational mission of universities.
- Research agendas are dictated by corporate needs rather than by the public good, and that disinterested enquiry is inhibited.
- Academic freedom is being restricted as researchers agree to abide by confidentiality clauses which can prevent them from publishing or discussing their work.
- Conflicts of interest develop, particularly where researchers and/or the university are given the opportunity to share in a sponsoring company's profits.
- Institutions are growing increasingly fragmented as special interests are asserted by different groups, most noticeable in (but not confined to) the marginalisation of the humanities, where programmes are being cut and salaries of researchers and professors are often lower.

These are valid assertions which present real risks, and which have been borne out in individual cases. Such cases, though, appear to be exceptional rather than typical, and there is no evidence to suggest that the US higher education research enterprise is in jeopardy. Close monitoring of the Berkeley-Novartis/Syngenta deal, for example, has to date failed to reveal any of the potentially insidious effects which were predicted by detractors, although it remains too early to assess the long-term implications. The blurring of traditional boundaries between the public and private domains is not unique to the higher education sector, and with this trend set to go on, it is likely that new academic-corporate relationships will continue to be forged. It is therefore submitted that it is of little value to discuss whether or not such relationships are desirable in themselves; a more constructive approach would seem to be to identify appropriate policy interventions which seek to maximise the benefits of these relationships, while minimising the risks.

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27 Press and Washburn, *The Atlantic Weekly*, March 2000.

For developing country universities, these risks are arguably amplified, since so much less funding is available for research from all potential sources, and the percentage of the total contributed by government often tends to be smaller (certainly the case in South Africa). As a result, universities have less freedom of choice in turning down funding from external funders, including industry, where the terms under which such funding is offered are less than favourable.

At the same time, there is a growing call for responsive applied research, which serves the country's needs, to take precedence over basic or blue sky research, countered by the argument that a solid base of fundamental research is essential to ensure long-term research excellence and capabilities. Seeking the appropriate balance in this regard is an additional related issue with which universities are grappling, also felt more keenly in developing countries where the public interest is closely tied to improvement of the socio-economic conditions of the people.

By assessing the status quo in South Africa and examining international practices in this regard, this paper aims to stimulate debate on how exploitation of intellectual property in South African academic research institutions might best serve the public good, taking into account the constraints imposed by our status as an emerging economy and as a strikingly unequal society.

**Some general observations on the South African intellectual property framework**

In certain respects, South Africa is seen to have a relatively well-developed intellectual property framework, particularly when compared to other developing countries. Our statutes have been largely influenced and informed by equivalent British and European legislation and generally comply with obligations assumed under the relevant international treaties and conventions, including the World Trade Organisation-administered Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), arguably the most important instrument in this regard at present. While the South African Patents and Trademarks Office (SAPTO) has limited capacity, concerted efforts are under way to increase and improve the services it supplies. Knowledgeable legal practitioners in the field of intellectual property and willingness of the courts to uphold intellectual property rights when they become the subject of litigation contribute to a certain extent to overcoming some of the shortcomings of the system. But management of intellectual property in general is less sophisticated than in the industrialised world and, for the most part, intellectual property remains a somewhat esoteric field for all but those who are actively involved.[28]

**Intellectual property in South African higher education institutions**

Nonetheless, there is no doubt that awareness of the importance of intellectual property is increasing, and this is certainly true in the academic environment. In the past, South African HEIs had little interest, inclination or incentive to ensure that the intellectual property generated by their researchers was appropriately exploited, with dissemination of research findings confined mainly to publication. The situation has, however, changed markedly in recent years for many South African institutions. This can be attributed to several factors, including the observation of trends and practices at institutions overseas, the prominence of intellectual property in international debates, greater collaboration with industry, pressure to find new sources of funding, a

[28] One indication of this can be found in the low number of patents of South African origin issued by foreign patent offices.

need to find alternative ways of incentivising researchers, and the necessity for universities to demonstrate their relevance to society and thereby confirm their right to receive state funding.

In response to these trends, and in the absence of a general enabling framework from government to regulate or support this activity, some universities have put in place structures to manage intellectual property and related activities in support of innovative research. This has of necessity been done on an ad hoc basis, depending on available human and capital resources, and capacity varies from institution to institution. By examining some of the relevant experiences to date in these institutions, lessons can be drawn to inform policy development.

One aspect of intellectual property management to be taken care of is the negotiation of rights of ownership and use, both internally (i.e. the university's rights and obligations in respect of staff and students) and externally (i.e. the university's rights and obligations vis-à-vis third parties, especially funders, both public and private). Another aspect is promoting the exploitation of university intellectual property.

**Universities' rights to intellectual property developed in the course of university research**

*University internal intellectual property policies* [29]

University internal intellectual property policies are by no means uniform across South African institutions: some policies require staff to assign their rights in intellectual property they develop in the course and scope of their employment to the university; some policies permit staff to retain ownership of their intellectual property; and some institutions have no intellectual property policy. The situation is even more complicated as far as ownership of student intellectual property is concerned, as students cannot be bound via conditions of employment.

It would seem that in order for a university to be assured of ownership of intellectual property, an explicit assignment of rights must be obtained from the researchers concerned. Even so, occasionally situations may be encountered where it is not clear whether or not a university researcher's invention arose in the course and scope of his/her employment, which can cause difficulties. Even where universities generally allow researchers to own intellectual property from their university research, exceptions are likely to be made in certain cases, for example where funders require that intellectual property be owned by the institution.

Universities which claim ownership of intellectual property have mechanisms in place to share any revenue which accrues to them as a result of exploiting their intellectual property with the researchers responsible for generating it, both in their personal capacities and for their own or departmental research accounts.

*Intellectual property rights in government-funded research*

While historically organs of government did not generally make claims to ownership of intellectual property developed within universities in the course of government-funded research, a variety of positions on this issue are currently taken by different departments and agencies.

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29 These policies usually deal with inventions or technological developments which would typically receive patent protection. In many cases, material falling under the copyright system would not be covered.

For example, the National Research Foundation (NRF) does not claim ownership at present to intellectual property from research programmes they fund out of their parliamentary core grant. Ownership by institutions or individual researchers is permitted, depending on internal policies and conditions of employment.

The Medical Research Council (MRC), in terms of the South African Medical Research Council Act,[30] is entitled to claim full ownership of intellectual property developed from any MRC-funded research, even where this might constitute a small proportion of the total funding of the project concerned. In acknowledgement of the fact that this may not be fair and/or workable in many instances, the MRC has entered into intellectual property-sharing agreements with recipient institutions of MRC funding. There are several categories of MRC funding: in certain cases, MRC administers and distributes funds which derive from the government science vote (analogous to NRF funding), while in others, MRC sponsors contract research in universities, financed from MRC's own funds, or MRC-administered funds. MRC generally makes no distinction between the source/category of funding in their treatment of the intellectual property issues.

University research groups are commonly commissioned by government departments and agencies to perform consultancy-type projects. In recent agreements, the trend is for the sponsoring entity to claim ownership of intellectual property. It is unusual for such research to generate intellectual property which can be commercialised, but by conceding all rights to the intellectual property, the researchers concerned can be restricted in further related work they wish to pursue in the relevant field, and in relationships with third party collaborators both during and subsequent to the project. It is generally futile to attempt to negotiate amendments to such agreements: even if the individuals responsible for commissioning the work agree, the delays involved in obtaining the necessary approval from the state legal advisors often present an insurmountable barrier.

*Intellectual property rights in privately funded research*

Ownership of intellectual property from non-government funded research is determined by the contract governing the project concerned. While in certain cases, companies might not have an interest in the research output (for example, when the funding takes the form of a donation or emanates from a social responsibility programme), in most cases companies will expect to receive some benefit as a return on their investment. Often, this will be rights to any intellectual property developed in the sponsored project. These rights may take the form of an assignment of all intellectual property rights, a licence to use the intellectual property (on an exclusive or non-exclusive basis) or an option to negotiate a licence. Licence fees may or may not be payable over and above the original research funding.

Many companies demand full ownership of intellectual property as their due and are unwilling to consider alternatives. For universities, this can pose a risk, for example by placing limitations on researchers' further use of the intellectual property they have developed, or by requiring the university to pay to access such intellectual property. In such cases, companies are usually willing to agree to grant a perpetual royalty-free licence to the university concerned to make use of the intellectual property for the purposes of teaching and research, and many universities will insist on this.

An exclusive licensing arrangement is more satisfactory from the university's point of view. It can

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30 Act No 58 of 1991.

be structured so as to give a company all the freedom it needs to commercialise the intellectual property, while the university is able to retain certain rights, including the right to grant further licences to other licensees for territories and/or fields of use in which the licensee does not intend to operate. Even more importantly, the university may build in terms which encourage the licensee to utilise the intellectual property, such as a minimum royalty or diligence payment (payable whether or not any sales are made), a provision for exclusivity to be converted to non-exclusive rights or a provision for withdrawing the licence altogether as a penalty for failing to ensure that the intellectual property was put to good use.

It is somewhat alarming that it is no longer uncommon even for not-for-profit funders of research, such as foundations and aid agencies, to assert rights to intellectual property from projects they fund. While it is understandable that these organisations wish to have unfettered use of the material, it is difficult to see how they benefit from restricting the universities' and researchers' own rights in the material, for example by requiring researchers to waive their moral rights in the copyright of written material. In these cases, there are usually alternatives available which would be satisfactory to both parties, but there is often no opportunity to negotiate amendments to pro forma contracts, for example where local representatives have no authority to do so.

Appropriate intellectual property agreements will differ from case to case, depending on which party initiates the research and on the respective contributions of the university and the company. Since most universities do not implement full cost recovery on research performed for industry, the overhead costs, as well as charge-out time for investigators who are permanent university staff members, should be taken into account in assessing these contributions. A body of precedents is being built up where a range of compromise positions is represented.

South African universities, particularly those with a strong research base, have become very reliant on industry funding of research in recent years, which has been increasing both in real terms and as a percentage of total research funding. Institutions therefore have limited bargaining power for securing favourable terms from industry in the area of intellectual property and few are in a position to reject funding because of unsuitable intellectual property provisions.

Related contractual matters include publication restrictions and confidentiality clauses in sponsored research contracts. Where ownership of intellectual property is at issue, it is common for companies to request publication restrictions in order to ensure that commercially important information is not made public prematurely and confidentiality restrictions to safeguard proprietary information. While certain limitations are acceptable (e.g. a time-limited embargo on publication to allow for patent protection to be obtained, after which publication can go ahead), these can impinge on academic freedom, and the contractual language of these terms must be carefully scrutinised to avoid undesirable consequences. It is also important that each contract is examined in its own context, as terms which are acceptable in one situation might not be in another (e.g. where a student's graduation may be delayed due to a publication embargo, which otherwise would not have negative effects).

