Education for Sustainability and the Australian Curriculum Project

FINAL REPORT | For Research Phases 1 to 3

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Final Report

For Research Phases 1 to 3

Prepared by the Australian Education for Sustainability Alliance

The Australian Education for Sustainability Alliance is an alliance of organisations representing teachers and educators across the public and independent school sectors, university staff and students, and environmental organisations. Our vision is to help create a more sustainable Australia by ensuring that all Australians have the opportunity to learn the skills, practices, and values of sustainability through the formal education system and throughout life.

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Disclaimer

The views expressed here are those of the author and do not necessarily represent the views of the Australian Government Department of Education.

Education for Sustainability and the Australian Curriculum Project: Final Report for Research Phases 1 to 3

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Executive summary

Advancing the implementation of Education for Sustainability in the Australian Curriculum — Views from the Classroom and Community (the 'EfS project').

Project objectives

In 2012 the Australian Government Department of Education contracted the Australian Conservation Foundation on behalf of the Australian Education for Sustainability Alliance (AESA) to engage with a wide range of teachers and educators, as well as with decision makers in government, to recommend ways to:

- improve the accessibility of high quality classroom-ready resources
- support the alignment of Education for Sustainability (EfS) learning tools and programs with the Australian Curriculum
- provide better training and support services for teachers and educator programs to enable efficient delivery of sustainability learning outcomes across the Australian Curriculum.

In summary, the EfS Project seeks to identify, verify, recommend and facilitate ways to improve the integration of EfS into learning as a cross-curriculum priority across all subject areas under the Australian Curriculum, to achieve the following outcomes in schools:

For teachers: ***'This makes sense, this fits naturally and easily into what I teach.'***
For students: ***'This is fun, engaging, and relevant to my world and my future.'***

Project context

Reflecting the goals of the Melbourne Declaration, the Australian Curriculum, Assessment and Reporting Authority (ACARA) included sustainability as one of three cross-curriculum priorities to be incorporated into the Australian Curriculum. To this end, sustainability has been incorporated across all learning areas, with particular attention being given to the development of knowledge, skills and understanding relating to sustainable patterns of living, how humans interact with the environment and the importance of designing and acting for sustainable futures. ACARA makes EfS explicit in the Australian Curriculum by using key Organising Ideas as a guide for the integration of sustainability into *all* learning areas. Education Services Australia (ESA) identifies gaps across the key learning areas and develops, or makes discoverable, digital resources to support teachers in developing flexible learning approaches and integrating them into the classroom.

Scope of this report

This report provides the findings and conclusions of the first three phases of the project carried out by independent researchers utilising the extensive networks and databases of AESA members. This report also recommends strategies and actions for the engagement of teachers and schools in EfS in the future to support the effective delivery of the cross-curriculum theme of sustainability in the Australian Curriculum. The EfS Project is now moving to begin action on some of the findings (Phase 4 of the project).

What is EfS?

> *Education for sustainability develops the knowledge, skills and values necessary for people to act in ways that contribute to more sustainable patterns of living. It is futures-oriented, focusing on protecting environments and creating a more ecologically and socially just world through action that recognises the relevance and interdependence of environmental, social, cultural and economic considerations.*
> (From: Australian Curriculum Assessment and Reporting Authority)

In essence, sustainability addresses the ongoing capacity of the earth to maintain all life. Sustainable patterns of living seek to meet the needs of the present generation without compromising the ability of future generations to meet their needs. This requires a renewed and balanced approach to the way humans interact with each other and the environment.

ACARA Organising Ideas — sustainability as a cross-curriculum priority

For each cross-curriculum priority, a set of organising ideas reflects the essential knowledge, understandings and skills for the priority — which are embedded in the content descriptions and elaborations of each learning area as appropriate.

ORGANISING IDEAS

Code	
	Systems
OI.1	The biosphere is a dynamic system providing conditions that sustain life on Earth.
OI.2	All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing and survival.
OI.3	Sustainable patterns of living rely on the interdependence of healthy social, economic and ecological systems.
	World Views
OI.4	World views that recognise the dependence of living things on healthy ecosystems, and value diversity and social justice are essential for achieving sustainability.
OI.5	World views are formed by experiences at personal, local, national and global levels, and are linked to individual and community actions for sustainability.
	Futures
OI.6	The sustainability of ecological, social and economic systems is achieved through informed individual and community action that values local and global equity and fairness across generations into the future.
OI.7	Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments.
OI.8	Designing action for sustainability requires an evaluation of past practices, the assessment of scientific and technological developments, and balanced judgments based on projected future economic, social and environmental impacts.
OI.9	Sustainable futures result from actions designed to preserve and/or restore the quality and uniqueness of environments.

Research methodology

Phase 1 of the research gathered findings and conclusions of previous studies and evaluations of EfS and summarised the current state of play in regard to teacher training and professional development opportunities for teachers in EfS. Phase 2 gathered the views of executive staff and teachers already engaged in teaching EfS and of teachers that were unaware of sustainability as a cross-curriculum priority or how to incorporate it into their teaching. This included a qualitative research stage, conducted via focus groups and in-depth interviews. Based on the preliminary findings from this stage, a quantitative analysis was conducted of the views of almost 5,000 teachers, curriculum coordinators and principals via an online survey of both the government and non-government school sectors across Australia.

The research findings provide:

1. A thorough benchmarking of the levels of awareness and comprehension of, and engagement with, sustainability as a cross-curriculum priority.
2. Elucidation of the barriers to teaching sustainability and the enabling strategies which engaged teachers have successfully implemented to overcome these barriers.

Approximately 88% of the responses to the online survey came from the eastern states of Queensland, New South Wales and Victoria. About 70% of the responses to the survey were from primary and secondary teachers; the rest were from principals and executive and support staff in schools. By far, the majority of responses from secondary teachers were from teachers of mainstream subjects: English, Science, Maths and History. The survey results are presented for the combined responses of the AEU and IEU completed surveys as there were no significant differences between AEU and IEU member responses. State and territory differences in the survey data are included in the body of the report.

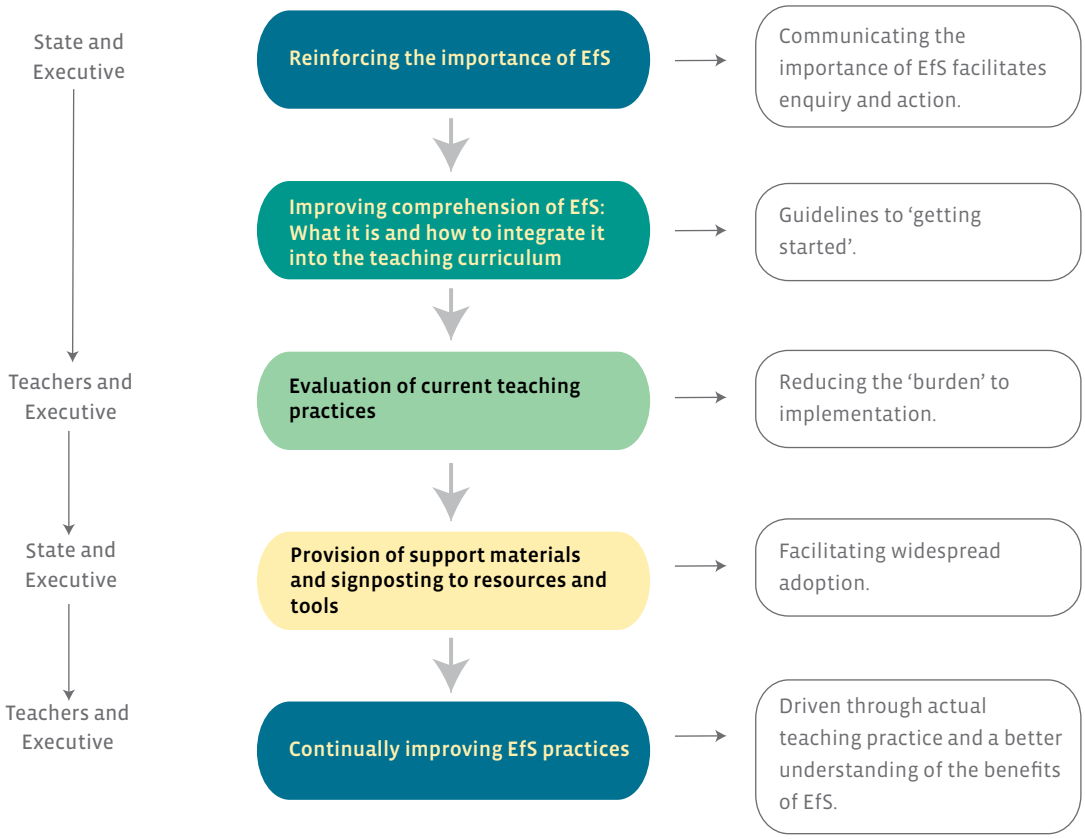
Findings and recommendations

The research found that 92% of teachers surveyed think that sustainability is important, of value to students, and should be integrated into the curriculum.

The key findings of the research elucidate the barriers and enablers for teachers and schools on their 'sustainability journeys'—see diagrams on the next page. The findings and recommendations that follow focus on the enablers to support teachers and educators to incorporate sustainability more easily and effectively into teaching and learning with reference to the ACARA Organising Ideas for sustainability as a cross-curriculum priority; that is, to progress along the teacher journey map for EfS—see the diagram below.

The recommendations need to be taken as a complementary suite of actions and also should be reviewed by each jurisdiction with actions aligned to any existing programs and resources that jurisdiction manages. If taken together as a package, particularly as part of a whole-school approach, this will provide a durable pathway to continuously improve and support the abilities of teachers to integrate EfS into their teaching and improve student learning outcomes.

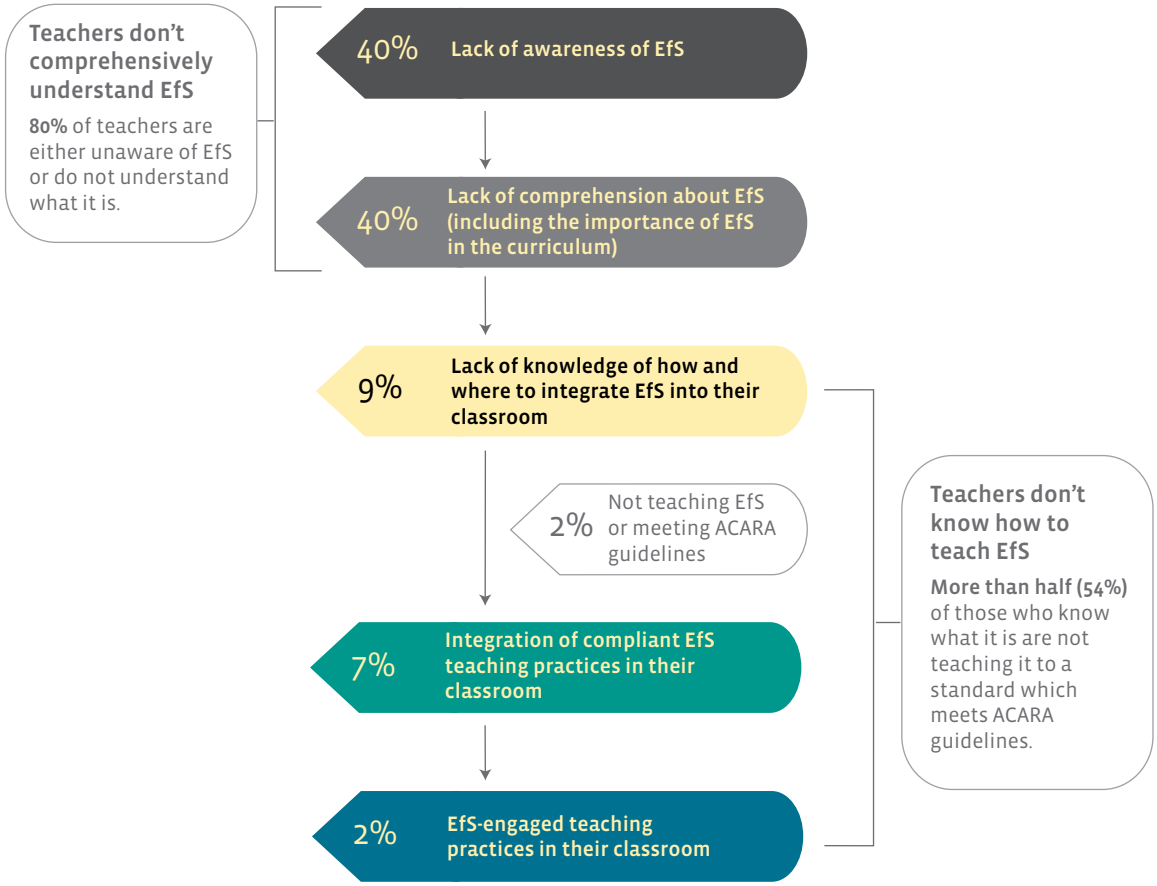
FIGURE 1:
IN SUMMARY: DRIVING EfS INTEGRATION FORWARDS



Source: Lonergan Research

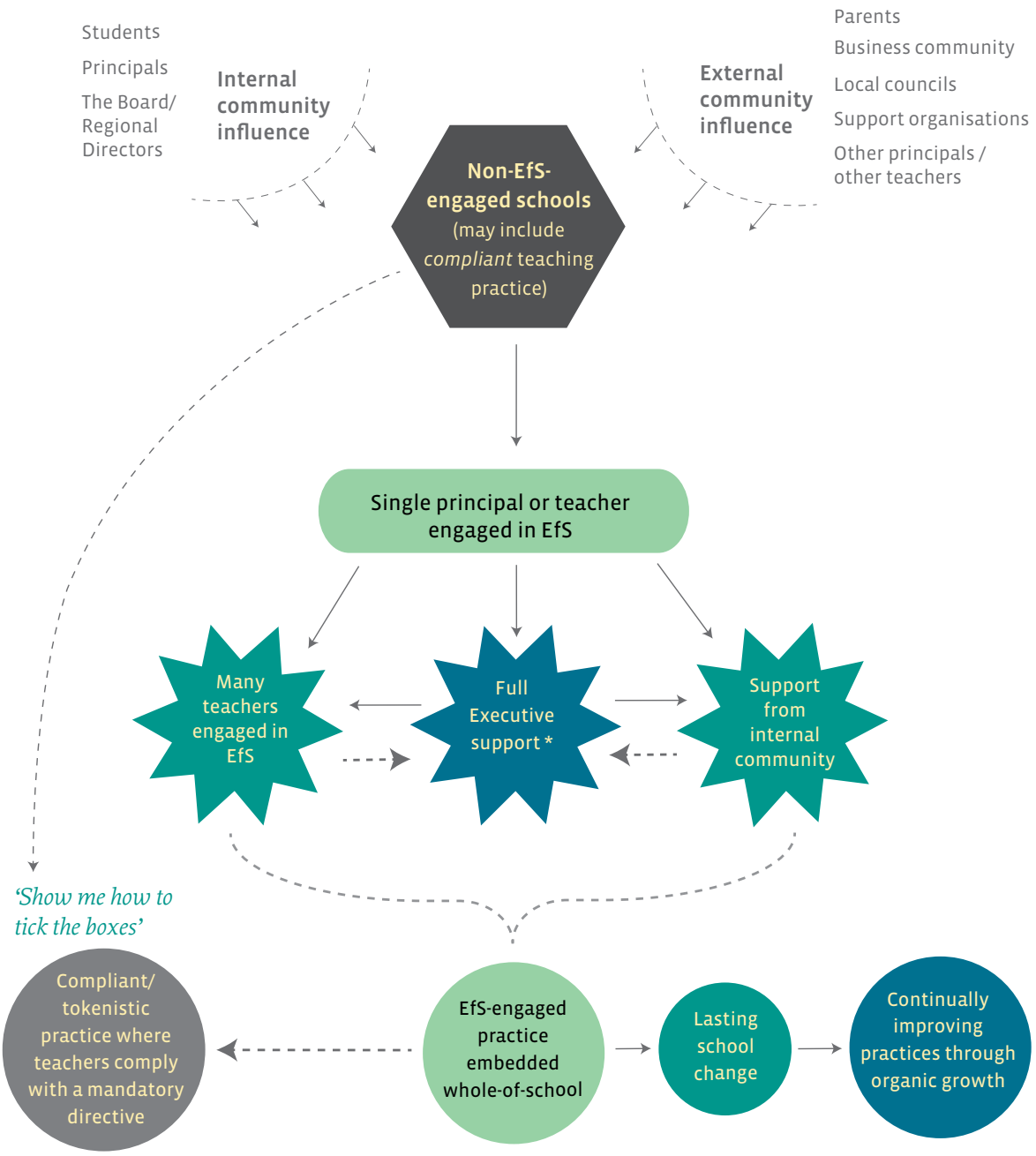
FIGURE 2:
WHERE AUSTRALIAN TEACHERS ARE ON THE TEACHER JOURNEY

Proportion (%) of Australian teachers (excluding those who don't have an active teaching responsibility):



Source: Lonergan Research

FIGURE 3:
THE SCHOOL JOURNEY



Source: Lonergan Research

1 / FINDING 1

Low level of awareness of sustainability as a cross-curriculum priority amongst teachers.

There is a considerable lack of awareness and comprehension of sustainability as a cross-curriculum priority (80%) to the extent that:

- 40% of Australian teachers say they are unaware of sustainability as one of the three cross-curriculum priorities within the Australian Curriculum
- 40% of Australian teachers say they have a lack of comprehension and understanding of the concept and relevance of teaching sustainability within the Australian Curriculum
- The largest knowledge gaps were considered to exist with regard to:
  - the extent to which teachers were expected to integrate sustainability into their teaching practices (i.e. breadth and depth)
  - where teachers can access resources to help them integrate sustainability into their teaching practices.

Amongst Australian teachers who reported their schools had **no** teachers currently engaged in EfS (15%), the most effective enabling strategies to facilitate the first teacher becoming engaged in EfS were considered to be professional development events and funding (60%) as well as the **development of a 'getting started pack'** (54%).

Despite the low level of awareness of sustainability as a cross-curriculum priority, the vast majority of Australian teachers think that teaching sustainability is important and will be of benefit to students:

- 85% considered it important to personally integrate sustainability into their own teaching practices
- 74% considered that students would benefit from being taught about the concepts, knowledge, skills and values of sustainability.

→ / RECOMMENDATION 1

Develop an EfS 'getting started pack'.

For the 80% of teachers not fully comprehending EfS, a 'getting started pack' was considered the most effective enabler. The 'getting started pack' should provide:

- a clear definition of what Education for Sustainability is and why it is important to integrate it into teaching practices
- guidance on how and where sustainability should be integrated into teaching practices (*notably* for subjects where the link is not clear e.g. Maths, PDHPE, Art)
- guidance on how to evaluate current teaching programs to identify where sustainability may already be taught
- sign-posting to appropriate tools and resources
- examples of good and best practice (including visual stimuli, visits from representatives from other schools and/or 'experts' e.g. AuSSI or local council).

2 / FINDING 2

Only one third of teachers aware of EfS know how to integrate it into their teaching practices.

The majority of Australian teachers have yet to integrate sustainability into their teaching practices (91%). The research reveals that:

- fewer than 1 in 10 (9%) of Australian teachers say that they are currently teaching sustainability in a way that addresses the ACARA Organising Ideas for implementing sustainability as a cross-curriculum priority <www.australiancurriculum.edu.au/CrossCurriculumPriorities/Sustainability>
- only 2.3% of Australian teachers say they are currently teaching sustainability to a standard which *exceeds* the ACARA Organising Ideas for implementing sustainability as a cross curriculum priority.

Of the 60% of teachers who were aware of EfS, only 1 in 3 (34%) knew what was required of them with regard to integrating sustainability into their teaching practices. The remaining 66% claimed either not to know or were unsure of what was required of them.

Where Australian teachers claimed that their schools had many teachers engaged in EfS (33%), about 75% claimed that **access to best practice resources/teaching materials** would be the ***most effective*** way to encourage all teaching staff in the school to become engaged with integrating sustainability.

→ / RECOMMENDATION 2

Provide readily accessible classroom-ready resource materials for teaching sustainability.

Fifty-six per cent of teachers not knowing how to integrate EfS into their teaching claimed that classroom-ready resources would be the most effective way to help them develop the knowledge they needed to integrate sustainability into their teaching practices.

The most appropriate and efficient distribution mechanism for providing classroom-ready resource materials for EfS is a national online website. The most important aspects of such a website would be one which provided:

- teachers with a clear definition of what Education for Sustainability is and why it is important to integrate it into teaching practices
- guidance on how and where sustainability should be integrated into teaching practices
- guidance on how to evaluate current teaching resources and programs to identify where sustainability may already be taught
- examples of good and best practice teaching
- ready-to-use resources and materials that are linked to the Australian Curriculum
- sign-posting that is easy to use and intuitive.

As identified in the research, there are many EfS-related resources available that teachers can use with their students. In fact, the number of resources has become overwhelming, hence the need for readily accessible and classroom-ready resources. Education Services Australia (ESA) manages the online database called Scootle, which links to, and makes discoverable, a huge number of such resources (currently over 20,000) for teachers from K–12 across all subject disciplines. These resources are available free from additional copyright collection. The Scootle database includes a facility that enables teachers to rate resources as well as an indicator of the frequency of access to the resource. The database tags content in the resources which relates to the cross-curriculum priority of sustainability — consistent with the design and content tags in those of the Australian Curriculum developed by ACARA. The discoverability of the resources is driven by content filters for the online database and by application of standard terms defined in the Schools Online Thesaurus (ScOT). The database also allows a word search for 'sustainability' resources.

3 / FINDING 3

Professional development in EfS is a major enabler for teachers no matter where they are on their EfS teacher journey.

