Environmental Education: A Mismatch Between Theory and Practice

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Introduction

Environmental education has received widespread recognition over many years as being an important process in the preservation and improvement of the world's environment (Lucas, 1979; UNESCO-UNEP, 1988). Environmental education assumes this importance through its potential to involve people at local, national and global levels in a socially active, problem solving, critical and participatory process (Greenall, 1987, 1990; Robottom, 1987) to ultimately develop environmentally literate, responsible and active citizens (Hines, Hungerford and Tomera, 1986/87; Stapp, 1969). Obviously then, environmental education is much more than just a process of knowledge transmission about the environment and awareness raising of specific environmental problems. Rather, environmental education is described by many (e.g. Greenall, 1987; Huckle, 1983; Lucas, 1979; Robottom, 1987) as a process that facilitates the challenging of dominant environmental attitudes and behaviour patterns of individuals, groups and entire societies to bring about positive social transformation and the development of a new environmental ethic.

For environmental education to fulfil this role of social and ethical change, it is internationally recognised that environmental education must address knowledge, awareness, skill, attitude and participation objectives (UNESCO-UNEP, 1976, 1978, 1988). Much of the literature on environmental education encapsulates this range of objectives into three broad categories or forms - education *in* the environment, education *about* the environment and education *for* the environment. Education *in* and *about* the environment is intended to develop the knowledge, awareness, attitude and skill objectives, while education *for* the environment has its focus on the values, ethics, problem solving and action objectives.

While many environmental educators (e.g. Fien, 1988, 1990; Greenall, 1990; Huckle, 1983; Lucas, 1979; Maher, 1986a, 1986b; Robottom, 1984; Walsh, 1984) agree that environmental education should encompass all three forms, it is also asserted that for education to be "truly" environmental and thereby achieve its ultimate goal of environmental well-being, then the real and end purpose must be education *for* the environment. Despite this well accepted view of the essence of environmental education, there is widespread concern that there is very little education *for* the environment actually occurring in

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Australian schools. Several commentators (e.g. Greenall 1981; Maher 1982; Robottom 1984; Walsh 1984) argue that environmental education is functioning in a neutralised form with the practice of environmental education being characterised by a dominance of education *in* and *about* the environment. The concern is that this neutralised form of environmental education does little to develop commitment amongst students to environmental conservation and restoration or to empower them to take action on and resolve environmental problems (Greenall 1989; Maher 1986a, 1986b; Walsh 1984). Thus the ultimate goal of environmental education is being lost.

The research problem

The apparent mismatch between contemporary theory of environmental education (what environmental education *should* be) and current environmental education "reality" in schools (what *is* generally being implemented under the label of environmental education) forms the basis of this research study. While many assertions are made that environmental education in Australian schools exists in an incongruous and neutralised state, many of these claims have little empirical standing. To date, very limited research data exists at national, state or regional levels to indicate the nature and extent of environmental education in schools or to indicate current teacher attitudes and concerns regarding environmental education which may account for any mismatch between its theory and practice.

The purpose of this study was to fill in some of these research gaps for the Queensland situation with a view to providing current data that may make for informed planning, curriculum development and implementation initiatives in environmental education. The study also sought to provide baseline data against which future trends can be evaluated.

The research design and method

The research instrument for this survey-based study took the form of a postal questionnaire. Participants for this study were drawn from a comprehensive list of full-time state primary classroom teachers of Brisbane North Region, one of the twelve education regions in Queensland in 1990. From a total population of 1221, a random sample of 300 teachers was obtained using a random selection table. A response rate of 76 percent (228 teachers) was achieved.

Ideally, participants for this research study should have been drawn from all education regions of Queensland, from both state and private schools, and from primary and secondary sectors. This would have allowed data to be collected to represent teacher practices, attitudes and concerns regarding environmental education for the total Queensland situation. However, certain restrictions resulted in the study being limited to the state primary sector of one Queensland region only. Therefore, the data from this study has certain limitations regarding the extent to which the findings can be interpreted for the

total Queensland or Australian situation. However, confident generalisations can be made about primary schools in the Brisbane North Region. Further studies may address the limitations of this research for the Queensland situation.

Data was processed by the Statistical Analysis System package (SAS, 1988). Responses to all variables in the questionnaire were analysed through frequency distribution tabulation.

The research objectives

This study collected data to achieve the following research objectives:

(a) To determine teachers' current practices in environmental education in relation to the implementation of education *in*, *about* and *for* the environment;
(b) To determine teachers' current status of professional preparation for teaching environmental education in relation to the type(s) of training received;
(c) To determine teachers' attitudes towards environmental education specifically in relation to its perceived importance compared to other learning areas and the level of importance attached to the various aspects of environmental education; and
(d) To determine teachers' concerns about implementing programs that incorporate education *in*, *about* and *for* the environment.