A flexible approach is therefore called for, within a policy framework which is consistently applied. It is preferable for these issues to be dealt with at an institutional level rather than by individual researchers, to ensure consistency, and to see that the needs of both the institution and its researchers are met. This also allows for long-term relationships to be built up between the institution and funders and avoids the need for repetitive negotiations where a single funder is involved.

*Exploitation of intellectual property by universities*

Since only in rare circumstances will universities commercialise their intellectual property themselves, by taking ownership of intellectual property they assume the responsibility of ensuring that it is exploited appropriately. In the first instance, researchers must be educated about the importance of their intellectual property and the procedures which facilitate its protection, in order to encourage timely disclosures of research results with potential for application in industry or society. These disclosures must be evaluated and decisions made on whether and where to seek patent protection. Available options must be considered for licensing or assigning rights to companies or to the researchers who created the intellectual property for further development in a spin-out or start-up company, or for donating technology to communities who might benefit but are not in a position to pay.

Intellectual property management is a specialised field requiring a combination of technical, legal and business expertise. The objectives of the university intellectual property management function generally include some combination of generating income, providing a service (to researchers, industry and/or the community) and promoting economic development, although different operations might assign different priorities of importance to each objective. Revenue generated can be used to cover the costs of intellectual property management, to provide discretionary research funding and to reward and incentivise innovative researchers.

Researchers wishing to see their research ideas developed for the marketplace might not know how to go about doing so themselves, or might not want to get involved in the commercialisation process, and companies interested in accessing new technologies could be assisted by an intellectual property management or technology transfer office. By putting in motion the process of translating innovative ideas into useful products, new companies might be established, employment opportunities created and lives improved.

**The international experience**

These activities have only recently been embraced by South African institutions. It is therefore instructive to examine how intellectual property is treated by universities elsewhere, particularly in those countries which have introduced legislation to promote intellectual property exploitation by universities. Three such examples are discussed here.

*The US model: the Bayh-Dole Act as catalyst*

It is acknowledged that US universities have the most advanced intellectual property management operations, attributed mainly to a key statute enacted in 1980, the Bayh-Dole Act,[31] its 1984 amendments,[32] and related regulations.[33] This legislation was aimed at promoting the transfer of technology, developed as a result of federally-funded research, from the laboratory to the marketplace, in order to maximise the social and economic benefits of the research. Pre-Bayh-Dole, few federally-owned inventions were successfully commercialised. This was thought to be due to the government's reluctance to relinquish ownership of federal inventions to other entities and its aversion to exclusive licensing, which served to disincentivise the inventing institutions (as beneficiaries of federal grants) and potential industry licensees from commercially exploiting inventions arising from federally-funded research programmes.

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31 PL 96-517.

32 Contained in PL 98-620.

33 Codified at 37 CFR Part 401 in 1987.

Bayh-Dole (and the related legislation) served to stimulate the utilisation of results of public-funded research, which in the past were often left to languish unexploited. Some of the main provisions are summarised below:

- A uniform intellectual property policy was introduced for all federal funding agencies.
- Universities are explicitly entitled to retain ownership of inventions generated in the course of research funded (even partially) by government agencies. (And university inventors are required to assign their rights in any such intellectual property to the university employing them.)
- By taking ownership, universities are obliged to exploit the invention actively, by obtaining patent protection and seeking licensees to take the invention to market.
- Failure to do so can result in the government exercising its march-in rights, to take control of the technology concerned (e.g. by granting a licence to practise the invention to a third party).
- The government receives an irrevocable non-exclusive royalty-free worldwide licence to practise all inventions.
- Small businesses and US firms are preferential licensees.
- Inventors must receive a share of any revenue accruing to the university from successful exploitation of an invention.

Two decades on, most US universities have very active technology transfer offices involved in filing patent applications on university inventions, licensing out rights under those patents to companies with an interest in further developing and marketing them, and providing support (often in exchange for an equity share) for start-up companies which spin out of university research laboratories. The public benefit and economic impact of this activity can be measured by several criteria. For example:[34]

- Since 1980, over 3,000 new companies have been established based on receiving a licence from an academic institution, 454 of these in 2000.
- It is estimated that universities hold equity in one-third to one-half of such start-up companies.
- Most of these companies are located in the same state as the institution which licensed the technology concerned.
- Academic licensing is thought to support around 270,000 jobs.
- In 2000, over 300 new products based on university research were introduced commercially.
- Tax revenues in the region of $5 billion are generated from the business activity associated with product sales.

While this output is impressive, the US success must be put into perspective. Patenting, marketing and licensing are resource-intensive activities. Once licensed, the invention usually requires further development by the licensee, and a substantial time lag can therefore be experienced before any revenue is generated. Blockbuster technologies yielding huge returns are rare, and many inventions are never particularly profitable. It is not unusual for university technology transfer offices to do little more than break even. Technology transfer activity must also be seen in the context of the tremendous investment made by the state in research. Even in those cases where a university is fortunate enough to score a "big hit" which leads to millions of dollars of royalties flowing into the institution, these royalty payments seldom constitute more

34 AUTM Licensing Surveys, FY 1999 and FY 2000.

than a small fraction of the institution's total research budget, and averages out across surveyed universities at about 4 percent.

*Some examples from other parts of the world*

Several other countries, primarily but not exclusively in the industrialised world, are attempting to emulate the US success by implementing their own policies to support technology transfer. While some countries have legislated a Bayh-Dole equivalent, most promote technology transfer at the institutional level as part of intellectual property legislation or national innovation policies.

In Japan, steps were taken in response to a perception that universities were not effectively exploiting their intellectual property. Because national universities did not have juristic personality, they were unable to take ownership of intellectual property, which vested in government in some cases, and in the inventor in others. In order to facilitate a more efficient process, the 1998 Law Promoting Technology Transfer from Universities was enacted. It provided for the establishment of technology licensing offices (TLOs) by offering financial support and loan guarantees from the government. Some of the TLOs were set up to support a specific university, whereas others service multiple institutions in a particular area. Procedures have been put in place to grant legal personality to national universities to allow them to own intellectual property developed within them. An office of Research and Educational Policy Planning has been established in the Japanese Patent Office to provide information and other support to universities on intellectual property matters. A national technology licensing association has been formed.

Brazil has recently enacted legislation to stimulate university technology transfer. By accepting research funding from certain government ministries and agencies, universities are obliged to comply with conditions which include having procedures in place to clarify ownership of inventions and ensure that inventors share in the proceeds generated by exploitation of a university invention. However, due to lack of capacity, information and funds, institutions have been slow to implement the relevant policies, with the majority yet to do so. Nonetheless, technology transfer offices have been established in almost half of the main Brazilian universities, with the remainder planning to do so in the near future. It is too early to assess the returns of the policy.

**How successfully are South African universities managing their intellectual property?**

South African universities have chosen different structures for managing their intellectual property. Some have set up dedicated offices, some have established associated companies (fully or partially university-owned), some utilise outside consultants, and some have not taken any steps to deal with the matter. The learning curve has been steep for everyone, and numerous barriers have yet to be overcome. These include the following:

- The intricacies of intellectual property management are not well understood by many of the individuals dealing with it, in all sectors (government, academia and even business), and the objectives of a technology transfer office are often questioned.
- Patenting is a high-cost endeavour, particularly overseas, and the weak rand exacerbates this. Until intellectual property management offices are able to generate sufficient income to support their activities, they will have to compete with the rest of the institution for their slice of a finite pie.
- Mentors and training opportunities are few and far between and practitioners are forced to learn by trial and error rather than by means of good practice.
- Due to the small base of research funding in the country, the flow of invention disclo-

sures is weak, and is unlikely to increase soon without a substantial injection of funding into the system.

- A very high percentage of research funding comes from external sources (i.e. other than government agency grants),[35] subject to conditions which may restrict the university's freedom to exploit any intellectual property developed from such research.
- The intellectual property landscape has become increasingly complex, particularly in respect of biotechnological inventions. Biological material and research tools are commonly proprietary, which can severely limit the exploitation of inventions developed using such material or tools. This is particularly alarming because many such inventions offer advances in healthcare and food security.
- Many inventions emanating from South African institutions are aimed at solving Africa-specific problems and the intended market will not be able to afford to pay for them. Without guaranteed assistance, the upfront costs of commercialisation cannot be met by the institutions.
- Support for new business formation is very limited. The financial institutions and venture capitalists are risk-averse and therefore reluctant to get involved at an early stage. However, without early stage funding, many good ideas will not be developed further.

Some institutions have made considerable investments in setting up infrastructure and supporting training, patenting and marketing costs. While success stories of note seem far away, small income flows are beginning to trickle in, and a wealth of experience is starting to accumulate which will equip institutions to deal with counterparts and competitors globally, and inspire creative solutions to problems at home.

**Policy options**

The South African higher education research system is arguably under threat on a number of fronts.[36] Policy interventions must therefore ultimately seek to improve the amount of high quality innovative research coming out of our universities. More funding for research will be one condition for achieving this. While it is hoped that at least some of this will be forthcoming from government as part of the R&D strategy under discussion, it is unrealistic to expect unlimited public funds suddenly to become available. This means that other sources must be tapped, including the private sector.

With university-industry interactions set to continue, and probably to increase, policies must be sought to cultivate and nurture these relationships without compromising the integrity of the higher education system and the ideal of academic freedom. Prescriptive top-down measures to regulate these relationships will be difficult to enforce and could alienate potential funders and further demoralise researchers who are despondent about lack of support available in the research system. On the other hand, internal regulation might be arbitrary, and inconsistent across institutions. As long as universities continue to be dependent on external research funding, there will be risks of a skewed research agenda developing, but the risks of further eroding the research enterprise by shutting down funding opportunities might be greater. A first priority must be to

35 This is estimated at almost 70 percent of the total research funding of the main research universities. In comparison, government-funded research in American universities accounts for over 90 percent of the research budget.

36 These have not been discussed in full in this paper.

strengthen the national R&D system. Policy dealing with intellectual property management should therefore be focused on how this activity can best assist in accomplishing this goal.

