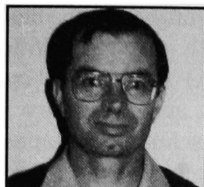


Environmental Education: Implementation in a NSW Department of School Education Region

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A B S T R A C T

Survey results are described for the perceived, implementation of the NSW Environmental Education Curriculum Statement in one School Region. Data provide a picture of the extent to which schools have documented Environmental Education policies and the amount and kind of implementation at school level. Reference is made to the use of field study centres, community involvement, and the extent and possible impact of professional development opportunities on these measures. Comparisons are made between the primary and secondary sectors. Professional development does appear to have had some impact, and the 'across curricula' approach seems to have had partial success. Reasons for the limited involvement of secondary schools are suggested. The extent of primary project work which was occurring appeared encouraging but there were unanswered questions about whole school programs. NSW Government initiatives such as Field Study Centres and the Greening of Schools program appeared to be playing important roles.

Introduction

In 1989 the NSW Department of Education released the Environmental Education Curriculum Statement, hereafter referred to as the EECS. Its purpose was "to provide guidelines for environmental education within the total school curriculum". The NSW Government (1993) more recently asserted that

as a result [of the EECS release] environmental education has been incorporated into the total curriculum of the school.

In mid-1993 a NSW Department of School Education regional environmental education committee surveyed all the schools in its region in order to determine the perceived nature and extent of implementation of the EECS and some of the factors which may have influenced that implementation. This paper describes the results of that survey.

There have only been a small number of studies concerned with the implementation of environmental education in Australian schools, most of which were completed several years ago. In a review of environmental education studies the Queensland Board of Teacher Registration (1993) indicated that

- environmental education was not a high priority in curricula
- it was misunderstood with virtually no attention given to affective objectives
- there was a lack of environmental education in schools which focussed on education *for* the environment
- teachers' self reported practice indicated they devoted much more time to teaching *about* and *in* the environment rather than *for* it

The Australian Teachers' Union (ATU 1990) completed a

very brief survey of Australian schools through its union representatives and concluded that "environmental education appears to be being quite enthusiastically taken up—especially in country schools". None of the articles reviewed for this study specifically referred to the implementation of a system-wide environmental education curriculum statement, and in that sense the data in this paper are unique in the Australian context. On the international scene Ham and Sewing (1987/88) and Lane et al. (1994) have reported on environmental education implementation surveys in the USA.

Procedure

Surveys are often used "to describe the incidence, frequency, and distribution, of the characteristics of a population...[and can be] used to investigate relationships between variables" (McMillan 1992). The stated purposes of this study, to determine the perceived nature and extent of implementation of the EECS and some of the factors which may have influenced that implementation, could therefore be readily determined by the use of an appropriately constructed questionnaire. A brief survey was considered to be a cost-effective and manageable means of gaining access to information from a wide variety of schools.

The survey was prepared by a NSW Department of School Education Regional Environmental Education Committee, and distributed in June 1993 to all schools in the region. In November 1993 a follow-up reminder letter was forwarded to all schools which had not responded. The survey sought information from the school's environmental education contact teacher (EECT), or in their absence the principal. It asked for their perceptions about environmental education practices within their school.

The survey was a brief three A4 page questionnaire with 17 items. Four related to demographic data and ten were

predominantly 'yes/no', multiple choice, rating and annotated Likert items. The content of the closed questions related to the availability of the EECS, the nature and frequency of professional development, the presence of environmental education in the school management plan, extent of implementation of the EECS, community participation, school level documentation of environmental education, the presence of environmental studies programs, units or electives and the use of Field Study Centres. A further two open-ended questions were related to school-wide environmental education initiatives and future directions. A final question sought comments about environmental education in the school. The whole survey could have readily been completed in less than ten minutes.

