

How About A ... Biologist?



A Short Report on Environmental Career Guidance For School Leavers

Eureta Rosenberg, Glenda Raven, Yvonne Nsubuga,
Solly Mosidi, Presha Ramsarup and Jane Burt

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Introduction

South African employers who need staff with qualifications in the sciences include industries and state agencies in health, engineering, technology and the environmental sector. These employers have access to only a relatively small pool of qualified individuals. Of the total population of 18 year olds (about 980,000) fewer than 140,000 pass Grade 12 Mathematics, and only some 20,000 – 25,000 (2,5%) pass the subject at higher grade (Taylor *et al*, 2007). Only a fraction of those who write the Senior Certificate Examination (SCE) pass Physical Science and Mathematics, as Table 1 illustrates:

Table 1: Performance in Maths and Science in SCE, 2007 (DoE, 2009a)

Year	Number who passed Matric	Number passed HG	Number passed Maths SG	Total number passed Maths	Number passed Science HG	Number passed Science SG	Total number passed Science
2007	368,217	25,415	123,813	123,813	28,122	87,485	115,607

Of the Grade 12 learners who sat for the SCE in 2005, just 13% entered higher education in 2006¹. In their first year at university or universities of technology, 15% of this group enrolled in a natural science programme, compared to 15% in engineering, 20% in the social sciences and 30% in business/commerce (HEMIS data quoted by Cosser & Sehlola, 2009).

The pool of qualified individuals for which the environmental sector must compete is thus relatively small. In addition, there is a perception that the environmental sector is not very attractive to school leavers and graduates, particularly among designated groups. One reason could be that career opportunities in the environmental sector are largely 'hidden' from the public view in comparison to occupations such as law and medicine, and that few young people know about the study - and career possibilities in the field. It is clearly important that the opportunities in the environmental sector be introduced to and promoted among young people, to encourage adequate numbers of students to enrol for studies that would set them on a career path in the environmental sector.

To explore if and how school leavers are being exposed to environmental careers, and how the situation could be improved, we compiled this short report. It is being written in parallel with and with information from a chapter in the Monitoring and Evaluation report for the C.A.P.E. Capacity Development Programme, which in 2008-

¹ The generally accepted benchmark for developing countries is 20%.

2009 undertook a pilot initiative (discussed below) to strengthen career guidance in schools in relation to conservation-related occupations.

Findings on study - and career guidance aimed at post-school students (at comprehensive universities and universities of technology) will be reported in due course.

Research

The report is based on a number of data sources, as follows:

- ✘ **Desktop review** including studies conducted among school leavers by Michael Cosser and colleagues of the Education, Science & Skills Development Research Programme of the Human Sciences Research Council (HSRC).
- ✘ **General questionnaires** distributed among teachers in the Western Cape, Eastern Cape, Gauteng and North West to probe challenges associated with guidance on environmental careers in schools; 50 were returned.
- ✘ **Specific questionnaires** distributed among Grade 9 and Grade 12 Life Orientation teachers in the Eastern Cape, Southern Cape and Western Cape, who participated in the C.A.P.E. programme's Careers in Conservation initiative (see footnote), to evaluate the initiatives; 29 were returned.
- ✘ **Interviews** with departmental officials responsible for Life Orientation in the Eastern and Western Cape (one curriculum advisor and one Education Specialist], to address the same aims as the teacher questionnaires.
- ✘ **Focus group** discussion among 52 candidates from around the country, on a Learnership in Gauteng.

Findings

Are school learners interested in environmental careers?

There is a common perception that environmental careers are not particularly popular, either because they are (a) not well known, or (b) not financially rewarding and/ or (c) not part of the cultural context of the majority of South African families, perhaps due to alienation from the land during disenfranchisement under Apartheid.

Because there are unfortunately very few if any empirical studies on the popularity of environmental careers among the school-going youth, we had to draw on a range of indirect data sources to help us probe the above.

