

CHAPTER 5

THE CHALLENGE WITHIN THEIR COMMUNITIES FOR KZNDEC ENVIRONMENTAL EDUCATION CENTRES

5.1 TOWARDS DEFINING ENVIRONMENTAL EDUCATION GOALS FOR THE KZNDEC EE CENTRES

5.1.1 The Environmental Education Centres advance Sustainable Environmental Management in School Communities

To be optimally useful, the KZNDEC Centres should energise both the *environmental* and the *educational* states/statuses in the educational communities in which they are situated (Le Roux 1997:49; Wade 1996:14; Robottom 1987:199). The Dundee, Durban and Eshowe Environmental Education Centres should be “prime movers” in the advancement of the environmental responsibilities of the KwaZulu-Natal Department of Education and Culture to its service community in the provision of education *about, in* and *for* “a better world” (Republic of South Africa 1998:2; O’Donoghue 2000:5; see Chapter 4 Section 4.2.4).

The *Whole School Evaluation* (WSE) process of the Department of Education encourages institutions to “identify to what extent the school is adding value to learners’... knowledge, understanding and skills” (Department of Education 2000:6). The Centres have the ability, through formal, informal and non-formal education processes (DEAT 2001:7), to “contribute to a better environment and [training for] sustainable environmental management” (O’Donoghue 2000:5).

As has been suggested, helping schools establish environmental policies (SEP&MP) is an

important way in which the Centres can promote “Best Practice Environmental Management” (BPEM; see Chapter 4 Section 4.4.2; KZNDEC Environmental Education Unit 1999:10). A school’s BPEM should integrate all aspects of its environmental management, enabling it to use its resources wisely and to reduce its environmental impact (KABC 1996:7; Lotz 2000:2).

Clearly, the extent to which any degree of sustainability will be realised is dependent upon the environmental ethos and the determination for reform generated via the school’s management (Ankoné et al 1998:4). The BPEM, the audit that precedes it, and its recommendations, are reliant for execution in a school on the ethics of its leaders and suasion from, for example, an environmental education centre. The BPEM system in a school’s community may be weak, or might even collapse, with the lack of real authority of an outsider to be able to oblige a school’s community to rectify any areas of environmental concern (pers. comm. C. Torlage, 2 October 2003).

5.1.2 Defining Programmes through Analysis of a Centre’s Community

Hungerford and Volk write: “Environmental education must look outward to the community. It should involve the individual in an active problem-solving process within the context of specific realities...” (2001:13; own emphases; EEASA 2002:5; see Chapter 4 Section 4.6). It would appear obvious, therefore, that the knowledge gained from a careful evaluation of the challenges facing their communities would aid the centre personnel in better defining their goals and, therefore, in organising their programmes (Chenery and Hammerman, 1985:40).

With contextual investigation leading to appropriate amelioration in mind, a four-fold research programme was embarked upon:

- An exploration of the feasibility of curriculum-based environmental education courses for educators from urban and rural teaching situations in north-western KwaZulu-Natal by piloting such courses at an environmental education centre (Section 5.2);
- A study of the environmental knowledge and attitudes of the educators attending these courses (Section 5.3);
- A study of the environmental knowledge and attitudes of a representative sample of learners from north-western KwaZulu-Natal (Section 5.4); and
- An examination of the results of the pilot courses for improvements in confidence and/or ability in curriculum-related education in the course-attendees (Section 5.5).

5.2 CURRICULUM-BASED ENVIRONMENTAL EDUCATION COURSES FOR EDUCATORS: JUNE AND SEPTEMBER 2003

5.2.1 Selection of Educators Representing Urban and Rural Constituencies

In consequence of the Umgeni Valley workshop (16 May 2003; see Section 4.5.1), three (3) pilot, residential, curriculum-based environmental education programmes were run: "Incorporating Environmental Teaching into the (OBE) Curriculum: a Course for GET Educators" (see attached course outline: **APPENDIX 5:A**).

| Dates of Courses | Circuits where Schools based & Numbers of Educators | Male Educators | Female Educators | Number of Schools Represented | Dates of Follow-Up Workshops |
|------------------|---|----------------|------------------|-------------------------------|------------------------------|
| 2-6 June 2003 | 19 x Madadeni/ Newcastle; and 2 x Charlestown | 9 | 12 | 12 | 15 Sept '03 |
| 23-26 June '03 | 26 x Normandien and Dannhauser | 13 | 13 | 26 | 16 Sept '03 |
| 16-19 Sept '03 | 30 x Nquthu | 4 | 26 | 30 | 1 Dec 2003 |

FIGURE 5:1 – CURRICULUM-BASED ENVIRONMENTAL EDUCATION COURSES FOR EDUCATORS (JUNE & SEPTEMBER 2003)

With the help of the TLS (Teaching and Learning Services) and Management personnel from the KZNDEC Ukhahlamba Region, volunteer educators representing thirty-eight (38) schools from the Majuba (Newcastle) District were selected to attend curriculum-based environmental education courses (see attached attendance lists: **APPENDIX 5:B** and **APPENDIX 5:C**). A third (3rd) residential curriculum-based course was run for thirty (30) Nquthu educators, selected in a similar fashion, from the Dundee District (see **APPENDIX**

5:D). To check on progress of the educator delegates, follow-up sessions (“Refresher Courses”) were held (**FIGURE 5:1**).