Research results and discussion

The research results are presented and discussed under the following headings which have been derived from the research objectives:

1. Teachers' practices
2. Professional preparation of teachers
3. Teachers' attitudes
4. Teachers' concerns

1. Teachers' practices

(a) Results

Respondents were asked to indicate which of the seven aspects of environmental education outlined in the questionnaire they had included in their class programs over the last twelve months. The seven aspects of environmental education outlined in the questionnaire were:

1. Information about the environment;
2. Studies of humans and the environment;
3. Skills to investigate the environment;
4. Positive attitudes to the environment;
5. Investigating and clarifying environmental viewpoints;
6. Environmental problem solving; and

7. Taking environmental action.

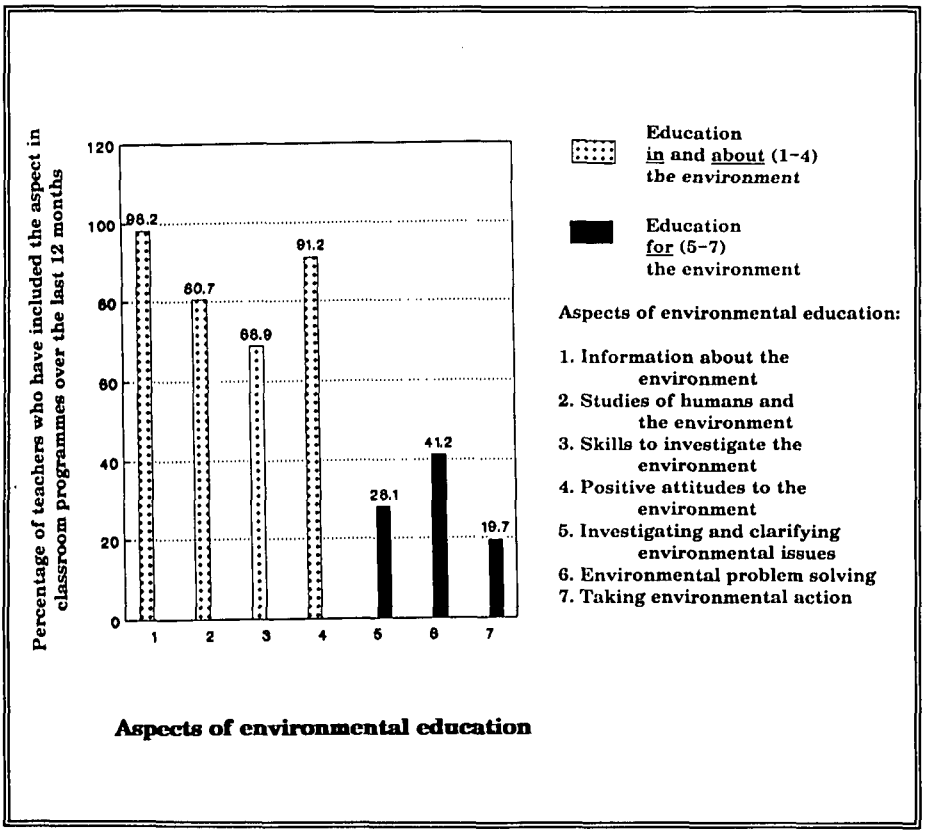
Aspects 1 to 4 represented the intentions of education in and about the environment with a focus on environmental knowledge, skills, awareness and concern. Aspects 5 to 7 represented the intentions of education for the environment with a focus on environmental values, ethics, responsibility, problem solving, behaviour and action.

Results (Figure 1) indicate that a much greater percentage of the teachers in the study are implementing education *in* and *about* the environment (Aspects 1 to 4) than education *for* the environment (Aspects 5 to 7). More specifically, the teachers are most commonly incorporating 'Information about the environment' (98.2 percent) and 'Positive attitudes to the environment' (91.2 percent) into classroom programs. To a slightly lesser extent, the teachers are incorporating 'Studies of humans and the environment' (68.9 percent) and 'Skills to investigate the environment' (68.9 percent). In comparison, only small numbers of teachers are incorporating 'Investigating and clarifying environmental viewpoints' (28.1 percent), 'Environmental problem solving' (41.2 percent) and, in particular, 'Taking environmental action' (19.7 percent).

(b) Discussion

These findings on teachers' practices in environmental education support the claims found in much of the literature and research that there is very little education *for* the environment occurring in schools and that the practice of environmental education is characterised instead by a dominance of education *in* and *about* the environment (Greenall, 1990; Maher, 1982; Robottom, 1984; Walsh, 1984). This lack of emphasis on education *for* the environment means that the real and end purpose of environmental education is being lost (CDC, 1981; Fien, 1988, 1990; Greenall, 1990; Huckle, 1983; Lucas, 1979; Maher, 1986; Robottom, 1984; Walsh, 1984) and that environmental education is operating contrary to internationally recognised prescriptions and recommendations (Hungerford, Peyton and Wilke, 1980; Maher, 1982). The dilution of environmental education through the lack of emphasis on education *for* the environment, implies that students are not being helped to develop the appropriate environmental values, ethics, morals, motivations, behaviours and skills necessary to act constructively for the environment.

Figure 1 Aspects of environmental education included in classroom programs over the last twelve months by full-time state primary classroom teachers in Brisbane North Region (n=228).