Firstly, the perception that only Black people have 'lost' a connection with the land needs a more thorough probing than we can afford it here, but we can note that the reasons for young people not wanting to live and work in rural areas could be more diverse. Many of the white families who had benefited from Apartheid and forged a strong bond to the land as generations farmed on settled areas, are also reporting that young people no longer want to farm the land, as it is no longer seen as a viable livelihood. The choices made by beneficiaries of land resettlement claims tend to confirm this common trend.

Higher Education Management Information System (HEMIS) data shows that the 2006 enrolments in the natural sciences was 15% of the entire first year group. Cosser & Sehlola (2009) provide an analysis of enrolment patterns for different groups (Table 2).

Table 2: Percentage of various learner groups enrolled for first year studies in the natural sciences in 2006 (Cosser & Sehlola, 2009)

Percentage of all male students	19%
Percentage of all female students	12%
Percentage of all black students	15%
Percentage of all white students	16%

This data suggests that there are no notable differences in the enrolment in certain environmental study fields among our race groups.

Of course, enrolments do not necessarily reflect preferences; students are often unable to enrol for a study programme of their choice, as a number of other factors, besides interest, influence their options and decisions (see next section).

Another source of information in this section is the questionnaires we distributed to teachers tasked with career guidance in schools. The teachers who responded to these questionnaires by and large indicated that *environmental careers are not high on the list* of those in which learners express an interest, and that they (teachers) themselves carry very little knowledge about environmental careers.

However, an informal survey in the Eden Municipality (where a fair number of people are employed in nature-related tourism and conservation) indicated that many young people in this region would indeed consider a career in conservation².

² Personal communication, Prof C Fabricius, Nelson Mandela Metropolitan University School of Conservation and Natural Resource Management (George Campus).

At several universities we included in a study on provisioning of environmental learning in higher education institutions, we heard that their environmental courses were popular and in fact over-subscribed. At other institutions, some environmental departments were operating below capacity, but they were unable to attract more students who met the academic requirements. Many of those who are interested, do not meet entry requirements. Staff here felt that needed to be doing more to attract more well-qualified entrants into their programmes. Among current employees (of all race groups) in the environmental sector, two thirds of respondents³ indicated that they are engaged in their current occupation because they have an interest in or passion for the environment, or because they regard the work as important. Only a third indicated that they simply do an environmental job because it was all they could find.

In overview, this data suggest that *knowledge or awareness of careers in the environmental field* might be one of the most significant factors limiting the number of students choosing to study towards such careers. It is certainly one of the factors which organisations in the sector would be able to address relatively well. But to do so effectively and strategically, we also need to know what *other* factors influence school leavers' career and study choices.

What influences career and study decisions?

Baseline and tracer studies by the HSRC (Cosser and Sehlola, 2009) indicate that in 2005, a higher number of Grade 12 learners would have *preferred* to study in Science, Engineering and Technology programmes, than the number who actually *enrolled* in these programmes, in 2006. The authors argue that this must be due to these school leavers' aspirations being "thwarted by insufficient university points and a lack of places for study"; insufficient funding undoubtedly also playing a role.

They go on to report that: "Lower percentages of students of all race groups enrolled in SET programmes than had planned to – the differential being much higher for Africans ... than for students of the other three race groups. These shifts indicated a broad shift from preference for study in SET to enrolment in business/commerce and the humanities" (Cosser and Sehlola, 2009, p.xiv).

Reddy and colleagues (2008, 2009) conducted an evaluation of the Youth in Science Strategy of the Department of Science and Technology. This initiative includes camps where inputs are aimed at increasing high school learners' interest in science, engineering and technology (SET). During the camps, the majority of Grade 12 learners expressed a high interest in a career in mathematics and/or science. However, in their post-Grade 12 year, the majority of the students interviewed

³ Unpublished data from Environmental Sector Skills Plan sector analysis, analysed by Prof H Sisitka and S Mosidi on behalf of Department of Environmental Affairs.

actually registered for a qualification in commerce (63%), rather than science or engineering (29% combined). Although the study could not comment on the reasons why students switched from science and mathematics career intentions to enrolling for a commerce qualification, it is known that during the camps, the South African Institute of Chartered Accountants offered students the possibilities of bursaries if they chose to study Commerce. This was not done for the SET areas.