The survey questions were partially based on the expectations of schools as described in the EECS—the required documentation of environmental education at the school level, for example. The validity of the survey was supported by its being developed by a committee, which drew on a range of environmental education expertise and experience held by primary and secondary school teachers, a teacher education lecturer, a field study centre teacher-in-charge and representatives from several environmental community organisations such as Greening Australia.

The region surveyed was non-metropolitan with a relatively stable teaching population. Of the 189 primary schools (K-6) in the region 99 responded (52%). This represented a response rate of about 47% for smaller schools, here defined as six or fewer teachers, and 58% for larger schools. Seventeen secondary schools (years 7-12) responded from a total of 29 (59% response rate). The response rate was typical for mail questionnaires (McMillan 1992). It does mean however that non-response bias may have influenced the results. It is difficult to speculate on the influence of this bias but it is probably reasonable to assume that the data reported are biased towards a more favourable representation of the implementation of the EECS that existed in 1993. The schools which did respond fairly equally represented small and large primary schools and secondary schools in the region in that about half of all these categories replied to the survey.

Results and discussion

The extent and kind of professional development opportunities available for teachers are first reported; it was considered that in-service may be an influential factor in determining the extent of implementation of the EECS. Documentation of environmental education at school level is then described, followed by perceptions of the extent of implementation of the EECS, staff involvement, and parent/community participation. The frequency of use of Field Study Centres is noted, as well as the ways in which the EECS was being implemented through curriculum initiatives and school-wide environmental projects. School plans for the immediate future are then categorised. It

should be noted that all percentages refer to the number of schools responding to each question on the survey. As some schools did not respond to all questions there are small variations to sample sizes and percentages referred to in different tables and parts of the text.

Provision of professional development experiences

Although 76% of primary (75 schools) compared to 63% (10 schools) of secondary reported that their staff had experienced some professional development related to the implementation of the EECS, the difference was not significant. Staff meetings were the main form of in-service experienced by both primary (56%, 43 schools) and secondary (64%, 11) teachers. About a quarter of the primary (22%, 43) and secondary (28%, 11) schools indicated a whole-school development day had been devoted to the implementation of the EECS with more than a third of these mentioning other inservice as well. The other inservice included specific environmental education courses. For example, 13 were held at the region's Educational Resources Centres and/or through external consultancy. This data would suggest only a small number of schools sought or were able to obtain outside expertise to assist in the introduction of this document. This of course was not necessarily required. The NSW Department of School Education had prepared an introductory implementation package to be used by schools. It included professional development activities and a videotape, supplemented by two regional videotapes. Unfortunately the extent of use of the package was not ascertained in this study. The activities in the package would have required at least a half day for effective completion. Those schools which employed a staff meeting as a means of inservice probably did not use these resources in any meaningful way.

The EECS was released in 1989. Of the approximately 70% (83) of schools which experienced professional development, most of it occurred on one occasion and soon after the release of the EECS. This was the case for 73% (57) of primary schools mainly in 1990-92, and 64% (7) of secondary schools in 1989-90. No secondary schools received professional development after 1990, while in-service was still continuing for some primary schools in 1993.

Professional development activities did occur in more than one year for about 25% of those schools which had experienced inservice. It was conducted over two years for 28% (3) of secondary, and 19% (15) of primary schools, three years for 6% (5) and four years for 3% (2) of primary schools. This could be an indicator of the number of schools which wished to develop environmental education as a significant part of their curricula; however there was no significant relationship between the number of years in which a school had received inservice and the perceived extent of implementation of the EECS or the availability of a school level environmental education policy.

Documentation of school level policy on environmental education

School level policy provides a clue to a school's intended curricula. It generally means a school staff has discussed the implications for their school of the state level document. It does not necessarily reflect the transacted curricula. There was no significant correlation between perceptions of the extent of involvement in environmental education or the percentage of staff teaching environmental education and the existence of a school environmental education policy.

