

How Research Helped Us To Move From Awareness to Action and Then to Systems Development

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Abstract

How can an organisation move from awareness raising, in the form of natural history poster production, to the development of systems that change organisations? Through close integration of research and practice, the Gould League has achieved this transformation. It began with extensive research into best practice environmental education, going beyond the traditional boundaries of environmental education to areas that included the psychology of culture change, business management, systems thinking, governance, drug education, marketing and organisational psychology. This broad approach to research has led to the development of highly effective sustainability education programs, such as Waste Wise Schools and Sustainable Schools.

The Waste Wise Schools Program, funded by EcoRecycle Victoria and managed in consultation with the Gould League, is an action-based waste education program. Originating in Victoria in 1998, it has been adopted by over a third of Victorian schools and has led to widespread outcomes, including waste reductions of up to 95%. There is strong evidence from surveys that this program is sustainable in schools over time and research confirms that the program is contributing to changes in the waste-wise thinking and behaviour of the families of the children at these schools.

A model for culture change in schools, based on the experiences of the Waste Wise Schools Program, has also been developed. This model, a valuable tool in the continual improvement of Waste Wise Schools, has applications to sustainability education in general.

Introduction

The Gould League

The Gould League has been active since 1909 in educating and enabling people to live sustainably. It has pioneered the development of outcomes-based education for sustainability in Victoria through student and community programs, professional development, resources and website development. The Gould League continues to have an important impact on the actions of the community in the areas of waste minimisation, conservation of wildlife and environments, and the development of sustainable lifestyles. For the past six years, it has managed, in consultation with EcoRecycle Victoria, the Waste Wise Schools Program and is working closely with the

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Centre for Education and Research in Environmental Education (CERES) and other sustainability education organisations to deliver Sustainable Schools in Victoria.

Early Approach to Research

Traditionally, environmental education has focussed on raising awareness, providing knowledge and skills, changing attitudes and values and then taking action, with the expectation that behaviour change will follow. This is the familiar linear, mechanistic approach used by many organisations.

However, there are many research papers (e.g., Hines, Hungerford & Tomera, 1987; Hungerford & Volk, 1990) that show the disjunction between awareness, knowledge and behaviour, and the limitations of this mechanistic approach in bringing about sustained change. This disjunction was also the experience of Gould League staff and many of our peers.

In the mid 1990s, the Gould League looked at the results of their work in environmental education and could not see long-term cultural change in schools. We discussed our experiences as educators and revisited the research, going beyond the traditional boundaries of environmental education to areas that included: psychology of culture change, business management, systems thinking, governance, marketing, organisational psychology and leadership. Accordingly, we redesigned our approaches to use transformative education (focusing on whole system or organisational, permanent change) rather than the traditional or transmissive methods (focusing on teaching, communicating messages etc.). The traditional transmissive model (Figure 1) shows that in a typical school, you may find that small groups, (e.g., environment club or a class) work on an sustainability activity, such as building a compost bin, but these activities are often conducted in isolation and their effects are usually only short-term. Meanwhile, the rest of the school is moving in the other direction of becoming less sustainable. On the other hand, in the model of transformative education model (Figure 2), all sectors of the school are involved in the change process and they all move in the same direction towards becoming more sustainable. In this case, there is a process of co-learning and a sense of ownership and empowerment. In schools where we have observed this happening, the change is evidenced by a shift in the culture of the whole school community. In these schools this change has been shown to be long-