The schools based in Madadeni/Newcastle and Charlestown were mostly urban in constituency; those in the Charlestown, Dannhauser, Normandien and Nquthu circuits, largely rural to “deep-rural” (pers. comm. Lancaster, 20 September 2003; see Maps attached as **APPENDIX 5:E**, **APPENDIX 5:F** and **APPENDIX 5:G** adapted from Wilson and Sewpal 2003). The educators attending taught learners from Grades 2 through Grade 12 (**FIGURE 5:2**):

| HIGHEST GRADE TAUGHT | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|
| MADADENI EDUCATORS | 0 | 2 | 2 | 1 | 2 | 7 | 0 | 2 | 1 | 1 | 3 |
| NORMANDIEN/DANNHAUSER EDUCATORS | 1 | 0 | 1 | 0 | 10 | 7 | 1 | 0 | 2 | 0 | 1 |
| NQUTHU EDUCATORS | 6 | 1 | 4 | 6 | 6 | 7 | 0 | 0 | 0 | 0 | 0 |
| TOTAL NUMBER OF EDUCATORS PER GRADE | 7 | 3 | 7 | 7 | 18 | 21 | 1 | 2 | 3 | 1 | 4 |

FIGURE 5:2 – SCHOOLING LEVELS OF LEARNERS TAUGHT BY EDUCATORS PARTICIPATING IN CURRICULUM-BASED ENVIRONMENTAL EDUCATION COURSES FOR EDUCATORS (JUNE & SEPTEMBER 2003)

5.2.2 Rationale behind the “Environmental Teaching” Courses

Lotz and Olivier have written that, in their opinion, “Social and educational transformation is not likely to come about through externally implemented curricula and training packages, but through ongoing and reflexive engagement by teachers with aspects of the learning context” (Lotz and Olivier 1998 *in* le Roux 2000). In South African education prior to the democratic era (i.e. before 1994), curricula were pre-determined, and educators were provided with fixed syllabi (cf. Behr 1988:110). Today, however, educators are required by the new framework to become more actively involved in developing their own learning programmes (Department of Education 1999:34). In so doing, they can become ambassadors for sustainable living (Fien 2002:44).

Taking the stand that “Many educators are *au fait* with the general workings of the National Curriculum Statement, but they are often uncertain about how to use it in practice in their classrooms,” the course proposed to provide practical methodology on curriculum design and execution. It “[encouraged] the examination and use of everyday environmental issues, such as water use and vegetable gardening, using such matters in the course of teaching and learning through all Learning Areas” (Burge 2003d).

5.2.3 Practical Arrangements for the “Environmental Teaching” Courses

Facilitators invited to assist in the courses included B Bakobi (SADC); K Burge (Dundee EE Centre; Co-ordinator and Organiser); M Mitchell (Birdlife South Africa); G Stroebel (Subject Advisor, Ukhahlamba Region and NEEP-GET Facilitator); and K Ward (National Co-ordinator: EcoSchools Project). Representatives of DWAF (for Arbor Day suggestions), KwaZulu-Natal Museum Services and Ezemvelo KwaZulu-Natal Wildlife (for opportunities to use museums and nature reserves for educational venues) also presented short talks.

It was felt by the organisers that thirty (30) educators from each of the three (3) selected KZNDEC Circuits should participate in the programme, as these were manageable numbers for group “bonding,” and for achieving the educational goals of the course. In view of the fact that the courses, and the follow-up days, would be held during secondary school examinations times, and that the NEEP programme had already worked with Subject Advisors in the Madadeni area (targeting the GET phase of schooling), the educators to be invited would also represent this GET-phase.

As these were pilot courses, the time span given to achieve the course work was experimented with, to achieve the optimum result. Therefore, five (5) days were set aside for the Madadeni educators’ course (2-6 June 2003); four (4) days for the Dannhauser and Normandien educators’ course (23-26 June); and three and a half (3½) days for the Nquthu educators’ course. It was further agreed to set aside a full day for each group (on 15 September: Madadeni Group; 16 September: Dannhauser and Normandien Group; and on 1 December: Nquthu Group) – “Refresher Courses” – where the educators could report on progress in implementing their learning programmes, and workshop challenges and difficulties experienced in their schools. It would also afford the facilitators opportunities to refine their presentation techniques and methodology in the light of these reports, and to have indications as to where needs – both *environmental* and *educational* – existed.

The educators and facilitators were provided with free accommodation and free meals for the four (4) days of each course, and for the one (1)-day “Refresher Courses.” The KZNDEC Ukhahlamba Region agreed to assist in providing transport during the week, to and from the central venue (the Dundee Environmental Education Centre), and for excursions that formed part of the daily programmes for all six (6) workshops.

5.2.4 Course Outline for the “Environmental Teaching” Courses

The pivotal intention for the courses was to assist the delegate educators in their ability to “implement environmental education within [their teaching programmes], and particularly within the new South African Curriculum” (Wagiet 2002:1). This would involve planning, implementing and evaluating units of work with environmental foci (Leballo 2002:4).

The outline of the courses followed the plan of a four (4)-day professional development workshop previously run by Prof. C Loubser at the Harmony Centre, Namibia, as well as at a number of other venues in South Africa (pers. comm., 19 May 2003). The aim of that workshop was to establish in educators a “functional environmental literacy,” a broadened knowledge and understanding of the nature and interaction between human and social systems and other natural systems (cf. Fortier *et al*, 1998:1).

