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Bridging minds and markets: The South African experience[3]

Abstract

At present an historical conjuncture of separate and essential unrelated developments concerning environmental management are occurring in South Africa. These include the issues of standards assurance, certification of environmental practitioners and the development of curricula for a professional science degree at tertiary level. All these are occurring in the context of a rapidly expanding job market into which graduates with widely varying educational standards and practical competence are entering. This article reports on a survey of professionals in environmental impact assessment and environmental management in South Africa that elicited opinions on the quality and appropriateness of professional training. It seeks to inform debate concerning these topics and to highlight limitations in the structure and content of contemporary education. It is argued that there is little standardization across curricula and that the core competencies as recognised by professionals are frequently being neglected.

Keywords: environmental practitioners, curricula development, professional training.

DIE OORBRUGGING VAN PERSEPSIES EN MARKTE: 'N SUID-AFRIKAANSE ERVARING

'n Sameloop van omstandighede bring tans in Suid-Afrika aparte en essensieel nie-verbandhoudende ontwikkelings met betrekking tot omgewingsbestuur byeen. Dit sluit sake in soos standaardversekering, die sertifisering van omgewingspraktisyns en die ontwikkeling van kurrikula vir professionele wetenskapsgrade op tersiêre vlak. Al hierdie fasette hang saam met die vinnig-groeiende arbeidsmark wat gegradueerdes met wyd-uiteenlopende opvoedkundige standaarde en praktiese opleiding betree. Hierdie artikel gee aandag aan 'n opname oor die beskikbare professionele kundigheid en die omgewingsimpak met betrekking tot omgewingsbestuur in Suid-Afrika soos dit tans die geval is, asook die kwaliteit en toepaslikheid van professionele opleiding. Die inligting werp nuwe lig op die hele kwessie van die beperkinge ten opsigte van die struktuur en inhoud van die huidige onderwysstelsel. Daar is skynbaar ook min standaardisasie binne die huidige kurrikula-spektrum. Verder blyk dit dat kernsake, soos aangedui deur kundiges, totaal en al verwaarloos word.

Sleutelwoorde: omgewingsbestuur, kurrikula ontwikkeling, professionele opleiding.

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1. Introduction

This article is predicated upon the confluence, at a singular historical moment, of several disparate, but ultimately interdependent, events and circumstances. These are:

- Regulatory change necessitates regular impact assessments or rather becomes mandatory for certain activities
- A rapidly expanding market for professionals in environmental assessment and integrated environmental management
- A review of the curriculum structure for the training of environmental scientists
- National Department of Education recommendations for four-year undergraduate degrees to be introduced in selected tertiary institutions with a view to meeting the demands of the market, and
- Current attempts by environmental organizations in South Africa to set in place measures for the certification of professionals.

In the context of growing market demand and attempts by the tertiary education system both to meet the requirements of the market and to establish and maintain standards commensurate with responsibility to clients, this article reports on a pilot study undertaken in the Western Cape to determine in what aspects of their work environmental assessment practitioners initially considered themselves to be inadequate and vulnerable. The Western Cape was selected as nearly one quarter of all professionals in the environmental sector are currently employed in this region (Wesgro 2000). Deriving from this, areas of core competence in the discipline were identified. It is argued that facility in these would ensure that environmental management in South Africa maintains international standards and is recognised by international accreditation bodies.

2. Regulatory change

The South African Constitution (Act 106 of 1996) entrenched, inter alia, a right to a healthy and protected environment and committed the government of the day to the principles of sustainable development. A strong environmental ethic now informs policy-making in both the public and private arenas as well as individual behaviour patterns. Several new environmental regulations and laws explicitly addressing environmental issues have been promulgated between 1996 and 2000 which, implicitly and explicitly, impose new obligations on environmental assessment professionals.