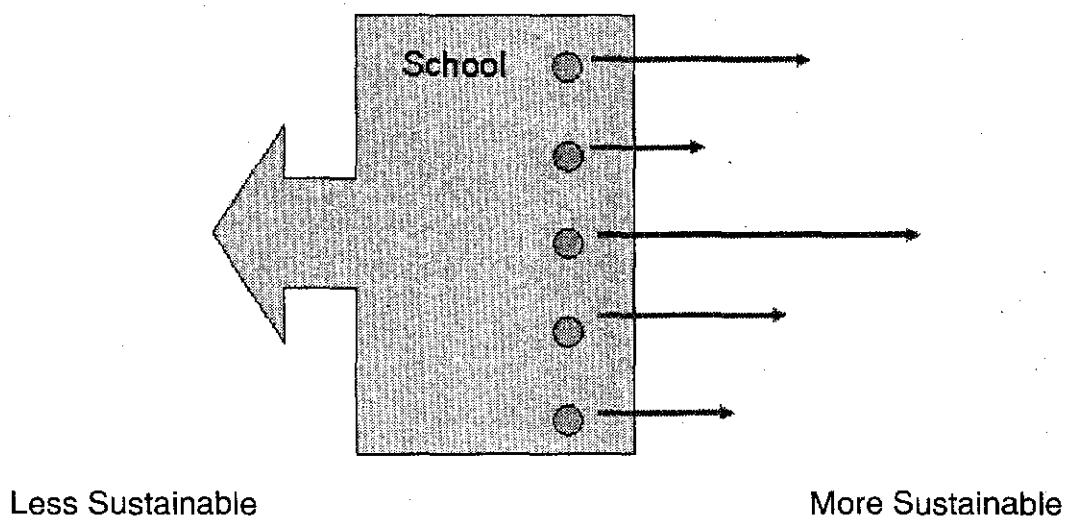


FIGURE 1: Transmissive (traditional) model of environmental education

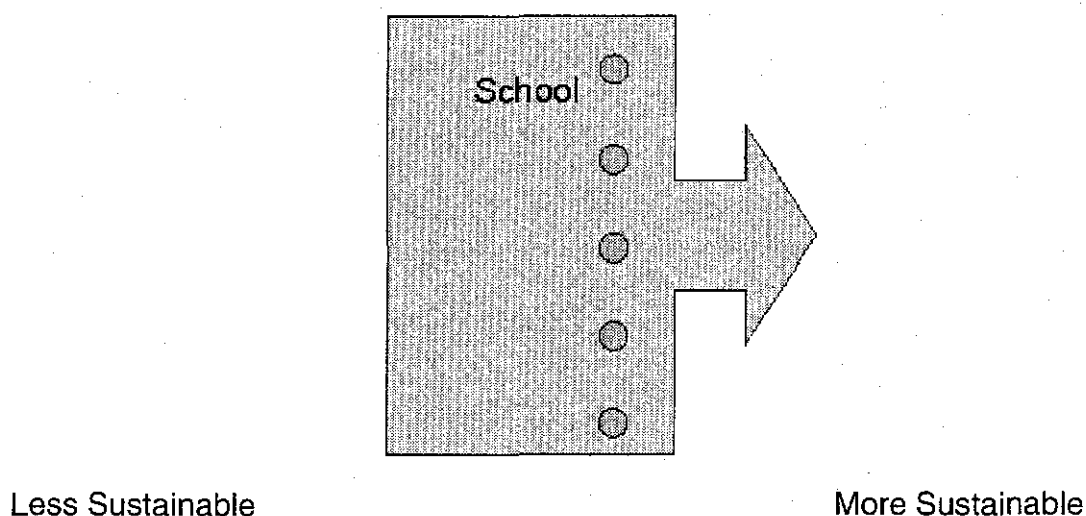


FIGURE 2: Transformative (systems approach) model of environmental education

lasting. This was the approach that EcoRecycle Victoria was looking for when it called for tenders and established the Waste Wise Schools Program.

Our work in programs such as Waste Wise Schools and Sustainable Schools has many parallels with Community-based Social Marketing (CBSM) (McKenzie-Mohr 2003), but does not use a CBSM methodology. We believe that it is very important to use a deep interactive approach, based on co-learning, addressing human and social needs, local ownership and, most importantly, facilitating change instead of controlling change. This approach reinforces the findings of Wals and Jickling (2002) and Sterling (2001) about community-based processes for sustainable development.

Waste Wise Schools Program

The Waste Wise Schools Program, which began in Victoria in 1998, offers a considerable package of support services to schools to assist them to develop and run their own waste and litter programs, covering both curriculum and school operating practices. This support includes a comprehensive resource kit; funding towards teacher release for professional development; professional development for teachers and waste educators; ongoing access to specialist advice; a network of support schools to provide working examples of best practice approaches; a website (www.gould.edu.au/wastewise); annual Awards; and Waste Wise Schools accreditation.

Waste Wise Schools is a long term program led by EcoRecycle Victoria. It is delivered through the combined efforts of a state-level consortium headed by the Gould League and CERES and a regional and local network of education officers of Regional Waste Management Groups, local Councils, waste contractors, education centres and other organisations. The Program is developed and run in partnership with the Department of Education and Training, Catholic Education Office, Victorian Primary Principals Association and others.