Providing learners (or educators) with information about environmental issues and problems is most important (cf. O’Donoghue and Janse van Rensburg 1995:4). “Information transmission” (or provision) alone would not, it was felt, result in the development of action-competent learners (Janse van Rensburg 2000:11; Mosidi 1999:3), learners that would be able to “analyse environmental issues in [their] local context” (O’Donoghue 2000:7) and become actively engaged in the solving of these problems (UNESCO 2003:1; UNESCO 1997, paragraph 38; cf. EEASA 2002:9). In line with national thinking on education processes, “Active learning, *as opposed to transmission*, allows students to feel part of the education process; learning to take responsibility for themselves and their actions” (Clacherty 1995:15; own emphases). Rather than being passive “silos” of information, pupils should claim “ownership” of environmental issues, thus providing for themselves opportunities and to develop life-long habits of caring for the environment (pers. comm., O’Donoghue, 6 June 1996).

To furnish learners with opportunities for such “active learning” (O’Donoghue 2000:7) in the milieu of environmental issues facing their particular schools and school communities (Janse van Rensburg and Taylor, 1993:3), delegates to the Dundee courses were introduced to the EcoSchools Project. The Project provides a convenient “framework” for educators to “organise existing resource materials and environmental education processes” (Le Roux 1999:63; Leballo 2002:4).

There is a “start-up process” that is “based on the elements of the SEP&MP” (Taylor, O’Donoghue and Wagiet 2002:1):

- An EcoSchool committee is formed from a wide range of stakeholders from the school community, “but the learners must be involved in as many aspects of the project as possible. As such, it makes an important contribution to the sustainable development of the school and even local community” (Ibid. 2002:1).
- Using the *Schools & Sustainability Pack* (see Chapter 4 Section 4.5.1), an audit or review of the broad environmental impacts and activities of the school is conducted. An environmental audit is “the process of monitoring and measuring the use of resources” (KABC 1996:8) from which a “base line” against which improvements in environmental management can be measured is established. It also provides an introduction, for a school community, into sustainable environmental management and BPEM (see Section 5.1.1).
- Environmental policies are then developed within an *active learning* framework (Ward 2003:11). Links are made to curriculum work and a monitoring and evaluation plan is developed. Group effort is concentrated on improving at least three (3) aspects of the school environment (Le Roux and Chadwick 2001:1; Ward 2003:3).

- Schools that effectively demonstrate their progress (through a portfolio that outlines their audit, policies and progress) are awarded an Eco-Schools Green Flag (Taylor, O'Donoghue and Wagiet 2002:1; see Chapter 4 Section 4.5.2). This review and evaluation process is on-going, and schools must continue to work towards their objectives and re-apply for the award every year. (It was the production of a draft portfolio by each school's educator/s, after three (3) months' "away-work" at their schools that formed the basis of deductions used in Section 5.5.)

Most importantly, it was felt, working on the EcoSchools/SEP&MP would strengthen educators' confidence in working with, and of implementing, environmental issues into their curricula. They would exercise their roles as "interpreters and designers of learning programmes and materials," "selecting, sequencing and pacing ... learning in a manner sensitive to the differing needs..." (Department of Education, 1999:1). In so doing, they would also be "participating in school decision-making structures" (Ibid.).

5.3 A STUDY OF THE ENVIRONMENTAL KNOWLEDGE AND ATTITUDES OF EDUCATORS ATTENDING THE COURSES

On the second morning of each educator course held in Dundee, delegates were asked to respond to certain "environmental" statements in a structured questionnaire (attached as **APPENDIX 5:H**). This research formed the basis of another survey, that sought information regarding their learners' knowledge about, and opinions on, various environmental matters (see **APPENDIX 5:I** and **FIGURE 5:9**).

5.3.2 Design and Structure of Educator Survey

The first ten (10) statements in the questionnaire examined depth of knowledge and

understanding of basic environmental concepts. The second ten (10) statements (deliberately placed at random) surveyed caring for those specific areas of the environment about which the respondents had been asked. It was decided that as “attitude towards the environment” might well hinge on “environmental literacy,” that “literacy” should precede “attitude,” both in the questionnaire and in the tables of frequencies and percentages.

The questions in each section increased in depth as they progressed, and an effort was made not to discriminate against, and to be sensitive to, those who come from homes where, for example, sanitary facilities may not be on a par with those in a city or town.

In the phrasing of the instructions, and of the questions, the language was made appropriate to the age of the young people for whom it was ultimately intended, and it is cognisant of the fact that the English language is not the home language either of the learners or of their educators.

5.3.3 Verification of the Tendency of the Survey

With a view to confirming the approximate reliability of the questionnaire administered to the educators, another questionnaire, in a similar vein (determining factual knowledge and attitudes), was drawn up (Huysamen 1985:36; **APPENDIX 5:1**). The original questionnaire was administered on the second day of the course for educators (16 September 2003; “Nquthu 1” in **FIGURE 5:3**); and the second questionnaire was administered on the final day of the Course (“Nquthu 2” in **FIGURE 5:3**). As can be seen, there is insignificant variation in the scores, demonstrating the relative reliability of the instrument (De Vos 2001:86):

| | NQUTHU 1 | NQUTHU 2 |
|--|----------|----------|
| “INCORRECT” RESPONSES | 23.7% | 20.6% |
| “UNCERTAIN” RESPONSES | 6.9% | 6% |
| COMBINATION OF “INCORRECT” & OF “UNCERTAIN” RESPONSES | 15.3% | 13.2% |