3. Expanding market

The South African environmental job market initially displayed similar growth trends to those experienced internationally with a gradual increase through the 1970s and 1980s as environmental problems and the growth of environmental knowledge made political institutions and civil society increasingly aware of the deleterious effects of many human activities. However, it was only in the early 1990s that voluntary environmental impact assessments became common in the South African context. Despite the existence of an active and innovative professional environmental sector for 15 years, the South African market for environmental scientists expanded exponentially when environmental impact assessments (EIAs) for specific 'listed' activities became a statutory requirement. In September 1997, Regulations were gazetted (No 1182, *Government Gazette* No 5999) in terms of the Environmental Conservation Act (No 73 of 1989). These require that environmental impact assessments (EIAs) be completed for activities listed in Schedule 1 of the Regulations. Moreover, all developments that are 'listed activities' require authorization from the Department of Environmental and Cultural Affairs and Sport through the sub-directorate Environmental Impact Management Unit (EIMU).

The impact of this legislation caused unprecedented growth in the industry. This is illustrated by the fact that, in the study region, there was a 240 percent increase in the number of IA reports submitted to the authorities for approval between 1998 and 1999 (Pers Comm D Laidler EIMU) and Duthie (2000) reports similar trends across the country. Commensurately, membership of the South African Institute of Ecologists and Environmental Scientists (SAIE&ES) has shown a dramatic growth during the post-apartheid period (1994-2000), nearly doubling the number of registered professionals.

4. Review of the curriculum structure

A direct consequence of the increased demand for the services of environmental scientists was an influx of individuals into the impact assessment market from varying backgrounds and with a diverse range of qualifications and professional competencies. No formal means existed to ascertain whether individuals undertaking environmental impact assessment (EIA) projects possessed the appropriate skills and many individuals took advantage of this to benefit from the increased EIA project opportunities available. While nominally, professional qualifications were (and still are) being awarded, evidence suggests that commensurate competence is frequently lacking.

Figure 1: Enviromental science degree course content

An analysis was undertaken of all universities in South Africa that included the word 'environment' in the title of their postgraduate degrees. The survey served to identify both the full range of subjects relating to substantive environmental theory and management and the frequency with which they are offered. The graph (Figure 1) clearly illustrates the variability with which courses are offered across tertiary institutions and points to the limited degree that subjects, considered fundamental to any degree programme with internal integrity or coherence in either environmental impact assessment or management, are included in the curricula. It would be invidious, and would serve no purpose, to identify particular institutions where environmental curricula are particularly superficial. It requires recognition, however, that few universities offer a high level of training, have registered lecturers and are held in high repute internationally.

This variability in educational standards does, however, have serious societal and environmental implications. It is also important because the South African government, as a signatory to the Rio declaration of 1992, has dedicated itself to making sustainable development a reality and to ensuring the welfare of the people in this and future generations.

It is therefore imperative that graduates in the field of environmental science have the necessary competencies to realize this future. A not unrelated issue is that South African environmental professionals are being commissioned for internationally funded projects throughout Africa and overseas. To ensure that qualifications and skills meet the requirements of funding agencies and multinationals, it is imperative that training and mentorship programmes be compatible with American and European standards. To this end, government instituted the South African Qualifications Authority (SAQA) to ensure that tertiary institutions maintain appropriate curricula. The board tasked with defining the necessary criteria for environmental science professionals has not yet been constituted.

5. Department of education recommendations

A further parallel development was debate stimulated by recommendations contained in a report of the National Department of Education entitled, "Towards a New Higher Education Landscape: meeting the equity, quality and social imperatives of South Africa in the twenty-first century". The essential purpose of the document is rationalization of resources and quality assurance. In it, the task team proposed that provision should be made for the introduction of a four-year first bachelor's

degree. The first two years of the degree "could provide for the development of required generic and foundation skills and include some broad discipline and multi-discipline based knowledge. Years three and four of the degree could include a strong emphasis on single discipline and multi-discipline based specialization, including an introduction to elementary forms of investigation and research methodology" (Chapter 3). Further, it was recognized that those institutions regarded as 'Comprehensive Postgraduate Research Institutions' would need to pursue strong partnerships with the science councils, private sector research and development establishments, industry, and continental and international academic and research institutions.