Several government departments[37] have acknowledged that the status of university intellectual property must be clarified. However, there does not appear to be any coherent plan on how this should be done, nor by whom. Two initiatives have come out of the Department of Trade and Industry (DTI): a sub-committee of the Standing Advisory Committee on Intellectual Property Rights has been tasked with proposing improvements to legislation dealing with the management and commercialisation of intellectual property, especially when developed as a result of public funding, while a joint project between the CSIR and SAPTO has a similar brief. It is not clear how these initiatives will link up with each other.

*Is Bayh-Dole the answer?*

It must be borne in mind that the US successes largely attributed to Bayh-Dole have come out of a vastly different research environment. Despite extensive interactions with and substantial support from industry, the bulk of US university research funding still comes from federal and state sources and, as such, falls under the ambit of Bayh-Dole. The relatively small proportion of South African university research funding which would be covered if an equivalent statute were enacted here would significantly lessen its impact. However, by setting out principles to govern the relationships between government, universities and business, such legislation could provide clarity and perhaps improve the bargaining position of universities in their interactions with the private sector. This will not be useful if overly prescriptive, and it might be argued that it would be more prudent to continue in a policy vacuum than to implement policy which restricts the research funding environment further than it is already by alienating funders.

One line of thinking within government seems to view exploitation of intellectual property developed out of public funds as a revenue-generating opportunity for government. This appears to indicate an unrealistic view of the income which could be expected, especially in the short- to medium-term, in light of the start-up expenses required coupled with the lag period before income accrues. Legislation which sought to retain ownership (and benefits) of such intellectual property for government would go against international trends and would seem to put South Africa in the position that the US sought to remedy by introducing Bayh-Dole. Institutions would have no incentive to implement policies to protect intellectual property or educate researchers about its importance. This could lead to opportunities for exploiting intellectual property being lost.

It might be argued that this approach could be a means of rectifying some of the imbalances amongst South African HEIs, by allowing cross-subsidisation of HDIs, but it would seem that the funds available are likely to be less than expected, due to an underestimation of the time that it takes to generate revenue and of the amount of revenue likely to accrue, taken together with the loss of commercialisation opportunities through disincentivising institutions from seeking adequate protection. Other methods should therefore be pursued to build research and innovation capacity in HDIs.

A middle ground option might involve a formula for benefit-sharing between government and the institutions which generate the proceeds. In principle, this could represent a balanced approach,

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[37] Including the Departments of Arts, Culture, Science and Technology, Education and Trade and Industry.

but practical considerations will have to be taken into account in assessing its feasibility. In order to prevent small sums being divided into ever-smaller shares which are of little value to any of the recipients, a threshold could be stipulated, below which government would waive its share. Careful thought would have to go into what might constitute an appropriate split. The share flowing to government could be capped at the level of public support granted to the project concerned. Every effort must be made to avoid unwieldy procedures and a cost-benefit analysis should be performed to ensure that the costs of administering a scheme like this do not exceed the benefits.

**National policy issues**

At national level, an enabling policy framework would be desirable to support intellectual property management by institutions. Coordinated input from stakeholder departments and agencies will be needed to design a coherent scheme and ensure alignment with other relevant legislation and policies. Some of the content of such a policy might include the following:

- A clear position should be taken on ownership of intellectual property from government-funded research and should apply to all publicly-funded research. It is submitted that putting ownership and responsibility for exploitation in the hands of universities, coupled with incentives for exploiting it in such a way as to promote government imperatives, would allow government to achieve its objectives while at the same time offering a higher probability of success, than if government were to attempt to retain ownership.
- Incentives could include government support for intellectual property management activities of institutions which:
  - Develop innovations which solve national problems, contribute to poverty alleviation or promote competitiveness.
  - Have a good record of licensing to small or medium enterprises or historically disadvantaged businesses.
  - Commit to capacity-building and sharing resources with HDIs.
- Government must have a mechanism to ensure optimal utilisation of research results from state-funded projects (including safeguarding its own rights to access such results), which need not (and preferably should not) entail government ownership of such results. It is worth noting that while Bayh-Dole confers broad powers on government, much of its success has been ascribed to the restraint shown by government in invoking these powers.
- Researchers must be rewarded for innovative work through sharing in any proceeds which flow from exploiting their innovations.

This policy will be necessary to lay the groundwork for exploitation of university intellectual property in the future, but in itself will be insufficient to create a climate conducive to effective intellectual property management. It is worth noting the obstacles experienced in Brazil in implementing similar policy. Since it will take time to bear fruit, it must be coupled with other endeavours. Government could play a vital role by tabling relevant issues and marshalling international support (both technical and financial) via initiatives such as the World Summit on Sustainable Development (WSSD) and the New Partnership for Africa's Development (NEPAD) and through organisations such as the World Intellectual Property Organisation (WIPO), the World Bank and the World Trade Organisation (WTO), in an attempt to level the playing field for South Africa and other developing countries wishing to participate in the knowledge economy and bridge the knowledge gap.

Government can also institute programmes to provide support for training and operating costs.

*Institutional policy issues*

The real efforts which are perhaps most essential at this stage, though, must take place at institutional level, building on the strengths and capacity which already exist (albeit to a limited extent) in the fledgling operations at certain institutions.

- Adequate human and capital resources must be devoted to supporting these activities in institutions with sufficient research output. Technology transfer must be recognised as an emerging profession, individuals must receive professional training, and proceed and be treated accordingly as professionals.
- Relevant institutional policies must be aligned and consistently applied in order to avoid conflicts, including those dealing with intellectual property, private work, ethics, conflicts of interest, and sponsored research (including cost recovery). Strong institutional ethics committees and review boards have a vital role to play in regulating interactions which push the boundaries of traditional relationships between universities and industry.
- Networks must be cultivated through which knowledge and experiences can be shared, and synergies capitalised on. This might involve joint training and education opportunities, capacity-building, transfer of skills and provision of services, and new partnerships between organisations.
- Key indicators must be determined and activities benchmarked against both international and local standards. The commercial and social impact of these activities should be publicised.

Institutions which lack critical mass in research will be hard-pressed to motivate for the resources needed to run such operations, but will benefit from awareness of the issues at stake and be able to tap into existing expertise in other organisations.

In acknowledgement of these needs, SARIMA was recently established. Its objectives include professional development of those involved in managing research and the creation of intellectual capital; promotion of best practice in the management and administration of research and the use of intellectual capital to create value for education, public benefit and economic development; advocacy of appropriate national and institutional policy in support of research and generation of intellectual capital; and advancement of science, technology and innovation.[38] Membership is open to institutions and individuals active in research and innovation support (public, private and academic). SARIMA has linkages with several South African and international organisations with related objectives. This is an organisation which can potentially offer a strong platform from which to drive research and innovation management activities, including technology transfer, nationally and regionally.

**Conclusion**

For policy-makers at both national and institutional level, the key issue at stake must be how university intellectual property can best be managed for the purpose of ensuring that the system of public higher education, both as a public good in itself and as a tool to be used in South Africa's quest for sustainable development, can be strengthened. At national level, this requires a sup-

[38] SARIMA Charter.

portive, coherent and enabling policy framework, and at institutional level a willingness to take an innovative and flexible approach towards setting up new relationships with partners who can help revitalise a research system under pressure, within certain defined parameters, to ensure that the universities' core activities of teaching and research are not put at risk.

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# An essential partnership: business / higher education relationships

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## A report for the South African Council on Higher Education

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**Summary**

> Education and business are inextricably linked. The business sectors are users of the outputs of higher education - mainly their graduates and their research results. For its part, business provides feedback as well as resources for the modernisation and development of educational programmes. Education and industry are thus interdependent for the supply of critical inputs that contribute to their respective productivity and performance. (M M Ansari - India)

This report offers a brief review of business/higher education relationships, drawing in particular on case studies from India, Malaysia and Mexico on the one hand and from the USA, UK and Australia on the other.

We find that the relationships between higher education and business are, not surprisingly, many and diverse. They range from cooperation on R&D and knowledge transfer to curriculum planning and taking students on placements both to improve their business awareness and to help raise the capabilities of the host organisation.

Governments play important roles in facilitating and encouraging such relationships. Indeed the provision of specific funds for this activity is often crucial to persuading academics to engage in an area that does not necessarily or easily accord with their academic research and teaching priorities.

Both business and higher education can secure real benefits from closer relationships:

- R&D activity can be informed by business needs, supported with joint funding and followed through with applied projects or start-up/spin-off companies.
- Academics can be better informed about business priorities and current issues; hence the curriculum can be refreshed and their graduates be more employable and add value earlier in their careers.
- Consultancy, work-based learning and continuous professional development can benefit the academic institution financially as well as raising the capabilities of the staff in business and other organisations.

To achieve maximum interchange, there is often cross representation on the boards/councils of businesses and universities. There also needs to be an effective, mutually respected and suitably resourced interface unit that sits at the boundary between the worlds of academia and business and has knowledge of how both operate.

We recommend:
That business/higher education interface units are encouraged in all South African HEIs.

In an age when the creation, dissemination and application of knowledge are at the heart of a value-added economy and society, we consider that close relationships between business and higher education are a prerequisite for sustainable wealth creation. Equally we see them as being potentially strategic and addressing some of the major social as well as economic issues facing all nations.

> We need others to engage with us in the business of planning and monitoring higher education. We need to encourage others, especially employers, to help with our

> broad agenda by engaging with us in addressing issues such as: How to strike the balance between narrow, vocationally focused courses and broad programmes designed to prepare students for their future life? How should the responsibility for funding students be shared between governments, employers and individual students? And how is the quality of higher education to be assessed and improved? ('Engagement as a core value for the university: a consultation document', Association of Commonwealth Universities, London 2001)

Higher education and business are sources of brainpower, experience, innovation and ideas. Their leaders have unique perspectives and the capability together to tackle some of the burning issues that affect society; issues such as raising personal aspirations and fulfilment and creating a more just, caring and tolerant society as well as enhancing national wealth creation.

However to harness the inherent capabilities of senior business people and academics requires a high-level forum where the process of dialogue and exchanging ideas are as important as the policy proposals and practical solutions adopted.

**We recommend:**
That the leaders of South African business and higher education consider how a high-level business/academic forum might best be established.

**We recommend:**
That the government offer such support as is appropriate to ensure its initial success.

# An essential partnership: business / higher education relationships

**Overview**

This report draws on the experiences of a range of countries to attempt to identify emerging patterns or differences in the relationships between business and higher education. The principal countries concerned are Australia, Hungary, India, Malaysia, Mexico and the UK although reference is also made to developments in some other parts of Europe and in the United States and Canada.