While it is of concern that the affective and cognitive objectives (the domain of education *in* and *about* the environment) enjoy a great advantage over the conative or action-oriented objectives (the domain of education *for* the environment), it should be noted that environmental education, in some form at least, has a recognised place in the curriculum. The vast majority of teachers, albeit through an education *in* and *about* the environment approach, have claimed to include environmental education as part of their classroom programs.

2. Professional preparation of teachers

(a) Results

Respondents were asked to indicate whether or not they had ever had any training in environmental education. If yes, respondents were asked to specify whether the training was pre-service, in-service and/or as part of college/

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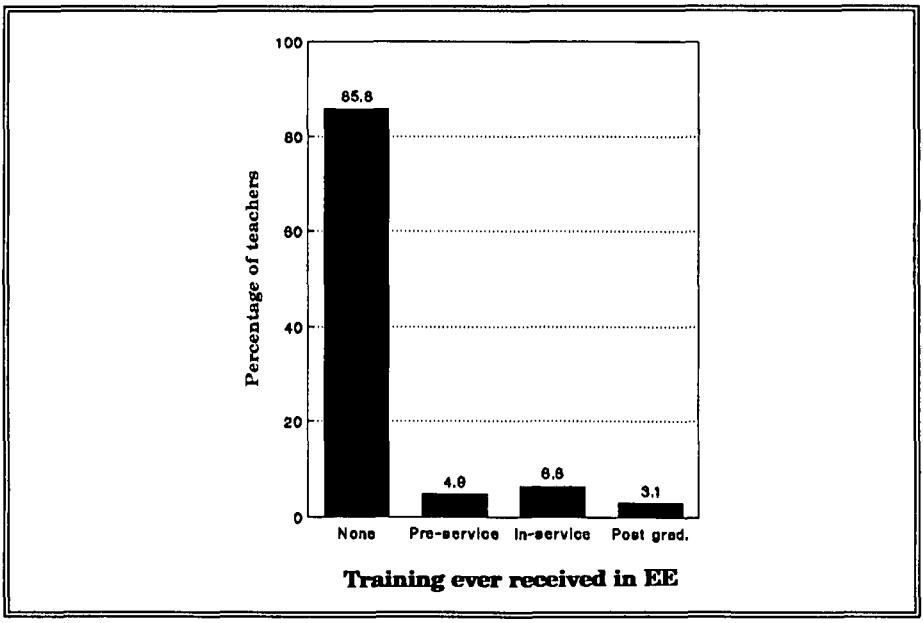
university post graduate study.

Results (Figure 2) reveal that the majority of teachers (85.8 percent) never had any training in environmental education. Only 4.9 percent of teachers reported that they have had pre-service training in environmental education, while 6.6 percent of teachers reported that they have received in-service training. Even fewer teachers (3.1 percent) reported that they have undertaken college and/or university post graduate studies on environmental education.

Figure 2 Type(s) of training in environmental education ever received by full-time state primary classroom teachers in Brisbane North Region (n=226)



(b) Discussion

The evident lack of professional preparation of teachers could explain to a large extent the current de-emphasis of certain aspects of environmental education in classroom programs (see 'Teachers' practices').

If teachers do not have knowledge and understanding of the goals, scope and nature of environmental education or the skills and expertise to facilitate its implementation, then "true" environmental education cannot realistically operate in Queensland schools. This is particularly disappointing considering the great potential available in the form of very positive teacher attitudes to all forms of environmental education and to environmental education in general (see 'Teachers' attitudes'). At present the scenario of environmental education and primary classroom teachers is one of a ready and willing but undeveloped workforce.

Lack of teacher training and preparation to teach environmental education has been highlighted in a previous study (Ham and Sewing, 1987/88) as an important precluding barrier to the implementation of environmental education programs.

3. Teachers' attitudes

(a) Results

Respondents were asked to diamond rank nine learning areas from 'most important' to 'least important' according to how vital they regarded the inclusion of the area into classroom programs. These nine learning areas were:

1. Drug education;
2. Sports and recreation;
3. LOTE (Languages other than English);
4. HRE (Human relationships education);
5. Computer education;
6. Multi-cultural education;
7. Environmental education;
8. Drama; and
9. Music education.