Taking cognisance of these developments, some academic institutions are currently engaged in debate concerning the relative merits of extending the traditional three-year degree to four years and building upon a more structured 'programme' format. Stated briefly, a strong programme would meet the criteria of, *inter alia*, overall coherence, well-structured core course requirements, sufficient formative electives to provide variety and depth, flexibility to adapt to new needs and opportunities, recognized exit standards, appropriate external evaluation, and a strong 'taproot' to postgraduate studies. Other, more generic criteria included, requirements for excellence and equity, provision of transferable and disciplinary skills, and the potential to play an active developmental role in Africa. This debate has been extended to solicit the opinions of professional bodies, commerce and industry and so on.

6. Certification of environmental practitioners

The term 'environment' encompasses biological, physical, social, economic and cultural elements and this broad definition has been embraced in post-apartheid South African legislation. In the light of this, critical comment was directed toward the fact that there existed no formal certification for environmental practitioners who had academic grounding other than in the natural sciences. It was contended that this biased employment opportunities towards the biophysical disciplines and marginalized the social sciences within the environmental sector (SAIE&ES *et al* August 2000). In response to these critiques and the imperatives identified earlier, practicing professionals in environmental impact assessment and management, under the aegis of the Southern African Institute of Ecologists and Environmental Scientists (SAIE&ES) and the South African affiliate of the International

Association for Impact Assessment (IAIAsa), have mobilized to develop a formal certification process which will ensure the quality and professionalism of members. A public process that engaged with environmental assessment professionals was conducted during 1998 and 1999 to establish criteria for a voluntary professional certification. This culminated in the establishment of an Interim Certification Board (ICB) in early 2001. The ICB has agreed to begin formal voluntary certification of Environmental Impact Assessment Practitioners by June 2001.

A related contextual issue involves equity in employment. The environmental profession faces a considerable challenge to ensure that the industry is transformed to reflect the racial composition of the country and to provide socially equitable opportunities to previously disadvantaged race groups. South Africa's history of institutionalized race-based education and job reservation has resulted in a marked lack of black professionals. The certification process had to ensure that it would not act as a barrier to emergent professionals and would provide the mechanism necessary to support black professionals. In particular, given the institutionalized inferior standards of black education during the apartheid era and their legacy, mechanisms had to be established that would adequately accommodate experience in the field. Another challenge for the certification initiative was a challenge by related professions who felt that this initiative was an attempt to stop professionals with backgrounds other than environmental or biological sciences from undertaking Impact Assessments (Gasson & Todeschini, 1997).

Several routes for qualification for certification were, therefore, devised by the ICB to ensure that the critical element of quality control was retained without inhibiting the necessary growth and racial transformation of the sector. It is proposed that only individuals actively involved in the co-ordination and management of the Integrated Environmental Management process would be permitted to apply for certification. Environmental scientists in government, consulting, non-governmental organisations (NGO) and academia are encouraged to become certified.

As mentioned earlier, the certification process is attempting to provide quality control for an industry that is composed of individuals with varied backgrounds and training. They chose to adopt an approach of ensuring that individuals satisfied specific core competencies (see Box 1) rather than to accredit particular courses or institutions. The specified core competencies prompted

the authors to query whether current university curricula provide the required competencies for graduates.

BOX 1: Requirements for certification of environmental assessment practitioners

- Formal training in both socio-economic and biophysical environments, and experience in integrating and co-ordinating significant components of both in such a way as to evaluate options and trade-offs, and facilitate sound decision-making
- Formal training and experience in environmental assessment and evaluation and an ability to make balanced judgements and objectively evaluate alternatives
- Formal training and experience in the application of tools contained in the Integrated Environmental Management 'toolbox', e.g. scoping and public participation, environmental management plans/programmes, mitigation and optimisation of impacts, monitoring and evaluation, auditing
- Formal training in and knowledge of the concept of sustainable development.
- Formal training in the interpretation of environmental legislation
- Experience in working in, and competently managing, a multidisciplinary team
- Experience in recognising when to involve specialists, the selection and appointment of specialists, and in drawing up terms of reference for these specialists which answer the particular needs of that project or work
- A working knowledge of current environmental policy and legislation
- Sound interpersonal and communication skills; both in oral and written form.