In all these countries, relationships between individual HEIs and business are many and diverse. It is not possible to do justice to them in a short paper. This report takes as its focus the national elements and forums that promote and steer such relationships, including the role of national governments and business/higher education bodies of various sorts.

There is a vast range of activities that may be addressed through business/higher education relationships. Businesses collaborate with higher education:

- In research, especially in the sciences.
- Via knowledge transfer and consultancy.
- To ensure the professional upgrading and retraining of their staff.
- To provide work placements for higher education students.
- By making inputs to academic planning and curriculum development.
- Above all, by employing higher education's graduates.

Higher education can both profit financially from its business relationships and develop relationships that help ensure the wider economic and societal relevance of its courses and research. It is a central theme of this paper that while there are numerous types of relationships at working level, there are benefits in forging strategic relationships that go beyond the instrumental and the immediate. A high-level partnership forum can offer a framework and a process where leaders from business and academia can engage in a dialogue to improve their mutual understanding and address broad issues such as:

- The changing nature and requirements of the world of work.
- The role of higher education and business in combating social exclusion and in widening opportunities for all.
- How business and higher education can together tackle some of the major social as well as economic issues of the day.
- The development of a culture that encourages and rewards enterprise, innovation and lifelong learning.

This paper is divided into four sections: the role of governments; national business/higher education coordination bodies; other mechanisms for collaboration; and benefits and problems. A general conclusion and recommendation is offered at the end.

**The role of governments**

Governments play a role in promoting, and in the early stages kick-starting, higher education/business relationships. Thus, we note from Hungary that the government wanted to:

- Encourage a shift from a scientific and academic orientation within universities to one that was practical and more related to the real world.
- Encourage and strengthen the "enterprise" character of universities.
- Better align the research objectives of academia and industry so as to gain the maximum economic returns from government investment in R&D.
- Provide better labour market information and guidance to institutions so as to maximise the return to individuals and the state from the investment made in teaching and research.

In the foreword to Malaysia's *Eighth Malaysia Plan*, the Prime Minister writes that,

> emphasis is being given to improving management and organisational techniques, upgrading R&D and science and technology, as well as strengthening innovative capacity.

This has led to a number of government initiatives highly relevant to higher education. For example, an Intensification of Research in Priority Areas (IRPA), a funding programme established in 1983. The IRPA was intended to underpin research and development activities in the public sector particularly in areas which address the needs of Malaysian industry. The IRPA programme continues and has been allocated RM900 million in the government's current Malaysian Plan.

In Australia, the government has emphasised for decades the need for Australian universities to work with industry. A programme of cooperative research centres has been the major active support for collaboration. The centres bring together university and business interests with some government seed funding to work on a particular, usually cross-disciplinary, issue of important practical concern. Another forum to bring university and industry together in Australia is through the Prime Minister's Science, Innovation and Engineering Council. However, it is at the state government level in Australia that most initiatives to support business/higher education relationships take place, for example supporting the development of technology or business parks in proximity to university researchers by providing under-used land and supporting necessary planning approvals.

In the UK, Foresight Programmes have considered major business sectors of importance to the economy, the key drivers for change and where research efforts might best be concentrated. The Foresight teams involve academics, business people, government and various research agencies. Their views influence research councils who decide on the allocation of project funds in response to bids from academic consortia. As far as teaching in higher education is concerned, the government has supported various initiatives to improve the employment relevance of courses and the higher education funding councils are introducing graduate employability and widening participation as performance indicators for all HEIs.

In Hungary, a National Committee for Technical Development covers the R&D interface between business and higher education. Equally, the establishment of research coordination centres has helped focus the R&D effort of universities on specific sectors and also at the regional level.

At the EU level, Framework Programmes have performed a similar role to the Foresight Programme in the UK. Cooperation has been a prerequisite for EU funding, and this has led to many pan-European partnerships between HEIs and business groupings.

> Priority-setting needs to be done not by academics and their peers (i.e. the research community) working on their own, as has often been the tradition. They need to argue their case with other individuals, such as business people, who expect to make use of the research findings. That dialogue, linking research funding to intense debate of researchers with users, is fundamental to the engagement of academic with societal purpose. ('Engagement as a core value for the university: a consultation document' Association of Commonwealth Universities, 2001)

In India, the Council of Scientific and Industrial Research is the largest chain of industrial research and development institutions in the world with 40 laboratories and 23,000 employees. Business insights enable this to be a more user-focused, people-driven and accountable organisation, which converts its knowledge into wealth and assists development. It has shown itself capable of developing a strategy that focuses R&D resources in areas agreed upon by both business and higher education in liaison with the government.

In most Latin American countries, governments have provided various legal and financial stimuli to promote collaboration, known as *vinculacion*, particularly by creating national schemes to finance programmes for promoting research and development, technology transfer and the delivery of professional services by HEIs. In Mexico, the National Council of Science and Technology (CONACYT), helped by the Association of Institutions of Higher Education, play this role. Large businesses have played a significant role in promoting *vinculacion* in Mexico, as have intermediary organisations such as chambers of commerce and foundations.

We should note that in India and more generally in Eastern Europe the concern is as much to reduce the intervention and micro-management by the state in the affairs of higher education as to persuade it to establish mechanisms, incentives and partnerships to encourage closer relationships with business.

The role of governments is therefore a mixture of setting the climate for, and of providing financial incentives to promote, business/higher education partnerships. In the case of state sectors of higher education, legislative requirements on matters such as institutional governance and quality assurance can also bring "business into higher education" by ensuring that its nominees sit on key councils and committees. This is probably a stronger tradition in Anglo-Saxon systems and remains weak in countries (e.g. most of central and eastern Europe) where academic and institutional autonomies have only recently been regained and where their protection remains a priority for the academic community. In such cases, there may be a growth in the number of private institutions of higher education to meet the growing demands from business and industry. Consequently, business/higher education relationships are left more to the marketplace and the role of government is more modest.

**National business/higher education coordination bodies**

*The UK*

The Council for Industry and Higher Education was established in 1986 by business leaders and senior academics to encourage business and higher education to work together on issues of shared concern and to present their joint thinking to government. Business leaders in particular felt that both sides were not engaging in a dialogue based on mutual understanding. Equally business leaders wanted to exert pressure on the government of the day to expand higher education to meet the emerging needs for more educated and skilled people in all walks of life. They

considered that a high-level forum that spoke for both sides would stand above sector interests and be able to exert influence for the benefit of the nation as a whole.

CIHE members are senior business leaders and vice-chancellors. This gives the council a unique status and perspective. Meetings are also usually attended by the heads of the funding councils and a government minister. As an inclusive organisation, it is in a prime position to influence the key government, business and academic players.

Current CIHE policies call for:

- The government to provide the funding needed to raise higher education's capability.
- The funding councils to distribute funds to support institutional diversity.
- Institutions to cooperate more in a drive for business excellence.
- Widening participation in higher education including through progressive employer recruitment practices.
- Employers and academics to cooperate on developing the employability of all students.
- Excellence in research, scholarship and knowledge transfer.

As can be seen, the council's interests are broad and strategic. It seeks to ensure that both sides are better informed and work together to secure an effective, efficient and better resourced higher education system. It influences the government and its views are widely respected. It appears not to act as a forum to promote business values as such but rather to promote a fuller partnership in the development of higher education, between the leaders of business and higher education.

*The United States*

The Business-Higher Education Forum is a partnership of the American Council on Education and the National Alliance of Business. Its remit and way of working are similar to those of CIHE. Its members are chief executives from American businesses, colleges and universities, and museums. The goals of the forum are to increase communication amongst the sectors, to analyse issues of mutual concern, and to deliberate on courses of action that will effect change on these topics. The forum has addressed issues of a high performance workforce, global interdependence, minorities in the workforce, and economic competitiveness. It holds semi-annual meetings, convenes occasional round-table discussions, publishes policy reports, and manages projects that mobilise the resources of its members. It is interesting to note that currently it is the business leaders that are driving the politicians to place greater value on the role of higher education in helping to broaden the education base of the nation and create a more inclusive nation.

*Australia*

The Business Higher Education Round Table (B-HERT) is the major formal mechanism to bring together business and universities. Its membership extends to most Australian vice-chancellors and the senior managers of many larger Australian businesses. Its activities appear to be not dissimilar to those of the CIHE in the UK and the Business-Higher Education Forum in the US.

In all three cases, it appears to be the larger business organisations that are represented.

*Other organisations*

We are also aware of similar high level business-higher education forums in:

- Canada - the Corporate and Higher Education Forum
- Japan - the Business-University Forum

- Poland - the Polish Higher Education Business Forum.

Such organisations are by no means universal; France is the only other European country to have established a similar independent and high level organisation representing both business and higher education interests. This is partly because the strongly federal or regional structures of Germany, Spain and Italy, for example, do not easily lend themselves to forums at the national level.

Most countries and regions possess organisations representing business and these may also provide forums for the exchange of views between business and higher education. For example, in Hungary, the Round Table of Business Leaders (GVK) has incorporated a few rectors of universities and has developed closer links with the College of University Rectors. The GVK has provided a non-governmental national forum for the encouragement of cooperation between universities. In Belgium there is close cooperation between the College of University Rectors and business partnerships. However, in Spain, for example, the interface between business and higher education remains weak. This is causing increasing concern to policy-makers. Graduates emerge after a number of years where their education has been paid for by the taxpayer but with insufficient awareness of business realities and concerns and without sufficient relevant skills and competencies to add value early in their careers.

High graduate unemployment or underemployment in many European countries (and indeed in other countries around the world) is in part a reflection of the dislocation between the worlds of higher education and business. It represents a waste of national resources and investment as well as individual potential.

It is hard to assess the significance of national partnerships and forums. They clearly provide a valuable source of communication between business leaders and higher education. They may also exert influence on government thinking and, by virtue of their independence from the interests of a single sector, may make a significant impact on national policies and the practices of the players involved. Insofar as they commission research and policy analysis, they can also add to the knowledge base for higher education policy-making at both national and institutional levels. Although such national organisations do not exist in all countries, they perform functions that probably have to be performed by other means in their absence. Where they do not exist, as in India, there is a growing awareness of the need for such an agency.

**Other mechanisms for collaboration**

All countries have a variety of ways through which relations between business and institutions are developed at the practical and local level. These include:

- Cross-representation at board/council and faculty level.
- Interface units through which access to institutions and their R&D and knowledge can be channelled.
- Department and faculty level arrangements for liaising with specific sectors and businesses.
- Specific schemes whereby knowledge is transferred for the benefit of businesses, the institution and students.