Teachers at all stages of the teacher journey considered that professional development (PD) was a major enabler for integrating EfS into their teaching practices:

- 60% of respondents claimed that the most effective enabler of EfS *awareness* would be professional development
- Likewise, 62% of respondents considered PD for sustainability was an important enabler of *comprehension* of EfS (just behind the 64% who thought a 'getting started pack' was an important EfS enabler)
- 54% of teachers nominated PD for sustainability as an enabler *to facilitate knowing where and how to integrate EfS into teaching practices.*

→ / RECOMMENDATION 3

Scale up the delivery of relevant professional development for teachers at all stages of their EfS journey.

The key aspects of professional development in EfS include providing teachers with:

- a clear definition of what EfS is and why it is important to integrate it into teaching practices
- clear guidelines as to *how* and *where* sustainability should be integrated into teaching practices (*notably* for subjects where the link is not clear e.g. Maths)
- sign-posting to appropriate tools and resources
- examples of good and best practice (including visual stimuli, visits from representatives from other schools and/or 'experts' (e.g. AuSSI or local council)
- continuous and staged professional development in EfS to match where they are on the teacher journey (refer to figure 6)
- more conversational and networking styles of professional development, as distinct to online courses.

Audit and gap analysis

Phase 1 of this research also gathered data on the current state of PD in EfS and EfS training for pre-service teachers nationally. However, data collection has been difficult due to the *ad hoc* nature of EfS PD services across state jurisdictions and because very little is known about EfS pre-service teacher training in teacher training institutions apart from the courses identified for this report. An **audit and gap analysis** is recommended to:

- obtain a more complete picture of both EfS PD services and EfS pre-service teacher training across all state jurisdictions
- ensure scaled-up, relevant PD addresses critical gaps as identified in the research.

Funding for professional development in EfS

As there is currently no dedicated funding for professional development for practising teachers in EfS, it is recommended that funds be provided for this purpose. The Australian Government has provided funds in the past for specific purposes for schools, for example, through their Quality Teaching Program and Smarter Schools National Partnership, initiatives designed to support the Melbourne Declaration's educational goals for the 21st century. These funds are devolved through state education departments across the three school sectors.

4 / FINDING 4

Teacher support networks play an important role in helping teachers integrate EfS into their teaching practices and are the most effective form of professional development for time stressed teachers.

Amongst teachers who had not integrated sustainability into their teaching practices in line with the ACARA Organising Ideas, the most effective enabling strategies were considered to be:

- having *more time* (35%)
- professional development funding/events for sustainability (35%).

The research highlighted that support networks are particularly important as an enabler by providing guidelines and examples as to *how* teachers can incorporate sustainability into their teaching (42% teacher support). Thirty-five percent of teachers who had not integrated sustainability into their teaching practices considered that more PD funding and events, facilitated by personalised networking, would be an enabling strategy for EfS. Amongst teachers who considered that their teaching practices *exceeded* suggestions in the ACARA Organising Ideas (only 2% of teachers surveyed), the three key enablers that would allow them to do more were:

- access to grant funding for sustainability-related projects (40%)
- the *opportunity to learn from other teachers* (38%)
- PD funding/events for sustainability (36%).

→ / RECOMMENDATION 4

Provide more support networks for teachers both within (internal) and outside (external) the education system.

The three enablers identified above would be significantly enhanced through better support networks for teachers. Networking styles of professional development are more aligned with a sustainability perspective which values diversity, partnerships, relationships and behaviour change rather than purely knowledge and skills.

Examples include:

- The *peer-learning model* of professional learning currently used by the school environment networks in NSW and Victoria, most often run by local government officers.
- A *mentoring scheme for new teachers* so that they don't feel so isolated when they find challenges in implementing EfS in their new schools. Such a scheme could be developed and implemented through professional organisations such as the Australian Association for Environmental Education (AAEE).
- Local government specialists such as water catchment officers, nursery staff, wildlife officers, waste officers, sustainability officers etc assisting with school sustainability programs and projects by providing resources such as water-quality testing kits, plants etc and attending and co-organising events such as discovery walks, plantings, waste audits etc with teachers. Some council officers also have classroom-ready resources and programs they can assist teachers with.
- online discussion forums such as the Scootle Community accessed via the Scootle website. School teachers in all states and territories now have access to Scootle ‹www.scootle.edu.au›.

The role of external organisations (e.g. AuSSI, QESSI, Sustainable Schools NSW, local government, community-based organisations) in supporting teachers educating for sustainability could include providing:

- professional development (PD) events for schools
- schools with a support network (e.g. connections to other schools teaching sustainability)
- schools with a clear definition of what EfS is and why it is important to integrate it into teaching practices
- schools with clear guidelines as to how and where sustainability should be integrated into teaching practices
- examples of good and best practice teaching
- ready-to-use resources and materials that are linked to the Australian Curriculum.

5 / FINDING 5

A whole-school approach to EfS was considered the most effective model to implement EfS in schools across all disciplines, over and above piecemeal implementation by individual teachers.

A whole-school approach to EfS is defined as one where sustainability is embedded throughout the school — within the curriculum, operations and management, and is embraced by all school staff. This requires a commitment to EfS by a significant proportion of teachers and the internal school community as a whole, as well as by the education system and administrative authorities, exemplified through system-wide policies and actions, for example, by managing waste to enable recycling and composting.

What does a whole-school approach look like?

Teachers offered the following indicators for a whole-school approach to EfS:

1. **EfS is integrated into all or most subjects through:**
   - The use of resources that have a sustainability context e.g. Maths examples, English comprehension and reading materials, foreign language development topics
   - sustainability investigations aligned to curriculum e.g. Science, Geography, Economics, Ancient History, Indigenous perspectives etc
   - Problem-based learning to cover big ideas e.g. projects, debates, specific events — at classroom, year or school level.

2. **EfS engagement is evidenced physically in the school through:**
   - Active involvement of the school community in EfS-related activities, e.g. recycling, vegetable gardens, water and energy conservation programs, student extra-curricular activities etc
   - Active links of the school community to the wider community in an EfS context e.g. school-community committee, involvement with place-based learning, support of local and worldwide sustainability programs.

From other studies and findings a whole-school approach also has the following features:

- most teachers engaged in teaching EfS in the classroom and accessing school-based EfS projects/initiatives
- teachers accessing continual and staged PD in EfS
- support from the Principal
- staff with dedicated roles and responsibilities for EfS
- student engagement with EfS through curriculum and/or whole-of-school EfS projects
- regular planning for EfS (both strategic and succession)
- constant re-evaluation of the level of engagement of both internal and external communities
- evaluative measures of accountability e.g. for EfS projects
- ongoing commitment to the philosophy of EfS through incorporation of EfS as a goal in the school's management plan (not just in the school's environmental management plan).

The research confirmed that the following groups have a major influence in facilitating a whole-school approach:

- teachers
- parents and the wider school community
- support organisations and programs (e.g. AuSSI)
- the school leadership team (principal, curriculum coordinators)
- federal and state government education authorities.

The most effective strategies to enable lasting change with a whole-school approach were considered by teachers to be:

- embedding sustainability support practices into the school culture (61%)
- embedding sustainability into a whole of school strategic improvement plan (57%)
- including sustainability learning across all subjects taught (55%).

Where teachers said that all teaching staff in their school were engaged in EfS (4% of respondents) sustainability was also in the school's annual improvement plan. Greater funding for support networks that can assist and provide guidance to facilitate a whole-school approach (41%) were considered to be the most effective enabling strategies.

Without a supportive principal, lasting change towards whole-school sustainability is unlikely. A passionate principal will facilitate other enablers for EfS, whilst a disinterested principal will be a key barrier. Even with the support of the principal and most of the enablers in place, it is hard to maintain a whole-school approach without an ongoing active plan.

Key enablers towards maintaining a whole-school approach include:

- direction from the school leadership regarding the importance of EfS
- clear communication and supporting guidelines for EfS at the school level
- engagement with the local community
- cross-curriculum teacher support through internal and external support networks and/or a dedicated support team in the school
- accountability mechanisms (e.g. a regular system-wide audit of sustainable teaching practices in schools)
- state assistance with the development of teaching units
- at least one passionate teacher to begin the whole-of-school EfS journey.

→ / RECOMMENDATION 5

Promote a whole-school approach as the most durable model for implementing EfS in schools and invest in programs which achieve this over the long term.

The achievement of a whole-school approach to EfS was considered to be a medium to long-term strategic objective for schools and one which the majority of survey respondents felt would take years to achieve.

In this context, the research indicates the value of the Australian Sustainable Schools Initiative (AuSSI) in promoting a whole-school approach. Based on the findings in this report, the reinvigoration of AuSSI, or similar nationwide program, is regarded as the best way to embed sustainability into all facets of school curriculum and operations. The whole-school approach embedded in the AuSSI framework has the potential to involve all students and staff in schools in some form of exposure to EfS, whether that be through a school vegetable plot, recycling or a student-led event such as a Green Day. This is superior to sending individual teachers to attend

a day course in EfS where they may or may not pass on their learning to their peers. A school environmental management plan (SEMP), as recommended in NSW, can provide 'a mechanism for managing change by providing structure, direction and momentum' (Larri p40) in schools, especially if the SEMP is written into the school's management plan. Other advantages of AuSSI are:

- flexibility — each school is different and will have a different EfS focus
- covers school governance, resource and curriculum areas thus providing opportunities for cross-curricula learning in social, economic and environmental sustainability
- cost effective professional development for teachers supported by the peer learning model
- promotes experiential and cross-curricula learning in sustainability through visible, practical on-ground projects such as food gardens
- saves money through environmental initiatives (e.g. reduced energy use)
- enables partnerships with other EfS providers outside of the school
- promotes student leadership, entrepreneurial skills and enhanced learning.

In this context, it is recommended that government and/or non-government funding be allocated to the AuSSI program or similar, with the appointment of a national coordinator. Consideration could also be given to providing funds to the national Catholic Education Commission to enable more systemic Catholic schools to also access the whole-school ASSISI program, developed by Catholic Earthcare (see section 5.1). Victoria has the most systemic approach to embedding the AuSSI framework in schools. Funding from Sustainability Victoria generously supports the Resource Smart accreditation process for schools. It is recommended that this model also be adapted for use across Australia.

A database of support organisations, resources and schools already adopting a whole-of-school approach to EfS would also be very useful in helping teachers and schools to integrate EfS into their teaching and school.

6 / FINDING 6

Other people and organisations, including those outside of the school, can bring about behaviour change amongst those teachers who do not currently incorporate EfS into their teaching.

These 'other people and organisations' include:

- parents
- pupils/students
- the business community
- teachers from *other* schools actively teaching sustainability
- support organisations and programs (e.g. AuSSI)
- local government programs
- community support organisations.

→ / RECOMMENDATION 6

Provide targeted funding for effective community and business networks/ organisations which provide support for teachers to incorporate EfS in schools.

Ensuring some program budget support to build and maintain networks for teachers which are external to the immediate school, for example through AuSSI, NGOs, and local government programs, would help schools adapt the ACARA Organising Ideas for sustainability as a cross-curriculum priority in practical ways in their local contexts. This would also engage the broader school community in learning about sustainability, which in turn reinforces learning and helps ensure consistently high standards for teaching resources.

This opportunity will be explored further in Phase 4 funding of the EfS Project, which has the following objectives:

- develop and disseminate best practice models for the building of efficient support networks for teachers and school communities, drawing from the wider school community, to enable effective delivery of EfS in Australian schools.
- identify and promote strategies which enhance the engagement and efficient contributions of local business networks, local government agencies and community based organisations, to contribute efficiently to building durable support networks for teachers and schools in the delivery of EfS.

7 / FINDING 7

There is no reference to competencies to teach EfS in the National Professional Teaching Standards developed by the Australian Institute for Teaching and School Leadership (AITSL), nor are teachers aware of the opportunities for applying the National Professional Teaching Standards to EfS.

The National Professional Teaching Standards provide an opportunity to highlight the importance of EfS. Incorporating sustainability into all disciplines across the Australian Curriculum may be best served through either a specific competency standard in EfS or its inclusion as a focus area in one of the new standards, for example, under Standard 2: *Know the content and how to teach it.*

AITSL has already worked with groups interested in Asia literacy and early childhood education to identify how the professional teaching quality standards can highlight relevant content and pedagogies (see ‹www.aitsl.edu.au/initial-teacher-education/initial-teacher-education.html› for the work on Asia Literacy and ‹www.teacherstandards.aitsl.edu.au/Topics/EarlyChildhoodReport› for the work around early childhood educators).

→ / RECOMMENDATION 7

The Australian Institute for Teaching and School Leadership (AITSL) identify, in collaboration with teachers and practitioners engaged in EfS, how competencies for teaching EfS can be most effectively incorporated into the National Professional Teaching Standards.

There are a number of ways in which the competencies to teach EfS could be included within the National Professional Teaching Standards to ensure that trainee teachers understand EfS principles and have the confidence, skills and motivation to competently incorporate EfS in their teaching (and achieve the desired response of the project for teachers: *'This make sense, this fits naturally and easily into what I teach'*). The possible approaches are:

1. Competency in EfS is incorporated into all three domains (professional knowledge, practice and engagement) and across the seven standards.
2. Competency in EfS is added as an additional focus area under Professional Knowledge Standard 2: *Know the content and how to teach it*, to give it equal status with other cross-curriculum priorities listed under that standard (understanding Aboriginal and Torres Strait Islander peoples; literacy and numeracy and ICT).
3. Competency in EfS becomes a new stand-alone professional standard.

Some suggested elements/capabilities for teaching sustainability, applicable to all three of the above possibilities, include:

- the ability to engender hope for the future in their students
- an understanding of the holistic nature of sustainability and its applicability across all subject disciplines
- influencing and motivating skills to inspire school leaders, other staff and students to realise the value and need for EfS in schools
- relationship skills
- integrative curriculum writing skills
- envisioning skills to help guide their school towards a more sustainable future
- teaching and learning strategies for EfS such as place-based learning
- recognising that EfS is much more than content knowledge, skills and values — it is also about how world views influence, inform and have consequences on thinking, decision-making and actions.
- knowledge of experiential and inquiry-based learning pedagogies.

The general consensus among academics and practitioners working in this field is that a stand-alone standard is preferable, as research has shown for some 20-30 years that interdisciplinary frameworks are not as effective in practice (refer to Miles et al 2006 and Cutter-Mackenzie 2010).

8 / FINDING 8

Education for Sustainability in pre-service teacher education is patchy and is often only included in courses by academics who have an interest in the area.

Currently, there is little communication between stakeholders working in the EfS teacher training area (Chris Watt pers. comm. 19/12/2012). To drive systemic change at the grassroots level, the links between EfS pre-service teacher educators and other EfS practitioners/teachers working in schools 'at the chalkface' could be strengthened. This could be achieved via a national consultative committee utilising networks such as the National Teacher Education for Sustainability Network.

→ / RECOMMENDATION 8

Facilitate systemic change in teacher education institutions by setting up a high-level National Consultative Committee on EfS involving all stakeholders to develop effective pre-service teacher training courses in EfS.

To successfully mainstream sustainability into pre-service teacher education in Australia, members of a consultative committee would need to be leaders in their organisations able to drive cultural and systemic change and be prepared to work collaboratively with other members of the committee to embed EfS training into all pre-service teaching institutions nationally. The organisations that should be represented include:

- teacher education institutions
- teacher and student unions
- professional teacher associations
- teacher registration boards
- governance bodies of schools across the three sectors
- state/territory departments of education and environment
- federal departments and agencies with EfS roles e.g. ACARA, ESA.

Additionally, it is recommended that the National Teacher Education for Sustainability Network shares its views with the Teacher Education Ministerial Advisory Group established by the Coalition Government to provide advice on how teacher education programmes could be improved to better prepare new teachers with the practical skills needed for the classroom. It replaces the planned 2014 review of initial teacher training which was to have been undertaken by the Tertiary Education Quality and Standards Agency (TEQSA) under the previous government.

The Terms of Reference for the National Consultation Committee on EfS would include:

1. ***Developing a foundation course in EfS*** to be run early on in the pre-service education program so that it informs any subsequent subject specialisations (Lynne McLoughlin pers.comm. 8/1/2013). The course should be informed by best practice in EfS training as discussed in this report and be developed by a team of academics who work in the field and have a track record of excellence in EfS education for pre-service teachers. The course should cover foundation values and attitudes towards EfS, the principles of EfS, how to get started in teaching EfS and teaching and learning strategies leading to competency in EfS.
2. ***Determining the type, amount and source of data needed to embed EfS into pre-service teacher training and into the teaching of practising teachers.*** Very clear terms of reference and a timeframe for the collection of data and analysis should ensure that relevant data is available swiftly for use by the committee in their decision-making role. For example, data identifying barriers and enablers to embedding EfS training into pre-service teacher courses across all jurisdictions should be collected. Databases of national education unions, professional teacher associations and state teacher registration bodies are available to be used to collect the data.

A valuable addition to the EfS Foundation course would be to develop strategies and/or professional learning to deal with individual and motivational factors which are barriers to the delivery of EfS in schools by new teachers. Ground-breaking work in this area by Paul Murray, University of Plymouth, as described in his book *The Sustainable Self*, has resulted in cross-disciplinary sustainability training for over 1,000 students and teachers in the higher education sector in the UK.

Education for Sustainability and the Australian Curriculum Project

Final report

For Research Phases 1 to 3

Advancing the implementation of Education for Sustainability in the Australian Curriculum — Views from the Classroom and Community (the 'EfS project')

1. Introduction

1.1 THE PROJECT

Project Objectives

To engage with a wide range of teachers and educators, as well as with decision makers in government, to recommend ways to:

- improve the accessibility of high quality classroom ready resources
- support the alignment of Education for Sustainability (EfS) learning tools and programs with the Australian Curriculum
- provide better training and support services for teachers and educator programs to enable efficient delivery of sustainability learning outcomes across the Australian Curriculum.

EfS Project Phases 1-3

The three phases of the EfS project were:

1. **Phase 1:** *Developing the vision — the opportunities for more effective delivery of EfS in the Australian Curriculum* (December 2012 — February 2013) reviewed the current literature on EfS in relation to delivery in schools; assessed the availability and ease of access to EfS resources; examined the state of professional development and level of funding for teachers in EfS nationally across all school sectors through contacting key providers; and identified the characteristics of effective EfS-related pre-service teacher training and professional development through an extensive literature search.
2. **Phase 2:** *Views from the classroom and community — engaging and consulting* (April–July 2013) sought the views and insights of mainstream teachers and other target audiences via a series of structured collaborative events and engagement processes, including focus groups, telephone interviews and two comprehensive online surveys organised through the Australian Education Union and the Independent Education Union.
3. **Phase 3:** *Telling the story — reporting back on needs, barriers, strategies and actions to improve delivery of EfS in the Australian Curriculum (*August–December 2013) is the collation of the findings and recommendations from Phases 1 and 2 presented in this report.

Phase 4 will focus on establishing national support systems and networks for teachers and schools.

1.2 WHAT IS EfS?

The five principles of EfS are generally considered to be:

1. Envisioning a sustainable future
2. Systems thinking
3. Critical and creative thinking
4. Participation to encourage 'ownership' of solutions
5. Partnerships to maximise creativity and systems resilience. ‹www.aries.mq.edu.au›

> *Education for sustainability develops the knowledge, skills and values necessary for people to act in ways that contribute to more sustainable patterns of living. It is futures-oriented, focusing on protecting environments and creating a more ecologically and socially just world through action that recognises the relevance and interdependence of environmental, social, cultural and economic considerations.*
>
> ‹www.acara.gov.au›

Education for Sustainability (also known as Education for Sustainable Development) is an internationally recognised educational approach that moves beyond just imparting knowledge about the environment — educating *about* sustainability — to building people's capacity for transformational change — educating *for* sustainability. It focuses on motivating and engaging people to help create a better future. It is thus a broader, more encompassing concept than environmental education (EE). Environmental education has been around for longer and has provided a good building block for the growth and conceptualisation of EfS. Global, national, regional and local imperatives exist for the incorporation of EfS into all education sectors. For example, the United Nations has made 2005–2014 the Decade of Education for Sustainable Development.

National support for the UN initiative was provided in *Caring for our Future: the Australian Government Strategy for the United Nations Decade of Education for Sustainable Development 2005–2014* (DEH 2007) preceded by *Educating for a Sustainable Future: A National Environmental Education Statement for Australian Schools* (DEH 2005) and *Living Sustainably: The Australian Government's National Action Plan for Education for Sustainability* (DEWHA 2009). State governments followed the Commonwealth's lead, for example, the NSW Government formulated its *Learning for Sustainability NSW Environmental Education Plan 2007–2010* in 2006 (NSW DEC 2006).

Education for Sustainability is very broad, and many social and cultural issues involving human activity and impacts fall under its umbrella. There is some confusion about what it means and there is not a wide understanding of the associated pedagogy. There is more activity (with a practical) focus and recognition in primary schools than in secondary schools. EfS in active schools has been built on existing, usually practical, programs such as WaterWatch and WasteWise as well as experiences at camps and environment centres.

1.3 EfS: A CROSS-CURRICULUM THEME IN THE AUSTRALIAN CURRICULUM

Sustainability is one of three cross-curriculum priorities in the Australian Curriculum. The other priorities are Aboriginal and Torres Strait Islander histories and cultures and Asia and Australia's engagement with Asia.

The *Melbourne Declaration on Educational Goals for Young Australians* (MCEETYA 2008), developed by state, territory and commonwealth education ministers in collaboration with the Catholic and independent school sectors to set the direction for Australian schooling to 2018, acknowledges that all young Australians should be supported to become 'successful learners, confident and creative individuals, and active and informed citizens of the 21st century'. A four-year plan to achieve the goals was developed to accompany the Declaration ‹www.mceecdya.edu.au/mceecdya/melbourne_declaration,25979.html›.

However, EfS is not specifically mentioned in the plan, although it is clearly very relevant to the stated goals. Section 2 reports on international thinking about what sorts of skills and competencies will be needed by students as they enter the workplaces of the 21st century and the important role that EfS can play in delivering those skills.