The philosophy of the Waste Wise Schools' Program can be summarised as follows:

- It is fundamentally a school culture change program for improved learning and action, rather than just a program on an environmental topic;
- It uses co-learning and action on waste and litter as a process to empower schools to rethink and reshape their future approach to sustainability;

- It simultaneously achieves major outcomes for both school education priorities and priorities for community sustainability;
- It facilitates close links with parents and the wider local community, including partnerships with local councils, businesses and community organizations;
- It emphasises student ownership, teamwork and real and relevant learning experiences leading to a range of important generic educational outcomes;
- It provides a very useful context for facilitating specific learning outcomes in each Key Learning Area; and
- It offers many different ways in which schools can access the program to suit their own local circumstances.

Features of the Program include:

- It is a strategically planned, statewide system of support for those driving local change, based on stable, long-term funding and inclusive (rather than competitive/adversarial) relationships;
- It is built around partnerships between groups such as councils and regional education officers, industry groups and sustainability education providers;
- It is outcomes-based – Educational, Economic, Social and Environmental;
- It builds six-monthly evaluation into the overall management. This has allowed continuous improvement of the Program;
- It focuses on the positive and provides inspiring case studies to show what different schools have achieved;
- It can be customised to suit the needs of different schools and different regions or States;
- It recognises that every school and every teacher is different and provides a package of resources, services and on-going support;
- It recognises that behavioural change is a long-term process requiring the commitment and engagement of the whole school;
- It builds on the prior waste wise achievements of the schools. In workshops, facilitators adapt the course to meet the needs of the participant teachers. Follow-up workshops and local teacher networks provide additional local support;
- It provides incentives such as accreditation, awards and funding towards teacher release for the training workshops. Feedback from teachers shows that initially this was an important motivating factor for schools to send teachers to the workshops. However, in recent years, because of the high reputation of the Program, there are waiting lists for most workshops; and
- It provides several entry points through which teachers can join.

Research Methodology

Waste Wise Schools

Evaluation has been an important part of the Program from the beginning. A wide range of indicators was measured to guide different aspects of the Program. These included teacher satisfaction with training, number of teachers trained, number of schools participating, percentage inclusion of waste education in school curricula and sustainable operating practices in school operations, percent reduction of garbage by schools, percentage of parents in selected schools influenced by the program, level of ongoing participation by schools, key success factors and constraints to progress identified by schools and program partners.

The evaluation tools used for this program were:

Questionnaires

Participants completed evaluation forms at the completion of each workshop and a questionnaire three to six months after the workshop.

Stratified Random Surveys

To date, nine separate surveys have been undertaken, providing on-going evaluation of the effectiveness of the program in bringing about a sustained waste and litter education program in schools (e.g., Sharpley, 2001b; Sharpley, 2002). A recent survey looked at the impact of the Waste Wise Schools Program on other sustainability programs (Sharpley, 2003b).

Case Histories

Detailed case histories were completed for two advanced Waste Wise Schools, Rutherglen Primary School and Cobden Technical School (Sharpley, 2001a; Sharpley 2003a). Additional case histories were undertaken by Gould League staff (Lomdahl & Bellissimo, 2003) and for the case studies of the winners and finalists for the annual Waste Wise Schools Awards (e.g., Kosterlitz, 2004).

Focus Groups

Focus groups were held with teachers, education officers and education specialists at various points in the development and implementation of the program.

Achievements and Key Results

Highlights of the Achievements

Some highlights of the achievements of the Waste Wise Schools Program in Victoria for the first six years include:

- 900 schools are involved in the Program in Victoria (more than one in three);
- 1250 teachers have been trained in over 100 free, one-day workshops;
- 55 Waste Wise Support Schools provide support to local schools;
- More than 70 waste and recycling educators have been trained;
- Since the Program began, schools have diverted an estimated 14,500 tonnes of waste from landfill; and
- Some schools have reduced waste going to landfill by up to 90%, with savings of up to \$6,800 per year.

Change in School Waste-Conscious Practices

Schools that began the Program in 1998 were surveyed in 2002. This survey showed that since the Program commenced, there had been a marked increase in the percentage of schools participating in various waste practices, including recycling, reducing, reusing, purchasing practices and curriculum. With some practices, this increase was three to four fold. For example, Figure 3 shows the increases for recycling, composting and worm composting practices (Sharpley, 2002).