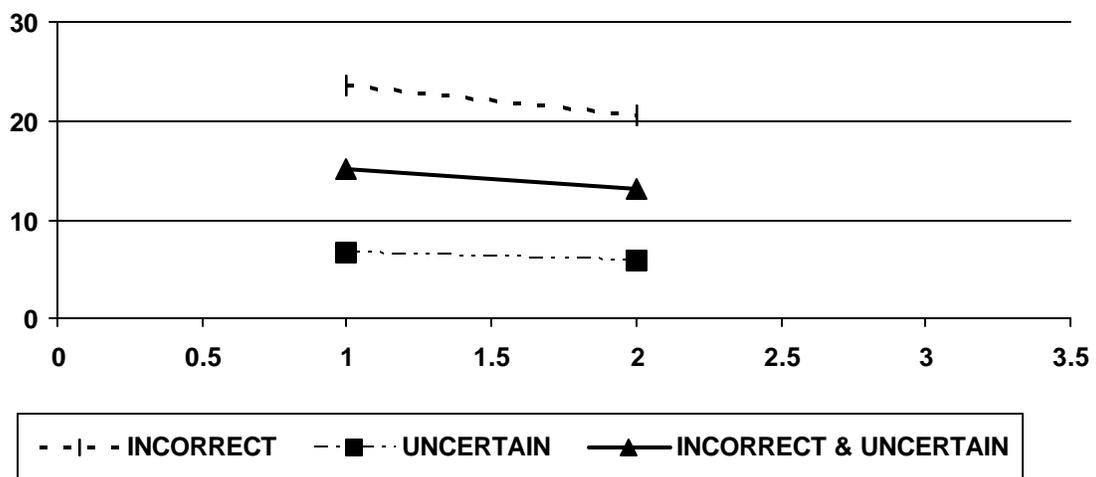


FIGURE 5:3 – “INCORRECT & “UNCERTAIN” RESPONSES AS A PERCENTAGE OF ALL RESPONSES IN ENVIRONMENTAL QUESTIONNAIRES: NQUTHU EDUCATORS PARTICIPATING IN EDUCATOR EE COURSES (16-19 SEPTEMBER 2003)

5.1.1 Interpretation of Educators’ Survey

Of special concern was the number of “uncertain” responses in the survey conducted on all

of the educators (**FIGURE 5:4**). This indicated that these educators were unsure of certain basic environmental concepts, upon which attitudes and behaviours largely rely.

| | MADADENI EDUCATORS' GROUP | NORMANDIEN/ DANNHAUSER GROUP | NQUTHU EDUCATORS' GROUP |
|---|--|---|--|
| ENVIRONMENTAL KNOWLEDGE | 21.4% | 18.6% | 8.3% |
| ATTITUDES TOWARDS ENVIRO. ISSUES | 23.3% | 14.1% | 5.7% |

FIGURE 5:4 – “UNCERTAIN” RESPONSES AS A PERCENTAGE OF ALL RESPONSES IN ENVIRONMENTAL QUESTIONNAIRE: EDUCATORS PARTICIPATING IN EDUCATORS’ EE COURSES (JUNE AND SEPTEMBER 2003)

That they answered equally “incorrectly” on some statements indicated ignorance of these issues (**FIGURE 5:5**):

| | MADADENI EDUCATORS' GROUP | NORMANDIEN/ DANNHAUSER GROUP | NQUTHU EDUCATORS' GROUP |
|---|--|---|--|
| ENVIRONMENTAL KNOWLEDGE | 30.9% | 32.3% | 25.2% |
| ATTITUDES TOWARDS ENVIRONMENTAL ISSUES | 17.7% | 30% | 22.2% |

FIGURE 5:5 – “INCORRECT” RESPONSES AS A PERCENTAGE OF ALL RESPONSES IN ENVIRONMENTAL QUESTIONNAIRE: EDUCATORS PARTICIPATING IN EDUCATORS’ EE COURSES (JUNE & SEPTEMBER 2003)

Below are three (3) typical items reflecting educators’ knowledge about environmental matters (**FIGURE 5:6**):

| QUESTION | ORIGIN OF EDUCATORS | AGREE | UNCERTAIN | DISAGREE |
|--|---------------------------|-------|-----------|----------|
| 6. The biggest threat to South Africa's plant life – is <i>other</i> plants from around the world that are taking over our countryside. | MADADENI | 33% | 43% | 29% |
| | NORMANDIEN/ DANNHAUSER | 16.7% | 33% | 50% |
| | NQUTHU | 65.2% | 13% | 21.7% |
| 7. Earth's atmosphere is heating up (the so-called "Greenhouse Effect") because of escaping refrigeration gases, in aerosol vapours, and in the production of foam rubber. | MADADENI | 48% | 48% | 9% |
| | NORMANDIEN/ DANNHAUSER | 50% | 29% | 21% |
| | NQUTHU | 47.8% | 30.4% | 21.7% |
| 11. Fumes from coal-fired power stations cause acid rain to form – but it is not as serious, in this respect, as the exhaust gases from motor vehicles. | MADADENI | 48% | 48% | 9% |
| | NORMANDIEN/ DANNHAUSER | 37.5% | 33% | 29% |
| | NQUTHU | 69.6% | 0% | 30.4% |

FIGURE 5:6 – VARIATION IN EDUCATORS' KNOWLEDGE ABOUT ENVIRONMENTAL MATTERS (EXPRESSED AS A PERCENTAGE OF TOTAL RESPONSES FOR EACH STATEMENT) IN ENVIRONMENTAL QUESTIONNAIRE: EDUCATORS' EE COURSES (JUNE AND SEPTEMBER 2003)