1.4 CONTENT DELIVERY OF EfS IN THE AUSTRALIAN CURRICULUM

Broadly conceived, EfS goes further than the definition of sustainability as a cross-curriculum priority in the Australian Curriculum. The definitions of EfS concepts as noted above have primarily come from academics working at the international level. Some of the concepts proposed for EfS are too complex for many teachers to understand and/or to incorporate into their teaching programs. In a 2002 survey of curriculum documents in all states and territories, few of the key ideas and concepts that are proposed for EfS programs could be identified in the documents. This has not changed a great deal with the development of the four confirmed K–10 learning areas of the Australian Curriculum. However, the new curriculum areas — Geography (approved by Education Ministers in 2013) and Civics and Citizenship (due for implementation in early 2014) — do provide greater scope for EfS.

For each cross-curriculum priority, a set of organising ideas reflects the essential knowledge, understandings and skills for the priority (called 'repertoires of practice' in the *Sustainability Curriculum Framework* document prepared for the Australian Government to assist teachers in their curriculum planning to include sustainability themes). The organising ideas are thus embedded in the content descriptions and elaborations of each learning area as appropriate. This holistic view of sustainability is more wide-ranging and applicable across the curriculum than the traditional environmental sustainability approach of years past and is exemplified in Table 1 below.

TABLE 1:
ORGANISING IDEAS FOR EfS IN THE AUSTRALIAN CURRICULUM

Code	
	SYSTEMS
OI.1	The biosphere is a dynamic system providing conditions that sustain life on Earth.
OI.2	All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing and survival.
OI.3	Sustainable patterns of living rely on the interdependence of healthy social, economic and ecological systems.
	WORLD VIEW
OI.4	World views that recognise the dependence of living things on healthy ecosystems, and value diversity and social justice are essential for achieving sustainability.
OI.5	World views are formed by experiences at personal, local, national and global levels, and are linked to individual and community actions for sustainability.
	FUTURES
OI.6	The sustainability of ecological, social and economic systems is achieved through informed individual and community action that values local and global equity and fairness across generations into the future.
OI.7	Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments.
OI.8	Designing action for sustainability requires an evaluation of past practices, the assessment of scientific and technological developments, and balanced judgments based on projected future economic, social and environmental impacts.
OI.9	Sustainable futures result from actions designed to preserve and/or restore the quality and uniqueness of environments.

Source: <www.acara.gov.au>

Defining the priority in this way provides a context for teachers to offer meaningful experiences to their students within learning areas where EfS is not directly described, while at the same time satisfying the requirements of the Australian Curriculum. The repertoires seem to be best suited to older students and it may be challenging for teachers in the earlier years of education to incorporate them into their teaching programs. Additional findings relating to EfS content and its delivery in schools include:

- There was not a widespread understanding of basic sustainability concepts such as ecological sustainability and how this impacts our society and how our society impacts upon it amongst students (Skamp 2009; DEWHA 2010; EcoChange 2012).
- A lot of environmental sustainability information available to schools is negative and depressing (EcoChange 2012).
- At present there is little evidence of 'new' concepts in many of the mainstream Australian syllabuses (Skamp 2009).

- EfS must be regular and ongoing (Skamp 2009; DEWHA 2010).
- EfS initiatives should involve the community beyond the school where appropriate (Skamp 2009; DEWHA 2010).
- Activities need to be related back to causes not symptoms (Skamp 2009; DEWHA 2010).
- There is also the implication that outdoor experiences, whether in the school grounds or at an environmental education centre (EEC), need to be seen as 'part of school learning' (Skamp 2009; DEWHA 2010).
- A major review of the curriculum in all states and territories of Australia in 2002 found limited reference to the major concepts defined in EfS (such as carrying capacity, eco-efficiency, ecological footprint, ecospace, life-cycle analysis, natural resource accounting, precautionary principles, personal actions, intergenerational equity). Although biodiversity is featured in most science and biology programs, it is not a major theme, and it appears in only a few key learning areas. Although mentioned in some science documents then, sustainability was generally not a feature (Curriculum Corporation 2002).
- There is also considerable support for EfS engaging learners in most, if not all, aspects of decision-making about local issues that are of significance to learners. Exposure to 'controversial issues' also is an imperative within an EfS learning environment. Experiential learning, in the sense that it embraces critical thinking and reflection, is an invaluable approach to embrace. Further, there is strong evidence that students should learn in outside environments on a regular basis — there are, though, various associated strategies that will make such learning more meaningful. Interaction with the 'natural' environment is considered to be critical from the earliest years if more students are to hold sustainability values. More recently research studies have been stressing the 'learners' voice' and this needs to be a strong feature of any proposed pedagogies in an EfS curriculum framework (Skamp 2009).
- There is still a silo approach between learning areas at most of the schools who participated in the EcoChange review. There was little example of cross-curricular planning or teaching (EcoChange 2012).
- Schools in the ACT AuSSI program have achieved a range of behavioural changes in relation to resource management by implementing the strategies promoted by AuSSI ACT. Curriculum integration of EfS into the ACT Curriculum Framework is a key strength (ACT Government 2010).
- Repertoires of practice: This organiser identifies a wide body of knowledge and practices that is developed through a range of learning areas and is drawn upon and applied in the sustainability action process.
  - *World viewing* involves practices associated with reflecting on, comprehending, negotiating and changing fundamental beliefs, perceptual orientations, ethical principles and values.
  - *Systems thinking* involves practices associated with comprehending and working rationally with complexity, uncertainty and risk, so that they can be managed effectively.
  - *Futures and design thinking* involves practices associated with visualising, modelling, selecting and developing ideas, products, environments, processes and systems that contribute to preferred futures, with the aim of formulating viable solutions (DEWHA 2012).

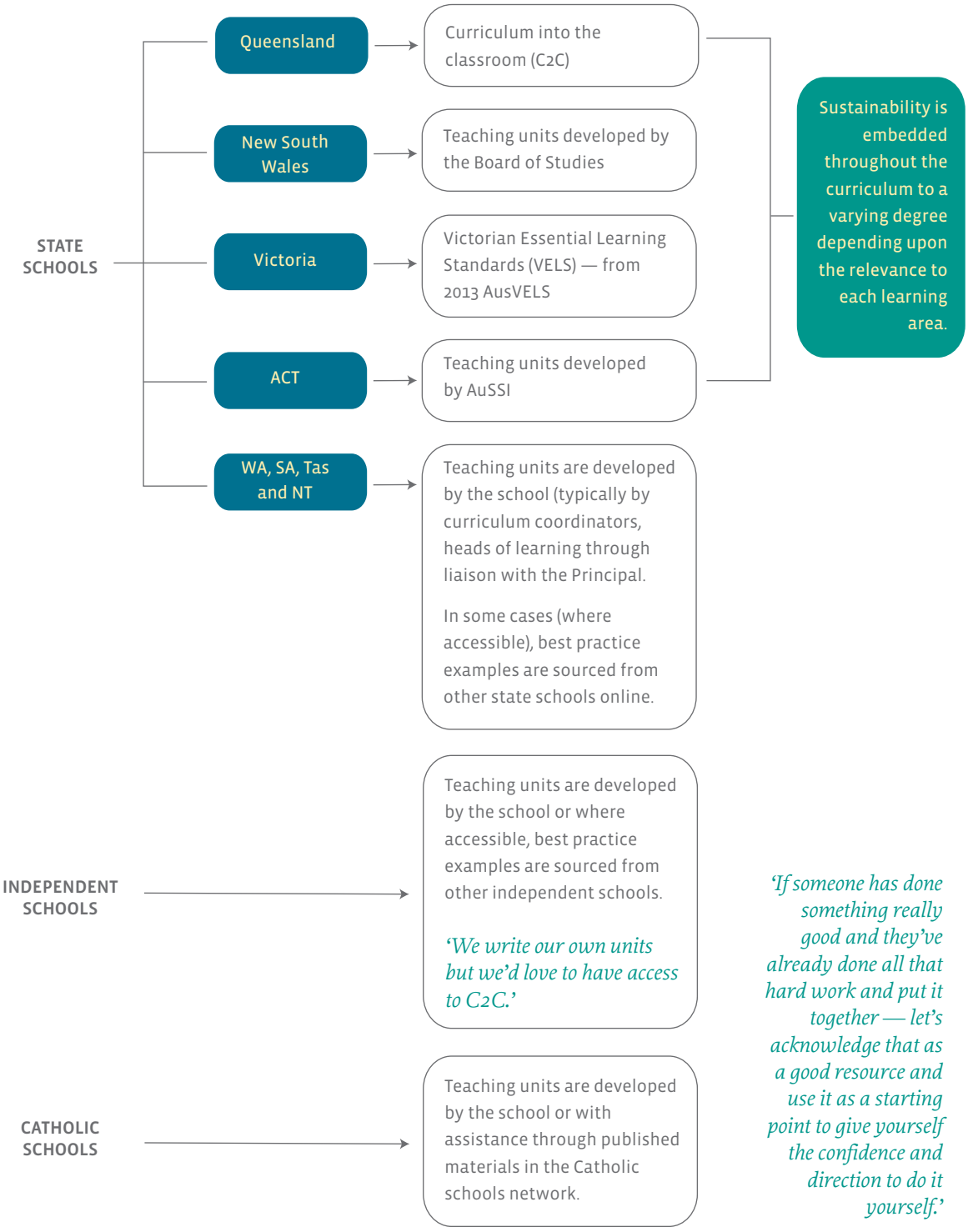
It is important to note that the roll-out of the Australian Curriculum is the responsibility of individual state governments. New South Wales, for example, is creating syllabuses from the Australian Curriculum. In this context, the NSW Board of Studies has limited inclusion of the sustainability leaf icon to subject content on mainly 'environmental' topics. Such an approach could be said to limit the potential of EfS in the new Australian Curriculum. There are social and economic issues that could easily be taught from a sustainability perspective. For example, the 'Built Environment' topic in Stage 3 Science, eminently suitable for the sustainability icon, has none (see OI.9 in Table 1 and ‹www.syllabus.bos.nsw.edu.au/science/science-k10/content/978/›). Most states are applying content directly. There is no choice on how the cross-curriculum priorities are included across disciplines; there is, however, choice by teachers on whether they include the cross-curriculum priorities in their own lesson plans.

The last four of seven 'general capabilities' in the Australian Curriculum particularly support the sustainability cross-curriculum priority but all seven are essential for EfS:

- literacy
- numeracy
- information and communication technology capability
- **critical and creative thinking**
- **personal and social capability**
- **ethical understanding**
- **intercultural understanding.**

The *process*, however, of 'reorienting education towards sustainability is a broader and more pervasive task than that of revising syllabuses and devising new teaching and learning materials' (Fien 2001), as this report will endeavour to show.

FIGURE 1:
SCHOOL SECTOR CURRICULUM DELIVERY OF EfS CONTENT



'If someone has done something really good and they've already done all that hard work and put it together — let's acknowledge that as a good resource and use it as a starting point to give yourself the confidence and direction to do it yourself.'

Source: Lonergan Research

1.5 EfS AND NATIONAL PROFESSIONAL TEACHING STANDARDS

Opportunities for incorporating competency in EfS in the National Professional Teaching Standards for quality teaching developed by the Australian Institute of Teaching and School Leadership (AITSL) could be highlighted. In addition, sustainability educators could work with AITSL to ensure a broader awareness of these opportunities amongst teachers.

Teacher accreditation at graduate, proficient, highly accomplished and leadership levels was introduced in 2005 and is managed, in NSW, by the NSW Institute of Teachers set up under legislation passed by the NSW Parliament in June 2004. Adding 'competency in EfS' as a graduate and professional teaching quality standard would greatly enhance its status and the attractiveness, for at least new teachers requiring ongoing accreditation, to undertake professional learning in EfS. Currently, however, most teachers are concentrating their efforts on improving numeracy and literacy standards so that their schools achieve high rankings under the National Assessment Program in Literacy and Numeracy (NAPLAN) (Kennelly, Taylor and Serow 2011). Hence, sustainability education is considered a low priority by many schools.

An encouraging development that could be used to inform the future development of a quality teaching and learning standard in EfS in the school sector is the introduction in 2012 of the National Quality Standard which sets new national, assessable and enforceable benchmarks for early childhood education centres (see ‹http://www.acecqa.gov.au/national-quality-framework/the-national-quality-standard›). The quality areas, of which numbers 3, 5, 6 and 7 comprise a sustainability component, are:

1. Educational programmes and practice
2. Children's health and safety
3. **Physical environment**
4. Staffing arrangements
5. **Relationships with children**
6. **Collaborative partnerships with families and communities**
7. **Leadership and service management.**

Standard 3.3 states 'The service takes an active role in caring for its environment and contributes to a sustainable future'. Element 3.3.1: Sustainable practices are embedded in service operations. Element 3.3.2: Children are supported to become environmentally responsible and show respect for the environment.

2. Benefits to students of Efs in schools

An extensive literature search revealed common characteristics of best practice pre-service teacher training in EfS as well as the latest thinking internationally about the need for a new approach to school education that is more closely aligned with skills students will need in their future workplaces and lives in an increasingly complex, globalised and technologically literate world. A sustainability perspective across all subject disciplines, as required under the Australian Curriculum, can substantially enhance this new educational focus. It follows then that pre-service teacher education (see section 3) should reflect the intent of the sustainability focus for Australian Curriculum subjects and look towards the new educational paradigm as explained below, which is closely aligned with the principles of EfS.

2.1 INTERNATIONAL TRENDS IN EDUCATING STUDENTS FOR THE 21ST CENTURY

International literature suggests that some traditional content-based approaches to curricula may not meet 21st century needs.

Skills, or educational outcomes, needed for 21st century jobs are closely aligned with the five principles of EfS (refer p32). Indeed, integrating EfS principles and capabilities into all learning areas could help the Australian Curriculum to meet 21st century educational objectives. A re-writing of curricula that encompasses the skills below would be perfectly aligned with 'sustainability' principles. Table 2 identifies the dimensions of a 21st century education and the related challenges for curriculum developers. Student capabilities compliant with EfS are highlighted. For example, the knowledge paragraph stresses the need for content relevance to maximise student engagement. This is where experiential and inquiry-based learning (so essential to EfS) and using the local environment or issues can be of tremendous benefit.

TABLE 2:
DIMENSIONS OF A 21ST CENTURY EDUCATION

Knowledge	— relevance required: students' lack of motivation, and often disengagement, reflects the inability of education systems to connect the content to real-world relevance. The author suggests a need to rethink the significance and applicability of what is taught, and in concert to strike a better balance between the conceptual and the practical.
Skills	— necessity for education outcomes: higher-order skills ('21st Century Skills') such as the '4 Cs' of **Creativity, Critical thinking, Communication** and **Collaboration**. The author notes that curricula are already overburdened with content, which makes it much harder for students to acquire (and teachers to teach) skills via deep dives into projects. He notes further that, while there is some consensus on what the skills are, and how teaching methods via projects can affect skills acquisition, there is little time available during the school year given the overwhelming nature of content curricula, and that there is little in terms of teacher expertise in combining knowledge and skills in a coherent ensemble, with guiding materials, and assessments.
Character	(behaviors, attitudes, values) — to face an increasingly challenging world: as complexities ramp up, humankind is rediscovering the importance of teaching character traits such as performance-related traits **(adaptability, persistence, resilience)** and moral-related traits **(integrity, justice, empathy, ethics).** The author describes the challenges for public school systems as similar to those for skills, with the extra complexity of accepting that character development is also becoming an intrinsic part of the mission, as it is for private schools.
Meta-layer	**(learning how to learn, interdisciplinarity, systems thinking, personalization,** etc.) — often neglected, or merely mentioned and not acted upon deterministically, this 'meta-layer' enveloping the other three dimensions is essential for establishing lifelong learning habits, activating transference, building expertise, fostering creativity via analogies, enhancing versatility, addressing individual students' needs, and so on.

Source: Schleicher 2012

Likewise, Valerie Hannon from the not-for-profit Innovation Unit ‹www.innovationunit.org› is a supporter of Schleicher's work as illustrated below in an extract from her article from *The Guardian* on Tuesday 29 March 2011:

> *Schleicher's work demonstrates compellingly that demand for the competencies 20th-century school systems were good at imparting (routine cognitive and manual skills) is falling sharply among employers across the world. He shows that 21st-century systems need to prepare young people with the* ***skills to undertake non-routine analytic and, especially, non-routine interactive tasks.*** *Schleicher's conclusion is: 'The skills that are easiest to teach and test are also easiest to digitise, automate and outsource.'*
>
> *The implication of these findings is that systems need to prepare students 'to deal with more rapid change than ever before ... for jobs that have not yet been created ... using technologies that have not yet been invented'. This is about* ***learning how to learn, and new ways of thinking that involve creativity, critical thinking, problem-solving and decision-making.*** *It is in sharp contrast to an emphasis on the capacity to reproduce facts. Reducing the debate into a 'skills v knowledge' dichotomy is manifestly false. The issue is the right balance between content acquisition, and the skills and dispositions needed to succeed in fundamentally changed conditions.*

Another leading international thinker on the need to completely rethink our current educational focus in schools is Yong Zhau, Professor of Education at Michigan State University ‹www.zhaolearning.com/2009/08/07/no-child-left-behind-and-global-competitiveness›. He juxtaposes the high OECD Program for International Student Assessment (PISA) test scores of Asian nations with the high levels of innovation and creativity of US students and much lower PISA scores. Which is more relevant for an uncertain, globalised and highly technological future? He suggests the rote learning of content leading to high PISA test scores is becoming increasingly irrelevant in an age where knowledge is available at our fingertips and employers are looking for students who can deal creatively and analytically with new situations. Again, the EfS principles/skills of critical, reflective and creative thinking in a collaborative working environment, along with envisioning a better future, are closely aligned with the new educational paradigm that Professor Zhao promotes. He further argues that global competitiveness comes from a diversity of talents and recognition of individual passions and creativity. Promoting individuality and innovation in schools thus leads to happier students and, arguably, more 'sustainable' lifelong learning behaviour.

A 2007 UNESCO technical paper (Bjorneloo and Nyberg) on drivers and barriers for implementing EfS into K–12 schools and into teacher education gives an excellent international perspective on the many challenges faced by teachers and teacher educators in attempting to educate their students for the 21st century. Contributors cover initiatives from all parts of the world such as Africa, Russia, Scandinavia, Asia, the UK and Canada. It would seem that successful approaches to EfS have the common characteristics of addressing the principles of EfS, that is, they are collaborative, inclusive, relevant, values-based, flexible and creative.

The recent UNESCO 2012 report on progress of the United Nations Decade of Education for Sustainable Development called *Shaping the education of tomorrow*, notes that education for sustainable development (ESD) is increasingly perceived as 'a catalyst for innovation in education' and 'the unifying theme for many types of education that focus on different aspects of sustainability ... It appears that as the sustainability content of the curriculum evolves, pedagogy is evolving simultaneously' (p5).

Supporting the incorporation of ESD into teaching in higher education institutions, about 20 Australian universities (or related organisations) committed to implementing six principles related to ESD at the Rio 2012 United Nations Conference on Sustainable Development (UNESCO 2012). The two principles most relevant to this research report are:

> *Encourage our teacher-scholars to work on the theme of sustainable development and to spreading knowledge to the broader public (students, enterprises, communities ...) to stimulate their own commitment.*
>
> *Integrate within the next decade sustainable development issues in our teaching, in required and elective courses and integrated throughout the curriculum as appropriate.*

This commitment, if fulfilled, will make it easier, indeed imperative, to embed EfS training into pre-service teacher education.

2.2 STUDENT LEARNING

Research into student learning associated with EfS is limited, and most studies lack rigour. Much of the data has been sourced from teacher or student interviews or surveys, including attitudinal surveys. The positive findings focus on improved student wellbeing, confidence, empowerment or leadership. A recent study (Salter 2012) indicates that school sustainability programs can have a positive impact on students' knowledge about ways they can care for the environment and attitudes towards school environmental activities. Another study (Boyes *et al* 2009) emphasised that students' taking action depended on the nature of the issue and this varied a great deal. Some more specific findings include:

- There is evidence that AuSSI has had a positive impact on the learning experiences of students in some schools. A student-centred approach, especially incorporation of student leadership teams, enhances the involvement of students in learning for sustainability. There were numerous examples given by interviewees and observed in school case studies of high levels of student engagement in the unique content and approach of EfS. Teachers appear to be applying the principles of action-based learning in their EfS teaching, which has proved much more engaging for students (DEWHAb 2010).
- Despite our overall confidence in the methods, this evaluation must be viewed in light of the limited data and information currently available on the impact of AuSSI and its progress towards meeting its goals (DEWHAb 2010).
- There have been significant positive impacts on the wellbeing of students as a result of schools implementing the ACT AuSSI. Anecdotally, the relationship of wellbeing to EfS is known to produce positive effects for students [from attitudinal surveys of teachers and students] (ACT Government 2010).
- Teachers and students have indicated that significant attitudinal and behaviour change is occurring both at school and at home (Renshaw *et al* 2010).
- The data was also explored to determine the strength of the relationships, for each action, between students' professed willingness to act and their belief that an action would be effective. This suggested a measure of the potential effectiveness of education about that action. For some actions, this relationship was weak; in such cases, altering belief about the usefulness of the action might not be expected to produce major changes in behaviour. Issues concerning public transport were of this type; clearly, for issues such as these, other approaches and/or inducements may be needed to persuade people to adopt pro-environmental behaviour patterns. For other actions, the relationship was stronger, so that in these areas environmental education could well be effective, especially if a large proportion of the population are not already willing to undertake that action (Boyes *et al* 2009).
- Teacher and student descriptions of environmental action projects provided additional insight into what appeared to be a relationship between that climate and student learning and identity. This relationship appears to be mediated by teachers who act as interpreters, conduits and culture brokers between the social and cultural climate of the school and its community, and the development of student learning and identity (Eames *et al* 2009).