The EECS did not explicitly state that schools must develop a school level environmental education policy, but most schools interpreted the statements "it is mandatory for schools to ensure that environmental education is incorporated in the whole school curriculum" and "schools are required to integrate the aims and objectives of environmental education within existing teaching/learning programs" (NSW 1989) to imply that such documentation was required.

Although 88% of primary schools (85) indicated that environmental education was included in the school's Strategic Management Plan, as required by the NSW Department of School Education, only one in every two primary schools had a current environmental education school level policy. Those schools which had experienced professional development activities were more likely to have a school environmental education policy than those which had not. A similar trend was present for the inclusion of environmental education in the school's Strategic Management Plan, but it was not statistically significant.

More secondary schools, but not significantly so, had school level policies available, although not as many (68%, 11) had included environmental education in their Management Plan. Of the 17 secondary schools which responded to the school level policy question, 71% (12) did not have an environmental education policy in each faculty. Table 1 indicates that the key learning areas (KLAs) of Science and Human Society and its Environment (HSIE) were more likely to have environmental education included in their faculty policy and programs, whereas Mathematics and Languages Other Than English were not. The other KLAs were between these two extremes.

Table 1: Occurrence of environmental policy in secondary school faculty KLAs

KLA	Percentage of schools (n = 17)
Human Society and its Environment	76.5
Science	76.5
Technology and Applied Science	58.8
English	58.8
Personal Development	
Health & Physical Education	47.1
Creative and Practical Arts	43.8
Mathematics	35.3
Languages Other Than English	35.3

The *Environmental Education Project* (University of Sydney 1990) commented "there could...be the perception [among secondary teachers] that the environment is studied in traditional subjects such as geography and science and that other subjects have little to contribute to environmental education". The above data does not necessarily support such an assertion but still suggests that some KLAs may not have recognised the significant role they might have played in implementing the EECS.

Utilisation of Field Study Centres

The NSW Government's environmental education plan had three prongs: the EECS, the Greening of Schools Program, and the Field Studies Centre (FSC) network (NSW 1989). Overall 53% (51) of primary and 47% (8) of secondary schools, which was not a significant difference, had used the region's two Department of School Education Field Studies Centres programs. It was also noted that 12 primary schools and 8 secondary visited at least ten other non-Department of School Education centres which the respondents considered to be field studies centres. In contrast to the primary schools, secondary schools had visited locations beyond the school region.

The extent of implementation of environmental education at school level

In 2 out of 10 responding primary schools and 3 out of 10 secondary schools teachers did not have access to the EECS. Copies for every teacher were distributed in 1989. Although limited access to the curriculum statement would appear to have been an obvious constraint on the implementation of environmental education in schools, there was no relationship between its availability and the school's documentation of environmental education, its perceived implementation, or the involvement of parents and the community.

EECTs' or principals' perceptions of the extent to which they believed environmental education was being implemented in their school is indicated in Table 2. It

reveals that 77% (75) of primary schools were perceived to be implementing the EECS to 'a fair extent' or 'extensively' compared to 41% (7) of secondary schools. This result is consistent with the perceptions of the percentage of staff who were actively implementing the EECS as shown in Table 3. Again, responding primary schools appeared to have had significantly more staff actively involved—80% compared to 40% in secondary schools.

Table 2: Perceived extent of implementation of NSW EECS and degree of parent/community involvement

Kind of school	Mean ¹ (s.d.)	Not at all	To some extent	A fair extent	Extensively
How well do you think the EECS is being implemented in your school?					
Primary EECS=24 Principals=73	2.93	0.0	22.7	61.6	15.5
Secondary EECS=12 Principals=5	2.41	5.9	52.9	35.3	5.9
Have parents/community been involved?					
Primary EECS=25 Principals=73	2.99	0.0	31.7	37.8	30.6
Secondary EECS=11 Principals=5	2.13	18.75	56.3	18.75	6.25

¹These are means on a 4 point scale where 1 = not at all; 2 = to some extent; 3 = a fair extent; 4 = extensively; the responses for each point are given in percentages. The differences between the primary and secondary mean scores for both items are significant at the 0.001 level (t-test).