Further confusion on basic issues is noted in the brief survey of their attitudes (**FIGURE 5:7**):

| | | | | |
|--|----------------------------|-------|------------------|-------|
| 21. The jacarandas and syringa trees of a city, or the black wattles and blue gum trees of a farm, are safe to the environment if they are not allowed to spread from those areas. | ORIGIN OF EDUCATORS | 29% | UNCERTAIN | 9% |
| | NORMANDIEN/ MADADENI | 37.5% | 37.5% | 29.2% |
| | NORMANDIEN/ DANNHAUSER | 39.1% | 33% | 47.8% |
| | NQUTHU | 17.4% | 17.4% | 60.9% |
| 18. Having a deep, warm bath uses more electricity than leaving on all the lights of the house for an hour. | MADADENI | 43% | 33% | 19% |
| | NORMANDIEN/ DANNHAUSER | 52.2% | 8.3% | 37.5% |
| | NQUTHU | 95.7% | 0% | 4.3% |

Vocabulary is unlikely to have been a problem in the testing procedure, as all educators participated fluently in discussion sessions in the days before and after the survey. The

| | | | | |
|--|---------------------------|-------|-------|-------|
| 23. There is nothing wrong with racing 4x4's, scramblers or quads through forests, over the veldt, or on lonely beaches. | MADADENI | 14% | 33% | 57% |
| | NORMANDIEN/ DANNHAUSER | 20.1% | 12.5% | 66.7% |
| | NQUTHU | 4.3% | 8.7% | 87% |

researcher was assured afterwards by the participants that if they had been unfamiliar with

FIGURE 5:7 – VARIATION OF EDUCATORS' ATTITUDES TOWARDS ENVIRONMENTAL MATTERS (EXPRESSED AS PERCENTAGE OF TOTAL RESPONSES FOR EACH STATEMENT) IN ENVIRONMENTAL QUESTIONNAIRE: EDUCATORS' EE COURSES (JUNE AND SEPTEMBER 2003)

Considering the origins and use of electrical power, then, the researcher wonders, judging from the ambivalence in responses whether many had connected “deep, warm baths” (Question 14) to conditions of acid rain (Question 8)? Likewise, had many had traced the environmental hazards caused by alien vegetation incursions (Question 3) to domestic trees (Question 17)?

Confusing was the response of most, that “Eating vegetables and fruit is the most efficient way of getting energy” (Question 20), when most had already agreed that “The best source of proteins [and, therefore, energy] is obtained from the meat of animals” (Question 6). “Caring for the environment” in one’s choice of foods drew an ambivalent response (Question 18).

Combining the “incorrect” responses and the “uncertain” responses, the researcher realises that 42.1% of the educators’ answers were not correct (**FIGURE 5:8**). These are responses from those who play the role of “key contributors to the transformation of education [in their locales] in South Africa” (Department of Education 2002a:9), “mediators of learning, interpreters... of Learning Programmes and materials” (Ibid. 2002a:9).

Wagiet has noted that in the earlier stages of the *Learning for Sustainability* project, many teachers had a similarly superficial understanding of environmental issues; had a limited ability to identify environmental issues relevant to the achievement of curriculum outcomes; and thence found it difficult to use available resources to explore such issues (Wagiet 2001a:22).

The question may be asked: if “the teacher initiates the learning situation” (Behr 1976:1), how can he/she “provide a range of specially selected experiences”... and “appropriate and

meaningful situations which will give rise to ... discoveries” (Ibid. 1977:10 and 63), if he/she is him/herself short on such exposures?

| | MADADENI EDUCATORS' GROUP | NORMANDIEN/ DANNHAUSER GROUP | NQUTHU EDUCATORS' GROUP |
|---|--|---|--|
| ENVIRONMENTAL KNOWLEDGE | 26.2% | 25.5% | 16.8% |
| ATTITUDES TOWARDS ENVIRONMENTAL ISSUES | 20.5% | 22.1% | 14.0% |

FIGURE 5:8 – A COMBINATION OF ALL “INCORRECT” AND “UNCERTAIN RESPONSES AS A PERCENTAGE OF ALL RESPONSES IN ENVIRONMENTAL QUESTIONNAIRE: EDUCATORS PARTICIPATING IN EDUCATOR ENVIRONMENTAL EDUCATION COURSES (JUNE AND SEPTEMBER 2003)

With such conceptual limitations, and without further professional empowerment, educators are likely to develop superficial curriculum activities that fail to achieve environmental learning of an appropriate depth and scope (Wagiet 2001a:22). As Tselane and Mosidi have asserted, therefore, “the challenge for ensuring implementation in the curriculum [is] through development and support, relevant and quality educational resources [as educators possess

the ability to promote] environmental literacy and proper actions towards the environment” (1998:5).

5.4 A STUDY OF THE ENVIRONMENTAL KNOWLEDGE AND ATTITUDES OF A REPRESENTATIVE SAMPLE OF LEARNERS FROM NORTH-WESTERN KWAZULU-NATAL

A similar survey was also performed on learners from Madadeni, Charlestown, Dannhauser and Normandien, in order to determine whether there was any correlation between the learners’ knowledge of, and attitudes towards, matters of the environment and those of their educators.

5.4.1 Design and Structure of Learners’ Survey

The educators attending the above-mentioned courses from were instructed (as would be “field-workers” – de Vos 2001:185) in the correct administration of a questionnaire to their learners. This was regarded as further professional development by the facilitators.