- Results from a mixed-method evaluation of the Stephanie Alexander Kitchen Garden Program: Qualitative data showed that some of the program attributes valued most highly by study participants included increased student engagement and confidence, opportunities for experiential and integrated learning, teamwork, building social skills, and connections and links between schools and their communities. Quantitative findings [however] failed to support findings from the primary analysis (Block et al 2012).
- [Effective] ... school sustainability programs can have a positive impact on students' knowledge about ways they can care for the environment and attitudes towards school environmental activities. Furthermore, when sustainability facilitators work closely with schools these outcomes can be maximised. The degree to which pro-environmental behaviours carry into students' home lives, however, is mediated by complexity of the behaviour, family norms and parents' willingness to encourage their child's enthusiasm (Salter 2012).
- In summary, EE 'can effect change in students' environmental attitudes, knowledge and [in a few cases] behaviours' ... *These changes are probably short term.* As implied earlier connections between independent and intervening variables on student learning outcomes is not always present or well understood. Certain aspects of EE programs do appear to yield 'positive impacts'.

  These are:
  - the length of environmental experiences and courses (week long as compared to short outdoor experiences);
  - preparatory and follow-up work with outdoor experiences/excursions;
  - parental and community involvement with programs;
  - authenticity of content in terms of dealing with local issues;
  - role modelling;
  - direct experience in outdoor courses may aid attitude change; and
  - collaborative group discussion seems to help conceptual development in classrooms (Skamp 2009).
- Student empowerment, whole-of-school approach, school-home transitions, student commitment, and recognition of environmental education practices were identified as key successes in being involved in the Wastewise schools program (Cutter-Mackenzie 2010).
- The main benefits of Education for Sustainability as identified by Education for Sustainability program stakeholders as part of this research were: engaging for students, builds life skills, ecological savings and an opportunity to bring change (EcoChange 2012).
- Student ownership and involvement is leading to a body of youth who are developing strong leadership skills. It is possible to research the link between improvements in student wellbeing as a result of implementing EfS (ACT Government 2010).

3. Pre-service teacher training in EfS

Ideally, teacher training should encompass all educational stages from early childhood, schools, vocational training to tertiary as this supports lifelong learning and a sustainability perspective and behaviours. The literature review for this section, however, focuses on pre-service teacher training for mainly primary and secondary teachers. Section 3.3 covers current initiatives in the VET sector.

3.1 BEST PRACTICE LITERATURE REVIEW PRE-SERVICE TEACHER TRAINING IN EfS

Julie Kennelly's PhD thesis entitled *Education for sustainability and pre-service teacher education* (2010, unpublished) and her related journal articles (Kennelly and Taylor 2007; Kennelly, Taylor and Maxwell 2008; Kennelly, Taylor and Serow 2011, 2012) discuss the main components of effective pre-service teacher education for primary teachers. She points out in her qualitative research of five student teachers who undertook a unit in EfS in their last study semester[1] that pre-service teacher education is but one of a number of requirements for the embedding of EfS in schools. Other essential requirements include:

- a school culture that encourages starting teachers to implement EfS initiatives, dependent on strong commitment to EfS by school principals in particular and other staff more generally. Where a new teacher's supervising teacher has to assess her/him for accreditation, their commitment to EfS (regardless of accreditation standards as discussed previously) is essential, unless the new teacher is passionate enough to override any disapproval in that regard.
- a strong sense of purpose and a positive vision of EfS possibilities held by the new teacher to the extent that EfS is considered by them as a necessity to be addressed in their work. The quotes in the thesis by the five participating students both before and after their pre-service training in EfS illustrate the critical importance of this trait in new teachers as it leads to *action*. In addition, 'actually experiencing a personal shift towards sustainability appeared to be important' (Kennelly 2010 p148) for new teachers wanting to implement EfS in their new schools.

Additional challenges face the pre-service educator of secondary teachers. Only one article (Jenkins 1999/2000) was sourced that dealt with the attitudes of pre-service secondary teachers from a variety of subject disciplines in a Diploma of Education course at the University of New England. Even though at the time the NSW Government's environmental education (EE) policy required all teachers to teach aspects of EE, the student teachers considered quite strongly that

[1] Julie was asked to design a more engaging, relevant Science based unit for pre-service teachers at the University of New England, NSW (pers. comm. 11/1/2013)

this was solely a role for science and social science teachers, as they alone had the 'knowledge' to teach about environmental 'issues'. This simplistic knowledge-based approach to EE suggests that much work needs to be done at the pre-service teacher education level to engage pre-service teachers in:

- learning how EfS goes beyond EE to engender cultural and personal change
- understanding the new policy requirements under the Australian Curriculum
- being made aware of the exciting possibilities for engaging their school students in EfS.

There was a pervasive feeling about the poor state of the environment but a recognition nonetheless that it was an important field of study that should be tackled in a positive way with students to give them hope for the future. A telling comment from the article was:

> *The students believed that if the teaching of EE was mandatory then it made sense that all pre-service teachers should have access to it in their professional preparation. They wanted to know why EE was not mandatory in teacher education if it was important enough to be a legitimate responsibility of all teachers (Jenkins 1999/2000, p50).*

The research describes features of pre-service EfS courses that facilitate school implementation by new teachers (additional references to those of Kennelly *et al* are listed). These features include:

- reflective practices such as journaling to clarify values, visioning a positive future etc.
- place-based learning and teaching strategies (Wooltorton 2004; Stevenson 2008; Green 2012)
- integrative curriculum writing skills to incorporate a sustainability perspective, experiential learning etc. across a number of subject disciplines (Kysilka 1998)
- deep knowledge of the holistic concept of sustainability (environmental, social, economic, governance, personal) and the 'culture of change' it exemplifies (as distinct from environmentally sustainable behaviour most commonly associated with EfS) (Pepper and Wildy 2008)
- covering implementation challenges such as dealing with a negative school culture towards EfS and innovative ways of overcoming them such as running 'theme days' and student-initiated curriculum
- instilling/nurturing leadership competencies such as passion, commitment to action and EfS principles, self-motivation, emotional intelligence, stamina, etc. (Pepper and Wildy 2008; Ferreira *et al* 2009; Scott 2012). A number of authors stress the importance of *self-leadership* for sustainability (Pepper and Wildy 2008; Middlebrooks *et al* 2009; Murray 2011)
- building interpersonal relationship skills with strong networking and delegation skills (*ibid* p626)
- teaching future-oriented skills such as creativity.

As can be seen from the above list, the success of pre-service teacher education in EfS will heavily rely on the qualities, or attributes, of student teachers. They have the potential to be 'lighthouses' (term used by Lynne McLoughlin, pers.comm. 8/1/2013) to bring sustainability to life in all of its facets in schools, as do any practising teachers committed to EfS. Hence the importance of effective EfS pre-service teacher education. Indeed, it could be considered the 'priority of priorities' (Ferreira *et al* 2006). Wilson (2012), however, identified significant societal and personal 'drivers and blockers' to embedding EfS across a primary teacher education course, with lack of time considered the biggest blocker.

Pre-service teacher education in EfS for secondary teachers faces particular challenges. For example, very few examples of successful implementation of cross-disciplinary EfS teaching in secondary schools could be found in the literature apart from two examples, one in WA (Pepper and Wildy 2008) and one in Norway (UNESCO 2007). The success of the WA initiative relied on the enthusiasm of one teacher who had good relationship skills plus plenty of enthusiasm to drive the cross-disciplinary teaching which was based on a place-based approach using the local school environment. Commitment to action is an important quality for EfS teachers. In the Norwegian example, the teacher based his teaching on what his students wanted to do. He was able to use a team teaching model to work with other teachers. This can work well, particularly where one teacher likes working with data and another prefers written work (Kysilka 1998).

It's easier for primary teachers to implement sustainability themes into their teaching across subject disciplines as they don't have the timetabling constraints common in secondary schools. An excellent example of how this has been done around the theme of school food gardens can be found in Part IV of the book *Outdoor classrooms: a handbook for school gardens* (Nuttall and Millington 2008).

There are so many variables that teachers need to work with/around that can form barriers to EfS implementation. Examples include lack of time to adequately plan EfS activities, 'ownership' by teachers of particular subjects, and a lack of upline/executive support. A good example in the NSW secondary school sector is timetabling team teaching and theme days, particularly helpful for EfS, where the timetable is most often run on periods for individual subjects. Another example of 'perceived' barriers that secondary teachers may face is the hesitation that many have of dealing with 'the level of emotion that could be aroused amongst students and the community both in and out of the classroom' in raising EfS issues (Jenkins 1999/2000 p51) and worries about their future clientele such as a lack of student motivation for EfS, general apathy about EfS, feelings of disempowerment and a lack of openness to consider views apart from those held by their parents and peers (Ibid p52).

The issue of leadership in schools to facilitate EfS is crucial. A quote from a principal for a research project into EfS in WA high schools (ECC 2012 p41) highlights this point:

> *As the principal I am able to drive the (whole-school EfS) program and negate the barriers. The barriers are real but they can be negated ... You can make it happen easily but the sustainability coordinator has to make it easy for other teachers.*

A research report on mainstreaming EfS into pre-service teacher education was published by the Australian Research Institute in Education for Sustainability (ARIES) in 2009 (Ferreira *et al*) with a follow-up smaller report on enablers and constraints in 2010 (Steele). Both reports followed initial desktop research into international best practice in whole-of-school approaches to EfS (Ferreira *et al* 2006). Five enabling actions for mainstreaming EfS in pre-service teacher education were identified:

- collaborating for curriculum change
- developing an ethos of sustainable practice
- connecting existing EfS content
- creating time and opportunities for integrated programs
- providing experiential learning.

The stage 4, and final, project in Queensland funded by the Australian Government Office of Learning and Teaching (OLT) and called *A state systems approach to embedding the learning and teaching of sustainability in teacher education* was completed in late 2012 but was still unavailable on the OLT website in January 2014 at the time of finalising this report. Conversations with two of the project leaders however, Julie Davis and Jo-Anne Ferreira, revealed that they recognise how time consuming and slow the process of mainstreaming EfS into pre-service teacher education will be and that it is still early days. To achieve successful systemic change, they believe, requires a 'simultaneous bottom-up and top-down' (Jo-Anne Ferreira, pers.comm. 24/1/2013) approach to ensure all stakeholders are included. Who are these stakeholders? They include:

- pre-service teacher educators
- teacher education institutions
- state government education and environment departments
- students
- teacher registration bodies
- practising teachers and their professional and union support organisations
- federal government departments and statutory authorities e.g. ACARA, OLT
- professional development/peer learning service providers in EfS such as private companies, NGOs, local governments.

In summary, it is clear that the current system of relying on individual sustainability 'champions' in schools and/or individual teacher educators trialling EfS units is never going to lead to the systemic change required to embed EfS in schools. Systemic change is essential plus ensuring that new teachers have all the qualities needed to carry out the implementation. One of the outcomes of the Queensland OLT project is the setting up of a framework for working with multiple stakeholders to drive *systemic change* in embedding EfS into the education system in Queensland in particular and nationally more generally. More details are provided in section 4.11.

3.2 TEACHER TRAINING INSTITUTIONS OFFERING COURSES IN EfS

A comprehensive search for EfS courses/units across the national university sector was not done as it is outside project brief requirements, although an audit and gap analysis is recommended (see section 6). Reported here are examples of EfS courses relayed by contacts whilst undertaking the research. The disparate nature of the courses reinforces the need for systemic change at a national level in the quest to embed pre-service teacher education in EfS in all higher education institutions.

The **University of Tasmania** now offers sustainability subjects (contact Dr Allen Hill UTAS Launceston for more information about these). TAFE and Polytechnic offer opportunities around play-based learning and sustainability.

Dr Catherine Baudains coordinates a unit in EfS at **Murdoch University, WA** which is constantly in danger of being 'written out' of courses (Jennifer Pearson email 14/1/2013) and is convening a group of researchers who meet regularly about their work. Coral Pepper is a committed EfS lecturer but she left **Edith Cowan University** Bunbury campus at the end of last year. She has an impressive list of written material around a range of issues related to EfS.

In contrast to the above, there is now no named Master in Environmental Education degree offered by Macquarie University. Environmental education was to be a specialisation in the new Master of Environment, however that specialisation is being rested this year (Lynne McLoughlin pers. comm. 8/1/2013).

3.3 VET SECTOR INITIATIVES IN EfS PROFESSIONAL DEVELOPMENT

The projects described below are both funded by the Australian Government to improve professional expertise in EfS for educators in the vocational training sector. Similar projects could be funded for teachers in the future.

1. ***Skilling educators for sustainability Australia*** (SESA)
   SESA is a three-year project funded by the Australian Government as part of its Skills for the Carbon Challenge. This initiative is part of the Australian Apprenticeships Workforce Skills Development Program which aims to enhance skills development in the Australian workforce.

   SESA is overseen by four professional associations: Australian Water Association, Marine Education Society of Australasia, Waste Management Association of Australia, and Australian Association for Environmental Education. This project is all about providing targeted professional training for those working in the field of sustainability education.

Initially the project will work with an industry reference group (IRG) to develop an agreed set of core skills (or units of competency) and map existing short course training modules against these. The IRG will be made up of a range of educators in the various sectors including: providers of short courses in education for sustainability (EfS); vocational education and training (VET) providers; and universities. The second stage of the project will involve revising, piloting and then delivering up to eight training modules that are aligned with the newly developed units of competency.

Regular updates about the development of the project will be provided through the newsletters of each of the member associations and websites. The mapping of core competencies in EfS is not due for completion until March 2015. When finished, however, the project outcomes should be of benefit to those responsible for developing courses in EfS pre-service teacher training and primarily for professional development such as teacher educators (Larraine Larri pers.comm. 29/1/2013).

2. ***Sustainability champions scholarship program: Vocational Graduate Certificate in Education and Training for Sustainability***

This one-year fully subsidised course is offered to a select number of VET teachers across Australia (about 20 in each state) to undertake training in EfS. The program is culminating shortly with a conference attended by international keynote speakers who specialise in the area of EfS.

4. Professional development of teachers in EfS across school sectors nationwide

Professional development or learning is defined as any form of training (online, coursework etc) or collaborative interaction between practising teachers that enhances their skills, knowledge and enthusiasm for EfS. The main approaches to professional development in EfS, which are currently non-mandatory, include:

- The Australian Sustainable Schools Initiative (AuSSI) framework, which focuses on whole-school approaches to sustainability, ideally incorporating curriculum, school resources and management initiatives towards sustainability. This was by far the most important avenue for professional development of teachers nationwide in public schools that were initially funded by the Australian Government to implement the framework.
- peer learning as exemplified through the local government schools networks
- workshops run by state education departments and state-funded environmental education centres, private providers, professional teacher and schools associations and NGOs
- conferences and seminars e.g. the Green Schools conference run by the Independent Education Union's Victorian and Tasmanian branch; the AAEE national and state conferences
- newsletters, journals e.g. AAEE and websites e.g. Sustainable Schools NSW.

Statistical data for the above was difficult to come by due to the many service providers nationwide. The most significant form of professional development nationally was through continuing state programs under the AuSSI framework. The 2006 comparative assessment report for the Victorian and NSW AuSSI programs (Larri 2006) comments on the success of the AuSSI model for professional development in EfS for practising teachers. Interestingly, the importance of EfS training for pre-service teachers is also raised:

> *Professional development in environmental sustainability was the most important* ***benefit for teachers*** *i.e. improved awareness, vision and commitment amongst teachers, knowledge, understanding and skills relevant to environmental education and opportunities to work with other teachers, networks, organisations and groups. It is highly likely that in addition to in-service professional development there is also an emerging need for pre-service training of teachers in environmental education and its relationship to achieving student outcomes as part of the current pedagogical frameworks in each state.* (ibid p37)

Some features of what constitutes best practice professional development in EfS for practising teachers could include:

- developing skills, knowledge and capacity in teachers to deliver effective EfS
- practical activities and hands-on real life experiences such as field trips
- training that supports the Australian Curriculum organising ideas framework (see Table 1 on p36) comprising systems, world views and futures
- networking with other EfS practitioners both within and outside the school sector
- including students in professional development activities where appropriate, such as field trips
- ensuring professional development activities are relevant to their teaching context e.g. school environment, student demographics, school ethos etc.

Table 3 puts the schools participation data in the following sections into perspective and also attests to the approximately 70% of all students nationwide enrolled in state government schools.

TABLE 2:
NUMBER OF SCHOOL TEACHERS (FT EQV) NATIONALLY ACROSS SECTORS 2002

Sector	Number of teachers
Primary	114,400
Secondary	110,900
Government	153,000
Non-government	72,000 *

* In 2002, of those teachers in non-government schools, 58% were in Catholic diocesan schools and 42% in independent schools.

Source: Schools, Australia (ABS cat.no.4221.0)

The qualitative and quantitative data in the following sections was primarily supplied by AuSSI coordinators in each state. After each state is considered in detail, a general summation of the impact of AuSSI follows, provided by Sharpley (1:3-4).

4.1 NSW

In NSW, responsibility for EfS professional development is split between the state's environment department (the Office of Environment and Heritage (OEH)) and education department (Department of Education and Communities (DEC)). Sustainable Schools NSW is a partnership between these two departments.

Sustainable Schools NSW has over 2,000 people on its elist and approximately 1,500 schools across all sectors have either registered on their website, sent a teacher to a professional development event or developed a school environmental management plan (SEMP) (Mark Caddey pers. comm.10/1/2013).

From 2007–09 funding was provided for Sustainable Schools NSW (located in the OEH) professional learning in addition to the above funds. In 2007 the federal government gave $50,000 project-based funding to the environmental education centres for Sustainable Schools NSW (AuSSI) activities to support the use of the Sustainable Schools NSW website. This built on the success of the pilot project in 2002. In 2008, the Department of Environment and Climate Change (DECC) provided $200 per teacher for professional development — 440 teachers took up the offer; similarly, in 2009 the same money was provided and 280 teachers undertook training. Teachers accessing training in 2007 were mostly from state schools but from all sectors in 2008 and 2009.

The Sustainable Schools website lists all 19 school environmental education networks in NSW. The networks are open to school teachers from all sectors and are based on a **peer learning model** whereby regular meetings provide opportunities for networking with other like-minded teachers. Attendance at network meetings can vary greatly across networks. For example, the author attended a Hornsby Shire Council network meeting where only one teacher turned up! Attendance at Ryde Environmental Education Network (REEN) meetings varies depending on the agenda and teacher priorities at the time, from 10–60 participants, with an average of 10–15 people attending (Nilushi Disanayake email 15/1/2013). Communication material such as agendas, workshop information and/or newsletters is sent to about 50 school administration and teaching staff. The City of Ryde has no budgetary allocation for sustainability professional learning activities specifically, rather a schools environmental education budget (typically varying from $10,000 to $5,000) is allocated according to teacher interest/surveys/strategic priorities/opportunities etc. Although grant money in the past has been used to fund a professional development workshop and replacement casual teachers for participating schools, most of the school workshops that were funded by the sustainability team at Ryde were targeted at the students rather than the teachers.

The NSW Department of Education and Communities provides $100,000 every year for environmental education curriculum support. This is provided to the 10 regions for sustainability and environmental education activities with the planning, management and delivery of activities by the environmental education centres. Accurate data on who attends what programs isn't available. These activities include environmental education programs and resources, professional learning and student learning events. Various activities have been carried out by regional environmental education centres over the last financial year.

In addition to the above, the 25 Environmental and Zoo Education centres provide professional learning through teacher workshops, environmental and sustainability education learning resources. The Environmental Education page on the Curriculum Support website provide student investigation scaffolds and resources: ‹www.curriculumsupport.education.nsw.gov.au/env_ed/index.htm›

Statistics provided by the NSW Institute of Teachers on participation in sustainability related accredited courses indicate that very few teachers are accessing them. Note that only numbers of teachers requiring accreditation are required to register their attendance with the Institute so the assumption can be made that at least double the numbers of teachers actually attended each course. It should be noted that departmental professional learning courses are *mostly* attended by state school teachers (Julie Wallis pers.comm. 14/1/2013).

TABLE 3:
NSW TEACHERS REQUIRING ACCREDITATION ACCESSING ACCREDITED NSW INSTITUTE OF TEACHERS SUSTAINABILITY COURSES 2011–12

NSW Course Provider	Course name	Numbers registered with the Institute
DEC	Early career teachers Middle years: literacy & sustainability*	none
DET	Environmental sustainability forum: educational leadership	3
DET	Environmental sustainability forum for teachers	7
DEC	Integrating sustainability education into Quality Teaching & Learning K–6	42
DET	Sustainability education and management in schools	10
IEU	Pedagogy in the Pub: Environmental sustainability in the classroom **	2
DEC	Using the local environment for integration of sustainability education outcomes	9
Education for sustainability	Whole-school sustainability planning	5

Source: Data provided by NSW Institute of Teachers

* This course was cancelled due to lack of interest.

** This course was run four times in 2012.

Note: DET and DEC are the state government Department of Education; this represents a name change in 2012.

The NSW Early Childhood Environmental Education Network (ECEEN) is setting a good foundation in professional learning in EfS for early childhood teachers that could be a model for the primary school system. In 2011–2012, ECEEN received a state government grant from the then NSW Department of Climate Change and Water to work in collaboration with other state sustainability networks to develop a tool called 'sustainable quality improvement plans' under their EcoSmart program. As a follow-up, in 2012 ECEEN offered *Leadership for sustainability in early childhood education* workshops and conducted free sessions funded by the NSW Office of Environment and Heritage. Participants are able to receive free mentoring as they progress along their sustainability journey.

4.2 VICTORIA

In 2011, the Victorian Government committed $8.305 million over four years to build on the existing ResourceSmart AuSSI Vic (RSAV) framework. Sustainability Victoria and the Department of Education and Early Childhood (DEECD) are working in partnership on this initiative. At the end of 2012, over 700 schools, out of 2,000 statewide, were participating in some way with the initiative (Jane Leifman pers.comm. 10/1/2013), with a minimum of one teacher per school. By June 2015, it is planned to have 1,100 schools involved, thus the need to recruit 400 more schools over the next two and a half years.

ResourceSmart AuSSI Vic aims to provide practical support to schools and their communities to learn to live and work more sustainably. The ResourceSmart AuSSI Vic framework was developed, integrating state and federal programs and bringing together sustainability educators, facilitators and organisations.