In Hungary, many HEIs have established "social senates" to ensure business representation in university decision-making. On the other hand, there is little business representation on the main

councils of HEIs. Nor is there much academic representation on the boards of businesses. However, at sectoral and local levels, the establishment of various advisory bodies has enabled representatives of higher education, business and local government to contribute to strategic thinking on higher education. In addition, research coordination centres help focus the R&D efforts of specific sectors and also at regional levels.

Elsewhere in Europe, rectors sit on the supervisory boards of many companies and business people sit on the governing bodies of HEIs. However, they are rarely involved in academic policy-making although they do also sit on advisory groups that help determine the curriculum at department and faculty levels.

In India the fact that such cross-representation is not the norm is a matter for regret, with calls for the state to require business involvement on the boards of institutions.

Most Australian universities have structured themselves to interact effectively with business. Many have created senior management positions with briefs for development and links to the business community. These positions are generally supported by research offices and related commercialisation offices or entities that assist university staff to attract external funding and to commercialise their research results. The various research bodies are represented by Knowledge Commercialisation Australasia. As far as course provision in Australia is concerned, business involvement is through advisory and supportive roles with individual universities. A growing number of courses involve workplace placements as a required part of the course with universities seeking out suitable placements for students.

Most Malaysian universities have created units to coordinate research and consultancy activities. They have also established holding companies as commercial arms of the universities in order to streamline and to focus on the commercial activities of the university. A current trend is to bring research, consultancy and commercialisation initiatives under one organisation.

The University of Malaya has established an industrial training unit to facilitate work-integrated learning. The unit believes that students develop greater interest in academic work when they see the connection between jobs and the classroom. They develop career skills, knowledge, enthusiasm, self-confidence and focus. Upon graduation they have the experience and the skills to succeed in the workplace along with valuable professional contacts and references.

Industry-based courses represent a smart partnership all round for the educational institutions and employers. It is a cost-effective way for employers to identify and recruit potential full-time professionals, build fruitful long-term relationships with industrial institutions, and develop employees who have the skills and knowledge their industries need.

As part of the *vinculacion* system in *Mexico*, businesses work with universities and governmental bodies at local and regional levels to promote specific activities such as helping to arrange placements, furthering quality circle initiatives, suggesting curriculum changes and jointly sponsoring further educational programmes, mostly for professionals.

Professional bodies will also play a role in developing and accrediting courses in many disciplines. Despite their business focus, they can however be forces for conservatism rather than progression, flexibility and the encouragement of innovation.

Many institutions in the countries covered have established business incubation centres and technology parks. These promote the commercialisation of research findings by providing the expertise and facilities of the university for businesses and individuals to conduct start-up and pilot projects based on technologies developed by the university. The parks nurture their tenants' capabilities and attract existing high-tech companies to help create a rich soup of enterprise, skills, capital and mutual support and advice.

In England, the government has established via the funding council funds that facilitate in each institution the development of interface units between higher education, businesses and the wider community. These units are points of contact between the different organisations and often are the repositories of information on such issues as IPR, venture capital and contractual and legal issues. As centres of institutional knowledge and expertise they can benefit external organisations and where they handle placement opportunities can also benefit students.

Specific schemes part-funded by the government encourage the transfer of knowledge and establishment of contacts (including with small businesses). Where these involve students and graduates solving business problems there are benefits both to the external organisations and the student or graduate. The Teaching Company Scheme (TCS) is one such scheme.

TCS is a UK Government scheme that enables firms of all types to take advantage of the wide range of experience/expertise available in the knowledge base of HEIs and public and private sector research institutes and organisations. Through TCS, partnerships are formed between UK companies and groups of staff, often from different disciplines, in the UK knowledge-based organisations. At the heart of TCS programmes are innovative projects that are central to the strategic development of the company partner. The projects are implemented by senior staff from both the companies and the knowledge base partners with the help of recently qualified graduates who are recruited for the specific project. The aims of each TCS programme are to:

- Improve the competitiveness of the company partner.
- Enhance the employability and career of the graduates.
- Increase the business understanding and relevance of the knowledge base partner.

The establishment of interface units ("cooperation centres" in Hungary) is often crucial to achieving this. HEIs are diffuse and often impermeable creatures. Small businesses in particular value a single point of contact that can then direct the enquirer to the appropriate information or relevant person within the institution. Academics can also welcome the expertise, business experience and contacts that can reside in a well-resourced and respected interface unit. That unit may take responsibility for the letting of consultancy and other contracts to ensure an institution-wide approach and policy on such sensitive issues as the distribution of fees and apportionment of liabilities and responsibilities.

These few examples of mechanisms of collaboration between business and higher education at more local levels indicate something of the variety of the arrangements that exist.

**We recommend:**
That the establishment of business/higher education interface units is encouraged in all South African HEIs.

**Some general points can be made**

1. Many of the specific arrangements described reflect fairly immediate functional needs

of business and/or higher education, e.g. higher education needing student placements or businesses needing specialist research expertise. As such they are local and, as far as the HEI is concerned, may affect only few within it. They do not change the culture of the institution and the way it views its customers and partners. Neither do ad hoc arrangements change the overall business or academic climate and how each views the other.

2. Other forms of collaboration attempt to be more strategic with an agenda of shaping the future of higher education, whether within a single institution or in a city or region. These hold the prospect of more pervasive and long-term influences both on universities and businesses.

3. There may be a strong regional element. This may reflect the characteristics of the system of government and political authority, as well as economic factors and the existence of a diverse range of HEIs in the region. It should also be noted that, especially at regional levels, higher education as a distinctive educational sector may be less important than as part of a larger system of education and training, involving all sorts of institutions, public and private.

   In the UK, each region and country has its own association of HEIs. These provide a framework within which institutions can cooperate (for example on widening participation and knowledge transfer) and with regional development agencies on regional regeneration, economic and skills strategies. They can provide a medium for a structured and coordinated interface with business organisations and the wider community including for marketing the role and benefits of higher education and hence the appropriateness of regional financial support and investment.

4. The permeability of individual HEIs to business interests varies very considerably according to tradition, funding mechanisms, and current government policies - including legislation on institutional governance. In many cases, there is little doubt that government has played an important role in forcing open the door to collaboration within universities. In some other cases, it is also true that government has played a role in protecting higher education from what are sometimes seen as the malign influences of business. The overall pressure, however, is for institutions to:
   - Be more responsive to business needs.
   - Be more relevant to the wider communities in which they reside and operate.
   - Act as catalysts for the development of knowledge regions and wider national economic and societal development.

**Benefits and problems**

Given the diversity of collaborative arrangements and the diversity of the contexts in which they have arisen, it is difficult to discern general lessons from international experience in this area. It is certainly the case that there has been relatively little systematic attempt to monitor and evaluate the effects of the various arrangements, and hardly anything at all in a comparative context. Some commonly reported problems - e.g. unclear objectives or lack of commitment - are hardly surprising in this as in any other field of endeavour.

Amongst the more specific *benefits* discernible from the countries considered here are:

- Success in creating and nurturing an R&D culture in public universities that takes

account of business priorities and the potential for both business partnerships and follow-on applications research.

- The reduction in research duplication and progress towards commercialisation by developing research management centres, monitoring units and even companies which oversee the entire process (e.g. IRPAs in Malaysia).
- Business has provided additional stimulus and support for research in universities, including sometimes substantial investments in world-class facilities and joint research units.
- Success (due to various mixtures of exhortations, funding initiatives and self-interest) in developing a more entrepreneurial spirit in universities. In the UK, sponsored research reached some $3 billion in 1999/2000 with 12.3 percent from UK business (up from 10.9 percent in 1995/6) with the number of patents filed also increasing substantially.
- Extra income for higher education through the sale of patents, licences, royalties etc. and from consultancy and teaching work for outside organisations. In Hungary some 30 percent of HEI income comes from non-government sources.
- Success in the development by universities of courses for specific employers (e.g. almost 90 percent of post-1992 universities in the UK run such courses) and involvement in some form of local regeneration activity.
- Access by university staff to current information about developments in the professions and in business and industry, including contributions to curriculum development.
- Recognition and prestige for contributions made by universities to society at the local, regional, national and international levels.
- For business, the solution of operational and management problems and the acquisition of university expertise and technology, personnel training, enhanced efficiency, competitiveness and profitability.
- The development of graduates who are more ready for work with appropriate employability skills, awareness of how businesses operate and hence a capability to add value to those organisations and the wider economy earlier in their careers.

Some of these benefits are more concrete than others.

*Problems* include:

- The absence of sustainable funding for some initiatives.
- The tendency for business members to be less active in collaborative arrangements than their higher education counterparts (reported by B-HERT in Australia).
- A tendency for collaborative arrangements to involve only the larger business enterprises.
- A potential conflict (in education and training) between meeting employers' immediate needs and both ensuring academic coherence and depth and developing the underlying capabilities and competencies that individuals need to learn new approaches and handle different workplaces.
- Too much dependence on personal links rather than institutional ones - researchers may establish their own businesses and work for their own financial benefit, to the cost of their own institution.
- Poor strategic planning, monitoring, evaluation and programme improvement mechanisms in universities.
- Lack of programmes for orienting the academic community to collaboration and for training and professional development of the staff who are engaged in this difficult

interface area (few are equipped to move easily between the two worlds, understand the different cultures and speak the different languages).

- Over-centralised decision-making and bureaucracy in universities that limits their responsiveness to opportunities.
- Often a lack of prestige for working at the business interface reinforces an academic reluctance to embrace and feel comfortable with this area of activity; funding and reward mechanisms can encourage the process of change.
- Perhaps above all, the continued tendency for universities to "formulate their missions along traditional teaching and research lines" in the absence of alternative strong funding signals and incentives; without a clear lead from the government, change will be slower than it otherwise would be.

In Hungary no ministry has a budget to encourage cooperation between higher education and business. But without such a funding incentive institutional change will remain limited. Business and higher education recognise that there is a need for a concrete support programme to fortify their relationships. Given the priority the government also attaches to this issue, it is surprising that nothing has been established.

These and other problems can be overcome. But there needs to be a collective will to effect change and the mechanisms and incentives to bring that about.

For some in universities, a stumbling block may be the question of "who is in control?" Especially in societies where universities have only recently won back their autonomy from repressive political regimes, there may be understandable reluctance by academics to participate in "service" relationships with other parts of society. Collaboration does not of course need to become external control over the university, but the language used to support collaboration needs to be chosen with care in order to allay the fears of the sceptical. It can become divisive within individual institutions when business links are the preserve of a limited number of consequently rich faculties and provide nothing that can be valued by the institution as a whole.