They were further aided in a systematic sampling of fifteen (15) intermediate and senior GET phase learners from each of their schools. Although the researcher ran the risk of bias in that the selected interval (coming from strictly alphabetical lists of their learners) could coincide with another characteristic of the group, such as the majority coming from the sub-group of girls, it was convenient and simple to do (Babbie in de Vos 2001:197). In fact, of the 438 returns received, 39% were from boys and 61% were from girls.

5.4.2 Interpretation of Learners’ Survey

From this overview, the researcher deduces that certain aspects of environmental information require supplement:

- 15.5% of all learners were unaware, or unsure, of the fact that life on earth is dependent upon the sun (Question 1).
- 29.5% of all learners were unaware, or unsure, of the so-called “Greenhouse Effect” (Question 4).
- 38.4% of all learners were unaware, or unsure, of the fact that alien invaders pose a grave threat to South African vegetation (Question 3).

Referring to the questions on alien vegetation, Madadeni educators said of their learners’ responses that only trees not useful for “spiritual reasons” or for food could be spared, when looking for fuel. Some also said that indigenous, isiZulu names of trees should have been included in the questionnaire (“Refresher Course,” 15 September 2003).

Ignorance of certain matters may be attributed to cultural preferences and/or a lack of basic domestic facilities. According to the educators, the great majority of learners in rural and “deep rural” areas come from homes stricken with poverty, lacking potable water, electricity and, in many cases, even soap (“Refresher Courses,” 15 and 16 September 2003).

- For most, ablutions are performed in cold, or fire-heated, water from small tubs (Ibid.). Hardly surprising, therefore, that 42.4% of all learners were unaware, or unsure, of the major source of electrical energy in South Africa (Question 7); that 27.6% were ignorant of saving water by showering (Question 13; and many might not

have known what a shower is); or that 30.3% were unaware, or unsure, of methods of saving electricity (Question 14).

- 35.2% of all learners were unaware, or unsure, of the fact that meat is an inefficient source of protein/energy (Question 6); and 30.8% of were unaware, or unsure, of the fact that meat production may be regarded as “harmful to the environment” (Question 18; Vallely 1990:170).

Despite such conceptual and practical limitations, however, the learners came out strongly in favour of natural “reserves” (57.3%; Question 16); that motor vehicles should be used sparingly (54.7%; Question 15); and 73.2% supported organised recycling efforts (Question 11).

80,6% of the learner-respondents represented grades six (6) through nine (9). Piaget construed that the “stage of formal operational thought” begins to develop during the eleventh (11th) and twelfth (12th) year of a child when “his thinking becomes altogether dissociated from the concrete data” (Papalia and Wendikos Olds 1993:515). If such “formal, informal and/or non-formal” impressions (DEAT 2000:7) regarding environmental issues have been absent in a child’s experiential and educational development, it is unlikely that he/she will reach complete conceptual generality even at a more mature age (Ibid.).

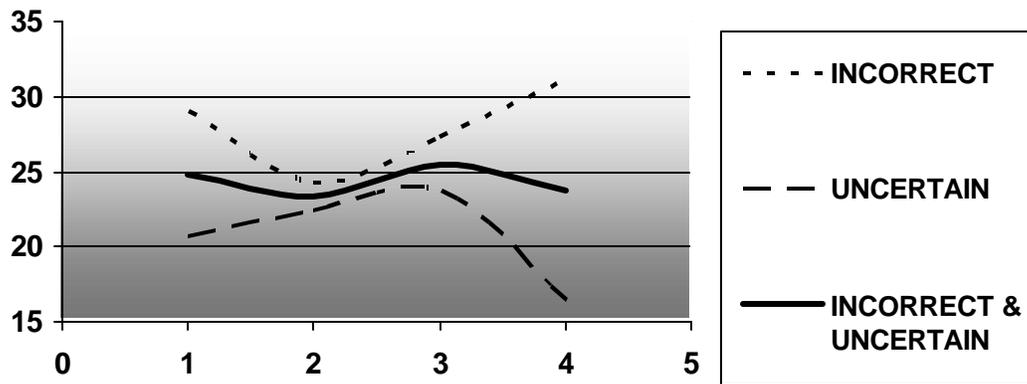
Therefore, it is interesting to compare the responses provided by the educators with those of their learners, especially in the light of transfer of knowledge (and even of attitudes) through classroom-based educational experiences (**FIGURE 5:9**). The researcher employed the statistical technique known as cross tabulation (“crosstab” – de Vos 2001:226, or “crossbreak” – Kerlinger 1986 *in* de Vos 2001:226) to determine the relationship (correspondence) between the two (2) sets of scores (**FIGURE 5:8**). This is a method of

correlation that describes the “degree of relation between (two (2) variables (where prediction is concerned with estimating one variable from knowledge of another)”

(Ferguson 1976:101 in de Vos 2001:227).

| | MADADENI LEARNERS | MADADENI EDUCATORS | NORM/DANN. LEARNERS | NORM/DANN. EDUCATORS |
|--------------------------------------|------------------------------|-------------------------------|--------------------------------|---------------------------------|
| INCORRECT | 29.0% | 24.3% | 27.5% | 31.2% |
| UNCERTAIN | 20.7% | 22.4% | 23.7% | 16.4% |
| INCORRECT & UNCERTAIN | 24.9% | 23.3% | 25.5% | 23.8% |

FIGURE 5:9 – “INCORRECT” AND “UNCERTAIN” RESPONSES AS A PERCENTAGE OF ALL RESPONSES IN ENVIRONMENTAL QUESTIONNAIRE: SURVEY OF ENVIRONMENTAL KNOWLEDGE AND ATTITUDES OF EDUCATORS AND LEARNERS (JUNE AND SEPTEMBER 2003)