The framework aims to help Victorian schools minimise waste, save energy and water, promote biodiversity, and cut their greenhouse gas emissions, integrate educational, environmental, social and economic outcomes and embed sustainability into the fabric of everyday school and community life. Its vision is for *all* Victorian schools to commit to whole-school sustainability.

To help Victorian schools do the above, ResourceSmart AuSSI Vic has consortia of service providers in each of the nine DEECD regions (and regional lead coordinators — list provided on their website) able to assist schools with:

- ResourceSmart AuSSI Vic 5Star Sustainability Certification
- information about the ResourceSmart Schools Awards
- information about professional learning to support ResourceSmart AuSSI Vic
- facilitation and assessment of ResourceSmart AuSSI Vic in each region.
- See: ‹http://www.sustainability.vic.gov.au/Services-and-Advice/Schools›

There are two accredited courses offered as part of ResourceSmart AuSSI Vic professional learning; both are delivered by the Victorian Association for Environmental Education (VAEE) and funded by Sustainability Victoria:

- ResourceSmart AuSSI Vic Facilitation
- ResourceSmart AuSSI Vic Assessment.

Accredited facilitators can be school teachers who have this role in addition to normal teaching (not too many of these). Data on the number of accredited facilitators and assessors was not available in time for this report but will be forthcoming (Georga Gowan email 30/1/2013).

All other professional development activities run by VAEE in 2011–2012 and the number of participants (minus the 300 teachers attending Greening Australia's Toolbox event) were identified. Funding for these is provided under the DEECD partnership program and membership fees or on a user-pays basis. VAEE's funding agreement targets work with teachers to support them working *within* sustainability in their school through a range of targeted professional learning activities (e.g. Sustainability in AusVELS, project management in schools, green purchasing etc).

Partnership programs that receive funding from DEECD, such as those provided by CERES, Zoos Victoria, Biological Farmers Association, Gould League etc, are required to follow the RSAV framework. The amount of funding allocated for these programs for 2012–2014 is $720,997. The full list of AuSSI Vic project partners is also provided at ‹www.education.vic.gov.au/about/programs/partnerships/Pages/sppscienceenv.aspx›.

Environmental science is a senior school subject (years 11–12) which no doubt improves the participation rates in professional development courses run by VAEE.

As in NSW, teacher environment networks are developed and run locally. They support teachers to deliver RSAV and provide an opportunity to share skills, knowledge and ideas with other teachers in the same area. There are 29 local teacher environment networks listed on Sustainability Victoria's website and coordinated by sustainability officers from mainly local councils or waste management groups.

The CERES environmental education centre in Melbourne runs programs for students across all school sectors.

4.3 TASMANIA

The main focus for Education for Sustainability (EfS) in Tasmania is the implementation of the sustainability cross-curriculum priority of the Australian Curriculum. To support this implementation, the Tasmanian Department of Education (DoE) has adopted a Lead Sustainability School model with a teacher designated as the Sustainability Network Coordinator coordinating EfS activities for each Lead School. Currently there are two active Lead Sustainability Schools. In the South, Lansdowne Crescent Primary School is the Lead Sustainability School, with Jenny Dudgeon being the Sustainability Network Coordinator, and in the North West, Andrew's Creek Primary School is the Lead Sustainability School, with Brett Dean being the Sustainability Network Coordinator. The Lead Sustainability School initiative builds on the successful work undertaken in the Australian Government AuSSI program which gave significant impetus to sustainability education in Tasmania. At the end of the AuSSI program, 43% of Tasmanian schools were participating in the program.

Oversight of the lead schools is provided by Dr Denise Devitt, Principal Education Officer for the Department of Education and overall responsibility is held by the Manager Curriculum — Sue Tolbert. The brief of the lead schools is to provide EfS professional learning / networking opportunities for teachers which are strongly aligned to the Australian Curriculum core subjects and the Sustainability cross-curriculum priority.

The DoE funds the Lead Sustainability Schools by providing eight teacher relief days to the lead schools [approximately $4,600] per school to cover planning and presentation.

The DoE also manages and largely funds a Sustainability Learning Centre, which is a partnership with Greening Australia, CSIRO Education, the Catholic Education Office Tasmania and Independent Schools Tasmania. The building of the Sustainability Learning Centre was largely funded by a grant provided through the Australian Government's *Local Schools Working Together* pilot initiative. The partners offer various sustainability and science focused programs and opportunities from the centre. EfS programs offered by CSIRO Education are generally on a cost-per-student basis, while ones offered through Greening Australia are generally funded through sponsorship. The centre itself is built to be a sustainable building.

EfS professional learning events / networking opportunities during 2012 included:

- A sustainability roundtable in the south at Lansdowne Crescent Primary School, attended by 30 teachers and 20 EfS professionals and students.
- The project launch of a cross-curriculum priority program: sustainability linked with Asia awareness, attended by 20 teachers, 250 students and 15 EfS professionals.
- A Kids 4 Kids Conference showcasing EfS learning across schools in southern Tasmania, attended by 430 students, 30 teachers and 30 EfS professionals.
- Professional learning workshops highlighting EfS practices in schools and enhancing 'seed to plate' programs and taste education for teachers and students; attended by 25 teachers from across school sectors.
- A statewide sustainability email communication network managed through the Department of Education that is distributed to interested educators across all three education sectors, state, Catholic and independent.
- EfS professional learning through AAEE Tasmania often in conjunction with Early Childhood Educators of Tasmania, much of which was focused around play-based learning and nature-based experiences.
- The University of Tasmania (UTAS), through Di Nailon, offered a professional learning session in each education region called *What's happening in EfS statewide and nationally*, attracting a total of 100 educators to the sessions.
- A number of Tasmanian early years conferences run by Early Childhood Australia and Lady Gowrie with a sustainability strand.

All Department of Education schools are committed to implementation of the Australian Curriculum. This implementation is informed by Curriculum policy and procedures, and incorporated into school improvement plans. All schools have implemented Phase 1 subjects but are currently at different stages with regard to embedding the cross-curriculum priorities.

4.4 WESTERN AUSTRALIA

Extensive research plus consultation with teachers and other key stakeholders about effective EfS professional learning (PL) has led to the provision of a range of PL opportunities through AuSSI-WA including:

- *Making the connections* (exploring AuSSI-WA, a whole-of-school planning framework for school communities). N.B. 'MTC' reflects key EfS principles as outlined in the 2009 National Action Plan
- Regional network groups for AuSSI-WA schools (teachers, administrators, parents)
- In school consultancy — whole-of-school presentations/workshops
- EfS expo and celebration activities
- Interconnected partnership activity with key organisations (AuSSI-WA Alliance members involved in AuSSI WA).

Key characteristics of this (best practice) EfS PL include: a consultative/collaborative design process; acknowledging and building on existing good practice (of schools, organisations); facilitating the creation of a shared vision for a sustainable future; well designed, interconnected resources (including support networks; partnerships, case studies, newsletters, etc).

There are currently 450 participating AuSSI-WA schools (approximately 40% of all WA schools). On registration, schools commit to engage with AuSSI-WA related PL and, so far, over 1,300 staff have engaged in (direct) AuSSI-WA PL as described above.

All 30 Alliance partners have mapped/linked (or are in the process of mapping/linking) their respective programs to the AuSSI-WA framework and so schools engaged in e.g. the Department of Environment and Conservation's Waste Wise Schools Program (say 700–800 schools) will have this activity area contextualised within a broader EfS framework.

AuSSI-WA PL is funded through the Department of Education and the Association of Independent Schools of WA.

Re Alliance partner PL, this is funded through respective government and non-government agencies/bodies. The Department of Environment and Conservation takes the lead role in terms of coordinating Alliance activity including meetings, collaborative projects, etc.

AuSSI-WA is a cross-sectoral initiative and, as is the case with all Alliance providers, provides support to public and independent schools alike.

4.5 QUEENSLAND

The Queensland Government, through the Department of Education and Training, provided approximately $6 million over three years to embed whole-school sustainability into schools through the Earth Smart Science program, which operated from 2010 to the end of 2012. This program built on the previously successful Queensland Environmentally Sustainable Schools Initiative (QESSI) which also had partnerships among community groups, industry and government agencies.

Key partners in the QESSI Alliance were Queensland Department of Education, Training and the Arts (lead agency) (Earth Smart and Solar Schools programs); Australian Government Department of the Environment, Water, Heritage and the Arts (AuSSI National Partnership Agreement); Great Barrier Reef Marine Park Authority (Reef Guardian Schools program); Environmental Protection Agency (Solar Schools, Waterwise and Waste Wise schools programs); Keep Australia Beautiful — Queensland (Green and Healthy Schools program); Queensland Transport (Travel Smart schools program); Department of Natural Resources and Water (Landcare and Waterwatch schools programs); Department of Mines and Energy (EnergyWise Schools program); EnviroCom (Wipe Out Waste schools program); Earth Charter Australia (Seed of Change schools program); Independent Schools Queensland and Queensland Catholic Education Commission (Education Sector liaison and advice); Science and Geography Teacher and Environmental Education Associations (Professional development and training for teachers); Queensland University of Technology and Griffith University (Research and evaluation on the QESSI and other sustainable schools concepts); Ergon Energy (Energy Efficiency in Schools program); and Origin Energy (Solar Schools program) and Gould League (Professional development and training for regional QESSI hub facilitators and Alliance members coordinators). All of these organisations and agencies formed the QESSI Alliance with a common vision and goals to provide support for schools through their various sustainable schools programs.

During the formative period of the QESSI Alliance concept, there were 12 QESSI regional hubs that supported clusters of schools. Local councils and regional natural resource management groups and Education Queensland's network of 25 outdoor and environmental education centres also supported schools on their sustainability journey. Over 900 schools participated in one or more QESSI Alliance partner program over the years from 2004–2009, approximately half of all government schools in Queensland; however the depth and commitment of participation by the schools was varied.

The Earth Smart Science program, which built on the QESSI model, has not been renewed under the current Liberal-National Party Government. The evaluation has not been released. The program featured an expansion of 21 regional hubs which serviced approximately 1,000 state primary schools only over the three years of the program, through three cohorts of 300, 350, and 350 schools each year. The 21 regional facilitators supported 98% of the Queensland state primary schools.

The program provided professional development for teachers by experienced regional facilitators through a 'train the trainer' model. Teachers in the participating schools were provided with three days relief time during the year to attend professional development sessions, regional cluster group meetings and celebratory events. Administrative and travel support was provided to the QESSI regional hubs as well as tools for implementing sustainability initiatives by the teachers back at school. Self-assessment of the schools' sustainability journey, using a Sustainable Schools rubric based on the Sustainable Schools indicators from the National Environmental Education Statement for Australian Schools, was conducted at the beginning and end of the year by the schools involved in the program. This assessment measured the sustainability journey travelled by each individual school during their year of engagement with the program. The NSW Sustainable Schools website was offered and modified for the Queensland context to develop the Queensland Sustainable Schools website ‹www.sustainableschools.qld.edu.au›. This website was used by schools participating in the Earth Smart Science program, to develop their own school environmental management plan (SEMP).

The recent and past programs within the Qld Environmentally Sustainable Schools Initiative utilised the resources and support from the NSW and Victorian frameworks. In fact, Sustainable Schools facilitators from Victoria were involved in the initial training of the Queensland Earth Smart team. Currently there is no central strategic support from the Queensland Government for the QESSI Alliance. According to the ex-principal advisor for environmental sustainability and the founder of the QESSI concept, Cam Mackenzie (pers.comm. 5/2/2013), the Earth Smart Science program was very successful with substantial improvements in professional development and training of hundreds of teachers in EfS through a whole-school approach to embedding sustainability planning and implementation; including curriculum, teaching and learning, community partnerships, governance structures, ecological footprint reduction and schools grounds biodiversity improvement.

4.6 SOUTH AUSTRALIA

The delivery of AuSSI in South Australian schools is via a partnership between the Department for Environment, Water and Natural Resources (DEWNR) and the Department of Education and Child Development (DECD). AuSSI-SA is delivered by the NRM Education program which is the schools' education initiative of the Adelaide and Mount Lofty Ranges (AMLR) Natural Resource Management (NRM) Board. Both departments support the partnership but the bulk of the financial investment is from the AMLR NRM Board.

Education for Sustainability (EfS) in SA is driven by this partnership and extends across the state through regional support provided by the AMLR NRM Education team. Across SA there are 290 schools registered with AuSSI-SA, 230 of these in the AMLR region that contains 80% of the state's population.

Within the AMLR region there are 11 externally hosted sub-regional staff (total of 9.6 FTE) and a program manager. It is this investment in staff that has contributed the most to the development of the AuSSI-SA program model, its successful delivery and uptake.

The statewide AuSSI program involves schools from across the state with most of the eight NRM regions giving some level of support to their schools. For example, the South East NRM region has two FTE staff working with schools; the SA Murray Darling Basin (MDB) NRM region 4.5 FTE; the Northern and Yorke NRM region has one FTE; Eyre Peninsula, Kangaroo Island and Arid Lands have staff who have a role supporting schools but are not dedicated education officers.

The AMLR NRM Education program is the largest and best funded EfS initiative in the state. It takes a lead role in developing program models and resource development. It has developed the AuSSI-SA program which falls into three key areas.

AuSSI-SA

The AuSSI-SA program sits as the overarching program that provides an EfS framework for all program deliverables. AuSSI-SA schools sign up to a commitment to embrace sustainability across their school management and actions. The focus is on mapping sustainability actions to date and planning for future projects and enquiries through the development of a school environmental management plan (SEMP). NRM Education staff support schools to form working groups that drive this work. A focus is to provide professional development to staff to build ownership and capacity. In 2012–13 NRM Education staff delivered 101 training events attended by 880 staff and 1,087 students. Professional development sessions are promoted through an email list of 1,100 interested school staff and via the NRM Education website <www.nrmeducation.net.au>.

Engaging with Nature

The AMLR NRM Education team delivers a range of technical and resource support under the 'Engaging with Nature' initiative. This began with an environmental monitoring focus but now extends to any outdoor action. This includes support for schools to create outdoor learning areas or living classrooms. During 2012–13 NRM Education helped schools with 82 biodiversity gardens, 42 Aboriginal cultural gardens, 34 butterfly gardens and 29 frog ponds. Such learning sites need more than technical advice for their development. In 2012–13 the AMLR NRM Board through NRM Action Grants provided financial support to 46 school projects, many of them for gardens.

There is increasing community concern to reconnect young people to nature, to bring them back from their disengagement from the natural world because of the time they spend inside or on screens. NRM Education delivers an environmental monitoring program that saw 2,689 students undertaking 116 monitoring events at 36 sites. One school response is to develop more natural playscapes, which NRM Education is supporting. Currently, 28 school yards have natural play areas.

Youth Voice

AMLR NRM Education runs 11 Youth Forums across the region with 86 schools coming together in local clusters. At the forums, 496 school students attend meetings where ideas are shared and school projects planned and reported on.

The Youth Environment Council is a state-wide initiative run by NRM Education teams from the AMLR and SA Murray–Darling Basin NRM region. Across the state 59 students from 51 schools represent 711 students (including those from the Youth Forums) at meetings throughout the year.

EfS Forum and Network

Holistic sustainability encompasses a broad range of themes such as biodiversity, water, waste, energy, transport and climate change. These themes are too diverse and specialised for any one agency to deliver but can be delivered powerfully in partnerships. NRM Education partners with the DECD to facilitate the EfS Forum across the region. This forum brings together five government departments with school programs to network and develop a common framework for their school involvement.

Alongside the forum sits the EfS Network with a broader membership open to stakeholders working with schools and the wider community. Run by NRM Education, this network meets four times a year with an average attendance of 40 people. These professional development days foster a common understanding of how best to work with schools and develop partnerships.

The intention of both these forums is to develop a common understanding and approach to sustainability in schools, likely to be through the implementation of a SEMP.

Sustainability awards

The NRM Education for Sustainability Awards are an extension of the AuSSI-SA recognition process that highlights the achievements of stand-out sites. Run by NRM Education, the awards recognise and celebrate the efforts of pre-schools and schools across the state at embedding sustainability on their sites. They allow successful schools to share their stories and receive recognition.

4.7 NORTHERN TERRITORY

AuSSI no longer exists in the Northern Territory. There were 21 AuSSI schools several years ago. There were 60 schools involved in the Energy Smart Schools Program (ESSP) from 2009–2010; some were AuSSI schools, some not.

The Darwin Garden Education Network (DGEN) is an informal, community-based group of volunteers linking people interested in community and school gardening across Darwin and the Top End; 13 schools are currently connected to the network. In 2013 DGEN ran a 'sustainable schools section' at the tropical garden spectacular, which included a school recycled planter competition, school garden photo displays and a school landscape Olympics (judged by Costa from *Gardening Australia*). Several schools ran sustainable art workshops to raise funds for their school gardens. The network is also connected and working closely with the Australian City Farm and Community Gardens Network, setting up new school gardens, and running in-school PD sessions for teachers and at Charles Darwin University. Snakebean Community Garden hosted a Sustainable Edible Education Day on October 19, 2013.

Curriculum consultants working in the NT Department of Education are preparing online resources for teachers in how to integrate EfS into PDHPE and Science subjects.

4.8 ACT

All ACT schools (government and non-government) are engaged in EfS which is delivered through AuSSI ACT. All ACT schools are registered with the program. This accounts for 71,000 people including staff and students — 20% of the ACT population. On registration of AuSSI ACT, schools commit to participate in AuSSI ACT professional development (PD) activities.

Over 2,500 staff have participated in AuSSI ACT PD activities. School facilities staff are also invited to relevant activities. PD activities are delivered as workshops (full-day and after school), eco-bus tours to schools demonstrating 'best practice' (tours target teachers and student leaders) and forums. PD is offered to an individual school upon request.

The themes for PD include the following: what is a sustainable school?; sustainable management of energy, waste and water; how to develop a school environmental management plan (SEMP); student leadership through sustainability programs; how to establish and maintain a school environment centre/area; the Australian Curriculum Sustainability Priority; sustainable procurement. Where appropriate, expert speakers from various ACT government departments and other organisations are invited to give presentations. The Sustainable Procurement PD includes speakers from Fair Trade.

The theme for the AuSSI newsletter, where appropriate, coincides with the theme of a workshop. The PD program and newsletter content reinforce each other e.g. the AuSSI ACT newsletter on 'purchasing green for your school' included the following: embodied energy, food miles, virtual water, eco labelling, waste disposal, social equity, sustainability selection criteria for purchasing typical school items and curriculum activities. These were all included in the program for the Sustainable Procurement PD.

AuSSI ACT is the only organisation in the ACT to offer the above PD activities and is funded through the ACT Environment and Sustainable Development Directorate.

4.9 THE IMPACT OF AuSSI

AuSSI has been the most significant vehicle for the development of EfS in Australian schools although a raft of other initiatives have also had an impact in more localised ways (such as Wastewise, Waterwatch, Kitchen Gardens programs, environment centres). It has provided a unifying framework across Australia, although it has been adapted somewhat differently in each state and territory as can be seen from the discussion above. The best examples of schools adopting AuSSI indicate that it was built upon initiatives that were already occurring at the schools. It contextualises them. AuSSI is more than a curriculum program as it promotes a whole-school approach (see section 7.4). The level of participation in AuSSI (as measured by registrations) in

the different states and territories appears to be dependent on the level of state government support. The outcomes of the eight evaluations of AuSSI are, in the main, positive, although they tended to focus on attributes of the successful schools in the program. Some conclusions about AuSSI are:

- Sustainable schools is a unifying initiative across Australia, although adapted somewhat differently in each of the states and territories (Skamp 2009; DEWHAb&c 2010).
- The evidence reviewed for this evaluation indicates that, overall, substantial progress is being made towards achievement of AuSSI goals. The weight of evidence points to real impacts across all four outcome domains: education, environment, economic and social (DEWHAb 2010).
- Schools in the ACT are provided with direct support to develop a SEMP, based on audits and investigations of what is already happening in each school. Schools are supported by a sustainable schools coordinator, and are provided with professional development and support programs and educational resources and modules (DEWHAb 2010).
- Professional development, for teachers and school staff, is an essential component of the implementation of AuSSI in all jurisdictions (DEWHAb 2010).
- The Australian Sustainable Schools Initiative has made a significant impact on Education for Sustainability (EfS) and sustainable schools over the six years it has been operating with a modest investment from the Australian Government (DEWHAc 2010).
- AuSSI does not have a clear statement of strategic directions which can be endorsed by Ministers and provide a basis for future resourcing and roll out of the Initiative (DEWHAc 2010).
- Some jurisdictions are still heavily dependent on 'start-up' funding and more sustainable models of implementation will need to be established (DEWHAb 2010).
- Partnerships are the cornerstone of AuSSI: particularly partnerships between states and territories and DEWHA, and between all education sectors and the environment sector (DEWHAb 2010).
- Up to 80% of the schools reported having done some or all of the water, waste, energy or biodiversity actions that AuSSI ACT promotes before engaging in the program. The program has been a catalyst for a fifth to a third of schools who previously had not implemented any sustainability actions (ACT Government 2010).
- The case studies and stakeholder interviews provided evidence that many AuSSI schools are taking action to include EfS in the school curriculum. Integration of EfS into school curricula was described as a key feature of schools that are leading in sustainability education (DEWHAb 2010).
- There was a significant improvement in teachers' understanding of education for sustainability and AuSSI due to professional learning opportunities and project officer support activities (Renshaw *et al* 2010).
- The Phase 2 Lonergan Research report supports the importance of AuSSI for implementation of a whole-school approach to EfS (see section 7.4).

4.10 CATHOLIC SECTOR

There are 28 Catholic dioceses across Australia (11 in NSW/ACT; 5 in Qld; 4 in Victoria and WA; 2 in SA and one in NT and Tas) and 1,704 Catholic schools (independent and Diocesan) in Australia (1,229 primary; 317 secondary; 148 K–12 (combined); and 10 special schools). Each diocese has a Catholic Education Office (CEO). The overarching national and state Catholic Education Commissions (CEC) decide on educational policy and federal grant funding distribution. The CEC bodies do not currently offer educational strategic planning or run collaborative programs across branches in school or teacher-based professional development activities in EfS. Approximately one quarter of the 28 CEO bodies offer some form of strategic planning and/or programs for their Diocesan schools (Jacqui Remond pers.comm. 29/1/2013).