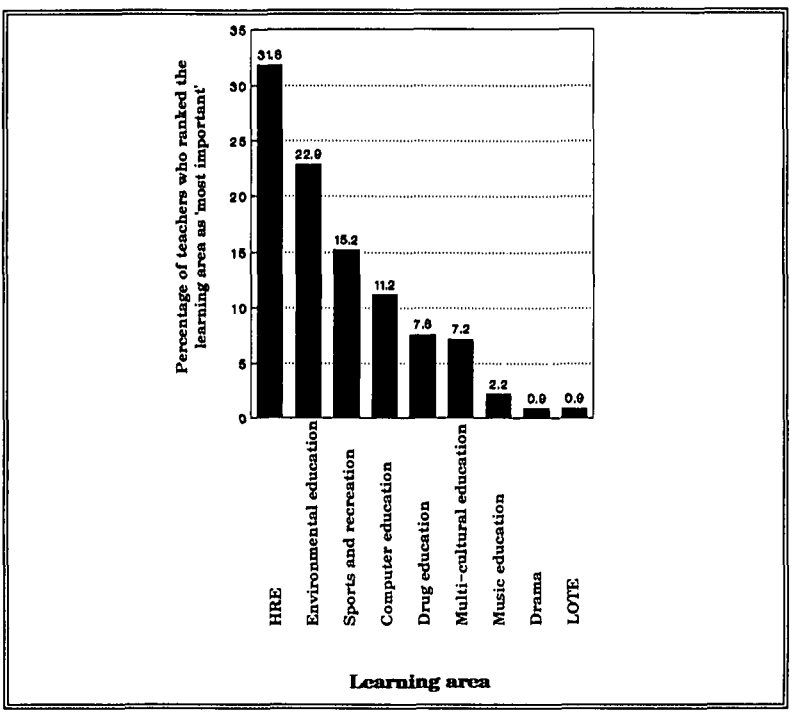
The diamond ranking process involved the respondents in distributing these nine learning areas across five levels of importance: 'most important', 'second most important', 'third most important', 'second least important' and 'least important'.

Results (Table 1) indicate that the majority of teachers (97.3 percent) ranked environmental education as either 'most important', 'second most important' or 'third most important'. No respondents ranked environmental education as 'least important' out of the nine learning areas. Almost half the respondents (48.9 percent) placed environmental education on the 'second most important' level. Results (Figure 3) also reveal that environmental education is one of the leading learning areas out of the nine listed that teachers regard as 'most important' to incorporate into classroom programs. Environmental education was ranked as 'most important' by 22.9 percent of the respondents, this being second only to HRE which received the highest percentage of respondents (31.8 percent) ranking it as 'most important'.

Table 1 Frequency distribution of how important Brisbane North Region, state full-time primary classroom teachers regard the inclusion of environmental education into classroom programs (n=223)

Rank	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Most important	50	22.4	50	22.4
Second most important	109	48.9	159	71.3
Third most important	58	26.0	217	97.3
Second least important	6	2.7	223	100.0
Least important	0	0.0	0	0.0

Figure 3 Percentage of full-time state primary classroom teachers in Brisbane North Region who ranked each of the nine learning areas as 'most important' to include in classroom programs (n=223)



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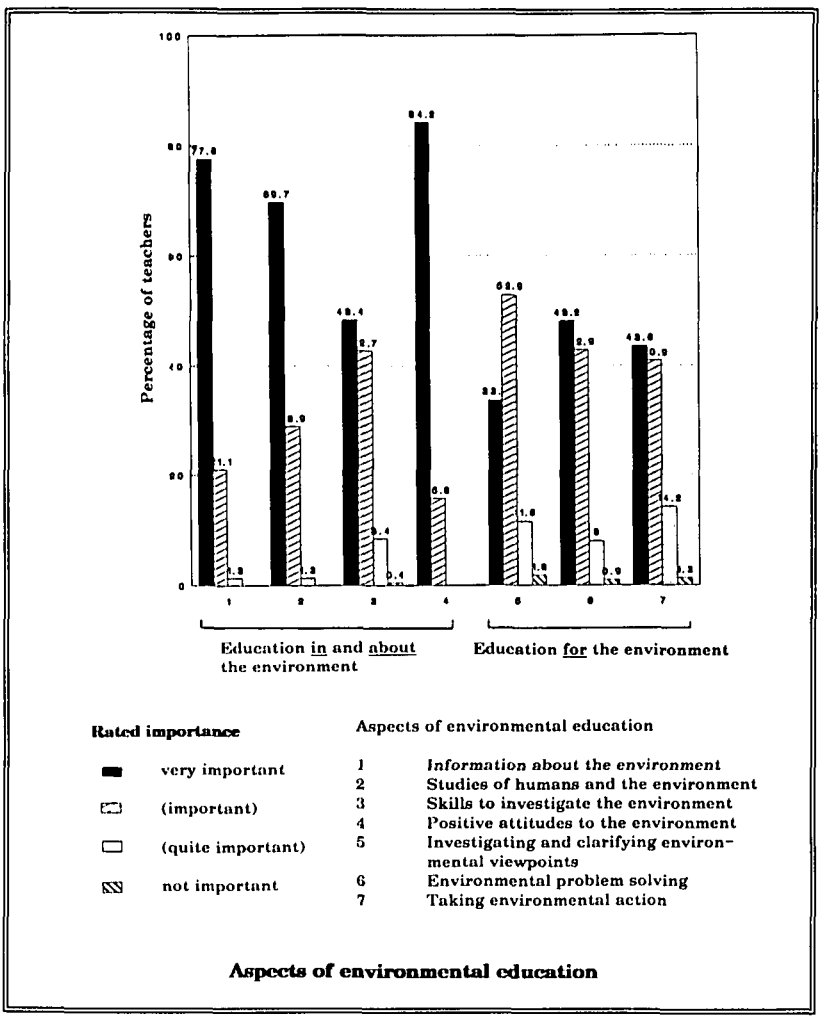
Respondents were also asked to rate each of the seven aspects of environmental education according to how important they thought it was for that aspect to be included in a classroom program of environmental education. The rating scale consisted of a four point continuum from 'very important' to 'not important'.