Table 3: Number of schools with staff actively implementing the EECS

Estimated percentage range of staff actively implementing the EECS	Percentage of secondary schools with staff in the range (n = 15)	Percentage of primary schools with staff in the range (n = 94)
0-24	33.3	4.25
25-49	20.0	8.5
50-74	40.0	21.3
75-100	6.76	66.0

Data in Table 4 suggest that primary schools which had undertaken in-service activities were perceived to be implementing the EECS to a greater extent than primary schools which had not undertaken in-service. They were also perceived to have more staff involved in teaching environmental education but this difference was not significant. Similar trends in the extent of implementation, and the percentage of teaching staff involved were found in secondary schools. Lane et al. (1994) found a similar positive correlation between experiencing professional development activities and implementing environmental education.

It appeared from written responses that smaller schools were more actively involved in environmental education than larger schools. A further analysis of the above data revealed that although there was no significant difference in the perceptions of the extent of implementation in smaller primary schools, there was between the number of staff thought to be actively involved in implementing the EECS, with this being 91% in small schools compared to 63% in larger primary schools.

Kinds of implementation

Although the EECS stated that environmental education was "best approached as an across curriculum initiative" and that schools were "required to integrate the aims and objectives of environmental education within existing teaching/learning programs", the document added that "schools should consider introducing environmental themes into existing programs, and in the case of secondary schools, introducing additional environmental school based courses" (NSW 1989). Forty-one percent of both primary (35 schools) and secondary (7) schools had incorporated separate environmental units or programs or electives. The existence of environmental studies courses in the secondary school did not seem to depend upon whether the school had been involved in professional development activities.

Of the primary schools which provided further information only 6 reported developing an environmental education teaching-learning program; one of these specified that the entire staff had formulated an environmental education curriculum with 4 units for each K-6 grade which was to be implemented over a 5 year plan. Twenty-two schools indicated they had introduced environmental units into their curricula and eleven stated the units were integrated across or within particular KLAs. Science and Technology and HSIE were by far the most common areas. Over 20 unit titles were cited including trees, Aussie animals, recycling, and rainforests. One school commented that environmental units were integrated with the year 4 camping trip. A superficial analysis of school level environmental education policies provided by respondents found that only 4 primary schools had identified specific ways in which environmental education could be incorporated into existing Key Learning Areas.

Of the 8 secondary schools which provided details, 2

indicated they had NSW Board of Studies Other Approved Studies (BOS-OAS) Courses in Environmental Studies in years 11 and 12; another school provided a year 11 course. The 2 schools with the BOS-OAS courses were amongst 3 schools which offered other kinds of Environmental Studies courses; 2 of these schools indicated the courses were available in years 8, 9 and/or 10 and the third stated it had applied for a 100 hour year 9 course in 1994. Four schools stated that there were compulsory class units in other Key Learning Areas with HSIE and Science again being mentioned.

Overall it would seem that where environmental education was being implemented it was primarily integrated within existing curriculum areas, although there were about 40% of the responding schools in which separate themes/units had been developed. The number of secondary schools which had developed separate environmental studies courses appeared limited.

Table 4: Professional development activities and EECS implementation/staff involved in implementation

Kind of school	Mean extent of implementation ¹ (standard deviation)	Mean percentage estimate of staff actively involved
Primary (n = 96)		
Undertaken professional development (n = 73)	3.00 (0.60)	82
Had not undertaken professional development (n = 23)	2.70 (0.63)	72
Difference between mean scores ²	0.30*	10
Secondary (n = 16)		
Undertaken professional development (n = 10)	2.70 (0.68)	48
Had not undertaken professional development (n = 6)	2.00 (0.63)	31
Difference between mean scores ²	0.70 ³	17

¹These are means on a 4 point scale where 1 = not at all; 2 = to some extent; 3 = a fair extent; 4 = extensively.