Change in Waste Wise Behaviour of Students and Families

Students in one of the leading, waste wise, secondary schools, located in rural Victoria, were asked if the Waste Wise Schools Program had changed their waste wise behaviour.

The results (Figure 4) show that the students reported that the Program had changed their behavior towards waste and at a level higher than that reported by

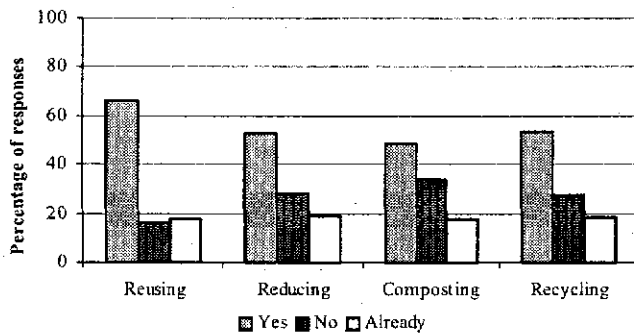


FIGURE 5: Family responses to the question ‘Has the program at Rutherglen Primary School changed your thinking about the following areas of being waste wise?’ (n=36)

that the school waste program had changed their waste wise behaviour (Sharpley, 2003a). These family surveys were self-reporting and hence must be treated with some caution. They only indicate, not prove with absolute certainty, that the program is influencing families to change their waste wise behaviour.

Waste Wise Schools – A Framework for Change

In 2002, a telephone survey was conducted of 35 teachers from Victorian Government, Independent and Catholic primary and secondary schools with highly developed waste wise programs (Sharpley, 2003b).

77% of teachers reported that their schools have, or are in the process of, developing education programs in other areas of sustainability, with the most commonly reported areas being water conservation and biodiversity. All the teachers in this group saw the Waste Wise Schools Program as providing either an important or very important framework for extension into these other areas.

According to Sharpley (2003b, p. 7) “There is a significant correlation between the nature of the waste wise program and the involvement in other areas of sustainability. All schools who report that ‘lots of things were happening’ also report that they were moving into other areas of sustainability, whereas only half the schools reporting ‘few recent developments’ in their waste wise program did so (Chi square, significant at the 0.05 level).”

According to Sharpley again “Schools that are actively developing their waste wise programs are more likely to move into other areas of sustainability when compared to other schools. This is a strong indication that sustainability education is a ‘natural’ extension of the waste wise program” (p. 2).

Change in Teachers

There is some evidence that Waste Wise Schools can also help to change teachers’ behaviour.

At Rutherglen Primary School, for example, the Principal believes that Waste Wise Schools, by providing a way of connecting to the students, has helped some teachers to develop leadership and teaching skills and this has boosted their self esteem. At this school, student surveys have shown that Waste Wise Schools has influenced the teachers to change their personal waste wise behaviour (Armstrong, Sharpley & Malcolm, 2004).

At Cobden Technical School, staff absenteeism is well below state average and there is a strong sense of belonging with the staff (Sharpley, 2003a).

According to Sharpley (2003a, p. 13) “It is not easy to untangle the complex reasons for the strong sense of belonging that is apparent among the staff. Initiatives such as the waste wise program undoubtedly help. They can reinvigorate some teachers and offer new teachers exemplars of quality teaching.” According to the Principal, “It’s given some of the teachers another lease on life. It has given them a goal. ...

For some people it has reinvigorated them. It has certainly raised staff awareness of environmental issues as well.” (p. 13)

Educational and Social Benefits

Waste Wise Schools has demonstrated many educational and social benefits. For example, a 2002 survey of the percentage of the original 1998 Waste Wise Schools showed that most (95%) now include waste and litter topics within their curriculum. This is three times the pre-workshop rate (Sharpley, 2002). There are numerous examples of the program engaging students in meaningful learning.

Case histories highlight the immense social value of the Waste Wise Schools' Program. For example, many schools report that the Program helps boost student's self-esteem by providing leadership roles for children of all ages and all abilities (Lomdahl & Bellisimo, 2003; Sharpley, 2003a). At Cobden Technical School, there is a high student attendance rate, low teacher absenteeism and high parental opinion of the school's education environment, compared with the State average. The Principal believes that the Waste Wise Schools Program has been one of the initiatives by which this has been achieved (Sharpley, 2003a).