Also instructional, in that it further highlights the role of funding availability in school leavers' choices (or lack of choices), is an earlier analysis by Cosser and du Toit (2002) of the factors that influence learners' choices regarding *higher education*, i.e., whether they chose to enrol in a comprehensive university or a university of technology, as opposed to a technical college, or going into employment. There was no overriding single factor swaying school leavers to go into higher education. The top ten influences (out of the 14 identified) are listed here in order of importance:

- ☒ Higher education enhances employability
- ☒ Intrinsic interest in a field of study
- ☒ Higher education leads to a higher income
- ☒ Urging on by family to study further
- ☒ Offer of a bursary
- ☒ Family urging for higher education study to support learner or themselves
- ☒ *Ability to finance study through NSFAS
- ☒ *Offer of a scholarship
- ☒ *Ability to finance study through bank loan
- ☒ Urging on by teachers.

* Very important influences among black learners

The same authors (Cosser & Du Toit, 2002) identified 15 factors that influenced learners' chosen *study field*. These were ranked in order of importance as:

- ☒ Interest in the field of study
- ☒ Probability of finding employment in South Africa after study
- ☒ Ability to use a qualification in the field to contribute to development
- ☒ Ability to follow a practical course of study
- ☒ Opportunities for finding job overseas after study
- ☒ Reputation of the school/faculty /department
- ☒ Amount of money to be made in the field after qualifying
- ☒ Ability to follow a theoretical course of study
- ☒ Possibility of obtaining a study loan
- ☒ The offer of a scholarship in the field
- ☒ Persuasion by parents/relatives
- ☒ Not being able to study within the field of first choice

- ☒ Persuasion by friends to study in this field
- ☒ Parent / relatives studied in this field
- ☒ Boy friend / girl friend studied in this field.

School leavers' choice of study was also influenced by the choice of institutions. They tended to choose fields in which institutions specialised, which was in turn influenced by the province in which the institution was located. In Cosser and Du Toit's (2002) study, 30% of learners had not applied to an institution by the time of the interview (September), citing insufficient information about institutions as the main reason. Some 60% of the learners interviewed in this study said that they had received no career guidance.

A study in the Eastern Cape identified additional factors that influenced the *selection of institutions* for further study, and noted that there were differences among population groups (see Table 3). These differences could be linked to the persistence of difference in the schools attended by learners from different race groups, the social networks to which learners from different race groups have access, and the differential targeting of schools by potential employers, with those tending to yield better academic results, being higher on the list of employers.

Table 3: Factors influencing the selection of institutions by school leavers (Steenekamp, 2002)

	White learners	Black learners	Coloured
Guidance at school	10%	24%	33%
Visit by institution	16%	11%	8%
Visit to institution	11%	7%	10%
Advertisement in the media	14%	31%	16%
Influence of other learners	22%	13%	21%
Other	8%	16%	0.2%

From various data sources we have noted that the following are prevalent among the factors influencing school leavers' *choices in relation to environmental study fields and careers* (not ranked in any way):

- ☒ Access to funding for particular studies
- ☒ Marks achieved in the final school examination
- ☒ Available places (some 40% of school leavers apply at more than one institution and/or in a number of different study areas, and may be constrained in their choice by where they find a placement)
- ☒ The subjects they take at school, which are in turn influenced by: The subject choices at that school (many schools cannot afford teachers to offer a range of subjects); advice from teachers; and academic performance

- ✘ The desire to contribute to the development of the country/community well-being/'make a difference'
- ✘ Parents' interest, networks and exposure to environmental careers, e.g. during visits to game parks (particularly among those with a passion for or particular interest in the environment)
- ✘ Exposure at school, e.g. in certain subjects or environmental education projects, and the interest shown by teachers and other potential role models
- ✘ Awareness of available options and opportunities.

What Matters Most to School Leavers?

Considerations we came across include:

- ✘ The cost of studies and/or availability of financial support
- ✘ Study fields that will lead to a job
- ✘ Careers that make a difference/contribute to social development
- ✘ Personal interest and passion
- ✘ The amount of money to be made in a profession.