²*refers to a significant difference at the 0.05 level (t-test)

³Although the trend is similar to primary schools the difference was only significant at the p = 0.06 level.

Parental and community involvement

Consistent with the above results Table 2 shows that primary schools were perceived to have involved parents and the community in environmental education significantly more than secondary schools. It also shows that in 68% (67) of primary schools parents and the community were involved to 'a fair extent' or 'extensively' compared to 25% (4) of secondary schools. At the primary level there was some parent or community involvement in all schools, whereas in up to about 20% of responding secondary schools no such involvement was apparent. Smaller primary schools did not seem to be involved with parents or the community more than other primary schools and such involvement did not appear to be related to whether the school had developed an environmental education policy or whether staff had experienced professional development activities.

Projects and initiatives in environmental education

Schools were asked what whole school initiatives had been implemented in the previous 2 years. The kinds and frequency of these projects have been classified and summarised in Table 5. The number of distinctively different initiatives for each school was also recorded; primary schools appeared to be involved in a wider range of whole school projects. Ninety-nine primary schools listed an average of 4.0 different projects/school; seventeen secondary schools listed an average of 2.9 projects/school. Only 2 primary and 2 secondary schools did not list any initiatives. No significant difference in the number of projects listed was found between small and other primary schools.

Table 5: Whole school environmental education initiatives

Initiative ¹ (undertaken during last 2 years)	Number of primary schools (max. n = 99)	Number of secondary schools (max. n = 17)
Recycling	70	9
Clean Up Australia Day	48	11
Composting	30	0
Tree planting	29	9
Greening Schools Entry	28	2
Gardens	24	1
Plant propagation projects	18	0
School grounds beautification	18	1
Rainforest regeneration	16	2
Landcare	14	6
World Environment Day	11	1
Preparation of nature/ environmental areas/walks	9	0
Tidy towns entry	8	1
Paper making	5	0
Worm boxes	4	0
Miscellaneous ²	11	3

1. Some responses not included in the above tended to refer more to environmental teaching learning activities rather than 'initiatives' such as excursions, camping and environmental focus days.
2. These were initiatives which were only mentioned by one or two primary and/or secondary schools. Examples were conservation, energy water survey, river bank regeneration, environmental club, Pacific Power to Schools award, family environment day, video & booklet on planting tips, bird watching, video production (landscapes).

Stimuli for undertaking environmental projects came from the school itself, the local community, or outside organisations such as Greening Australia. The opportunity to enter environmental competitions seemed to motivate some schools. Many projects appeared to be centred on school grounds; examples were composting, some Landcare projects, and gardens. From the other schools a smaller number had a local community focus such as dune care as listed by 8 primary and 4 secondary schools. The EECS stated that the main outcome of environmental education should be that "students will participate actively in maintaining and improving the quality of their environment" and that the classroom, school grounds, home and the community could each be the focus for such activity (NSW 1989). The existence and extent of whole-school initiatives suggested that a considerable number of students were actively involved in such projects.

Recycling was by far the most common environmental initiative undertaken in schools. It took a variety of forms many of which were specified for example aluminium recycling in 18 primary (P) and 4 secondary (S) schools, paper (17P and 4S), glass (8P), ink cartridges (1P) and plastic (1P). Three schools mentioned they had entered a competition organised by an aluminium processing company. One school acted as the community recycling

centre, while another had a co-operative recycling program with a local firm. A 'litter meter' was an initiative taken by one primary school.

National and state projects and special environmental days obviously acted as stimuli for action for some schools with 'Clean up Australia Day' being the most popular primary school activity, followed by World Environment Day. The Greening Schools competitions also attracted considerable support and several schools had participated in the Tidy Towns competition. Two primary schools indicated they had won awards in the former and one in the latter; another stated it had received a grant from Greening Australia.