It is probably valuable when collaboration moves beyond the functional and instrumental to the more strategic where business/higher education collaboration can be seen as part of a wider agenda for effecting economic and social change. This appears to be the level at which national business/higher education liaison bodies can play a particularly valuable role. Sufficiently removed from the practical needs (and interests) of individual businesses and universities (and the people who work in them), they can take a more detached and long-term view of relationships and purposes.

> Education must not be undertaken to pre-form its students to some fairly detailed person-specification sent out by industry. Most younger students nowadays, and probably most of their lecturers too, see their higher education, at least in part, as a preparation for working life. But we must never suggest that the desired engagement of universities and employers is one of "suppliers" (universities) of "products" (graduates) to "consumer-customer" employers. ('Engagement as a core value for the university: a consultation document' Association of Commonwealth Universities, London 2001)

Conclusion

Higher education is at the heart of developing more knowledgeable, wealthy and socially equi-

table societies. To do this, it needs to be engaged and embedded in those societies. It has to understand and respond to the concerns of the world. It has to be relevant. At the same time it has to be a key agent for change, influencing and not just responding to events and immediate pressures.

This strategic role and positioning underpins the rationale for high-level national forums. These are:

- The champions of an independent and healthy higher education sector.
- The medium through which understanding of mutual concerns are channelled.
- The forum where the wider needs of society can be considered and start to be addressed through joint action.

They embody a process where the meeting and exchange of concerns and perspectives is as important as the specific policy outcomes. They are most effective when they can engage the government behind the scenes and effect change through debate rather than through public statements and positions.

To be effective, such forums tend to be:

- Established independent of the government (though the government might have a role in signalling its support and stimulating its inception); hence it should be self-funding (though the government might commission specific projects or research from it).
- Founded by a business champion who cares sufficiently about the cause of partnership that s/he is willing to devote time and persuade others to join the forum.
- Comprised only of the heads of businesses and academic institutions; substitutes would undermine the special perspectives that such leaders have to offer and reduce the influence of the forum.
- Led by a chief executive who is full-time and can command the respect of both the business and academic communities.
- Focused on an agenda that is strategic but also with the potential for some early wins.
- Well connected to other forums, not seen as threatening and able to influence others by the power of persuasion and the quality of its output.

Such a forum would be an important and necessary signal to all sides that the issue of business-higher education partnership is central to the economic and social development of a modern South Africa.

**Recommendation:**
The leaders of South African business and higher education consider how a high-level business/academic forum might best be established.

The government offer such support as is appropriate to ensure its initial success.

**Terms of reference**

To offer an analysis on the content and structure of relations between business and higher education in a selection of countries. In particular, to offer insights into how such relationships were constituted, the main drivers and what their purposes, effects and achievements have been.

# KEYNOTE ADDRESSES

# Address by Professor Kader Asmal, MP, Minister of Education, at the opening of the Council on Higher Education Colloquium: Building Relationships Between Higher Education and the Private and Public Sectors and Contributing to their High-Level Personpower and Knowledge Needs

Chairperson,
Members of the CHE,
Professor Saleem Badat, Chief Executive Officer of the CHE,
Distinguished guests,
Ladies and gentlemen.

This colloquium marks a landmark for higher education. This is surely the first time that leaders from the public and private sectors, the labour movement, civil society and higher education have come together to discuss how they can together respond more effectively to the human resource needs of the country.

The colloquium also marks the coming of age of the CHE. The term of office of the first council came to an end earlier this month and the baton of leadership has passed to the new members under the chairmanship of Saki Macozoma. I would like to take this opportunity to pay tribute to Professor Wiseman Nkhulu for his pioneering leadership of the first council and for steering the CHE so ably through its birth pangs. I also want to thank all the outgoing members of the CHE who are here today for their valuable contributions. I hope that you will continue to serve higher education in new and different capacities.

I would also like to commend the CHE for rooting this colloquium in the context of the Human Resource Development Strategy of the government, led by my Cabinet colleague the Minister of Labour and myself.

The Human Resource Development Strategy is an investment in the future of our country, in particular its economic, social and political future. The strategy is profoundly mindful of the discriminatory practices that characterised education and training in the past. It is also mindful of the place of South Africa on the African continent and in the global economy. As such, the strategy asserts human dignity as the fundamental value informing human resource development and puts the realisation of the potential of each individual at its centre. It also sees work as the instrument to bring about social justice for all.

The strategy requires us to see education and training as an engine for economic, social and political development. This places responsibility on higher education to make a significant contribution to three objectives: to improve the social infrastructure of the country; to reduce disparities in wealth; and to improve international confidence in, and investors' perceptions of, the country.

To succeed in this challenge requires fundamental change to the relation between HEIs and society. While in the past, higher education could have been described as an institution in soci-

ety, now it must be an institution of society. The social contract that links HEIs and society must be accordingly revised.

The changes in the relation between higher education and society are, in part, a consequence of the changes that have taken place in society in general but particularly in the organisation of the world of work. This, in turn, has brought about a redefinition of the skills, competencies and knowledge that employers, whether public or private, expect to find in their staff, at all levels of employment.

Your discussions over the coming two days will address important aspects of this relationship, in particular the following three key questions:

- How do the changes currently taking place in the production system and in society affect the relationship between higher education and business?
- What are the best approaches and strategies for higher education to contribute to meeting the demand for high-level skills in the labour market?
- What is/ should be the nature of the relationship between higher education and business and the reciprocal rights and responsibilities in the production, ownership and dissemination of knowledge?

This relationship is critical to the success of our economic development strategy, in particular the government's commitment to improve the quality of life of all our people. However, I would argue that important as it is, the relationship between higher education and business cannot be the starting point for defining and understanding the role of higher education in society. We must guard against a narrow instrumentalist approach that reduces the role of education in general and higher education in particular to the needs of the economy.

I do not have to remind you that education aspires to loftier ideals. Its primary goal must surely be to provide individuals with the tools to take control of their lives, to understand, appreciate and engage with the world in all its complexity. It must, as the Class of 1976 reminded us so forcefully, provide the tools for liberation. Liberation from hunger, from want, from the drudgery of work and from the humdrum of everyday existence. It must lay the basis for creating the renaissance man and woman who, as a wise philosopher who has fallen out of fashion in recent times so eloquently put it, can hunt in the morning, fish in the afternoon and philosophise in the evening!

The fundamental point that I want to make is that education is more than about skills and competencies narrowly defined, particularly in relation to the needs of industry. This is not to suggest, however, that skills and competencies are unimportant. The key issue is how do we ensure that the skills and competencies we need to develop are embedded within the broad set of values and principles that give meaning to human existence.

It is against this background that I urge you to probe not only what kinds of knowledge, skills and attributes employers value in graduates of higher education but also what society more broadly values. What are the generic attributes? What are the specific requirements of different employers/professions? How fixed are these? What are the desired attributes of graduates destined to be self-employed and likely to change their occupations more than once in their working lives? Indeed, you may want to begin by asking whether employers have a clear understanding of the knowledge, skills and attributes that they seek in employees. Or more importantly, is it the role

of the education system to prepare individuals for particular occupations or should this be the responsibility of employers through on-the-job training?

In this regard, it is also imperative that we remind ourselves of the failures of manpower planning and the futility of the simplistic supply-demand approach to forecasting labour market needs. These approaches, which were punted for the better part of the 1960s and early 1970s by the World Bank, have had dire consequences for skills development in Africa. This does not, however, mean that planners in government and in HEIs should not be sensitive to the broad labour market signals. They cannot, however, be the primary basis for educational planning.

We must also interrogate the impact on higher education of a closer link with industry. It could be argued, for example, that the new forms of managerialism that are emerging in higher education in South Africa and elsewhere are in part the product of attempts to enhance the efficiency and effectiveness of higher education through utilising organisational principles and models from the world of business. While there can be no harm in learning from the business world, we must ask whether managerialist models impose constraints and limits on the teaching and research agenda of HEIs.

Indeed, the impact of business models has seen a marked shift in the focus and organisational ethos of HEIs, which are becoming increasingly competitive and market oriented. It has resulted in an undue focus on developing academic programmes that are marketable and consequently generate high income returns and a concomitant downsizing or closure of academic programmes which are not seen to be performing optimally in relation to a set of market-oriented criteria. There is no doubt that this is adversely impacting on teaching and research in the humanities and social sciences in general.

Ask any vice-chancellor present here and they will tell you that the future of history is threatened because of declining enrolments. In many institutions, the study of languages has been downgraded, if not shut down completely. This surely cannot be good for the development of our young democracy in which a common sense of nationhood remains to be developed. It surely cannot be good for the development of our industry in an increasingly complex global environment, in which the understanding of different cultures and the ability to converse in different languages is not unimportant in making inroads into new markets.

On the other hand, must academia remain forever fearful of entering into strong and meaningful partnerships and arrangements with industry and commerce? Surely, the most important challenge is to manage the relationship between higher education and industry in ways that are mutually beneficial and that advance national objectives. National objectives must come ahead of the narrower objectives of industry and commerce on the one hand or of academia on the other. Strong and robust dialogue between higher education and external partners is the surest way of defining national interest.

Let me conclude by turning to government's proposals for the transformation and restructuring of the higher education system. I must emphasise that, taken as a whole, the proposals, as set out in the *National Plan on Higher Education* (2001) and in my ministry's recently released document, *Restructuring and Transformation: A New Institutional Landscape for Higher Education*, are in essence designed to respond to the dual challenges of equity and development. Without doubt, the higher education system, as it is currently configured, simply is not able to respond adequately to the human resource development challenges that confront us.

We have to expect more from higher education. We expect institutions to markedly improve access, not only by increasing access but also by broadening access to a far wider cross-section of society, including mature students and the disabled. But equity of access must be accompanied by equity of success. No system can afford a "revolving door syndrome".

We also expect to see significant change in enrolment patterns by fields of study so that we can be internationally competitive while meeting more local needs. Equally important, we will also be paying attention to curricula issues and, together with key partners within and outside of higher education, we must address ways in which the cognitive skills and competencies of students are enhanced. All of this needs to happen in a context of an increasingly complex and diverse environment with competing tensions.

Many variables will inform the medium- to long-term success of our change agenda in higher education. However, our chances of success will be considerably greater if we succeed in building robust and sustainable relationships within the education sector and with partners in the public and private sectors and with civil society. I am confident that this colloquium will help to inform us about the nature and forms of such collaborations and partnerships.