In the tracer study reported by Cosser and Sehlola (2009), the variables exerting the strongest influence on students' choice of profession were:

- ✘ A passion for the profession
- ✘ Wanting to make a difference to the lives of all South Africans through working in the profession, and
- ✘ The certainty of finding a job in this profession.

The amount of money to be made in a profession had a modest influence on the decision-making of school leavers choosing professions. Seen in overview, the findings would suggest that the financial potential of a qualification is not the exclusive or dominant factor considered by school leavers of any race group, that it is often assumed to be. However, the school leaver's ability to finance his or her studies is a huge consideration, and it seems to pose particular constraints among Black South Africans, who are also less likely to have historical/established networks relevant to entry into the field of study/higher education, *and* are more likely to have had a less-than-adequate academic background and results (see Quality Report: Overview of Quality Issues in Schools).

Where do school learners get information on careers?

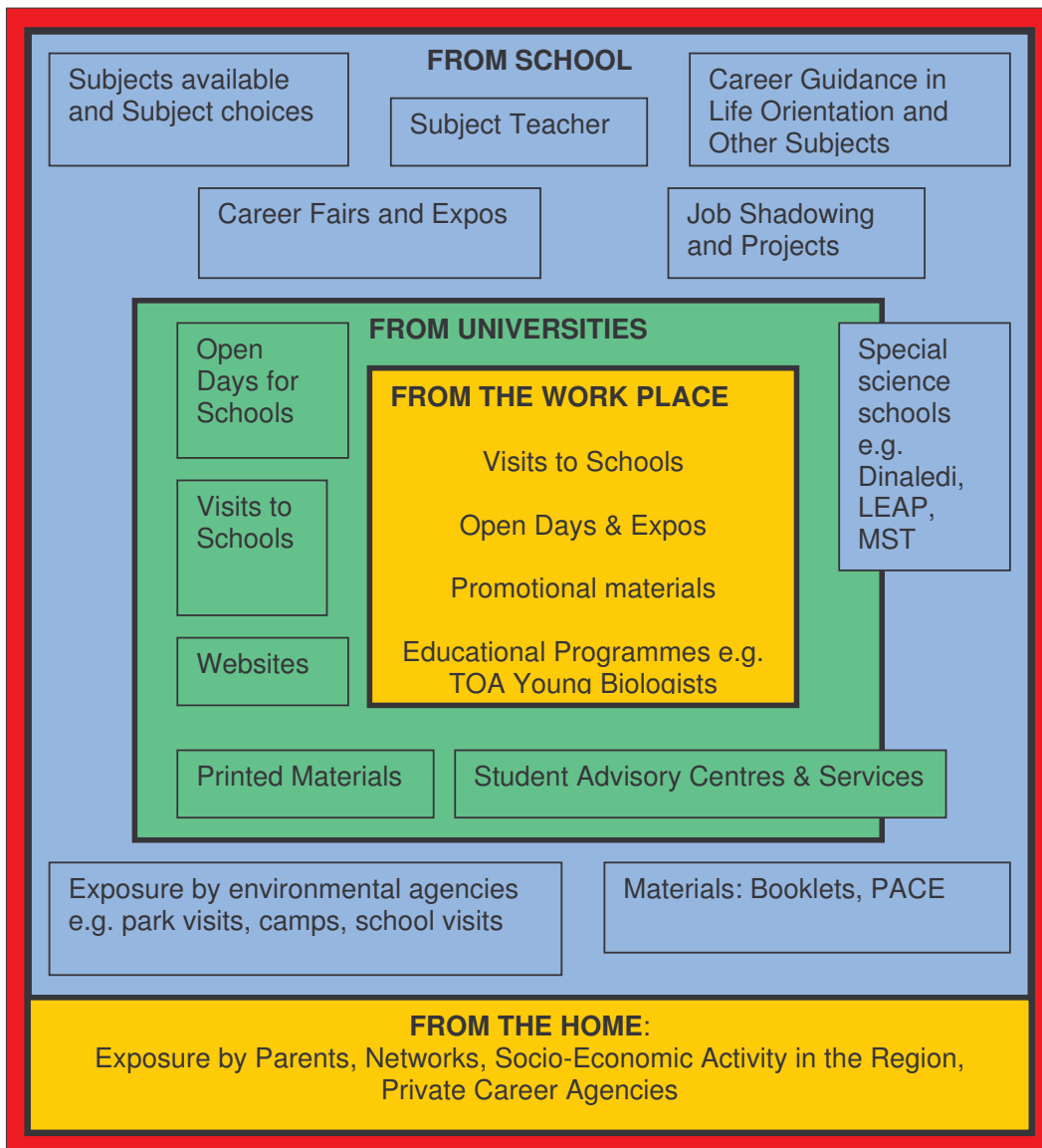
Career guidance in schools: Some independent schools have a dedicated career councillor who helps learners explore any particular career in which they express an interest. In public schools, career guidance is a component of a compulsory subject called Life Orientation. Our investigation showed that there are currently very limited opportunities for exposing learners to environmental careers through Life Orientation. The details follow later.