Tree planting took many forms which included a Koala corridor (2P, 1S), a focus on native trees, including the winning of a native garden competition (4P), a tree levy submission to the NSW Teachers' Federation resulting in a \$200 grant, adopt and plant a tree, birdwing butterfly vines, and involvement in Arbor day; all of these were mentioned by one primary school each.

Gardens were also a popular school level project. Examples included landscaped gardens (6P), edible gardens (6P), permaculture (3P), organic gardens (2P), sensory gardens (1P, 1S), an orchard (1P) and an agricultural plot (1S). Landcare work incorporated dune care (8P, 4S), catchment care (1P) and erosion control (1P).

Most of the projects related to care and improvement of the natural environment. Brief mention was made of energy usage but no references were made to heritage projects and the built environment.

Future directions

In order to ascertain the environmental aspirations of the region's schools respondents were asked which environmental initiatives they would like to implement. Most schools (67 primary, 13 secondary) responded to this question; the major categories which emerged are indicated in Table 6.

Table 6: School's preferences for future environmental education directions

Future activity ¹	Number of primary schools (max. n = 99)	Number of secondary schools (max. n = 17)
Recycling	17	0
Garden projects ²	13	0
Consolidate existing initiatives	7	0
Preparation of environmental tracks/outdoor classroom or learning/resource area	9	1
Worm farms	8	0
Greening Australia	6	0
Developing a school environmental education policy	6	1
Shadehouse/plant propagation	6	1
School grounds maintenance	5	0
Composting	5	1
Integrate environmental education across curricula	5	4
Implement the EECS	5	0
Erosion control	4	0
Growing specific bushes/trees	4	0
More excursions (including local area field work)	4	0
Development of environmental education units	4	1
Miscellaneous ³	14	13

¹Categorised according to commonality of response; more specific details within the text.

²The variety of garden projects included extending specialised gardens, herb gardens, dry climate garden, use of rainwater for gardens, planting native plants to attract wildlife, and garden plots for each class.

³There were 2 further preferences listed by three primary schools, 5 more by two primary and two secondary schools each (10 in total), and 9 and 11 by one primary and secondary each (20 in total).

Schools referred to two kinds of initiatives they would like to take in the future. These were environmental projects such as recycling which was cited about 75 times, and further curriculum improvements such as preparation of whole school policies, outdoor learning areas, and teaching units and materials, referred to about 45 times.

Other comments

Thirty-one schools (26P, 5S) made other comments about the implementation of the EECS. Most primary schools (14) made positive remarks about their involvement in environmental education and the initiatives they had undertaken. Seven of these schools referred to specific curriculum achievements.

Four examples were:

Students enjoy this perspective. It's easy to integrate with the KLAs.

All children, teachers and the wider community are becoming more conscious of the environment and changing attitudes in a positive way. Impact of the program on schools has helped result in this change of attitude.

Very environmentally aware school: school based curriculum; nature trail; rainforest; wormery; orchard; workcards K-6; labelled plants; community involvement.

Community indicated an active interest in an environmental education needs survey in 1994 and this has been included in the school's Management Plan. Also one day per week the school addresses environmental education issues.

Four schools indicated that the help they required included more prepared units, staff inservice across the KLAs, and advice on the use of a large bush area. One of these schools raised a curriculum issue probably deserving more attention; reference to this is made in the concluding remarks to this paper:

Need to look at the development of knowledge content beyond 'hands on' sensitising activities such as propagation and recycling.

Three schools referred to further initiatives they wished to take. Only 4 schools made any kind of negative comment. Three of these referred to time constraints; in two of them the schools juxtaposed these comments with positive remarks.

Additional comment were not as freely supplied by secondary schools. Of the 5 comments received 2 were hopeful that there would be an improved environmental education commitment and involvement in the future. Difficulties mentioned included, for example:

Student environmental groups are desirable but difficult to get running and to maintain. Need to maintain/broaden environmental education commitment in the school.