Discussion

Evaluation over more than seven years has shown that the Waste Wise Schools Program has been very effective in bringing about changes in the waste wise culture, behaviour and practices in the participating schools. There are indications that the Program is helping to change the behaviour of the families of students at these schools. Research has shown that there is high uptake of the Program and sustained participation in many schools (Sharpley, 2002).

The Waste Wise Schools system has been licensed to Western Australian and ACT government departments. In both cases, the system has been effectively adapted to meet local differences, indicating that the approach is readily transferable to other educational systems.

Key Factors for Success of the Program

The authors believe that there are several key factors that have contributed to the success of the Waste Wise Schools Program.

Firstly, the Program uses ecological thinking, rather than a behaviourist or mechanistic approach. Ecological thinking as used by Sterling (2001, p. 49) “entails a shift of emphasis from relationships based on separation, control and manipulation towards those based on participation, empowerment and self-organisation.” Waste Wise Schools fosters co-learning and encourages teachers, students and parents to take ownership of their program, leading to highly innovative solutions and approaches. This is transformative education rather than transmissive education. The Program encourages schools to use a systems approach in which all sectors of the school are involved in the planning and implementation of the waste wise program. As shown in the research, many schools have adopted waste wise practices and curricula and these changes have been long-lasting (Sharpley, 2002).

When we first conducted workshops for the Waste Wise Schools Program, in our enthusiasm for “the message”, we fell back to mainly “presenting” the information (i.e. transmissive), but soon learnt that this was not what the teachers wanted. Rather, they wanted a chance to share their experiences, to be recognised for their achievements, to learn from the practical experiences of the other teachers in the group and to share their problems, needs and aspirations. In other words, they wanted control of their own learning. As workshop presenters, we changed our roles from being deliverers

of information (the “experts”) to facilitators of learning and in the process became co-learners. This shift in approach was a major turning point in the Program and has been applied to other programs such as Sustainable Schools. Our experience, although developed independently, supports the later findings of other environmental educators (e.g., Sterling, 2001; Wals & Jickling, 2002).

Secondly, the Program provides a clear framework for schools to identify issues and barriers, set goals and targets, plan an approach and take actions to achieve these targets (Sharpley, 2003b).

Finally, there is a comprehensive package of support services to schools and multiple entry points into Waste Wise Schools. This versatility allows schools to enter and develop their waste wise program in a way that meets their needs.

The limitations of this Program would seem to be mainly financial. For the past few years, most workshops have had waiting lists. The simple answer to meet the demand for places in workshops is to find ways of increasing the number of workshops without compromising the quality, but this comes at a cost. We have tried increasing the number of participants in the workshops, but this proved to be unsatisfactory for both the facilitators and the participants.

The barriers to schools joining the Program may include competing demands of other curriculum areas, concerns over extra workload and concerns over occupational health and safety issues. Similar barriers apply to setting up programs in schools and maintaining them. These barriers are examined in some detail in the workshops.