Careers fairs, Expos and Open Days: There are a range of these opportunities, accessed by learners from diverse schools. Some represent only particular sectors, while others combine a range of sectors. Some are hosted by industries, others by public entities (such as the SABC). Universities participate in expos, or host their own open days for schools. We noted that the quality of these offerings varies, and that those of which we have knowledge, have both strengths and limitations (see below).

School visits: Companies in various industries, and some universities, conduct promotional visits to schools, targeting learners about to make study and career choices, particularly in schools known for their good academic results. Environmental organisations also conduct school visits, or interact with school children in a variety of contexts, but these are seldom focussed on careers and study choices per se. They have the potential to do so, but it is noticeable that visits from conservation agencies (or projects like Eco-Schools) are more frequently directed at the younger learners in primary schools, than those in the more senior grades. Visits from environmental agencies include and often focus more on average and poorly-resources schools.

Resource materials: Some teachers told us that they have very few or no resources for career guidance. Prinsloo (2007) reported that teachers in rural areas had great difficulty in finding information for career guidance. A free electronic, printed and on-line resource produced by a private careers agency (PACE) has been endorsed by the Department of Education for “national roll-out”. According to its promotional material PACE has been introduced in 3,500 schools. It lists and explains a number of environmental careers and study areas. Environmental agencies such as the Department of Environmental Affairs, the C.A.P.E. Capacity Development Programme and the Wildlife and Environment Society of South Africa (WESSA), among others, have produced booklets on environmental careers. None of these were mentioned in the responses to our questionnaires. The C.A.P.E. programme recently piloted a resource called Careers in Conservation. It consists of a DVD with curriculum – and job shadow guidelines; and a bursary offering for learners who excel in a related assignment. The evaluation of this pilot will be reported by its convenor, Dr Glenda Raven, and inform this report (see below).

Influences on School Leavers' Career and Study Choices



What is the Status and Practice of Career Guidance in Schools?

In government schools, career guidance is a component of the formal Life Orientation curriculum, starting at Grade 7 and continuing to Grade 12. The official curriculum makes provision for learners to be introduced to the world of work, a variety of careers and other work opportunities including entrepreneurship, and to not only learn the facts about these, but to explore them in relation to both their own aptitudes and interests, and the developmental context of the country. Job shadow tasks are included.

In practice the opportunities in the written curriculum are not fully realised. This relates to the following factors revealed in our interviews and questionnaire responses:

✘ **The status of Life Orientation:** Life Orientation (LO) is a compulsory subject. It is assessed and the marks contribute to the learners' final marks. There seems to be a pattern of the LO marks being much higher than a student's other marks, and officials are somewhat sceptical about this. One official also queried where teachers "got the LO marks from, because they are not teaching it". In many schools, LO periods are used by some teachers and learners to catch up on other 'more important' subjects or to do homework.

This marginal status of Life Orientation in many government schools is in sharp contrast to the LEAP schools, which aim to develop strong maths and science among talented township learners, but which also gives considerable attention (through time and trained staff) to Life Orientation. Jane Burt reports that the LEAP schools treat LO as a learning area through which to address the social and psychological (life skills) factors associated with a challenging socio-economic background, and which may hamper learners in fully developing and applying their academic skills, both in school and later in the workplace.