Initiatives in EfS across this tiered Catholic organisational structure vary and are far from ubiquitous but are spreading slowly. Some examples include:

- Tasmanian CEC (also the CEO) has employed a part-time sustainability officer who is supporting an ASSISI pilot program during 2013–2014 involving four primary schools around Hobart. The projects will be 'self-directed' to allow creativity to emerge. A parallel change process towards sustainability has been promoted throughout the Diocese under the supportive leadership of Archbishop Adrian Doyle.
- Brisbane CEO has a joint teacher and office sustainability steering group, as does Adelaide and Rockhampton. To capitalise on the recent launch of the SA version of On Holy Ground (see below), the Adelaide CEO will be running a series of programs, conferences and enquiry projects for primary and secondary principals to promote the Catholic schools EfS ASSISI model (see below).
- Parramatta Diocese (NSW) has a sustainability 'learning community' based around a community garden literacy program run by an employee.
- Townsville Diocese (Qld) runs an environmental education centre.
- Wollongong Diocese (NSW) will employ a primary schools based sustainability officer part-time from this year.
- Sydney CEO employs a dedicated sustainability officer who works on grant applications related to energy efficiency and sustainability
- The Sandhurst Diocese in Bendigo employs a dedicated sustainability officer.

Thus, implementation of EfS initiatives remains *ad hoc* across dioceses and is often dependant on the enthusiasm of a 'champion'.

Catholic Earthcare ‹www.catholicearthcare.org.au› was formed in 2002 to promote and support 'ecological conversion' in Catholic church communities, schools and organisations across Australia. The guiding principle for this 'conversion' in school communities is the document *On Holy Ground — an ecological vision for Catholic education*, a statement (not policy) by the Catholic Church that recognises an ethos of caring for God's creation and provides a framework and resources for bringing about a more sustainable school. The document has so far been customised for three states: NSW, SA and Qld. Catholic Earthcare has a director and staff who provide support for Catholic schools wanting to take on board EfS, particularly through helping

them set up 'learning communities' to develop school environment management plans and discuss sustainability issues amongst staff members and the broader community.

A strategic systems-based integrated sustainability initiative (ASSISI) model provides guidance for schools wishing to implement a sustainability perspective/program in schools. The ASSISSI model is explained graphically at www.catholicearthcare.org.au/documents/a1.ASSISIModelGenericDec2012.pdf. The ASSISI concept is similar to the whole-school approach of AuSSI but adds earth stewardship and personal perspectives with a stronger focus on linking schools with local faith and social communities. The evaluation of its pilot program from 2008–2012 is due shortly (Jacqui Remond pers.comm. 29/1/2013).

The ASSISI program seeks to build 'learning communities' over time, an approach that recognises that sustainability thinking and behaviour most often develop slowly. The steps in this process involve Catholic Earthcare:

- co-initiating the ASSISI process with school *leaders*
- leaders attend an Animators for Sustainability three-day program
- leaders set up a sustainability steering group
- professional development and spirituality day for staff to set up ASSISI
- co-facilitating action planning and developing a plan for sustainability as part of the school's overall strategic plan (if they have one).

Two programs, ASSISI *Animator 3.5 day* and *Creation and Reconciliation 7 day*, currently target sustainability leaders and aim to bring about deep transformation connecting ecology, culture and place. Interestingly, Catholic Earthcare requires buy-in by school leaders before they will work with teachers to implement EfS in schools, a strategic decision given the problems with burnout of the sustainability 'champions' model, observed many times by the author. Their services are provided on a 'user pays' basis but rates vary depending on school resources.

The features of the ASSISI model reflect the principles of EfS and include:

- ASSISI is **strategic** as sustainability initiatives are linked to the strategic intent of individual schools. In order to address *ad hoc* and fragmented approaches to sustainability, ASSISI is able to roll out ecological sustainability in schools in a more systematic manner.
- ASSISI is **systems-based** as it involves the whole organisation (school) and the broader community of which it forms a part. It also involves all aspects of organisational activity, in a participatory process. Organisational planning, resources, grounds and building management, community networks, learning processes, and the whole religious dimension of the organisation are integrated.
- It is **integrated** as ecological, theological, technical and educational perspectives are integrated through a focus on values and ecological sustainability. The formation of a sustainability steering group provides opportunities for project-based, experiential learning and for integrating ecological sustainability with social justice issues.

› It is **values-based** and encourages **reflection** and **participation** leading to conversations between people with different perspectives to form learning communities for sustainability. Each learning community is **unique** and defines itself by how it interprets the purpose and principles of ASSISI, hence the opportunity for **creative responses** to the sustainability challenge.

Data on schools participation in the ASSISI program is not available at the time of writing but is being compiled by Catholic Earthcare.

4.11 INDEPENDENT SECTOR

The Association of Independent Schools (AIS) in NSW does not provide any professional learning opportunities for teachers in EfS. It does, however, provide workshops for the new Australian Curriculum subjects, mainly on content changes. Nationally, as revealed via a web search, the NSW association is most active in providing professional learning activities on the Australian Curriculum with little happening in the other states, with the exception of Qld. Anecdotal evidence suggests that some independent schools are engaging with sustainability initiatives on a school by school basis but to discover the extent of this would mean contacting each school separately which is outside the brief of this report.

AIS NSW has 379 member schools in NSW. Up to 5,000 teachers access the more than 200 courses they run each year (Jo McLean pers.comm 6/2/2013); none were on the topic of EfS. Courses are provided on a fee for service basis, however, some courses are subsidised through federal government grants (see section 5.2).

There will always be sustainability 'champions' within independent schools as there are in state and Catholic diocesan schools. Some examples include two secondary teachers at Hills Grammar at Kenthurst in Sydney working collaboratively to use the local bush environment in their studies and the setting up and staffing of a specialist environmental education centre at Abbotsleigh and at Riverview in Sydney. Pymble Ladies College, also in Sydney, has some senior students as sustainability leaders who run sustainability challenges amongst the boarders and are being mentored by a member of the Sustainability Team from Macquarie University. No doubt there are many more initiatives in independent schools nationally but the situation is similar to EfS teacher training and engagement in the Catholic diocesan system, that is, *ad hoc*.

4.12 NATIONAL INITIATIVES IN EfS PROFESSIONAL DEVELOPMENT

1. The Australian Institute of Teaching and School Leadership (AITSL) called for professional associations such as the AAEE to create dynamic (video) and static (written) examples to showcase the EfS cross-curriculum priorities in the *Illustrations of Practice* material they were developing. These examples of relevant teaching strategies to develop knowledge, skills, problem solving and critical and creative thinking in EfS will soon be made available on the ‹www.teacherstandards.aitsl.edu.au› website and will be accessible to all (no password required). They will be used by teachers and leaders in schools to exemplify the National Professional Standards for Teachers.

2. One of the outcomes of the Qld OLT project is the setting up of a framework for working with multiple stakeholders to drive **systemic change** in embedding EfS into the education system in Qld in particular and nationally more generally. To that end a collaborative website, called the National Teacher Education for Sustainability Network (TEFSN) is being developed for the sharing of resources and conversations. There are plans to integrate the new networking group with the current professional association for sustainability educators, the Australian Association for Environmental Education (AAEE) through linkages between their respective websites and further collaboration with the AAEE's Teacher and Teacher Educator (TTE) special interest group (SIG) in the future.

3. The Sustainability Curriculum Framework (DEWHA 2010) employs a five-step 'sustainability action process' as a suggested way by which curriculum developers might incorporate a sustainability perspective into Australian Curriculum subjects. It considers what students may need to learn to live sustainably, and the most appropriate times and environments in which these learnings should occur. The framework has been structured into three broad year groupings (K–2, 3–6 and 7–10) to give curriculum developers flexibility to align the framework's content across learning areas.

5. Nationwide funding of professional development

It is impossible to give accurate statistics for how much EfS professional development funding is provided and/or received by each of the school sectors nationwide as it comes from many disparate sources. However, it is clear that state government education funding for professional learning in EfS varies greatly; for example, where AuSSI is more embedded, such as in Victoria, funding is more generous.

5.1 FUNDING ACROSS SCHOOL SECTORS

Overall, state school teachers appear to have received the most support in accessing professional development in EfS compared with those in Catholic and independent schools, although under the AuSSI umbrella, schools from all three sectors are catered for to some degree. Victorian teachers are able to access ResourceSmart accreditation workshops funded by Sustainability Victoria and teachers in SA are supported by the NRM Education levy. Professional development courses in EfS run by professional teacher organisations, school sector associations, state government education departments, unions or private providers (as distinct from AuSSI framework PD activities) are limited or non-existent (see Table 4 and section 4.10) and are most often offered on a 'user pays' basis. Teachers thus either get their school to pay or pay themselves. There is evidence to suggest that there is an unmet need in this area that will increase once the Australian Curriculum is rolled out from 2014.[2]

5.2 FUNDING ACROSS GOVERNMENT SECTORS

Federal

There is no federal funding for AuSSI at the time of writing this report. The Australian Government does, however, provide grant funding on occasions for sustainability initiatives in schools; the latest round was for the school solar infrastructure scheme. Some federally funded agencies sponsor sustainability-related programs in schools. Two examples are the Kids Teaching Kids program sponsored by Australia Post and the CSIRO's CarbonKids, the latter closely linked to the AuSSI framework.

The Australian Government Department of Education has provided funds for professional development for school teachers across the three school sectors <www.aisnsw.edu.au/fundedprograms/agqtp/pages/default.aspx> under the Australian Government Quality Teacher Program

[2] Education for Sustainability's first course offering in whole-school sustainability planning in October 2012 was over-subscribed and attracted teachers from all three school sectors.

(AGQTP), but not specifically for EfS. There have, however, been changes in Australian Government approaches to funding for school education since AGQTP was established. AGQTP funding for state schools finished 18 months ago but Catholic and independent schools have funding until the end of this year.

The three stated objectives of the AGQTP (the first two highly relevant to EfS) are to:
1. Equip teachers with the skills and knowledge needed for teaching in the 21st century
2. Provide national leadership in high priority areas of teacher professional learning need
3. Improve the professional standing of school teachers and leaders.

The three key areas for AGQTP activities are the:
1. Australian Curriculum
2. National Professional Standards for Teachers
3. Student wellbeing (including bullying).

AGQTP funding for all NSW Catholic schools, diocesan and independent, is administered by the Catholic Education Office Sydney.

Other programs such as the Smarter Schools National Partnerships encompass nationally agreed education objectives developed through the Council of Australian Governments (COAG). The three partnerships (improving teacher quality; literacy and numeracy; and low socio-economic school communities) form a cohesive platform for innovation but clearly cannot encompass professional development in EfS as 'competency in EfS' is not a national quality standard.

State

Most professional learning in EfS available for teachers is funded by state governments, primarily through the AuSSI framework and associated partners, although this varies greatly between the states (see section 4). In addition, many state agencies employ education officers such as catchment management authorities, national park departments etc. who run programs for students. Models vary. For example, it could be argued that the sponsoring of programs *in schools* leads to professional learning of the teachers running the programs. However, accompanying students to 'one-off' events where another educator is doing the 'educating for sustainability', for example at the 2012 Youth Eco Forum, run by NSW DEC, will not lead to a change in a teacher's approach to EfS in her regular work in the great majority of cases.

The NSW state government also runs grant programs that schools can apply for through its Environmental Trust Fund <www.environment.nsw.gov.au/grants/envtrust.htm>. Under the Eco Schools program in 2012, the Trust approved 47 grants of $2,500 each, totalling $117,500. Due to the popularity of funding requests for food gardens, a new garden-funding program was established in 2012. This year the two programs will run concurrently with $150,000 available for the Eco-schools program to address environmental issues in the local school or nearby environment and $70,000 available for the Food Gardens in Schools program. Both grant schemes provide opportunities for EfS cross-curricular experiential learning. School grants linked to EfS were not investigated in other states due to time constraints.

Local

The extent of local government funding varies greatly depending on the importance accorded to working in schools by individual councils. As well as setting up school environment networks, councils also often contribute funding to state government grant programs that facilitate professional learning in EfS in schools e.g. the Catchment Connections Urban Sustainability Grant project managed by the City of Ryde involved students and teachers in designing a mural depicting water pollution issues today in a local waterway compared to a pristine environment in the past. The mural was installed alongside a stormwater drain in a busy shopping centre for use by local teachers as an EfS learning resource.

The local government levy collected by the AMLR NRM Board in SA (see section 4.6) is a very effective way to ensure funding for EfS professional development. As the levy is attached to local council rates there is an expectation that NRM Education services are open to all schools, both public and private. NRM Education thus enjoys a positive and successful relationship with Catholic Education and works with individual private schools including numerous Lutheran schools.

Local councils in NSW pay a waste levy to the state government, part of which is returned to them to pay the salaries of waste educators under the Waste and Sustainability Improvement Payment (WASIP) scheme. This scheme is currently being assessed by the state government and could suffer from funding cuts (Sue Martin, pers.comm. 24/1/2013). Waste educators often work with schools on food garden projects. For example, waste educators at Hornsby Shire Council in Sydney run a free mentoring program for primary teachers, called 'Ready Set Grow', to help them establish a school food garden and design curriculum activities around it.

5.3 OTHER SOURCES OF FUNDING

Private sector

Some companies sponsor activities in schools. An example is Coal and Allied, a division of Rio Tinto active in the Hunter Valley, who employed a person to work with students at Singleton High School to run environmental 'theme' days, undertake energy audits etc. CarbonKids is a CSIRO initiative in partnership with the pharmaceutical company, Bayer. Parents and Friends associations in schools often raise money through local fund-raising to pay for sustainability initiatives in schools.

NGO sector

A large number of NGOs sponsor sustainability programs in and for schools. Some examples include Hotrock, funded by a philanthropist, which employs EfS educators to go into schools and run sustainability projects in WA and Sutherland Shire in Sydney. Other examples include Planet Ark, Greening Australia, Keep Australia Beautiful etc.

6. Teacher resources and support for EfS

There are many resources available — be it curriculum programs, student activities, websites, off-campus sites — for teachers to use but this is creating confusion among some teachers. Choice is too great and perhaps not well targeted. There is some evidence to suggest that targeted resources for secondary teachers are limited.

An important source that could overcome these issues is the National Digital Learning Resources Network (Scootle) managed by Education Services Australia. This collection contains more than 15,000 digital resources that are available to all practising teachers in Australia. Teachers, however, need to know that it is available, and then, how to access and to use it. The research revealed:

- There is an abundance of sustainability and EfS programs and providers and this is creating confusion for schools (DEWHAb 2010).
- A large amount of resources are available — places to visit such as zoos, field study centres and museums; organisations such as water boards and councils (Skamp 2009; EcoChange 2012).
- Currently there are not enough high-school-specific resources or support available for high schools implementing Education for Sustainability (EcoChange 2012).
- The data also showed that a specialised high schools approach is needed with programs being branded and marketed to high schools. High schools indicated that they need well-written curriculum materials that can be easily inserted into units of work across all learning areas and clearly linked to the Australian Curriculum (EcoChange 2012).
- Participants also indicated that well written curriculum activities which are available for all learning areas and which link to the Australian Curriculum will make it much easier for teachers to implement EfS (EcoChange 2012).

A framework to evaluate resources for EfS

Resources play an important role in any EfS initiative but are only part of the story: the overall school educational program, its philosophy, the teaching milieu and the pedagogical approaches used by teachers will all help shape the students' learning experiences.

With this in mind, useful and effective resources that could support EfS in particular learning areas should:

1. Address one or more learning statements in the Australian Curriculum in the particular learning area (mandatory)
2. Also incorporate and provide opportunities for students to be involved in some, but not necessarily all, of the following:

Approaches to knowledge acquisition, understanding and thinking

- Investigating environmental problems as problems of society
- Encouraging critical thinking — world views/ alternative thinking
- Promoting systems thinking
- Looking at causes rather than symptoms
- Considering effects
- Investigating alternatives and visions/ possibilities/futures
- Considering strategies and making a case for change.

Learning approaches and opportunities

- Providing opportunities for students to have a say in their own learning (student voice)
- Engaging students in school and/or community issues
- Offering action-oriented experiences (but not necessarily involving behaviour modification) which may include 'out of classroom' experiences as part of school learning.

This framework was developed from the conceptual understandings in Skamp (2009), the *Sustainability Curriculum Framework* (DEWHAa 2010) and the organising ideas in the Australian Curriculum Sustainability cross-curriculum priority (2012).

The sustainability cross-curriculum priority in the Australian Curriculum is derived from one of the three organisers proposed in the *Sustainability Curriculum Framework* — repertoires of practice. By defining the priority in this way it provides a context for teachers to offer meaningful experiences to their students within learning areas where EfS is not directly described, while at the same time satisfying the requirements of the Australian Curriculum.

Examples of EfS resources below have mostly been sourced from the National Digital Learning Resources Network using Scootle for two reasons: it is easily accessed by all teachers and the resources are free of additional copyright collection. This removes the difficulty of gaining the rights to use resources, an ever-increasing difficulty in education. A number of providers have moved to providing interactive experience via apps. None are included in this resource list. More useful resources are available on the Victorian Association for Environmental Education (VAEE) website ‹www.vaee.vic.edu.au›.

Resources at five levels of education have been identified (F–2, 3–4, 5–6, 7–8 and 9–10). At the secondary school level, resources have been identified for Science, English, Mathematics and History. A number also link to Geography. There were very limited resources available in History. At the primary school level, the resources identified often integrate the learning areas.

The resources have been identified but have not been fully reviewed due to the limited funding. A common structure was developed to present the resources — Title, Location, Year level, Curriculum area, Type, EfS Features and Description. The resources are described by type, such as unit of work, teacher resource and student activity.

SECONDARY LEVEL

ENGLISH

Level 7–8

Title **Sustainability: changing minds, changing behaviour**

Location Scootle TLF ID M011636

Year level 7–8

Curriculum area English, Geography

Type Student activity, teacher resource

EfS Features
Investigate EfS problems
Critical thinking
Student voice
Strategies for making a case for change
Engaging in community issues

Description This is an interactive resource about how advertising can be used to promote sustainability by changing the viewer's mind and behaviour. It is presented as a unit of work with an emphasis on media studies in English. Learning activities promote the use of critical and visual literacy techniques; the resource provides the user with tools to dissect advertisements to discover meaning, intent and techniques of persuasion. The text includes interactive links.

Level 9–10

Title **Change for the good of all: sustainability and climate change**

Location Scootle TLF ID M009598

Year level 8–9

Curriculum area English, Civics

Type Unit of work

EfS Features
Investigate EfS problems
Critical thinking
Student voice
Strategies for making a case for change
Engaging in community issues

Description This is a unit of work about climate change and about how understanding the 'common good' is an important part of developing possible solutions. Intended for lower and middle secondary students, the unit involves students in developing a concept map and definition of sustainability, considering what can be done to slow the rate of climate change, and forming a judgment about whether sustainability is an achievable common good. The unit provides a range of templates and links to useful websites.

MATHEMATICS

Level 7–8

Title **Is my class green? Comparing samples and population**

Location Scootle TLF ID M009123

Year level 8–9

Curriculum area Mathematics

Type Student activity

EfS Features Critical thinking
Investigate EfS problems

Description In this activity students conduct a class survey to discover the actions that classmates have taken to conserve the environment. They compare their results with CensusAtSchool data and write about their findings.

Level 9–10

Title **Calculating environmental deviation from the mean**

Location Scootle TLF ID M009076

Year level 8–9

Curriculum area Mathematics

Type Student activity

EfS Features Critical thinking
Investigate EfS problem

Description In this activity students predict responses to environmental issues from students who completed a CensusAtSchool questionnaire

SCIENCE

Level 7–8

Title **Future Sparks**

Location ‹www.futuresparks.org.au›

Year level 5–8

Curriculum area Science, Geography

Type Student activity, teacher resources

EfS Features Futures/alternatives
Energy and energy conservation
Creative thinking

Description Future Sparks *is a 'fun and empowering look' at a future with clean energy aimed at 8–13year olds. Jam packed with resources, videos, links, games and lesson plans.* Students are encouraged to make videos as part of a competition. Teaching resources developed by CSIRO.

Title **EnviroNorth — Living sustainably in Australia's savannas — Resource review**

Location ‹www.environorth.org.au/› also Scootle TLF ID S0293

Year level 7–10

Curriculum area Science

Type Teaching Guide, website and student modules

EfS Features
Sustainable futures
Systems
Critical thinking
Student voice
Community issues

Description This review was developed by the Northern Territory Department of Education and Training to provide teachers with information about the EnviroNorth website and resources. This review provides an overview of the two interactive student modules — Savanna Walkabout and Burning Issues. EnviroNorth is a collaborative project of the Tropical Savannas Cooperative Research Centre and the Northern Territory Department of Education and Training.

Level 9 – 10

Title **Sustainable energy**

Location Scootle TLF ID R12382; Commonwealth of Australia

Year level 9–10

Curriculum area Science

Type Teacher resources, student inquiries

EfS Features
Energy conservation
Renewable energy
Inquiry learning

Description This collection is built around a core group of 13 digital curriculum resources on the themes of energy, renewable energy and ocean acidification, and includes 9 supporting digital resources cited in the core group. The core resources are inquiry-based practical activities for students, which explore energy transfers and transformations, energy efficiency, series and parallel circuits, measurement of current, voltage and electrical power, wind energy, solar energy, biofuels and their energy content, and ocean acidification. Each activity comprises a write-on student edition and a teacher guide.

Title **CarbonKids: biodiversity**

Location Scootle; also at ‹www.csiro.au/en/Portals/Education/Teachers/Classroom-activities.aspx›

Year level 7–9

Curriculum area Science

Type Teacher educational resources and CSIRO program

EfS Features Biodiversity
Futures
Community and local issues
Action oriented

Description This teacher resource focuses on the effects of climate change on biodiversity. Students investigate their local biodiversity, identify its values and prioritise community actions to respond to the threat to biodiversity from a changing climate. The unit of work follows inquiry-based learning principles, includes many thinking tools and is easily adapted to most learning and teaching styles. It is part of an extensive CSIRO set of education resources called CarbonKids.