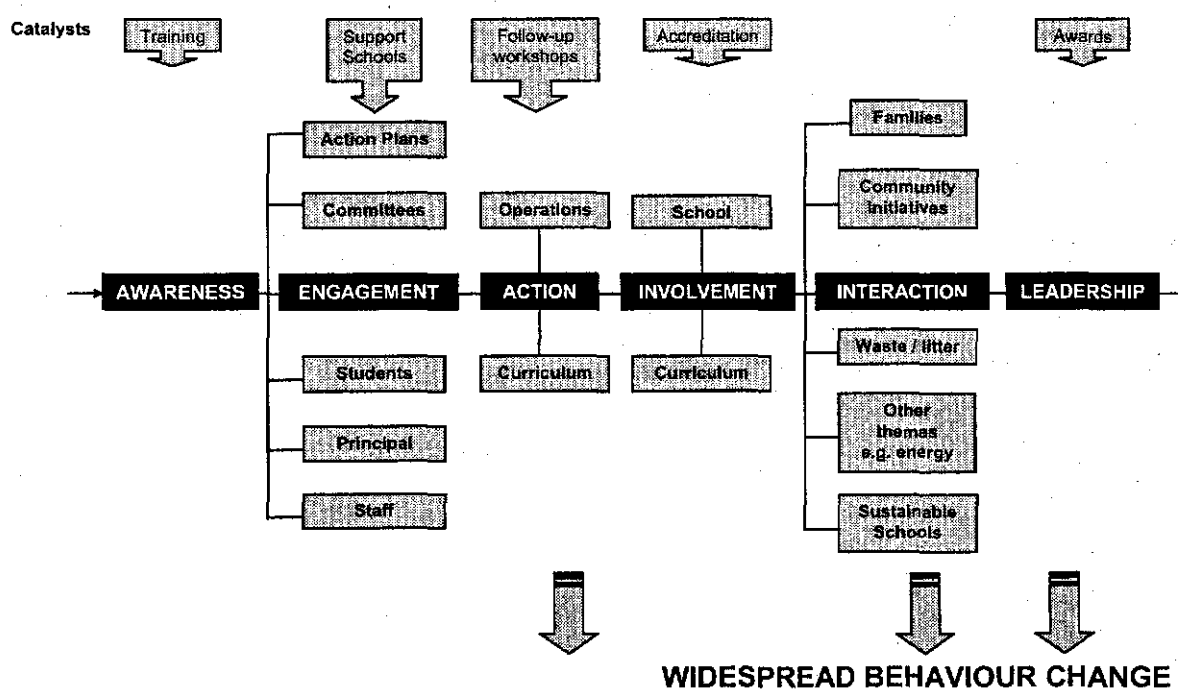
Factors for Success in Schools

Many teachers ask “What are the most important things that we need to do to be an effective waste wise school?” We have asked this question in many focus groups and during research for case studies (e.g., Kosterlitz, 2004; Lomdahl & Belissimo, 2003). We have concluded that there are a number of common factors that appear to be crucial for the success of a waste wise program in a school. These are:

- The school principal and leadership team are committed and supportive;
- The whole school community is involved in the planning and implementation;
- Students are empowered and encouraged to take ownership of the program;
- The program is planned and implemented in a strategic way with a committee or team, audit, policy, targets, action plan and curriculum plan;
- Operational changes are integrated into the curriculum;
- There are good systems in place – these are simple, easy to use and well-maintained;
- The school community strives to achieve cultural change, while understanding that change is often a long-term process;
- There is a process of continuous improvement; and
- There is fun and enjoyment in the program, a sense of common purpose and opportunities to celebrate successes.

A Model for Change in Schools

The authors developed a Model for Change in Schools, based on the evaluation results, experiences of some of the leading schools in the Waste Wise Schools Program and on-going observation by staff involved the Program. This model, shown in Figure 6, identified that there are a number of stages that schools pass through: Awareness, Engagement, Action, Involvement, Interaction and Leadership. The pathway of a particular school is not necessarily linear or identical to other schools, but the model provides a useful tool for schools to track where they are at any point and to identify



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FIGURE 6: A Model for Change in Schools in the Waste Wise Schools Program

what they may need to do in order to progress further along the pathway to leadership. It is likely that the model is applicable to other sustainability change programs. The model is further described in Armstrong & Grant (2001).

The model has also been valuable for dealing with issues that have arisen in the Program. For example, the 2001 evaluation report identified two issues. Firstly, some of the schools had commenced some waste and litter actions, but were not progressing (they seemed to be “hitting a wall”). Secondly, some of the leading schools were unclear about where to go next. (Sharpley, 2001b)

Program staff used the model to address the issues by first developing a table, listing the drivers, barriers, catalysts and resources for each stage in the Model. They then used the Model and the table in focus groups with regional education officers who provide additional support to schools. This combination of analysis and market research helped to identify the causes for each of the two issues and to devise strategies to deal with them.

With the issue of schools not progressing, the problem seemed to be a lack of new ideas, support and motivation. The regional education officers suggested conducting follow-up workshops and setting up local teacher networks. Both these suggestions have been implemented and have proved to be very successful.

With the second issue, two leading schools were given extra support, training and encouragement to become Advanced Support Schools. They have both played an important role in inspiring and mentoring other schools all over the State, while at the same time improving their own programs and moving on to other areas of sustainability.

Conclusions

Over the past decade the Gould League has changed from delivering activities that involved awareness raising to the development of systems that change the culture of organisations. Waste Wise Schools and Sustainable Schools are two examples of this systems approach.

The Waste Wise Schools Program, developed after extensive research and consultation, is based on the principles of best practice environmental education. Research over many years has demonstrated that the Program has been effective in bringing about widespread and sustained participation in waste wise activities in the schools involved in the Program. There are many examples of how the Program has led to environmental, educational, social and economic outcomes for schools. There are also indications that the Program is contributing to changes in the waste wise thinking and behaviour of families of the children at some of these schools. In essence, it is contributing to a cultural change in many of the participating schools towards waste and litter.