✘ **The 'full' nature of the subject:** Life Orientation is used to teach environmental education, health, safety and nutrition; personal life skills; citizenship and religion education; sport, fitness and physical motor development; and career guidance in Grades 7-9; and environmental education and citizenship; sport, fitness and physical motor development; and career guidance in Grades 10-12. In the FET band, two hours per week are allocated to LO, of which 5-7% should be used for career guidance and activities. Teachers are also encouraged to integrate aspects of careers education into their subjects, although it would seem that no guidance is provided in this regard. Dr Glenda Raven estimates that there are 12 hours in the year available for an orientation to the world of work and career guidance, under optimum circumstances. Circumstances are, as we have seen, far from ideal. An additional complication is the fact that many worthy initiatives related to, e.g., HIV/AIDS, substance abuse or sexual abuse, often driven through the initiative of external service providers and endorsed by the Department, are also allocated to the LO teacher and timetable.

✘ **The quality of teacher preparation for Life Orientation:** Although there are apparently LO and career training programmes, according to our survey few teachers have been trained in LO and its careers component. The LO portfolio in the school is frequently taught by a teacher also teaching another subject, and to share the burden among staff some schools rotate the portfolio from year

to year in what an official described as “the Life Orientation merry-go-round”.

✘ **The PACE career guidance package** (www.gostudy.co.za) is endorsed for national rollout by the Department of Education. Produced by a private service provider, it is a comprehensive ‘one-stop-shop’ resource that has been available for a number of years, is regularly updated, and includes information on a range of current environmental career and study opportunities. Both officials and teachers knew about the package, and some teachers indicated that they have used it.

✘ We also found no evidence of **environmental careers booklets** being used in schools.

✘ Teachers as well as departmental officials have **very limited knowledge of the current scope of environmental careers**.

How Useful Are Career Guidance Events?

Fortunately, the classroom is not the only place where learners are exposed to career opportunities, and schools do send learners to attend career fairs, university open days and expos. These ‘career events’ are sponsored by the private sector and public agencies including environmental organisations. We have not formally evaluated a sample of these events, and it would be useful to do so to inform our strategies, given that there is clearly a need to extend the exposure learners receive in schools. Informal observations have left us with mixed feelings:

✘ Open days, career fairs and expos are popular and clearly address a need; large numbers of children from township schools attend by bus (presumably sponsored by event sponsors) and in more affluent communities parents bring children to events such as the Biodiversity Expo organised by the South African National Biodiversity Institute (SANBI) at Kirstenbosch Gardens. The 2009 SABC careers fair in Cape Town featured 11 environment-related exhibits and was attended by nearly 6,000 learners and 2,500 teachers.

✘ The quality of exhibits is often outstanding and reflects considerable efforts put into them by organisations. However, they are limited by the fact that they tend to promote the organisation and what it does. They do not seem to be designed from the point of view of a school leaver needing to be exposed to the job and career opportunities in the organisation.

- ✘ When material is available to take away, it too tends to promote the organisation and what it does, and it is not necessarily clear what the associated career opportunities are, and what they offer and require from the school leaver.
- ✘ A day trip to an event with hundreds of peers from other schools is often a novel experience and unless carefully structured, and prepared for, the youngsters may have an interesting time, but not necessarily learn anything about careers.
- ✘ At the bigger career expos, young people spend very little time at each exhibit. They are encouraged to 'move along' in long rows down narrow isles between exhibits, and are given little if any time to study the exhibit, collect material or interact with representatives of the organisations on display.
- ✘ Smaller events allow for more interaction, but because they tend to focus on a limited range of careers, they are also attended by more limited numbers, and of particular concern to the environmental sector, is that learners (or schools, parents or teachers) probably need to have a prior interest in the environmental field, to make the effort to attend an event focussed only on environmental careers.