The country needs creative and brave approaches to difficult problems and the realisation that what we do today will have long-term consequences, especially when it comes to education. I wish you every success with your deliberations and I am looking forward to hearing about the conclusions you reach and any recommendations that you may come up with. I hope that your recommendations will not be confined to government but that you will seek to explore possibilities and solutions for all the key partners in the Human Resource Development Strategy, including employers, the education sector, the labour movement and civil society.

I thank you.

# Address at the Council on Higher Education Colloquium Dr Ben Ngubane, Minister of Arts, Culture, Science and Technology

Prof Figaji / Mr Alberts, distinguished guests, ladies and gentlemen, I welcome this opportunity to contribute to the deliberations of the CHE on R&D. This is a very important issue for the National R&D Strategy that DACST is preparing for the coming Cabinet Lekgotla.

It is important that we accept the very complex and comprehensive nature of the reform processes with which we are engaged currently.

The changes in the HEIs are redefining tertiary education and are calling forth a new dynamic vision for tertiary education.

The size and shape, the equity, quality, and social development imperatives of South Africa in the 21st century conjure up a number of questions:

1. Are we going to realise the higher levels of participation at the tertiary level, driven strongly by demands reflecting the diverse interests of students and society at large?
2. How should tertiary education better respond to the interest and choices of clients, students foremost amongst them?
3. What should be done to adapt teaching methods or restructure curricula?
4. How should the needs of those not currently served in the first years of tertiary education be addressed?
5. How should government interact with the large, diverse tertiary institutions that we are currently creating?

And, finally, how can we best mobilise the energies and expertise of staff and institutions as well as partners and how do we secure adequate resources and improve efficiency in the face of intense competition for public funds?

If we answer some of these questions we shall have contributed to the laying of a solid foundation for the new landscape of tertiary education in South Africa. However, there remain other issues just as urgent to which we must develop appropriate responses.

1. Internationalisation is becoming an integral part of university teaching and research.
2. Higher education institutions are increasingly operating in a global market in which quality assurance and assessment are particularly important and sensitive issues. Consequently our institutions are challenged by the necessary convergence required to meet the new demands of globalisation.
3. There is the increasing demand for specificity necessitated by the need to respond to continental, regional, national and provincial demands for knowledge-based development. There is a real need to move beyond simply increasing the general education level of the population and the output of scientific research and to harness university education and research to specific economic and social objectives.
4. There is an urgent need to create a more favourable climate for both old and young scientists.

- Young scientists decide what our universities - what our society as a whole - will look like tomorrow. We need to abolish outdated scientific hierarchies and dependence. We should move swiftly to create junior professorships so that young scientists (especially young women scientists) start doing independent research and to teach in their early 30s and no longer at an average age of over 40.
- For the over 40s we must reward performance i.e. commitment to teaching and research while at the same time strengthening performance-related criteria in fixing professors' salaries.

5. It is widely acknowledged that South Africa has achieved macro-economic stability and has established a policy environment that enables a sustainable growth trajectory. The positive rates of the GDP expansion, our increasing export orders, the improved revenue collection system, and the efficiency of our expenditure management have consistently contributed to this optimistic perception of our domestic economy.

A careful analysis of these and other macro-economic indicators suggests that the transformation in South Africa is qualitative as well. Our economy has emerged in the 21st century as a robust and dynamic set of private and public institutions, engaged continuously in improving its levels of productivity and competitiveness. The question we have been asking is whether a stable policy environment and increased efficiency are sufficient to hurtle us on to a higher plane of economic growth and sustainable development.

According to research commissioned by the National Advisory Council on Innovation, economic growth in South Africa in the 1970s and 1980s was largely due to growth in capital and labour inputs. By the 1990s, growth in the labour force contributed negatively, and growth in capital input contributed relatively weakly, to the expansion of the GDP. According to this report, the single strongest contributor to the output growth of the 1990s is strong augmentation in technology. However, there is presently a serious under-investment in science and technology. We are still largely a resource-based commodities economy and, even then, the degree of value-addition in the export commodities makes us very vulnerable in international markets, where gains in access to markets can be lost with growth in non-tariff barriers to trade, limited access to new technologies, and more particularly, a weak if not latent, domestic capacity for science and technology.

We need to examine this much more closely. Just how we understand and position ourselves in terms of the contribution of technology inputs to economic growth, determines whether development is sustainable or not. The conclusions of international studies such as that of the OECD in respect of knowledge-based economies indicate that more than 50 percent of new wealth creation of G8 countries is knowledge-based. In this context I would like to draw on comments made in one of the background discussion papers prepared for this colloquium by Rosemary Wolson, and I quote:

> Intellectual property (IP) is attracting unprecedented attention in the new technology-driven "knowledge economy". IP issues dominate or feature strongly in several global debates on topics such as international trade, sustainable development, access to drugs, food security, technology transfer and the conservation and exploitation of biodiversity, evoking fervent discourse.

The growing importance of the value and flow of national stocks of knowledge and the currency of the new economy is evident in terms of the growing range of development "divides", be it the

digital divide, the bio-divide or just in terms of the extent of the dependency a country has on foreign-sourced technologies. Recognised as a developing country, South Africa is considered to have achieved a significant level of technological sophistication both in the economic infrastructure base and in terms of the quality of life of our society. However, there are indications that our National System of Innovation has some serious deficiencies.

The crucial deficiencies I wish to single out are technology innovation, human capital development and governance.

By international accounts, it has been established that South Africa accounts for about 0.5 percent of the global output of new knowledge. Despite this, our economy is profiled as a net importer of technologies. In fact, we spend approximately R800 million per year on royalty and licence fees for the foreign technologies we are using. Work that has been done in preparing the National R&D Strategy recognises that there is an "innovation gap". The knowledge that we are producing finds its way into the global knowledge pool but has no interface with the economic base of this country.

What is even more alarming is that it can therefore be said that our industry has little confidence in the capability of the domestic knowledge base to generate knowledge-based solutions. South African industry, and quite often government as well, prefers to source technologies from abroad at dollar rates.

This takes me to another deficiency, namely that of human capital. Given the very rapid development of key technology areas today, we will expose ourselves to insurmountable security risks if we do not commit ourselves to maintaining and developing competencies across the system (universities, research councils, private sector, etc.) in critical strategic areas. Our human resources in science and technology are not being adequately developed and renewed; we have an ageing and shrinking scientific population. The key indicators show that black and women scientists, technologists and engineers are not entering the academic ranks and that the key research infrastructure is composed of people who will soon retire. In 1990, the percentage of scientific publications produced by researchers 50 years of age and older was 18 percent (one in five), but by 1998 this figure had increased, alarmingly, to 45 percent (one in two). Over the same period the percentage of publications by black scientists rose only very slightly, from 3.5 percent to eight percent (less than one in ten). Participation by women has not changed in the 1990s, with publication output being about 10 percent of the total. Currently there is less than one researcher for every 1,000 members of the workforce, as compared with five in Australia and ten in Japan. Given that "technology walks on two legs", the "frozen demographics" prevalent in our National System of Innovation represent a critical state of affairs.

The deficiencies in innovation and human resources create a compelling argument for government to provide whatever means necessary for the development of our knowledge industry, that is, to those who are in the business of producing new knowledge and finding applications for existing and new knowledge.

Some two to three years ago an article appeared in the *Engineering News* describing the policy environment and strategic basis for government's allocation of approximately R2 billion to supply-side interventions, mainly R&D, and other support measures advanced through the trade and industry, and science and technology portfolios.

Since then a number of policy and strategic interventions, industry and sector focused, have been restructured and designed to steer the public sector research and the higher education sector towards more economically relevant engagements with the private sector. Good examples are the Technology and Human Resources for Industry Programme (THRIP), the Technology and Human Resources for Industry Programme, as well as the Innovation Fund.

We have now reached the stage where a much bolder intervention is required and this has been captured in the National R&D Strategy, the key objectives of which are to:

- Achieve mastery of technological change in our economy and society.
- Increase investment in our country's science base, specifically addressing human capital and transformation.
- Strengthen and realign the science and technology machinery of government.

This represents interlinked challenges and is consistent with our understanding of the evolution of knowledge production from the academic exclusivity of Mode 1 to the problem-solving nature of Mode 2. In the latter, knowledge is the product of multi-disciplinary research in the context of applications. Supplementary to this approach is the collaboration between private and public sectors in higher education. This partnership has often been labelled the "triple helix" and, while not unproblematic in practice, is considered a source for higher levels of innovation.

HEIs play a key role in the generation of R&D capacity, increasing our stock of technically skilled personnel and maintaining our associated technological infrastructure. Our experience with the Innovation Fund confirms our commitment to Mode 2 knowledge production and the triple helix as a virtuous mechanism to ensure robustness in our efforts. This concern is especially relevant in the context of the scarcity of higher skills and the frozen demographics of the system.

In conclusion, higher education and research and development are intertwined in a co-dependent relationship. Positive externalities result from deliberate interventions by government in redressing the failures of market instruments. An evolutionary approach seeks to maximise social returns on the basis of public investments, while expanding the possibilities of economic results. This raises the need to retain elements of relevance and appropriateness that do not constrain innovation.

Thank you.

# Address at the Council on Higher Education Colloquium
# Alec Erwin, Minister of Trade and Industry

**Introduction**

Thank you for this invitation to address you this evening. The subject matter of your colloquium has long been a matter close to my heart. I think the fact that you are being addressed by a few ministers shows that it is a matter of vital contemporary importance to the South African economy and society. Looking at the papers and participants I am quite certain that there is little that I can say on the specific issues that has not already been said by more expert persons than myself.

So I hope you will indulge me if I share some of my own views on the relationship between the economy and institutions of higher education.

I would like to raise some of what I see to be the challenges that face this interface between higher education and economic change.

I believe that the full implications of the economic changes that South Africa is going through and will go through are not often understood. One of the most profound of these is that we all need both retraining and the capacity to rethink the obvious - or what we thought was the obvious. I think that it would not be unfair to say that the usual presentation of the problematic of the relationship between business and higher education is that on the one hand the latter needs to provide the appropriate skills for the former and that the former should help in various ways to finance the latter. This is a caricature - but not too wild a one - but it will serve me in making my case on the challenges.

It is my view that the relationship between business and higher education is going to change in that there will be a migration of business activities into institutions of higher education and of higher education functions into business and government.

Let me make my case and draw some inferences for how we should structure this relationship.

**The knowledge network**

I am not going to argue that there is some dramatic new model that you have not seen and I am bringing you the light and the way. Much of what I will say is very familiar. I want to arrange it in a way that leads to certain operational conclusions.