Two responses expressed difficulties in implementing environmental education:

I feel the environmental education document cannot be properly implemented in high schools across KLAs. A compulsory environmental education unit in Year 7 might be best.

Major problem because of changes in the education system. This area of learning needs to bide time. Danger of forcing through such initiatives.

Conclusions

The survey reported here has obvious limitations. A major consideration is whether the non-response bias means that the interpretations reported are skewed to provide more positive views than those which actually existed. As indicated earlier this could be the case and hence interpretations need to be seen as indicative only. Further it should be noted that the survey only reported respondents' perceptions of practice rather than observations of what, in reality, was occurring.

However the survey provides an overview of the 1993 status of environmental education in at least 50% of the schools in the region. The emergent picture is derived from the perspective of people who were expected to be aware of happenings in environmental education in their school. Hence, although the survey was limited, in the absence of other data it provides some baseline information for future reference. It would be valuable to compare these results with results of a similar survey carried out in a few years time when the National Professional Development Project's environmental education packages have been implemented for a reasonable period. The current results reported here may still suggest fruitful courses of action for improving the status of environmental education in the region. Bearing the above limitations in mind the following conclusions are drawn.

Data obtained in this survey suggested that the EECS was being implemented more in primary schools than in secondary schools. Involvement in professional development activities could have been an influential factor determining the extent of implementation. Even though the kind of professional development available was occasionally limited to a 'one-off' experience the positive statistical relationship found between extent of implementation and professional development suggests that the Department of School Education should further encourage all schools to become involved in appropriate inservice. Since the study by Lane et al. (1994) found that many teachers said inservice training would be the factor which would influence them to teach environmental education then such a decision is probably warranted. A related issue which did not surface in this study is the absence of environmental education in the pre-service studies of many teachers. Lane et al. (1994) found "a lack of background in environmental education" the second most cited response for avoiding environmental education, and as most current NSW teacher education courses do not include compulsory units in environmental education (Walker 1995) this could be an important factor in improving the status of environmental education in the medium to long term.

Extent of implementation could be influenced by a school size effect; small primary schools, defined here as having 6 or less teaching staff, may have had proportionally more staff involved in environmental education than larger primary schools. This might be related to the ease of

obtaining change in small compared to large organisations. Interestingly, the existence of school level environmental education documentation, for example, a school environmental education policy, did not appear to be an important factor in extent of implementation even though such documentation was more likely to be present if the school had experienced professional development activities.

The mode of implementing the EECS appeared to be predominantly across school curricula, although some secondary KLA's seemed to be less involved than others. This trend in secondary schools was followed to some extent in primary schools, that is there was a bias towards implementation in Science and Technology and in HSIE. Ham and Sewing (1987-88) found a similar trend in their USA survey. However, specific primary and secondary units and secondary courses had been implemented in about 40% of schools. The number of environmental education courses present in the upper secondary levels of years 11 and 12 at the time of the survey seems to have been low.

Two possible interpretations of the more limited involvement of secondary schools could be their larger size and the consequent difficulty of obtaining change, and the varied emphases placed on environmental education by teachers in different faculties. The main indicator from this survey of such differential interest is that some faculties, for example HSIE, had given the area more attention via their documented curriculum policies and programs than others. Hence, if environmental education is to be truly an initiative across schools' curricula, some curriculum areas may require more support than others. Both Samuel (1993) and Lane et al. (1994) report similar findings. Samuel's study was one of the few that determined empirically the impediments secondary schools might have experienced when attempting to implement environmental education. In her case study of a Canadian secondary school she isolated four factors which appeared to inhibit the cross-curricular implementation of environmental education. In brief they were as follows: conceptual problems about environmental education, poorly defined school philosophy and goals, difficulties in coordinating the environmental education implementation project between individual efforts and departments, and a hiatus between administration and teacher perceptions. Impediments at the secondary level were therefore complex and not just simply a matter of time and resources. This was further supported by Gayford (1993) referring to the British context when he commented "in secondary schools there has been much less consensus over the purpose and nature of environmental education". Whatever the cause(s) of limited implementation of the EECS at the secondary level further attention needs to be given to this sector; the NSW Gould League's suggested remedies (1993) for a list of nine possible barriers to the implementation of environmental education is at least a starting point for initiating change.