Results (Figure 4) indicate that the vast majority of teachers rated all seven aspects as either 'very important' or 'important' to include in a classroom program of environmental education. Put another way, most teachers regarded all forms of environmental education - education *in*, *about* and *for* the environment - as either 'very important' or 'important'.

Figure 4 Rated importance of the seven aspects of environmental education by full-time state primary classroom teachers in Brisbane North Region



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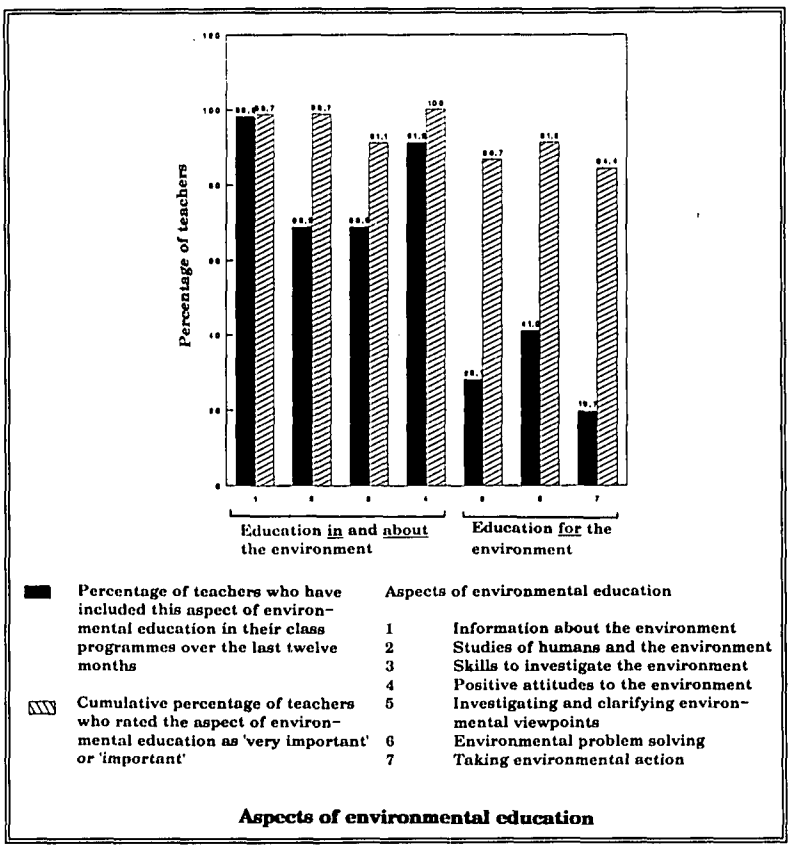
However, three of the seven aspects appear to stand out in importance to teachers over the others. Well over half the respondents rated 'Positive attitudes to the environment' (84.2 percent), 'Information about the environment' (77.6 percent) and 'Studies of humans and the environment' (69.7 percent) as being 'very important'. Each of these aspects fall into the categories of education *in* and *about* the environment. In comparison, the other aspects of environmental education were rated as 'very important' by only 30 to 50 percent of the respondents. Therefore, it can be concluded that most teachers in the Brisbane North Region place a slightly higher level of importance on education *in* and *about* the environment than on education *for* the environment.

While teachers regard all seven aspects of environmental education as being either 'very important' or 'important', results also indicate that despite this, teachers do not give equal attention to all seven aspects in their classroom programs. As illustrated previously (Figure 1), many more teachers are implementing aspects 1 to 4 (education *in* and *about* the environment) than are implementing aspects 5 to 7 (education *for* the environment). Therefore, there is a difference between what teachers regard as important to include in environmental education programs and what teachers actually implement (Figure 5). For example, 84.4 percent of respondents perceive 'Taking environmental action' as 'very important' or 'important', yet only 19.7 percent of respondents have incorporated this aspect into their classroom programs over the last twelve months. Similarly, 86.7 percent of respondents perceive 'Investigating and clarifying environmental viewpoints' as 'very important' or 'important', yet only 28.1 percent of respondents have incorporated this aspect into their classroom programs over the last twelve months.

Figure 5 Comparison between the implementation levels of the various aspects of environmental education and the importance rating given to each aspect by full-time state primary classroom teachers in Brisbane North Region



In comparing what teachers regard as important to include in environmental education programs and what teachers implement, it can also be noted that the largest discrepancies exist for aspects 5 to 7 (education *for* the environment).

(b) Discussion

The results of this study indicate that teachers generally have a very positive attitude towards environmental education and perceive it to be important relative to many other learning areas. These results correspond with the research findings of Ham and Sewing (1987/88) who investigated the possible link between modest levels of implementation of environmental education and negative or neutral teacher attitudes to environmental education. The perceived importance of environmental education by most teachers can to some extent be linked to research findings in 'Teachers' Practices', which illustrated that the majority of teachers are including environmental education, in some form at least, into their classroom programs. This implies that if teachers have positive attitudes towards environmental education then they are

likely to implement it. However, it should be noted that this study has not investigated the amount of time which teachers actually spend on environmental education. Past research (Ham and Sewing 1987/88) indicates that despite teachers having very positive attitudes towards environmental education, only modest amounts of time 'every now and then' are actually spent on environmental education discussions and activities.