GRAPH 5:1 – SCATTERGRAM ILLUSTRATING “INCORRECT” & “UNCERTAIN” RESPONSES AS A PERCENTAGE OF ALL RESPONSES IN ENVIRONMENTAL QUESTIONNAIRE: SURVEY OF ENVIRONMENTAL KNOWLEDGE AND ATTITUDES OF EDUCATORS AND LEARNERS (JUNE AND SEPTEMBER 2003)

Strong positive correlation is illustrated in the direction of the scattergram (**GRAPH 5:1**) in a comparison of the scores from each area’s educators and of their learners. It demonstrates the probability that the learners’ knowledge and opinions are attendant upon those conveyed to them by their educators. If this a reflection on learning in these areas, it may have implications for the teaching taking place, bearing in mind the performance of the educators in the survey.

It would appear that only a fraction of the holistic environmental understandings contained in some of the learning areas can be reaching the lives of many learners – and this is aggravated when learners are deprived by socio-economic circumstances of such basic resources as domestic electricity and water supply.

5.4.3 NW KwaZulu-Natal Learners Identify “Environmental Problems”

To explore the socio-ecological context of the learners’ environmental education

requirements (Wagiet 2001a:13), they were asked to identify environmental problems or issues in their locality, and also “ways in which you think people destroy the environment” (Janse van Rensburg and Taylor, 1993:3; O’Donoghue and Janse van Rensburg 1995:4; O’Donoghue 2000:7).

Those identified by learners have been listed in terms of O’Donoghue’s “Web of Socio-Ecological Interaction” (see Chapter 2, **FIGURE 2:1**) in **APPENDIX 5:H**. A strongly biophysical understanding of “environment” is prevalent, as the learners pointed out lack of vegetation (the reasons for it, and the dusty results); and pollution of land, air and water. They appeared to want to link these malaises to an inadequate peri-urban infrastructure; and from there to behavioural difficulties.

5.4.4 NW KwaZulu-Natal Learners Identify Environmental Amelioration

The learners were further asked to identify how “learners and educators in my school are doing things to help our environment.” Faced with poor amenities and less financial capacity, it is encouraging to learn what efforts were made to restore degraded environments:

“Educators say we must bring grass to school... They make us plant trees, they make us collect the cans... They teach us about recycling. We collect all that bottles and we take them to the recycle centre... We plant more trees so there’ll be more oxygen in our atmosphere. [And we] inform people not to throw rubbish near our school... Maintaining trees and flowers... [We have a] school garden which have vegetables... We don’t waste water. [We are] monitoring usage of water...”

The statement that “Educators educates the learners to care for the environment and not to destroy the environment for the future generation” shows that the concept of “sustainability” has penetrated into at least one (1) classroom in north-western KwaZulu-Natal.

A formative understanding of local democracy is also present: “They build the toilets, they try to call traffic wardens (*sic*) to come and build tar roads...;” very pleasingly, “[We work] with other schools' on our Environmental Policy...;” and “[we celebrate] different cultures during Heritage Day...”

On the other hand, possibly again due to cultural influences, “cleanliness” was often equated with a “good” environment: “The teachers teach us about how to clean our environment, to keep all rubbish to dustbin... Educators don’t want us to throw away paper and bottles in our environment. They organise learners to clean the school. Learners pick up papers daily. Sending childs to go take all the rubbish in the environment... By moving street to street collecting all the papers, plastics and bottles on the street. [It must] be clean, neat and safe place... Making gardens and keep our premesis clean. Putting rubbish bins around the school... We clean our toilets... [The educators] tell [the learners] don’t smoking, don’t drinking and make thing that is important wash you body... [The educators are] learning our children to behave themselves by not going anywhere...”

5.4.5 NW KwaZulu-Natal Learners Define “Environmental Education”

Asked what the term “environmental education” means, learners often (again) fixed their minds on the biological: “... studying about nature, life and plants ... non-living and living things around the world ... every living thing that exists on earth ... to learn about the natural world of land, sea, air, plants and animals that surrounds us... education about the environment like learning about caring for animals or plants in our environment... how to protect our environment, like how to protect soil from the soil erosion... to keep the place

clean and say no to pollution... we must keep our land clean. Do not throw papers in the grass, land or sea. We must make the world to be clean like you.”

Evidence of a more holistic understanding is evidenced by the responses from learners of Zabalaza Secondary School. This school had had learners engage in an environmental education programme. “We must learn about the areas, we must learn about our future and care for others. [It is] education that affects people’s lives. ... we are learning about the environment the thing that are happening around us we learn about nature and how to preserve it from destruction. [We have a responsibility in] ... teaching the public about the environment, how to conserve it so that future generations could enjoy it also... The school [must] do (*sic*) something in the world.”

In addition, obviously having been taught Article 24 of the Bill of Rights (Constitutional Assembly 1996:11): “Education is about learning something special...about helths and the plase that we live in. [It must be] ... to teach people to love nature and feel healthy, if you are keeping the environment clean all the time.”

It would appear that learners and their educators require further exposure to environmental concepts, leading to understanding, awareness, appreciation, and an action competence towards their total surroundings.