We all speak of the knowledge economy and I think what we mean by this is that knowledge is available in larger quantities in amazingly short periods of time. More important, the knowledge can be applied to a host of electronic, mechanical and chemical processes in a systematic form that allows the knowledge to operate processes, with limited but critical interventions of the human mind and hand. It is this that has an impact on the speed with which new products and technologies are produced. It is this that has had dramatic effects upon where production can be located and with what combination of skills any process can be undertaken. The human skill

component has to be more and more versatile. Simple operations are only simple for a while and there is a continuous pressure to reorganise processes and people. The higher the level of generic knowledge and skill and the more adaptable the persons the easier it is to reorganise.

What the Internet has done is to create a massive web of knowledge that can be accessed at any time and for any purpose. The permutations of knowledge manipulation have grown not so much in terms of the infinite number of permutations that are possible but in the speed with which there is turnover. It is important to understand this, as it is the rapidity of turnover that creates the new qualitative, and thereby quantitative, dimensions.

What this means is that no institution of higher education can afford not to be plugged into this web. The problem is, what do you teach? Are we teaching the students the tools to access the knowledge for themselves? Are we doing that but also interpreting events and teaching some generally useful knowledge? If we are doing this latter are we confident that the teacher is keeping up with events? Are the teacher's conclusions either wise or useful? If the knowledge base is hard to access or changes slowly we could ask ourselves these questions at our leisure. But we know that neither of these apply, so what do we do?

It seems to me that the institutions of higher education have to find a steady course between these fast-moving currents. They have to have the capacity to discern what is knowledge that is of use to all the students in a discipline and they have to give their students adaptive abilities that will allow them to continue learning so as to be useful in the rapidly changing world. To do this all institutions have to in fact transform themselves into learning institutions. This applies to universities, technikons, business enterprises and governments. Conscious teaching processes and learning processes are now necessary. It is no longer the question of acquiring a skill, embodied in a graduate, that will be put to use - at least this is not the sole and even main point of employing a graduate, although it is one of the points - rather it is acquiring that particularly human property of a capacity to adapt and learn. The acquirer will benefit more if institutions facilitate these two processes for the person employed and will benefit less if they don't do this. In fact it is likely that the latter such institution will be itself so lacking in adaptability that it will disintegrate in one or other way.

What is the practical or operational implication of this? It is that learning networks have to be built along with the knowledge networks. One yardstick that I use to measure institutional success is the number of learning networks it has. This is not the same as how many different people are taught. It is how many different situations are developed where the teacher and the student are both learning. With specific reference to business then it is how many linkages are created where the HEI is both learning and teaching a business entity or entities. If a business or a government is both learning from and teaching an institution of higher education then its knowledge networks are open and healthy. In the DTI we are only just embarking on such a course. Let me stress these are not some wild ideas as I have seen this starting to happen in a number of areas.

So for institutions of higher education to be effective they have to integrate themselves into learning networks with business enterprises and government. The teaching and skill development we seek as an output from our higher education system is not achieved only within those institutions; it is achieved within a network that they have to build within the economy. So the form and the site of learning are changing with a migration out of the institutions as such.

**Knowledge products**

It is now almost a trite proposition that knowledge is a product precisely for the reasons that we have looked at above. Maybe it would be better to say that the facility of its manipulation (the technology concept of old) is now the most sought-after of products. A simple but powerful and not unproblematic proposition follows from this and it is that business is forcing its way into the institutions of higher education. Knowledge is now more easily converted into a currency than ever before. This means that the temptation to move into business on the part of the individual and the institutions is greater than ever.

This is a complex, exciting but dangerous process. The various science parks around the world linked to universities or technical colleges are a testimony to this. Good providers of knowledge and more particularly their ability to manipulate it into technology are magnets for business. This is an important process and there are few governments who don't have some variant of such a programme in their manufacturing or industrial or R&D strategies. But it is a process that has to be very carefully managed as those same governments, including this one, are finding out.

Knowledge is not in fact a commodity and can never be one. Knowledge is the distillation of human endeavour and it is the most profound collective good that there is. So when it is turned into a commodity this is a particular use of knowledge and the more it is privatised the more it will either corrode the collective knowledge base or itself corrode as it distances itself from that collective wellspring. What governments are learning is that the latter process is surprisingly powerful and even dominant. So if an institution or even a society tries to make its knowledge an instant commodity it will soon find that the quality of the product rapidly deteriorates. This is because the generation of knowledge is a complex process of individual interaction with the collective with the only reward being the pursuit of knowledge.

The operational conclusion is that there is now a more powerful attractor between institutions of higher education - if they are good - and business. This is a positive development but will have the effect of rapidly distorting resources towards the better-endowed institutions unless there is an overall plan. Business no longer just has the need for graduates but the need to convert knowledge into a commodity. So it is a potentially positive process for all only if it is governed by some wise protocols that protect the collective dynamism of knowledge - its public dimension. Secondly, there has to be the overall plan we now strive for in tertiary education. This brings me to the next exciting challenge.

**The aggregators and validators**

The amount of knowledge available is also a practical problem for any institution and not only for the lecturers deciding what to teach their students.

It is a major problem for governments and business enterprises. Both need two critical functions to be performed by someone. This is to aggregate the useful. But to know what is useful and important we need some process of validation. The only known way of achieving the aggregation and validation process is for the best human minds to apply themselves to the problem. In doing this they will invoke method and wisdom - the latter referring to the understanding of human history and its interaction with knowledge and science. These are the centres of excellence that have occurred throughout history. They have interestingly enough almost always been cosmopolitan in the composition of the minds that they attract. The great success of the present industrial powers has been critically dependent on their ability to attract, at times even force, intellects to their own centres of excellence.

These sectors of excellence are always part of a knowledge network; otherwise they cannot fulfil the aggregation and validation process. However, they do not just spring up. They are conscious acts. In South Africa we have to build these. If we do not then we will remain technologically stunted and this will shape our economy in particular adverse ways. This requires a major collective effort that cannot be held hostage by any particular interest. But the effort is a partnership and a network. It is not a new job for a privileged few as the objective is precisely to invigorate that collective dynamism of knowledge in South Africa where the prospects for this are so exciting.

**Conclusion**

I have argued three areas where I think we are seeing and will see new relations building up between the institutions of higher education and business and the economy more generally. These are not discrete relationships like a donation or recruiting a graduate. They are permanent relations that are integral to the institutional success of all sides. All of them can be made more effective if we are conscious about what we are doing and if we act together to achieve them. We do require the institutional changes proposed for higher education, we require changes in managerial perspective and we will require an institutional form to advance the processes.

I sincerely hope that your colloquium will provide insight into how we proceed. Of course I accept the reality that my analysis may be wrong. I look forward to the colloquium putting me right because I, for one, cannot conceive of a more exciting time to be in the knowledge game in South Africa and Africa.

My mind races and my thoughts trip over themselves - maybe I need to go back to the good aggregators and validators that we will be building to learn a bit of discipline and acquire a little wisdom.

Thank you.

# Conclusion

In his summary of the deliberations of the colloquium, Saleem Badat pointed out that the actors who need to come together to build strong, healthy and durable relationships between higher education and the public and private sectors operate in particular spaces, often have particular preoccupations and may work according to different rhythms.

In terms of the higher education system while it is clear that the key functions of HEIs today are the production and dissemination of knowledge and the induction of learners into knowledge, skills and competencies that ensure that they are equipped to be economically and socially productive as well as critical and democratic citizens, the extent to which this is happening is not always evident.

In this sense HEIs agreed that the national challenge of the reconstruction and transformation of the economy and society requires responsive HEIs, and that unless they are organised to undertake these functions effectively and efficiently and with close attention to equity and quality they are unlikely to be innovative, dynamic and responsive institutions. This would inhibit their ability to make a powerful and critical contribution to the economic, social, cultural and intellectual development of South Africa.

It was also widely acknowledged during the colloquium that if there is no fundamental renewal, reconstruction and transformation, the functions that are today performed by HEIs, and especially public HEIs, will be increasingly undertaken by other knowledge-producing institutions as well as private institutions.

As for the private and public sectors, they clearly have their own transformation challenges. These include the present pattern of ownership of productive assets, the racial and gender composition of high- and middle-level occupations, job creation, reduction of inequalities and poverty, effective and efficient delivery of services, social security and generally the creation of a better life for all.

Just as with HEIs, the legacy of the past continues to manifest itself in the private and public sectors. If there are concerns about the institutional cultures of various HEIs, concerns can equally be raised about the institutional cultures of private and public sector organisations.

One of the points that both the research commissioned by the CHE and the discussion during the colloquium made amply clear is that it is unlikely that there will ever be a congruence between the outputs of higher education in terms of graduates and the immediate and specific needs of public and private sector employers. In this regard, if HEIs must become learning organisations, private businesses, parastatals, public organisations and government departments need to become mentoring organisations or they will not retain the staff who are endowed with great potential or expertise.

The deliberations of the colloquium brought to the fore a series of future tasks and activities that need to be undertaken by different groupings. Firstly, there is the need for research investigating the extent, nature and forms of partnerships between HEIs and the private and public sectors. Secondly, it was suggested that attention could be given to developing a principled rela-

tionship between higher education and the private and public sectors at the national level. The basis, nature and form of this relationship, the projects that could be undertaken jointly and indicators of its progress would need to be defined. Thirdly, it was suggested that regional interactions as well as individual interactions between a higher education institution and relevant private and public sector bodies could be more effective in yielding concrete benefits to both sectors.

At the time of sending these proceedings to the publishers the CHE has embarked on an initiative that puts into action some of the suggestions made at the colloquium, specifically, those that refer to the exploration of concrete forms of collaboration between HEI and private and public sectors on a smaller, more focused scale. Thus, "Responsiveness 2: Exploring Models of Collaboration", is a CHE project designed to facilitate three models of interaction between private and public sectors and HEIs. The first model is at the local level and involves collaboration between higher education institutions and local government; the second one is at the regional level and involves interactions between higher education institutions and businesses at that level; the third one is at the sectoral level and involves the interaction between higher education institutions and a specific economic sector.

As the results of these investigations unfold during 2003 the CHE will keep the Minister of Education as well as both HEIs and the private and public sectors informed of the outcomes and possibilities brought about by each of the three models.

Finally, the CHE would like to thank HEIs, businesses, representatives from the public sector, science councils and, of course, funding agencies, who contributed with their support, insight and enthusiasm to the realisation of a historical gathering between higher education institutions and the employers of high-level skills in South Africa.