A positive finding of this survey was the considerable involvement of schools, especially primary, in environmental education projects which suggests schools are 'acting locally' and hopefully 'thinking globally'. Qualitative responses provided to the survey indicated how schools were trying to implement environmental education for the environment. Together with the data about parent and community participation it appeared that several schools, again mainly primary, were "facilitating the investigation by students of local issues through the involvement of local community members" (NSW 1989).

Integration of the above classroom- and school-level initiatives with an effective school-level environmental education program cannot be assumed from the data in this survey. Involvement in a large number of projects is not necessarily indicative of a sound environmental education program. Gordon and Suzuki's comments (1990) about activities such as recycling and planting trees need to be kept in mind:

...recycling programs are misleading...and can't be equated with good garbage management...it's saying you can still continue to consume as much as before. You just have to throw the stuff into your garbage can in a slightly different way...recycling is just reinforcing the throw away society.

Plant some trees and deal with global warming- it has a nice ring to it; it's clean, green and easy to do, a motherhood solution, but unfortunately the problem is not all that simple.

Despite reservations of this kind the survey suggested that there was productive environmental education activity in a considerable number of the region's schools.

Both the other two prongs of the NSW Government's environmental education initiatives seemed to be playing an important role in encouraging environmental education as part of schools' curricula. Field Study Centres had been incorporated into about half of the responding schools' environmental education programs and the Greening of Schools program was involved in at least 25% of the primary schools who referred to whole school initiatives, although secondary schools did not seem to have been as active in this area. There were obviously many schools which could have taken advantage of these facilities and of organisations which very strongly encouraged environmental education in the environment—and often in different environments in the case of Field Study Centres

Further investigations

The secondary school data reported in this study suggest further investigations are needed. More detail is required concerning secondary teachers' perceptions of why they are, or are not, teaching environmental education. In particular, teachers in KLAs such as Mathematics could be asked to provide a deeper insight into why they generally

appeared to avoid environmental education. Secondary school principals may also be able to provide information about whether all cross-curricular areas cause implementation difficulties for secondary schools, or whether there are implementation problems unique to environmental education.

The data in this survey suggested that platforms existed in primary schools for more substantive environmental education initiatives to be taken in the future. As implied earlier, comprehensive environmental education programs at the primary level were rare. However, the results reported here suggest a need for further research into why primary schools appeared to readily get involved in environmental education projects but not in environmental education curriculum planning. Other questions also surface such as "Why did some kinds of projects appear to predominate?"

Many important questions still remain to be answered and a deeper probing of individual teachers' ideas as well as how schools handle cross-curriculum issues may be required before any further real progress can be made in increasing the extent and kind of environmental education being taught in schools in the region of NSW surveyed.

Summary

If this survey can be generalised across the region and NSW then the NSW Government's assertion that as a result of its initiatives "environmental education has been incorporated into the total curriculum of the school" (1993) was, at the time of this survey, only true in some schools. The survey results suggest there was probably a considerable number of schools in which environmental education had yet to make an impact. The factors influencing implementation were many and seemed to be more complex at the secondary level. There seemed to be indicators that environmental education was making 'inroads' into primary school curricula in the region surveyed. At the secondary level the implementation of the EECS would seem to have needed more impetus before such a statement could have been made with any accuracy.



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Editor's note

Keith Scamp's paper has been 'in the hands of *AJEE*' for some time; *AJEE* volume 11, 1995 directed its attention to student research, thus precluding Keith's paper from publication there. However, despite the time lag between the research reported here and its publication in this issue what is suggested by the results of this survey probably remains so today.

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