HISTORY

Level 7–8

Title **Discovering democracy: the road to Federation**

Location Scootle TLF ID L9813

Year level 7–10

Curriculum area History

Type Student activity

EfS Features Community issues
Critical thinking

Description Interact with a slideshow of images and text to explore the main events in Australia's move to a federated nation. Investigate the library to find out more about the concerns the different colonies had about handing over some of their responsibilities to a national government, and the roles played by Lang, Parkes and McIlwraith. Complete a related task.

Level 9–10

Title **Old new land: exploring land and people over time**

Location Scootle TLF ID M006971

Year level 9–12

Curriculum area History, Geography

Type Unit of work

EfS Features Investigate EfS problem
Consider Effects
Student voice
Strategies for change

Description In this resource students investigate aspects of the Australian environment and our changing relationship with the land. This unit of work is based on the National Museum of Australia environmental history exhibition *Old New Land*, previously known as *Tangled Destinies*.

Title **Asia and Australia: regional communities, building a sustainable future**

Location Scootle TLF ID M009253

Year level 9–10

Curriculum area History

Type Unit of work

EfS Features
World views
Global equality
Intercultural skills and understandings
Futures
Work cooperatively and self-assess

Description This is a unit of work for middle secondary students. It provides teaching ideas and student activities supporting the Australian Curriculum cross-curriculum priority Asia and Australia's engagement with Asia. Globalisation means that the peoples and economies of the Asia-Pacific region are growing more connected and are cooperating with each other more than ever before. This unit explores these connections and Australia's role in an emerging regional community. It looks at the importance of students becoming active, responsible and informed citizens of a rapidly changing world.

Title **NASA's real world: what causes global climate change?**

Location Scootle TLF ID M011999

Year level 10

Curriculum area Science

Type Student activities

EfS Features
Investigate EfS problem
Student voice
Systems thinking
Considering effects and alternatives

Description This is a resource for educators detailing sequential learning activities that explore global climate change. It considers the influence of human activities on climate change and the patterns and trends in climate change that can be inferred by studying ice-core samples. The initial activity explores student attitudes towards, and prior understanding of, global climate change. In teams, students then observe, measure, record and analyse data gathered from simulated ice-core samples, looking for patterns and trends. This is extended as students explore real-world data through analysis of graphs and models developed by climate scientists.

PRIMARY LEVEL

Level F – 2

Title **Tasmanian Aboriginal shell necklaces**

Location Scootle TLF ID S4532

Year level 2–3

Curriculum area History, English

Type Teacher resource

EfS Features Sustainable patterns
Equality
Critical thinking

Description This is a multimedia presentation of a children's resource book about how Tasmanian Aboriginal women, known as Shell Stringers, find, sort, polish and string a variety of locally found shells into necklaces. The book, entitled *Tasmanian Aboriginal shell necklaces*, is presented as a slideshow accompanied by a voice-over reading of its written text. The photographs in the slideshow illustrate the Shell Stringers in action; the types of shells — Maireeners, Toothies, Black Crows and Penguins — that they string; the techniques they use; and the necklaces that result. The written and spoken text explains that making shell necklaces is an important part of Tasmanian Aboriginal culture and has been for many generations, and that shell necklaces are now found in many museums and galleries. Each screen can be printed.

Title **Water and waste**

Location Shannon Carty, Newman Primary School, Scootle TLF ID S4526

Year level 2

Curriculum area Arts, English, Mathematics, Science, Technology

Type Semester-length unit of work

EfS Features Student based learning
Community issues
Critical thinking

Description Water and Waste is a Model of Contemporary Learning linking Science, Technology and Enterprise, Literacy and Sustainability together to create a Semester of work suitable to a year 2 classroom. It is a fantastic way to integrate community resources into the classroom, making the student learning real for the students. The children in my class were engrossed in a 'hands on' learning experience, where the teacher worked as a facilitator to provide a print and digital rich environment.

Level 3 – 4

Title **Creating a picture book with an environmental theme**

Location Scootle

Year level 3–4

Curriculum area English, Science

Type Unit of work

EfS Features Investigate environmental issues
Intercultural understanding
Critical and creative thinking

Description This unit of work helps students to create a story with an environmental theme and then self-publish it as a picture book. It focuses on: the symbiosis and synergy between creatures and their habitat; the research required to write a story that has a strong basis in fact; the elements of a picture book; the need for, and construction of, quality writing; and the production of the picture book.

Level 5 – 6

Title **Online news: Green Valley Voice**

Location Scootle TLF ID L3455

Year level 5–6

Curriculum area English

Type Student activity

EfS Features Experiential learning
Independent learning
Problem solving
Visual learning

Description Students build a news story opposing a plan to dam a local river. They:

- Look at a model news story, telling readers how a dam would affect farmers.
- Build a web page describing the impact a dam would have on tourism and the environment.
- Choose titles, words and images to support their position. For example, use words such as 'destroy' and 'disaster' to say negative things about the dam.
- Check how readers respond to their story.

Level 5–6

Title **Sustainability: global footprints**

Location Scootle TLF ID M011551

Year level 5–6

Curriculum area English, Geography

EfS Features
Sustainable futures
Community action
Systems thinking
World views

Description This is an interactive resource about sustainable futures, ecological footprints and personal and social responsibility. It is a unit of work and uses a picture storybook, a factual text from a video and a short novel. Texts are examined for meaning and structure. A *Time* magazine photo essay about what the world eats explores the topic of waste production and ecological footprints, and a video with transcript shows a mother from an African country. There are four cooperative and collaborative retrieval devices for recording information.

Title **Climate change and the environment — a unit of work**

Location Scootle TLF ID R11135

Year level 5–6

Curriculum area History, English, Science

Type Unit of work

EfS Features
Sustainable futures
Systems
Critical thinking
Community issues

Description Students are encouraged to consider the effects of climate change on the environment, to take action to reduce their greenhouse gas emissions and to educate others to do the same. An introductory exploration of the concept of climate change is followed by three further activities framed as investigations. Links are provided to a variety of online resources, including online video and an 'ecological footprint' calculator.

Title **Solar hot water report data investigation: parts 1& 2**

Location Scootle TLF ID S3257 & S3258

Year level 5–8

Curriculum area Mathematics

Type Student activity, unit of work

EfS Features EfS problems
Futures
Critical thinking
Engaged in community issue
Comunity issues

Description Students explore *Solar report (Vic)*, a Department of Sustainability Victoria dataset showing the savings achieved by using solar hot water. Students undertake a data investigation, analyse and represent their findings, and draw and justify their conclusions in a presentation. Lastly, they reflect on their learning. The analysis and presentation can be done either by hand or with the use of technology such as graphing calculators, Microsoft Excel and Microsoft PowerPoint.

FIGURE 2:
ADDITIONAL SOURCES OF CLASSROOM RESOURCES FOR TEACHING EfS

The Lonergan research confirmed that classroom resources are essential for teaching EfS in the classroom.

Engaged teachers considered that sign-posting to suitable resources was poor and requires improving to facilitate more widespread engagement. Teachers need classroom-ready resources that are linked to the Australian Curriculum and are consistent with teaching units/syllabuses developed for state schools. This will enable teachers to effectively integrate sustainability with ease and more depth and breadth. They do not have to spend time trying to plan and source how it can be integrated—it needs to be done and ready to go.

Online resources (such as the Scootle examples given above) were considered to be useful but often deemed not to be user-friendly or intuitive. Many existing websites were deemed hard to use. Searches often yield pages of links to sift through. The Phase 2 surveys revealed that teachers require online resources which are accessible, intuitive and yield easy-to-read materials.

There should also be universal access to effective resources and online resources (without boundaries). Often teachers in one state or one school system (i.e. a state school) are unable to access resources used by another. Several teachers recommended that a universally accessible website be set up allowing users to access or share best practice with other schools throughout Australia.

> *'I'm thinking straight away electronic (online) resources because it's something that can be easily modified'.*
>
> *'You need a set of specialists who get together and produce these fantastic resources, which are freely available to schools and there would be no barriers'.*

7. **Phase 2 research:** identifying barriers and enablers to integrating EfS into schools

The Phase 2 research was undertaken by Lonergan Research and builds on the literature reviews in the previous sections. The value of this phase of the project lies in the actual experiences of current teachers and school executives which validates the desktop research and provides statistics to reinforce the need for additional support for teachers and principals in schools for EfS in the roll-out of the Australian Curriculum over the coming years.

The three stages of the research were:
Stage 1: qualitative research amongst **engaged**[3] teachers, stakeholders and supporters, which included six focus groups (Qld, NSW); 11 in-depth telephone interviews with teachers and principals; and an online survey (WA, Qld).

Stage 2: qualitative research amongst **non-engaged** teachers, curriculum coordinators and principals, which included three focus groups (Qld, NSW, SA); 18 in-depth telephone interviews with teachers and principals (WA, Vic, NT, TAS); and six face-to-face interviews with principals (SA, Qld, NSW).

Stage 3: quantitative research amongst **engaged and non-engaged** teachers, curriculum coordinators, head teachers and principals, the purpose of which was to validate the findings of the qualitative research in stages 1 and 2. The research involved an online survey of Australian Education Union (AEU) members (3,446 of whom 1,472 were primary teachers; 1,094 secondary teachers; 331 head teachers; 187 principals; 144 curriculum coordinators and 504 others) and a later online survey of Independent Education Union (IEU) members (1,493 of whom 507 were primary teachers; 561 secondary teachers; 225 head teachers; 27 principals; 109 curriculum coordinators and 207 others).

[3] An engaged teacher is defined as one who is *pro-active* in integrating EfS into their teaching rather than one who is simply following directives to incorporate it (defined thus as 'non-engaged').

TABLE 4:
QUANTITATIVE RESEARCH SAMPLE BY STATE AND TERRITORY

State	Total sample	AEU sample	IEU sample
NSW	1,166	1,166	0
QLD	1,934	1,176	758
VIC	1,201	805	396
NT	140	114	26
ACT	73	73	0
WA	326	76	250
SA	88	53	35
TAS	31	3	28
TOTAL	4,959	3,466	1,493

Table 4 shows that 88% of the responses to the surveys were from the eastern states. For this reason it is not possible to draw valid conclusions about differences in responses between states and territories. However, respondents from states and territories that currently have well supported AuSSI programs (see section 4), that is, the ACT, WA and Victoria, were more likely to have heard about sustainability as a cross-curriculum priority through support partnerships rather than through education departments, ACARA or through self-discovery.

The research documented the various stages of a teacher's and a school's journey towards becoming fully engaged with EfS. Looking at each of these journeys in turn provides the opportunity to see where barriers arise and where enablers can intervene to propel both the teacher and the school towards integrating EfS into their teaching programs, operations and other whole-school and community activities. Each of these journeys will be discussed in the following sections of the report as will, firstly, the key findings of the research which validate the importance of embedding EfS into all subjects as required by the Australian Curriculum.

7.1 SUMMARY OF THE MAIN FINDINGS OF THE QUALITATIVE RESEARCH

Knowledge about EfS in general and its importance and role as a cross-curriculum priority in the Australian Curriculum amongst teachers, executive staff and principals was low.

'I probably know "snippets" about sustainability in schools but nothing solid.'

'They think it's an add-on to the curriculum; something extra to do.'

If ***integration of EfS*** into teaching practice is to be achieved, the important first step must be to convince schools (and teacher training institutions) that sustainability is a priority and an important focus of the Australian Curriculum. To demonstrate this will require provision of suitable professional development (PD) — to raise awareness of EfS, clarify the concept of EfS and increase comprehension of what constitutes EfS-engaged teaching in schools.

> *'Some subjects will be harder than others to integrate it (EfS) into but that was the same as adding in literacy and numeracy into PDHPE … it's just a case of making it fit in somewhere.'*

Some ***mandate and/or measure of accountability*** will facilitate teacher compliance, which is considered to be quite different from teacher engagement with EfS. It was considered that where schools claim to be engaged, even where whole-school approaches are considered to have been adopted, schools will contain a mix of compliant and engaged teachers.

> *'If it's just a tick box, it won't work.'*

> *'At present, teachers can go into depth or just give brief surface information and feel justified.'*

The research validated a model that documents ***the teacher journey*** (see Figures 3 and 4 below) — from a lack of awareness and understanding of EfS to EfS-engaged teaching in classrooms. This model provides useful reference points for key barriers and enablers at different stages of the journey.

> *'To effect change in schools, teachers have to see and understand the need for change (that is, they need to understand the level of importance).'*

Seven ***key barriers*** to teacher engagement with EfS were identified and their relative importance linked to different stages of the teacher journey.

> *'The curriculum is like a cake mix — it's got a lot in it. Sustainability is another cherry which is being added into the mix. Without enough flour to bind it, it falls apart.'*

> *'I would probably go through my units of work and see where I could integrate it. But if it's my current lot of units I couldn't find a way that I could slot it in. I'd probably be less likely to do it then as I'm so busy doing other things such as ringing up parents to check on student absences.'*

> *'Resistance can also be based on a fear of criticism.'*

Key enablers identified included professional development (PD), internal and external support networks, clear definitions and explanations of EfS, the development of professional learning teams (PLTs), providing time for knowledge acquisition and planning, increased funding (for schools and support organisations) and the development of suitable classroom ready resources. ***Professional development was identified and unpacked as the universal enabling strategy.***

> *'You've got to educate the teachers before you can educate kids.'*

'Often with PD, someone is just going to get up and waffle and say you can do it here in Maths, here in so and so. I want someone to tell me what the overall aim and objective is, what my map to doing it is and then I can fill in the details.'

The principal was considered to play a very important role in whether a school becomes engaged with EfS or not.

*'We need to influence **our** leadership.'*

The principal develops ***the character of the school*** by determining the priorities and school focus at the local level, but must balance this with demands from the state education departments and the internal and external community. A passionate principal can facilitate enablers and overcome barriers for school EfS-engagement while a disinterested principal can do the opposite. In the latter case, the research confirmed ways by which a resistant principal can be encouraged to become supportive and engaged.

'It's the complication of this work in a primary school where my teachers are all generalists so they teach every key learning area, with a crowded curriculum with a very focused agenda from Education Queensland. It's about, I don't think it's an attitude or a knowledge issue, it's more about how do I get this done?'

Examples of key enablers on the school journey towards a whole-school approach include 'top down' directives regarding the importance of EfS together with clear communication and supporting guidelines for EfS at the school level, engagement with the local community, cross-curriculum teacher support, a dedicated support team in the school, accountability, state assistance with or development of teaching units. To begin the journey at least one passionate teacher (or principal) is required.

'If we start from really small projects and work our way up, it's not as scary as you think.'

'We had a marshy patch at the back of the school. The students worked with the council to get some blocked drains cleared and researched what could be planted in the reclaimed land to attract birds and help build a sustainable native garden.'

It was recognised that ***lasting school change*** will depend on the conversion to EfS engagement of a significant proportion of teachers and of the internal community of the school. Without a supportive principal lasting change is unlikely. The assistance of other external bodies such as AuSSI has proved invaluable to facilitate lasting change in many engaged schools. Even with the majority of enablers in place, it was acknowledged that it is hard to facilitate a truly ***whole-school approach*** and maintain it. To achieve lasting school changes requires continual PD, dedicated roles and responsibilities, regular planning (both strategic and succession planning), constant re-evaluation of the level of engagement of both internal and external communities, some evaluative measure of accountability, and ongoing re-commitment to the philosophy of EfS.

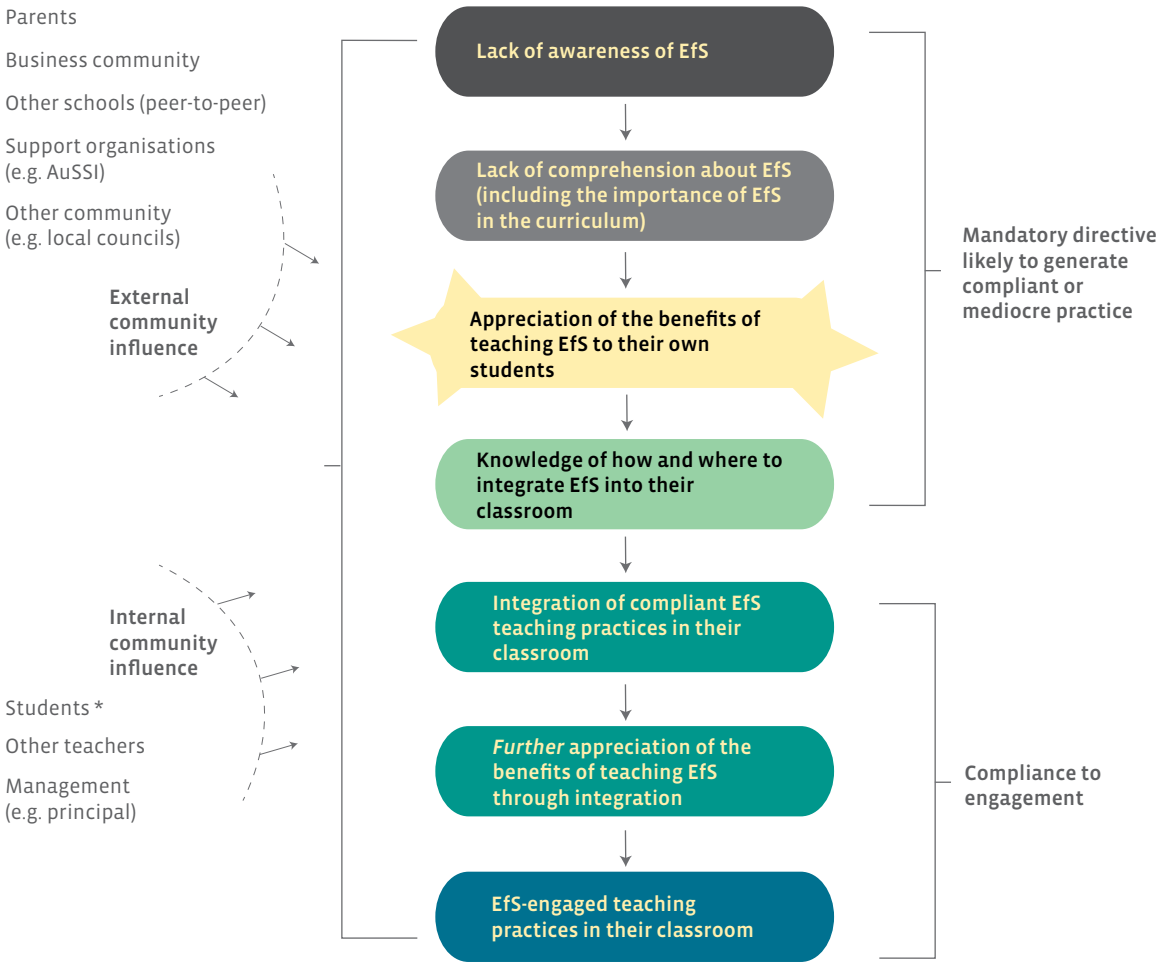
'You'll never get 100% commitment from everyone to anything — you go where the energy is, using the living, not raising the dead.'

'After 2 or 3 years, some schools will still only have a couple of teachers engaged.'

The research confirmed that each teacher and school is on their own unique EfS journey. Enablers can help overcome the barriers to full engagement and this process can vary between teachers and schools. What is important is that barriers can be overcome with patience, time and appropriate enablers, such as professional development. What doesn't vary though is the journey itself! Both the teacher and school journeys are described in sections 7.2 and 7.3.

7.2 THE TEACHER JOURNEY

FIGURE 3:
THE RESEARCH-CONFIRMED TEACHER JOURNEY



* Note: where the term 'students' is used this refers to students or pupils

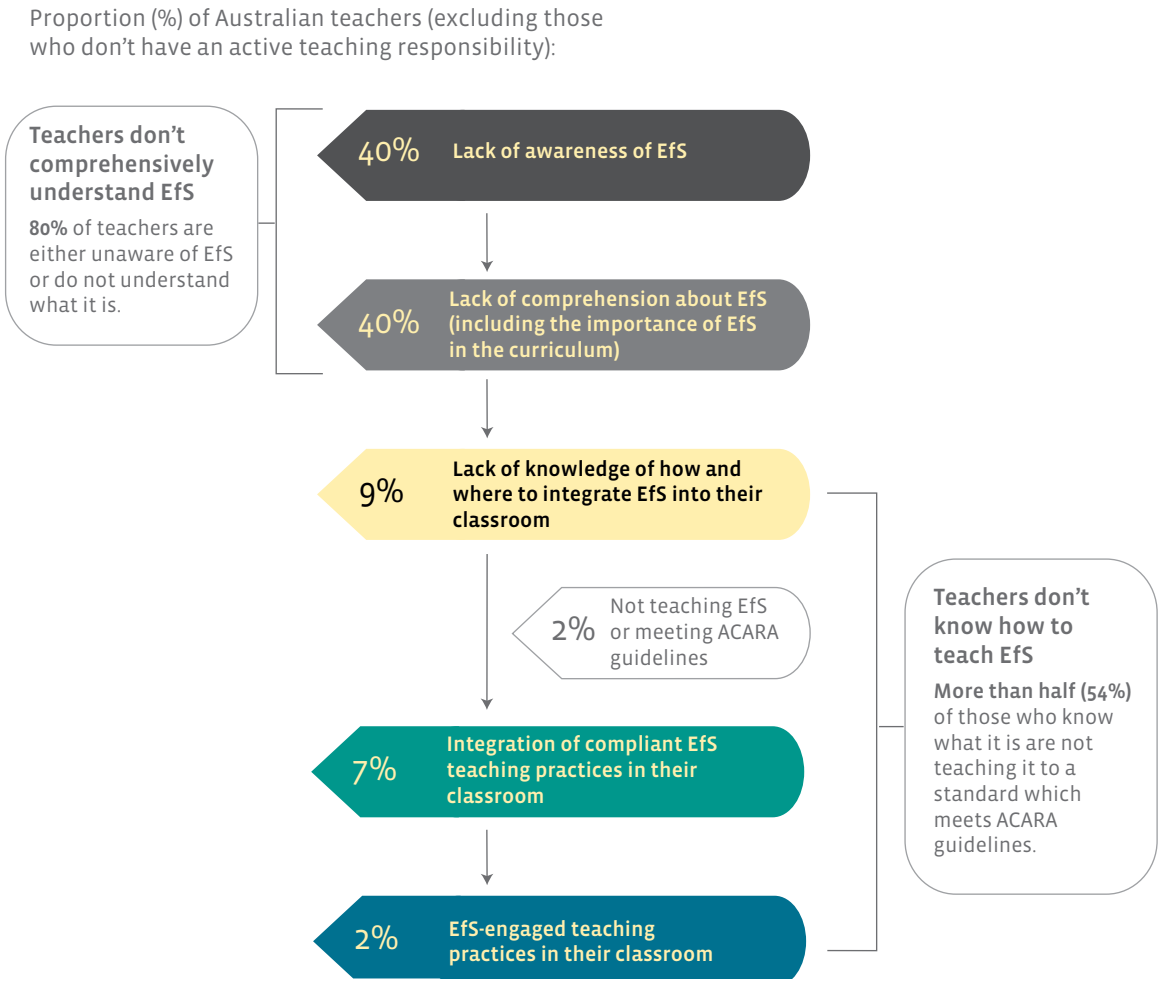
The pathway to engagement is likely to be considerably quicker where the teacher has an existing positive values system (with regards to environmental/sustainability issues)

The majority of teachers are currently in the first two stages of the teacher journey to becoming a fully EfS-engaged teacher: 39.5% of teachers are not aware that sustainability is a cross-curriculum priority in the Australian Curriculum and a further 40%, although aware of EfS, do not fully understand what it means, nor, it follows, its importance in the curriculum. In fact, only 2% of

teachers are using EfS-engaged teaching practices in their classrooms. Secondary school teachers were the least likely to be aware of sustainability as a cross-curriculum priority (52%) compared to 72% of head teachers, 79% of curriculum coordinators and principals and 63% of primary teachers.