The results of this study also indicate that most teachers have positive attitudes to all seven aspects of environmental education and, therefore, to all forms of environmental education (education *in*, *about* and *for* the environment). However, despite these positive attitudes to all aspects or forms of environmental education, results have revealed that teachers are not giving equal attention to them in classroom programs. Education *in* and *about* the environment are enjoying much greater levels of implementation than education *for* the environment (see 'Teachers' practices'). These findings support the claims of Ham, Rellergert-Taylor and Krumpe (1987/88) and Ham and Sewing (1987/88) that teachers' attitudes are not always reflected in their actual behaviour. What the results of this research study do indicate is that the lack of attention to some aspects of environmental education is not due to negative or neutral teacher attitudes towards them.

The dissonance between what teachers believe to be important in environmental education and what they actually implement may be due, in fact, to a lack of knowledge and understanding of the possible scope and content of environmental education, particularly concerning aspects to do with education *for* the environment. If teachers are not familiar with the goals of environmental education then they cannot be expected to effectively implement all aspects into their classroom programs. The dissonance may also have something to do with an erroneous assumption possibly being held by many teachers that an environmentally literate and active citizenry can be brought about through a focus on environmental knowledge and awareness. A growing body of literature and research indicates that the development of such a citizenry cannot be achieved through these objectives alone (Gray, Borden & Weigel, 1985; Hines, Hungerford & Tomera, 1986/87, Horsely, 1977; Lucas, 1980-81; Ramsey, Hungerford & Tomera, 1981; Robottom, 1987; Volk, Hungerford & Tomera, 1984) but also requires a focus on developing environmentally sound value systems (Lamb, 1975) and skills for citizenship participation and action (Borden & Schettino, 1979; Hines, Hungerford & Tomera, 1986/87; Ramsey, Hungerford & Tomera, 1981; Sia, Hungerford & Tomera, 1985/86).

Further reasons that may account for the difference between what teachers believe to be important in environmental education and what they actually implement will be discussed in 'Teachers' Concerns'.

4. Teachers' concerns

(a) Research

Respondents were asked to consider a scenario of environmental education in one primary classroom and then to indicate the concerns they would have if they were to do a similar program. The scenario described how a year five class became involved with all seven aspects of environmental education, from the knowledge and awareness components through to the taking of

environmental action. Therefore, the scenario illustrated a program that incorporated education *in*, *about* and *for* the environment. The questionnaire listed 14 possible concerns that a teacher could have, but provided opportunity for the respondent to add others if so desired. Respondents were then asked to rate each concern along a 4 point scale according to whether it represented a 'great', 'moderate', 'slight' or 'no' level of concern.

Results (Figure 6) reveal that teachers hold a number of concerns of a 'moderate' or 'great' level about implementing an environmental education program such as the one described in the questionnaire. The major concerns indicated by teachers were:

(a) lack of time;
(b) lack of resources;
(c) lack of own knowledge and skills in this area; and
(d) lack of own knowledge of departmental regulations on such activities.

Over half the respondents indicated either a 'great' or 'moderate' level of concern for each of the above. Lack of time was of the greatest concern, with 75.6 percent of respondents indicating it at a 'great' or 'moderate' level. Lack of time also received the most respondents (37.8 percent) indicating it as a 'great' concern (Table 2). Of least concern to teachers about implementing an environmental education program such as the one described in the questionnaire were:

(a) being labelled a 'greenie' or 'radical' by staff or students;
(b) students would not be interested;
(c) disapproval and/or lack of support from the principal; and
(d) adverse community reactions.

Over 80 percent of respondents indicated a 'slight' or 'none' level of concern for each of these (Figure 6).

Figure 6 Concerns (and the level of concern) about implementing a program incorporating education *in*, *about* and *for* the environment held by state full-time primary classroom teachers in Brisbane North Region