7. Methodology

In order to determine the needs of the market a pilot survey was undertaken. A questionnaire was issued to the members of the International Association for Impact Assessment South Africa (IAIAsa) regional Western Cape branch. A total of 150 questionnaires were distributed with their quarterly newsletter. Sixteen replies were received which constitutes approximately a 10 percent return rate. As a second phase of the pilot SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis five professionals, selected on the basis of their experience, considerable expertise and professional status, were interviewed to obtain specific insights into the specific requirements and challenges for environmental scientists in the following sectors: local government, provincial authority, and private practice. The third phase of the analysis included an analysis of environmental course outlines offered by South African Universities.

The first part of the research initiative explored perceptions of relative inadequacy and vulnerability. Stated differently, it aimed to ascertain in which aspects of the respondents' professional activities they considered themselves to have been deficient or inadequately prepared by their training. The second part extended this question of vulnerability to shortcomings that they considered their employees possessed in the discharge of their responsibilities.

8. Results

A range of responses was elicited from respondents concerning those dimensions of their job in which they had initially found themselves wanting. These may conveniently be listed as a lack of knowledge or understanding of:

- Legislation
- Public participation
- Social impact assessment
- Required processes — planning and legal
- Authority jurisdictions
- Report writing
- Budget and project management
- IA procedure
- Industrial processes
- Monitoring techniques
- Environmental assessment ethics and principles
- Conflict resolution
- Ability to integrate
- Data interpretation.

In general, it is apparent that the issues identified are located in the domain of organizational procedure, skills application and management rather than that of substantive theory. Exceptions are environmental ethics and principles of social impact analysis, which does require a grounding in social, economic and political theory. Admissions of functional inadequacy regarding the ability to integrate information from diverse disciplines and to operationalise a holistic or synoptic view, and relative ignorance regarding the principles of environmental impact assessment, public participation and conflict resolution, in particular, confirm earlier assertions about extremely variable standards within the profession. This wide range of perceived vulnerabilities may also be ascribed to the fact:

- That some individuals working as environmental scientists are limited to undergraduate training in 'traditional' geography courses and therefore have had only a notional exposure to process and principles of IEM
- Many graduates have the perception that their tertiary education will provide them with all the necessary skills for professional practice when in fact 'on-the-job' training is an essential part of skills development.

It is recognized that many professions require a period of internship or the serving of articles before competence. This begs the question whether environmental scientists need to formalise internships as part of professional training.

The respondents and 'expert' interviewees were further requested to identify generic topics that they considered essential or central to any professional degree programme (Box 2). These reaffirmed the primacy of management theory and techniques.

BOX 2: Subject matter deemed essential by practicing professionals

- Basic physio-biological principles and theories
- Basic socio-economic principles and theories
- Integrated Environmental Management (IEM)
- Environmental Impact Assessment
- Strategic Environmental Assessment
- Environmental Management System
- Environmental Auditing
- Social Impact Assessment
- Environmental Law
- Planning Law
- Urban analysis (structure, function and form)
- Sustainability
- Green Business Economics (e.g. Triple Bottom line)
- Biodiversity and basic ecological principles
- Resource Economics
- Industrial Ecology
- Waste Issues
- Research methodology
- Quantitative and qualitative analytical techniques
- Professional ethics
- Business skills (tendering, contracts, budgeting, meetings, terms of reference)
- Communication — oral and written.