Resources: C.A.P.E. Careers in Conservation Resource

In response to some of the above observations, the C.A.P.E. Capacity Development Programme developed a resource package focussing on Careers in Conservation. The package includes a DVD on which employees from diverse race and gender designations talk about four diverse careers in the sector. They discuss the sorts of things a school leaver might ask, such as: What is this job all about? What is fun and worthwhile about it? What are the downsides? What does one need to study and what subjects do I need? Where does one find employment?

The aim was for Life Orientation teachers to show the DVD in schools, to either Grade 9 or Grade 12 learners, after which those who were interested could do formal assignments for assessment, in which they further explore one of the conservation careers. The tasks included a job shadow exercise in a conservation agency, and the writing of a CV to apply for a job or a bursary from a conservation agency of the learner's choice. To this end, the DVD and associated curriculum guidelines were introduced to teachers through a professional development workshop, in schools in the Eastern, Southern and Western Cape. Teachers were asked to forward the best assignments to the C.A.P.E. CDP, which then awarded three bursaries to deserving students – quite a significant carrot!

This innovative and comprehensive pilot initiative has now been evaluated. The indications are that the project and the resource were highly regarded by

departmental officials for its quality and appropriateness. Teachers, too, think that it is a fantastic resource, and they were able to identify some of the careers described on the DVD, after viewing it. However, few were able to fully utilise the resource during the trial period, partly because it was introduced in the second or third term of the year, and some teachers had already used the PACE resource as the basis of career guidance for the year.

However, it would seem that the structural/organisational factors which marginalise and constrain the teaching of Life Orientation, including the rotation of LO teachers from year to year, will continue for some time to interfere with the roll-out of a resource like this, as it might be doing with the PACE resource described earlier, and the booklets on environmental careers, which do not seem to have reached the hands of teachers who are actually using them or sharing them with learners.

Recommendations

The most appropriate approach to strengthening school leavers' exposure to environmental careers and study opportunities may need to be *multi-pronged*, but nonetheless *focussed*. Of particular importance is to consider the structural constraints against comprehensive career guidance in schools, and the need to be clear and confident about how material resources, if these are to be developed, will be disseminated and deployed.

It is also important to remind ourselves that attracting young people into the sector is only appropriate if we do have posts to eventually offer them, and that the availability of posts is linked to organisational and budgetary planning. Similarly, we need to be confident that our higher education institutions have the capacity to train bigger numbers of interested school leavers in relevant programmes. This review highlighted the importance of offering financial study aid, as this seems a very significant factor in school leavers' eventual study direction – regardless of their actual preferences. To these ends we may need fundamental changes in the financial and human resource divisions of environmental agencies and government more broadly, in higher education institutions and in the private sector. To these fundamental changes, efforts to strengthen career guidance can only be complementary.

But what would these efforts be? Below follows a set of recommendations, based on the findings reported above.

Target: Schools

1. Do not exclusively target Life Orientation teachers. They have very limited opportunities to do career guidance during the school week and year; they are often poorly prepared for the job due to poor general training and a rotation system; and the Life Orientation subject of which career guidance is one small component, has a marginal status in many schools.
2. *If* teachers are targeted, include subject teachers (particularly natural sciences and life sciences, agricultural sciences, and social science and geography teachers) along with Life Orientation teachers, because these teachers are somewhat more stable in the teaching of their subject, generally somewhat better trained, and have more time in the curriculum. They could also be targeted more strategically through subject forums.
3. Another targeted strategy for reaching teachers with information about environmental careers could be environmental education training courses, which are run by environmental agencies and universities, and are generally popular among teachers with an interest in the environment, which include many natural - and social science/geography teachers.
4. Give special attention to maths- and science-support schools such as those on the Dinaledi programme, LEAP and MST schools. Here learners from disadvantaged backgrounds receive special academic support (unfortunately there are only four LEAP campuses in the country).
5. Support schools with:
 - a. Well-distributed materials on environmental careers, study fields and funding opportunities
 - b. Professional development activities for teachers (but see above)
 - c. Job shadow opportunities in environmental organisations
 - d. School visits as part of general environmental education support
 - e. Carefully designed Expos, School visits and Open Days which provide opportunities for learners' questions and adequate information on careers, not just on organisations.
6. Engage the producers of the PACE programme and ensure that updates adequately reflect developments in the field.