5.5 AN EXAMINATION FOR IMPROVEMENTS IN CONFIDENCE AND/OR ABILITY IN CURRICULUM-RELATED EDUCATION IN THE COURSE-ATTENDEES

5.5.1 Motivation for “Refresher Courses”

In consultation with senior personnel from the KZNDEC’s Majuba and Dundee Districts (Messrs. Zulu, Masondo, Majola and Lancaster in April 2003), it was agreed to hold two day-

long review sessions three (3) months after the June and September 2003 curriculum workshops for each group of educators. These “Refresher Courses” were felt necessary to:

- Maintain momentum and enthusiasm with the educators for their induction into environmental education (and especially in the process of incorporating environmental teaching into the curriculum).
- Evaluate the tasks set for the educators in terms of “curriculum formation, pursuance and goals-completion” in a “cyclical [manner] that accentuates inter-activity” (Carl 1995:185) and which leads to “dynamic curriculum development” (Ibid., 1995:200).
- Utilise collegial discussions to clarify misgivings, to help iron out difficulties, and to encourage one another.
- Afford the facilitators insight into future courses, based on experiences gleaned from the delegates.

5.5.2 Practical Arrangements Preceding the “Refresher Courses”

Those course delegates who wished to, registered their schools as Eco-Schools in June and September. In the interim, they were visited by the Subject Advisor, Mrs Stroebel or by the researcher. They were also posted some guidelines with ideas for compiling an “Eco-School portfolio.” It was suggested that notes made should be put into a file, filling in the relevant information and adding in their own photos and/or drawings, learning programmes, lesson plans and examples of learners’ work.

Information required in the portfolio was a “profile” of the school. It included its name, contact details, the number of learners, a description of the area and/or community, and the names of those who were serving as the Environmental Working Group (i.e. learners,

community members, SGB members and educators). Records of an audit of the school's environment, and of the three (3) focus areas on which the school/Group had chosen to work (e.g. School Calendar, Environmental Information and Community Knowledge, School Grounds and Fieldwork, etc.; Le Roux and Chadwick 2001:5; Ward 2003:6) also had to be included.

In the reports on the "focus areas," it was necessary to show evidence of professional development, which included lesson plans or learning programmes within an "active learning" framework (cf. Clacherty 1995:15; O'Donoghue 2000:7; Ward 2003:11). Lastly, each educator had to stipulate any future plans, and to set (environmental education) goals for the coming year.

5.5.3 Educators Report on Curriculum Design and Implementation at "Refresher Courses"

At each "Refresher Course," each educator submitted an interim report that included portions of his/her pending portfolio. (The documents needed only to be completed by November 2003 or April 2004.)

It was evident from the reports that environmental issues particular to each school's context are being tackled, and the learning gained by problem-solving enables educators to achieve their outcomes in a convenient, practical manner. Many of the presentations demonstrated unique adaptations of the RNCS (Curriculum) in a cross-curricular manner that drew in present realities, curriculum requirements, and deep environmental learning experiences.

Here are some such reports from educators from Madadeni-Newcastle and Dannhauser-Normandien:

- Fikile Mbatha of Bethamoya High School had learners "decorate" a beautiful collage

picture of an acacia tree with sweet papers and chip packets. It was a depiction of a township person's life: nature spoiled by pollution. A lesson on littering was followed by a drama of a young life degraded by drug abuse.

- Elias Magubane of Ntimande Primary School set himself the goal of restoring pride in his new school. Because they should contribute to environmental policy-formation, he involved his learners as active participants in the school's overall Strategic Planning. They used a vegetable-growing project to provide the learners with gardening, healthy meals, and practical environmental education. The venture has spawned other learning projects, such as plumbing (300 metres of water piping was laid on by educators and learners!), water purification, and tree planting.
- Mabaso Themba of Hlananathi High School had his Policy Team draw a plan of the school. In questing for focus areas (Section 5.5.2), learners complained about the lack of ventilation in their "prefab" classrooms. They said it was unhealthy, and the stuffiness made them sleepy. They wanted an electric fan. Mabaso challenged them instead to design a natural cooling system, and the learners constructed a Victorian-style vent, using the rising hot air to "drag" cooler air through the open doors and windows.
- Sibosiso Nyembe's learners at Ndumisani High School raised R120 in just three (3) months by selling waste paper. Using skills from Economic and Management Sciences, they hired a grader from the proceeds to create a sports field for themselves.

6. CONCLUSION

Hurry and Mokoena suggest that environmental education is "a process aimed at developing

a world population that is aware of, and concerned about the total environment and its associated problems, and which has the knowledge, attitudes, motivations, commitments and skills to work individually and collectively towards solutions of current problems and the *prevention* of new ones” (Hurry and Mokoena 2001:8; emphases supplied; cf. Section 5.1.1 and Janse van Rensburg and Taylor 1993:6).

This can be true for the Environmental Education Centres of the KZNDEC, that they provide a venue and/or opportunities keep their colleague-educators *informed* on environmental matters; that they act, when appropriate, as *catalysts for action* on environmental issues; and that as pedagogic institutions they seek innovative and effective methods for incorporating “environment” into the curricula in all of their varied facets (cf. White Paper on Education and Training, 1995:18).

The researcher would suggest that an era is dawning for the Environmental Education Centres where, having served their primary purpose as residential institutions providing “immersion and acclimatisation” types of experiential learning (“getting the kids out and making them aware” – Keegan 2002; cf. Delta 2001:6), they progress to affording capacity-building opportunities for educators (Fien 2002:44). The Centres are situated centrally in their KZNDEC Districts, and, with additional infrastructure, they could become “centres” indeed – where programmes that re-orientate teacher education and re-education becomes paramount (Ibid.) – to the benefit of educators and learners that they would serve, but, ultimately, towards a sustainable future for the environment in KwaZulu-Natal.