9. Discussion

It has been argued that South Africa stands at a decisive juncture with respect to both environmental education and professional practice in integrated environmental management (IEM). To reiterate, the overriding purpose of this investigation was to review the current status of the environmental profession in South Africa. A secondary purpose was to contribute to the policy debate concerning certification criteria for professionals and, later, defining parameters for accreditation of professional degrees. Consistent with the title, *Bridging Minds and Markets*, the study was motivated by four interrelated, but essentially disparate developments, viz:

- A government-driven standards assurance project
- On-going efforts by the South African Institute of Ecologists and Environmental Scientists to establish a system of certification of individuals entering the profession and their intention later to evaluate university degree programmes for purposes of accreditation
- Government-initiated reform of tertiary education — an important element of which would be the introduction of professional four-year degrees
- Curriculum reform within academia in the light of these developments
- A rapidly expanding market for environmental professionals – the consequence of legislation making mandatory the submission of environmental impact assessments for a range of 'listed' activities.

The intention is to contribute to these major policy debates and also, given the degree to which they are logically interrelated, to argue for much greater coordination between the relevant institutions as the debates progress to finality. It can be argued cogently that these various initiatives need to be coordinated so that there is a clearly defined set of rules and structures within which educational institutions, students and professional certification bodies can operate regarding the requirements and expected competencies of environmental professionals.

Comparing the 'environmental courses' offered by tertiary institutions (Figure 1) against the core competencies required by the professional certification initiative (Box 1), it is apparent that deficiencies exist. These deficiencies are highlighted by the results of the survey, in which practitioners identified their functional inadequacies and sense of vulnerability. Although, at first glance, the list of subjects "deemed essential for environmental

practitioners' training" would appear to be addressed in the South African education system, it is significant that none of the degree courses offer all of these subjects and that the frequency with which many subjects are offered is extremely low. An overriding conclusion is the need for greater emphasis on many dimensions of management theory and practice. These would include auditing, budgeting, accounting, drawing contracts, specifying terms of reference for expert consultants, tendering, conducting meetings and so on.

It is suggested that all graduates, in order to complement their degree, should have undergone some form of in-house or mentorship akin to accountants and lawyers serving articles. This would commit the profession, and give effect to a responsibility, to the next generation and would institutionalise continuity. It would also serve to expand professional networks and to inculcate the norms of professional behaviour. This emphasis on management-related procedures and skills reflects widely perceived limitations in current education. It does not, however, discount the central importance and relevance of substantive theory in particular disciplines and practical competencies that may be considered as 'core' to any degree curriculum.

The aim of the paper is not to suggest the content and structure of a detailed curriculum but rather to highlight the perceived limitations of the status quo at present and argue for consensus on criteria that could inform policy-makers and standards adjudicators. Logically, these criteria should also constitute the basis for the development of curricula in tertiary institutions nationwide. Notwithstanding the right (and desirability) of regional specialisms and identity, there is an urgent need for a much greater degree of conformity in teaching structures and educational outcomes in the country. It is strongly recommended that undergraduate degrees should provide structured exposure to basic theory in a range of systematic disciplines in the sciences and humanities appropriate to understanding environmental processes and problems. They should also reflect a holistic, integrated system interpretive framework.

Environmental management and assessment in South Africa is a thriving industry but it faces the risk of being discredited and marginalised unless the educational institutions, professional bodies and government standards assurance initiatives can adopt a coherent and comprehensive approach to training the environmental scientists of the future. The current certification initiative does not address accreditation of courses; rather it

certifies individuals based on their experience and training which may be inadequate as a long- term solution to quality control. Professionals need to work together with educationalists to determine appropriate curricula and quality controls in order to ensure that integrated environmental management practice in South Africa maintains international standards and is recognised by international accreditation bodies. An assertion by Krige (2000:3) referring to the development of human settlements is equally apposite in the context of environmental management: "university curricula are often rather conservative and not able to respond adequately to current social, economic, cultural and environmental issues".

It is vital to take the challenge beyond discussion and to proceed to action. What ultimately matters is the creation of better, and sustainable, human environments and this goal will not be achieved without a vision, co-operation between various role players, capacity-building, and a lot of hard work.

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