One important finding of the research was that the waste wise programs in many schools are sustainable over time. The programs appear to be embedded in the practices of the schools and continue even when the teacher that first attended a workshop is longer involved in the program. Other findings show that many schools are undertaking effective action at the “high end” of the waste minimisation hierarchy, and that there is a significant correlation with the “nature” of the waste wise program in a school and the participation of the school in other areas of sustainability. For many schools, adoption of the Waste Wise Schools Program appears to be a springboard to sustainability.

There appears to be several reasons for the success of the Waste Wise Schools Program: it uses transformative education involving co-learning and a systems approach, leading to long-term cultural and behavioural changes; it provides a framework for change; and it provides a package of resources and services with multiple entry points.

A Change Model for Schools was developed to help explain the observed stages in Waste Wise Schools. The model has been useful in addressing issues that have arisen in the Program. Future research could look more closely at some important questions, such as:

1. How does the Waste Wise Schools Program influence student teaching and learning?
2. Not all schools have joined the Program. What are some of the barriers for this?
3. Not all schools that have participated in workshops have continued with the Program. What are some of the reasons for this?
4. What are the social outcomes of the Program? How widespread are these?
5. How widespread is the impact of the school's program in changing the thinking and behaviour of families and local communities?
6. Does the Change Model for Schools that was developed for Waste Wise Schools apply to other environmental education programs?

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References

- Armstrong, P., & Grant, J. (2001). *A model for change in schools, based on the waste wise schools program Victoria*. Melbourne, Victoria: Gould League.
- Armstrong, P., Sharpley, B., & Malcolm, S. (2004, in press). The waste wise schools program: evidence of educational, environmental, social and economic outcomes at the school and community level. *Australian Journal of Environmental Education*.
- Fennell, K. (2002). *Pers. Comm.*
- Hines, J. M., Hungerford, H. R., & Tomera, A. N. (1987). Analysis and synthesis of research on responsible environmental behaviour: A meta-analysis. *Journal of Environmental Education*, 18(2), 1–8.
- Hungerford, H. R., & Hines, J. M. (1990). Changing learner behaviour through environmental education. *Journal of Environmental Education*, 18(3), 8–21.
- Kosterlitz, A. (2004). *EcoRecycle waste wise schools' awards: Case studies of finalists and winning schools in the 2003 EcoRecycle Waste Wise Schools Awards*. Melbourne: EcoRecycle Victoria.
- Lomdahl, A., & Belissimo, S. (2003). *Green schools' case studies*. Retrieved June 30, 2003, from http://www.gould.org.au/case_studies.htm
- McKenzie-Mohr, D. (2003). *Fostering sustainable behaviour: An introduction to community-based social marketing*. Retrieved July 2003, from www.cbsm.com
- Sharpley, B. (2001a). *A waste wise survey of families at Rutherglen Primary School*. Paper prepared for EcoRecycle Victoria. Melbourne: EcoRecycle Victoria.
- Sharpley, B. (2001b). *Evaluation of the waste wise schools program: A report prepared for the Gould League and EcoRecycle on the progress of the waste wise schools' program, June 1998 to June 2001*. Melbourne: EcoRecycle Victoria.
- Sharpley, B. (2002). *Waste wise schools program: Final report to EcoRecycle, Victoria 30 June 2002*. Melbourne: EcoRecycle Victoria.
- Sharpley, B. (2003a). *A report on the waste wise schools program at Cobden Technical School*. Prepared for the Gould League and EcoRecycle Victoria, April 2003. Melbourne: EcoRecycle Victoria.
- Sharpley, B. (2003b). *Sustainability education, litter and waste wise schools: A report investigating how schools in the waste wise schools program deal with two important issues – sustainability and litter*. Prepared for the Gould League and EcoRecycle Victoria, June 2003. Melbourne: EcoRecycle Victoria.
- Sterling, S. (2001). *Sustainable education: Re-visioning learning and change*, Schumaker Briefings. Bristol, UK: Green Books.
- Wals, A. E. J., & Jickling, B. (2002). "Sustainability" in higher education: From doublethink and newspeak to critical thinking and meaningful learning. *Higher Education Policy*, 15, 121–131.