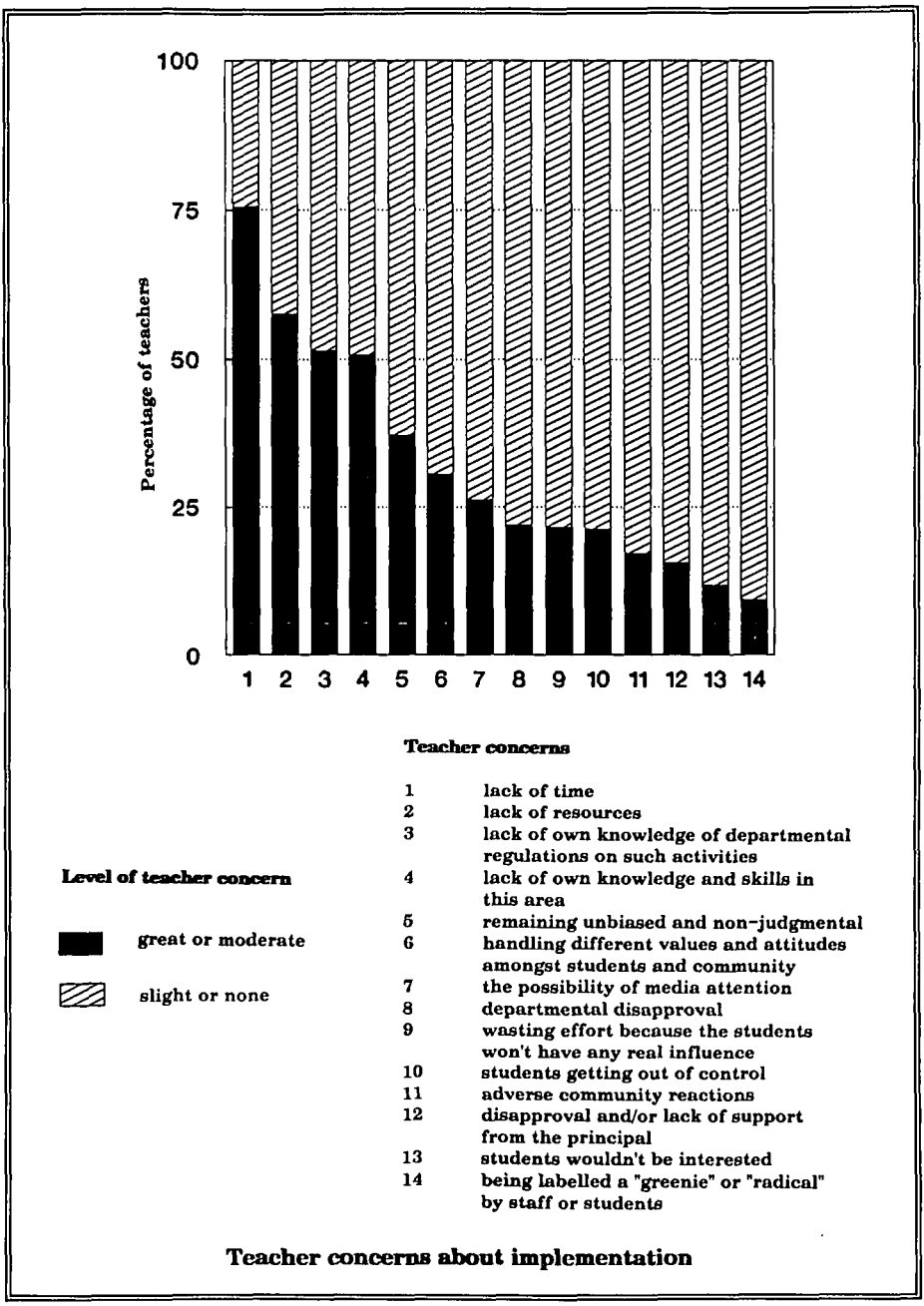


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Table 2 Percentage of Brisbane North Region, state full-time primary classroom teachers who rated possible concerns about implementing a particular environmental education program as 'great'

Teacher concerns	*Frequency*	*Percent*	
Lack of time	85	37.8	(n=225)
Lack of resources	45	20.1	(n=224)
Lack of own knowledge of departmental regulations on such activities	41	18.5	(n=222)
Lack of own knowledge and skills in this area	26	11.6	(n=225)
Remaining unbiased and non-judgmental	20	9.0	(n=221)
The possibility of media attention	19	8.6	(n=220)
Students getting out of control	15	6.8	(n=221)
Handling different values and attitudes amongst students and community	15	6.7	(n=223)
Departmental disapproval	14	6.5	(n=214)
Students wouldn't be interested	9	4.1	(n=220)
Wasting effort because the students won't have any real influence	8	3.6	(n=221)
Disapproval and/or lack of support from the principal	7	3.1	(n=221)
Being labelled a "greenie" or "radical" by staff or students	7	3.1	(n=224)
Adverse community reactions	5	2.3	(n=222)

Also of interest from the research findings is that those concerns which related to some form of adverse reaction or disapproval were largely of small concern to teachers. Figure 6 reveals that most teachers found the following to be of either 'slight' or 'none' concern: being labelled a 'greenie' or 'radical' (90.6 percent), disapproval and/or lack of support from the principal (82.9 percent), departmental disapproval (78.0 percent).

In addition, the results (Figure 6) of this study indicate that very few teachers regard lack of student interest (11.8 percent) or student influence (21.7 percent) as a 'great' or 'moderate' concern in relation to doing such an

environmental education program as described in the questionnaire.

(b) Discussion

Previous research (Ham and Sewing, 1987/88) has established that lack of time, resources and knowledge of scope and content of environmental education are some of the main barriers for teachers in their implementation of environmental education programs. The results of this study support the findings of Ham and Sewing (1987/88) with similar major concerns having been identified.