Target: Universities including Universities of Technology

1. Produce and make available materials on environmental careers, study fields and funding opportunities at all institutions.
2. Foster communication between Science Faculties, and career guidance/ student advisory centres, so that the career guidance arm of a university is aware of the opportunities in the environmental sector. At one university, which delivers the largest portion of environmental graduates in the country, the career guidance centre only had information about two environmental careers.
3. Keep websites up-to-date with information on environmental study paths and funding opportunities.
4. Consider a 'once-stop-shop' environmental careers and studies site where all higher education institutions can post information (e.g. as part of Human Capital Development Strategies' sites).

Target: Environmental Organisations and Other Employers

1. Provide organisations with guidelines on how to effectively include career guidance into school visits undertaken by these partners, and into schools' visits to environmental facilities e.g. recycling depots, waste water works, mines, museums, aquariums, national parks and municipal reserves.
2. Provide guidelines on how to effectively design displays and activities for career fairs, expos and open days (see below).
3. Provide and promote job shadow opportunities in environmental organisations.
4. Include private organisations/industries with environmental careers, so as to illustrate that not all environmental careers are necessarily low paying, and that government or government-supported agencies are not the only employers of graduates with environmental qualifications – the private sector, too, employs such graduates. (These are common perceptions in the field, and are reflected as such in the PACE careers resource.)
5. Produce or obtain materials on environmental careers, study fields and funding opportunities, and develop an effective distribution plan to get them to users.

6. Consider a 'once-stop-shop' environmental careers and studies site where all employers can post information (e.g. as part of Human Capital Development Strategies' sites – see above).

Target: Learners and Parents Directly

1. Provide low-cost or free materials on environmental careers, study fields and funding opportunities, and develop an effective distribution plan, e.g. sell materials at CNA, Pick and Pay or Shoprite-Checkers.
2. Use mass media effectively, e.g. provide the same materials with suggestions for use during youth programmes.
3. Consider a 'once-stop-shop' environmental careers and studies site where school leavers can get an overview of current trends in the field (e.g. as part of Human Capital Development Strategies' sites – see above).

In Summary, a career guidance plan would consist of:

1. Producing and distributing a set of materials for national use.
2. Producing and distributing guidelines on career guidance.
3. Engage with existing opportunities, through these guidelines and materials.

Materials to include:

- ☒ Careers and bursaries website (part of HCD Strategies' website and linked to organisational websites)
- ☒ Updates to existing resources such as PACE website, manuals and DVD
- ☒ Updates to existing environmental careers booklets – perhaps one consolidated resource, or a set of complementary, with
- ☒ A national dissemination and deployment strategy
- ☒ Exhibits that depict careers in an organisation/sector, their nature, focus and requirements - to be complemented with exhibits on organisations themselves.

Guidelines to include the following:

- ☒ Displays should focus on career opportunities and the kinds of questions school leavers are likely to have, and not simply on the organisation and what it does.
- ☒ Provide take-away material should be provided, with up to date contact and website details

- ☒ Provide an engaging person at an exhibit, who would be capable of answering questions. Although it makes organisational sense for a junior person to man a display, this would not be effective, if they cannot to answer questions about a range of careers satisfactorily.
- ☒ Arrange the event so that there is time for learners to ask questions, examine displays thoroughly, and collect pertinent material (which should only be handed out, once a judgement is made that the viewer has a genuine interest).
- ☒ Although career events are good opportunities to promote organisations to politicians and the public, this should not detract from the purpose of providing young people with a 'hook' and enough information to get them interested in actually choosing an environmental career.

Opportunities include:

- ☒ Existing career events (fairs, expos, open days)
- ☒ Teacher professional development programmes and activities including subject forums, conferences and environmental education courses (e.g. those run by SANBI, WESSA, universities)
- ☒ Science focus schools e.g. LEAP, MST schools, Dinaledi schools
- ☒ Human Capital Development (HCD) Strategies currently underway for the sector
- ☒ Capacity development strategies and programmes in organisations such as the Department of Environmental Affairs, SANBI, WESSA and WWF.

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