The results of this study also support the findings of Ham and Sewing (1987/88) in that the largest concern of all for most teachers in regard to incorporating environmental education into classroom programs, is lack of time. However, it should be noted that because of increasing demands on primary classroom teachers regarding curriculum changes and additions, lack of time may be identified by teachers as the greatest concern for any learning area, not just environmental education. Some environmental educators (Maher, 1986; Robottom, 1987; Stevenson, 1987) have noted that "real" environmental education (education *for* the environment) does not readily fit into the space and time restrictions of mainstream schooling because of such things as timetabling, assessment, compartmentalised subject areas and classroom constraints. Although this would probably be more the case for secondary schools than primary schools, such factors may account for the perceived lack of time for environmental education that primary classroom teachers report.

Although there is an increasing number of environmental education resources available (Ministry of Education, Victoria, 1990), the dominant teacher perception is one of a lack of resources. This may be due, in part, to a lack of teacher knowledge about what resources are available and where to get them. For teachers, particularly of young children, who are wanting to include all aspects of environmental education (education *in*, *about* and *for* the environment) into their programs, there is also the problem of a lack of action/value/problem solving orientations in many of the resources (Parry, 1987) and a lack of materials in general for the lower primary school (Ministry of Education, Victoria, 1990).

Lack of teacher knowledge and skills in environmental education and lack of knowledge about departmental environmental education regulations were reported as major concerns by teachers in this study. These findings are not surprising in the light of current levels of teacher preparation to teach environmental education, which the discussion in 'Professional Preparation of Teachers' shows to be seriously lacking.

Several commentators (Greenall, 1990; Henry, 1984; Stradling 1984; Stradling, Noctor and Baines) have claimed that there is a general reluctance and timidity of many teachers to take on the issue-action component of environmental education. This reluctance has been attributed to such factors as environmental education being seen as 'radical' (Greenall, 1985, 1986, 1987, 1990; Maher, 1986a, 1986b), fear of being adversely pressured by school or community (Henry, 1984), fear of being labelled (Maher, 1986a, 1986b) and fear of experiencing 'big brother' repercussions (Maher, 1986a,

1986b). The findings of this research study do not reflect these assertions. In fact, it was found that factors relating to labelling, disapproval, adverse reactions or repercussions were generally of minor concern to teachers. It must be noted that these results could have been very different, had the scenario in the questionnaire presented a more politically sensitive and controversial issue over which the community was divided. However, it is heartening to see that most teachers did not seem reluctant or fearful about the scenario of environmental education that was presented to them.

The research findings of this study also imply that teachers generally believe that students are interested in environmental education and that students can have some real influence on environmental matters. This is encouraging in view of an expressed concern that many schools consider the participation in environmental decision making and action as experiences more appropriate for adults than for students (Greenall, 1987).

Conclusions

The data from this research study supports commonly held concerns that environmental education in Australian schools is operating in a form largely contrary to widely recognised definitions and philosophies. This is not to say that environmental education is not happening in schools at all. This study has shown that environmental education is commonly implemented in classroom programs in some form or another and has a recognised place in the curriculum. However, the real intention of environmental education - education *for* the environment - is predominantly lacking. The vast majority of students are receiving environmental education which is knowledge, awareness and skill weighted, without being extended to the dimensions of values, ethics, morals, motivations, behaviours and actions.

This should be of concern to educators if we are serious in our intentions to develop an informed and active citizenry which is willing and able to act positively for the environment. Indications from this research study suggest that the type of environmental education being currently implemented in schools is not one which takes a socially critical or socially reconstructive orientation or encourages active involvement and participation in environmental problems and issues.

That environmental education should be suffering from such deletions is disappointing, especially in the light of data from this research study which indicates that teachers regard all forms of environmental education as important to incorporate in the school experience. As educators we should be compelled to consider and address the underlying reasons for the current mismatch between the theory and practice of environmental education in our schools.

Results from this study strongly indicate that lack of professional preparation and development of teachers may have much to do with the discrepancy between theory and practice. The vast majority of teachers have never had any training in environmental education and therefore it is not surprising that this study has identified lack of teacher awareness, knowledge and skills in the area, as well as perceived time and resource constraints, as

major barriers to the full implementation of environmental education. Considered, genuine and ongoing efforts in the professional development of teachers, school and regional administrators, curriculum designers, policy makers and teacher educators would no doubt contribute much to the reduction or alleviation of such barriers as these to education for the environment.

The reasons for the failure of environmental education to achieve its full set of objectives may, in fact, go even deeper than already suggested. Several authors (e.g. Maher, 1986; Robottom, 1984, 1987, Stevenson, 1987; Walsh, 1984) present the view that education *for* the environment presents major contradictions and challenges to generally-held presuppositions about classroom and curriculum practice, schooling, learning and knowledge. For example, the traditional uncritical role of schooling with its emphasis on passive assimilation of factual knowledge and social reproduction, sharply conflicts with the socially critical and political action goals of environmental education. In view of these assertions it would seem essential that professional development initiatives take on a function of critical review and challenge of such presuppositions so that educational contexts can be enhanced to increasingly favour and support the socially critical approach and value-action orientation of education *for* the environment.

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