Figure 3 shows the pathway from no awareness of EfS to full engagement with EfS for teachers. Relevant factors likely to impact on movement along the path include personal value systems, directives from within the school and internal stakeholders such as other teachers as well as the influence of external stakeholders such as parents, support organisations such as AuSSI etc. The sections below expand on the key barriers and enablers for teachers in their EfS journey.

FIGURE 4:
AWARENESS AND COMPREHENSION LEVELS ON THE TEACHER JOURNEY

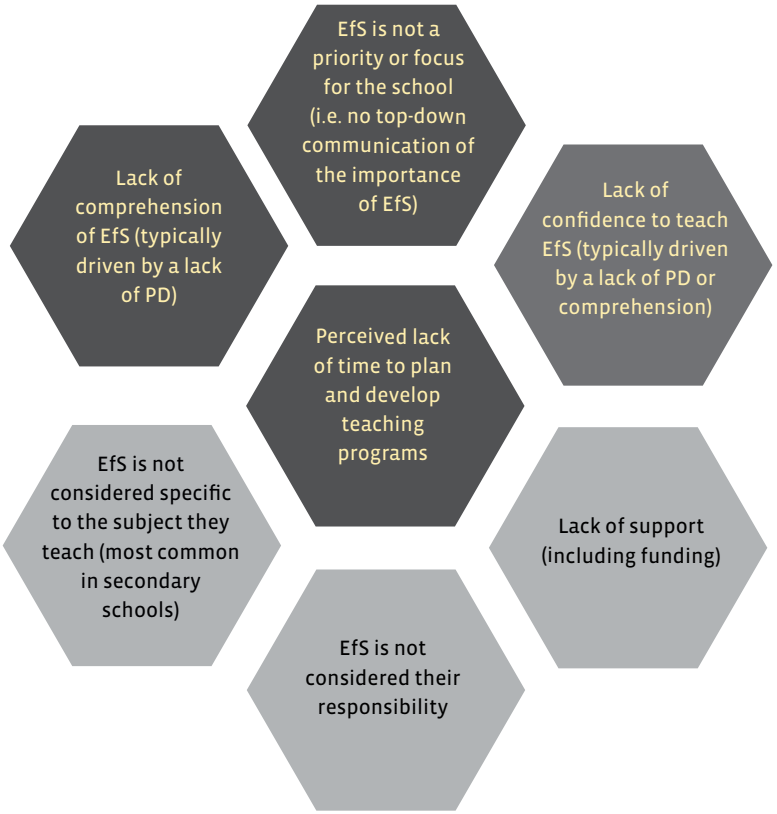


Source: Lonergan Research

7.2.1 KEY BARRIERS TO TEACHER ENGAGEMENT WITH EfS

Addressing the barriers that teachers face in the early stages of the teacher journey will have the biggest impact nationally as 80% of teachers are currently in the two earliest stages. The key barriers to **awareness of EfS**, as identified in the quantitative research, are: lack of professional development (41%); lack of communication from the top down (from the state level 34% and from school leadership teams 29%); and sustainability not a school priority (30%). Likewise, the key barriers to **comprehension of EfS**, are: lack of professional development (50%); lack of guidelines on how to link sustainability to subjects taught (42%); and not enough time to determine responsibilities in regard to EfS (38%). Additional barriers to integrating EfS into teaching practices are given in Figure 5 below.

FIGURE 5:
KEY BARRIERS TO INTEGRATING EfS INTO TEACHING PRACTICES



A common teacher sentiment was:

'It's not being tested and it's not my responsibility so why should I put in my time and effort?'

The research identified that 9% of teachers, fully aware of EfS and understanding its importance, don't know how or where to integrate it into their teaching practices. The reasons for this were: lack of time (55%); lack of suitable learning and teaching resources (33%); lack of professional development (33%); and lack of funding to attend relevant events/seminars (23%).

7.2.2 KEY ENABLERS FOR EfS ENGAGEMENT

For the 80% of teachers who are either unaware of EfS or lack a clear understanding of what it entails the following enablers were identified by the research:

- an EfS 'getting started' pack with a succinct, clear explanation and definition of EfS (64%)
- professional development (PD) for teachers is a universal enabler throughout each and every stage of the teacher journey. Engaged teachers highlighted the importance of continuous and staged PD for teachers (62%)
- clearer top-down communication about the importance of EfS (50%)
- specific information about how sustainability relates to various subjects (56%)
- ACARA Organising Ideas for sustainability distributed to every teacher (45%)
- curriculum materials such as syllabuses that clearly identify what learning statements can be achieved through a sustainability context (46%).

For teachers needing help with how or where to integrate EfS into their teaching practices the enabling strategies identified were:

- development of, and more access to, classroom-ready resources (56%)
- access to a national online database of best practice resource materials (40%)
- professional development (54%)
- increased funding for support programs/ organisations such as AuSSI and QESSI which provide a framework for whole-school sustainability programs and school partnerships (27%)
- visits to/from other teachers who have already integrated sustainability (33%).

Amongst teachers who knew little or nothing about how or where to integrate sustainability in their teaching practices, IEU members were more likely to claim that PD for sustainability (66% cf. AEU 49%) and improved access to an online database of best practice resource materials (49% cf. AEU members 36%) would be key enablers. Amongst teachers who had not integrated sustainability into their teaching practices, or at least in line with the ACARA Organising Ideas, IEU members were more likely to consider more time (59% cf. AEU 30%); more PD funding and events (67% cf. AEU 28%); increased school funding (67% cf. AEU 20%); more networking opportunities (56% cf. AEU 17%) and more classroom-ready resources for EfS (48% cf. AEU 25%) to be important enabling strategies.

Through using a range of enabling strategies, various outcomes improving teacher feelings about EfS could potentially be achieved as identified in Table 5. The table shows that a truly engaged teacher is one who embodies all five 'enabling strategies', from being able to understand the importance of EfS to *further* appreciating the benefits of EfS in his/her teaching. Levels of teacher engagement below the ideal mean that one or more of these enabling strategies are not present, resulting in *some* engagement with EfS but variously accompanied by feelings of confusion, anxiety, frustration and resistance. Continuous PD, however, can be a universal enabler which potentially overcomes such feelings, leading to full engagement with EfS.

TABLE 5:
THE TEACHER JOURNEY: OUTCOMES OF IMPLEMENTING A RANGE OF ENABLING STRATEGIES

OUTCOME	*Engagement*	Compliance	Confusion	Anxiety	Frustration	Resistance
ENABLING STRATEGIES	I understand the benefit to my students and want to do more	I don't see the value of teaching more than I need to	I don't understand why I have to teach EfS	I don't know how or where to integrate EfS	I don't have the tools to integrate EfS	I don't see the benefits of teaching EfS
Communicating the importance of EfS	✓	✓	✗	✓	✓	✓
Improving comprehension of EfS	✓	✓	✓	✗	✓	✓
Appreciating the positive benefits of EfS	✓	✓	✗	✓	✓	✗
Developing classroom-ready resources to 'get started'	✓	✓	✓	✓	✗	✓
Further appreciating the benefits of EfS	✓	✗	✗	✗	✗	✗

Further enablers suggested by respondents could include:

- career incentives for implementing EfS
- make sustainability teaching assessable
- make schools accountable for their sustainability initiatives e.g. require publicising on the MySchool website.
- depoliticise EfS so that it becomes more pedagogical rather than political
- provide more peer-to-peer sharing opportunities within and between schools
- encourage cross-disciplinary projects and working practices.

The first two dot points relate to one of the main recommendations of this report, that is, the development of a national professional teaching standard for teaching EfS.

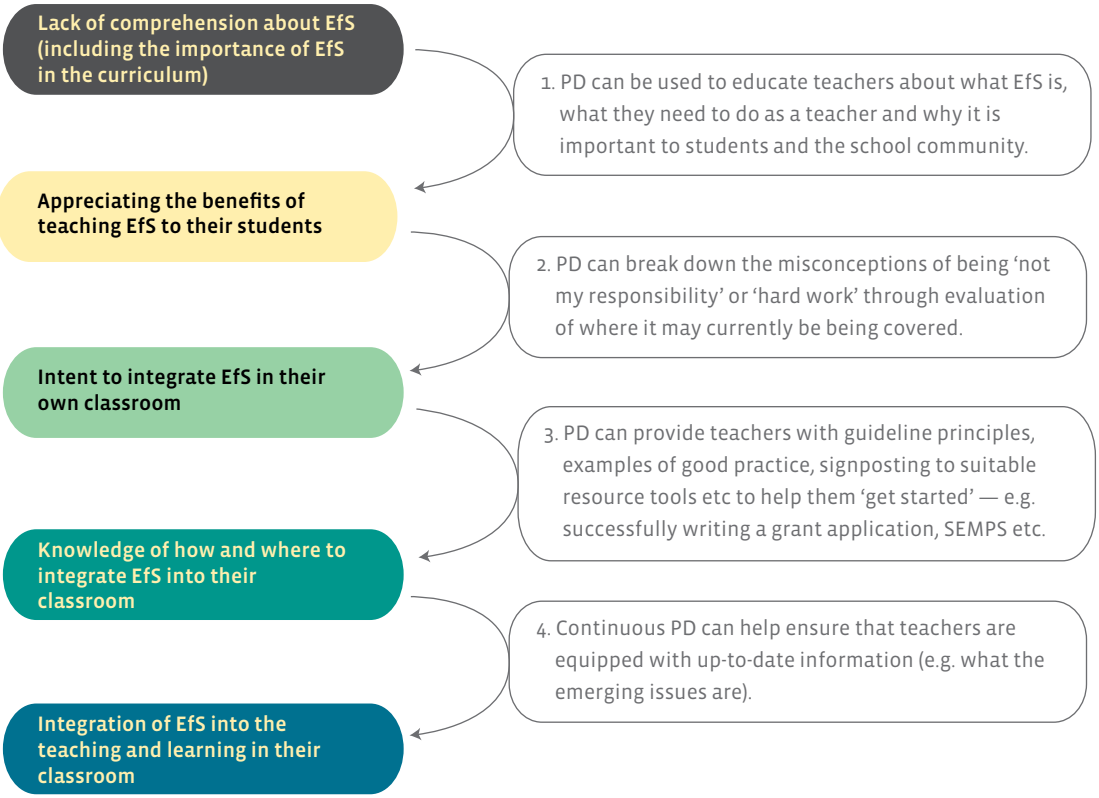
Where enabling strategies are implemented facilitating better comprehension of EfS and, in turn, a more positive appreciation of the benefits of EfS exists — the combination of the two should generate integration, at least at a compliant level. The support of the principal is crucial here.

The only exception to this rule is likely to be where a teacher is the first teacher in their school to reach this stage of the teacher journey. Where this is the case, there may be additional barriers to contend with:

- fear of **being stereotyped**/negative perception amongst their peers (e.g. the 'tree hugger')
- concern of **being isolated** within the school community with no support from peers or the executive
- fear of a **negative response from internal and external school community** (including parents and students).

The value of professional development cannot be underestimated for bringing teachers on board the sustainability journey. Figure 6 below shows how targeted PD can help teachers at the various stages of their EfS journey.

FIGURE 6:
TARGETED AND STRUCTURED PD ALONG THE TEACHER JOURNEY

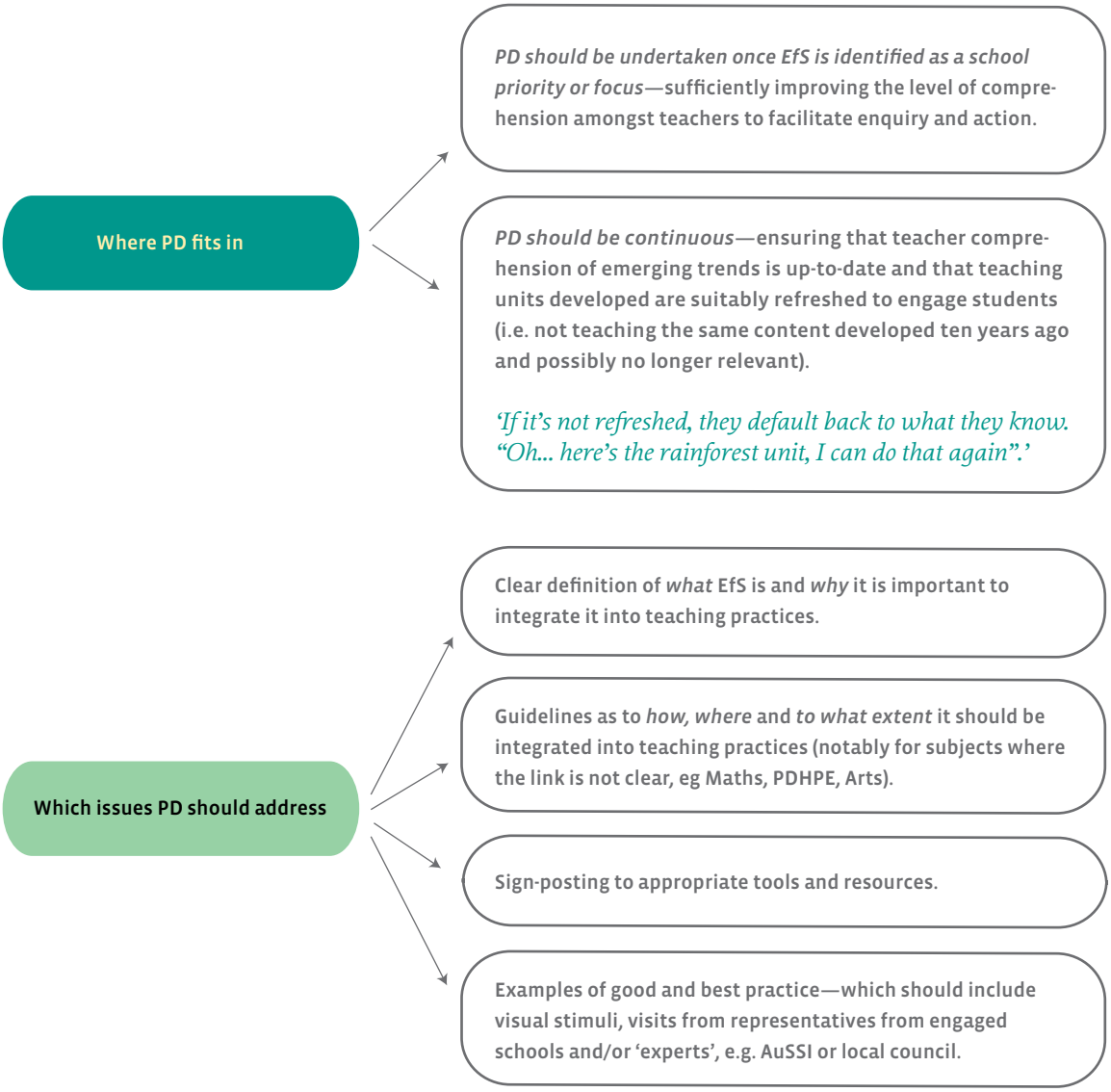


'Teachers need targeted PD, i.e. This is your curriculum. These are your learners. This is where it works and this is how it fits.'

In addition to targeted and staged PD, a 'getting started' pack was considered important for teachers starting out on their EfS journey. Figure 7 suggests what should be included in it.

FIGURE 7:
COMPONENTS OF A 'GETTING STARTED' PACK

FIGURE 8:
THE ROLE OF PD ON THE TEACHER JOURNEY



Principals and teachers alike were consistent in their opinion that PD was the key enabling strategy to facilitate engagement with EfS—this would provide teachers with the **time** to:

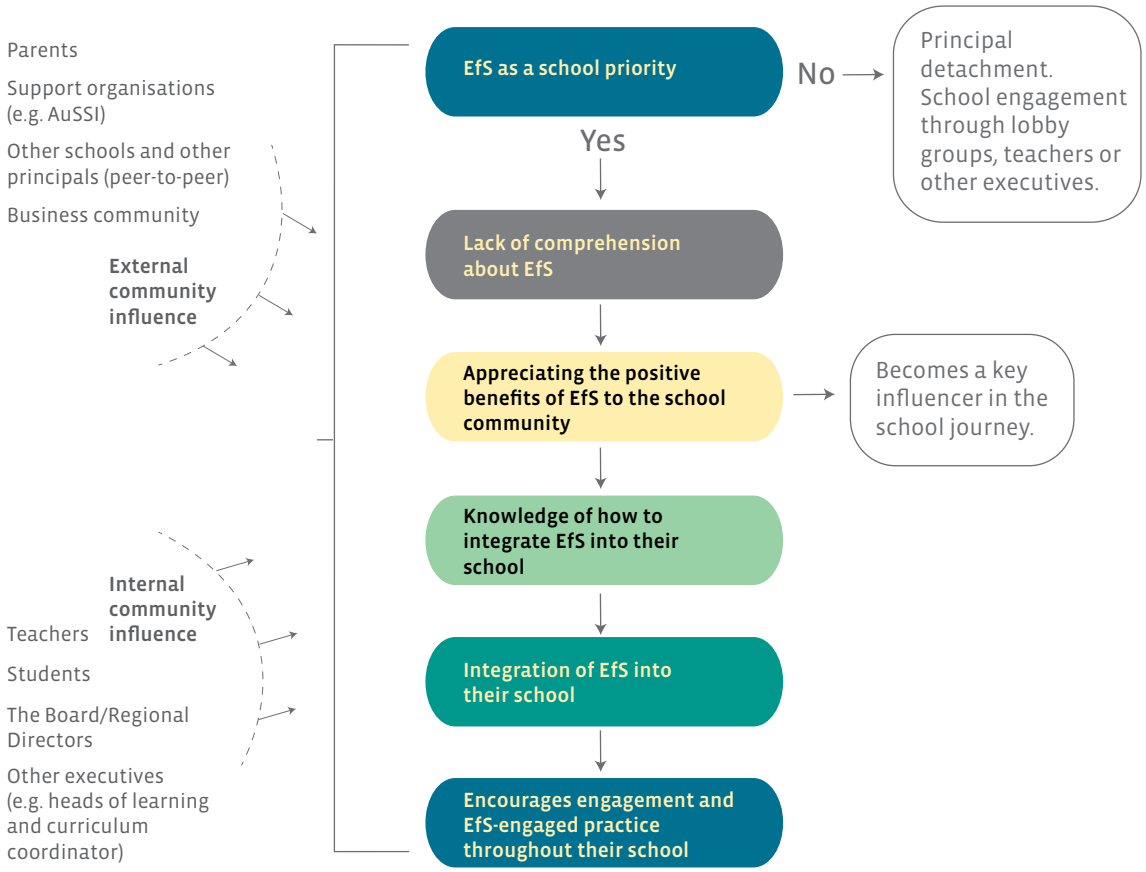
- **Comprehend** (understand what EfS is and where it needs to be integrated
- **Evaluate** (identify where in existing teaching units sustainability may already be covered, therefore requiring only some extension to existing teaching ('tweaking')
- **Develop** (amend teaching units to ensure EfS requirements are being met)
- **Plan** (plan where and when EfS can be integrated throughout the school year).

However, because of limited time for PD at a whole-school level (generally confined to pupil-free days or short presentations at staff meetings) PD on EfS must compete with other school priorities and mandated requirements. There was agreement that a 'one-off' PD session (even if a substantial part of one day was allocated to EfS) was not likely to be effective and that *continuous and staged* PD with ongoing expectation of teacher action and support was required.

The evaluation of teaching programs, development in terms of EfS and integration into the teaching scope and sequence should ideally be undertaken at the Department level. In the absence of time allocated for this, the reality was that teachers would need to invest time taken from other activities. This will only happen if teachers see it as a personal priority and/or if EfS is endorsed as a priority by the principal (see section 7.23 below).

7.2.3 THE ROLE OF THE PRINCIPAL

FIGURE 9:
THE PRINCIPAL'S JOURNEY



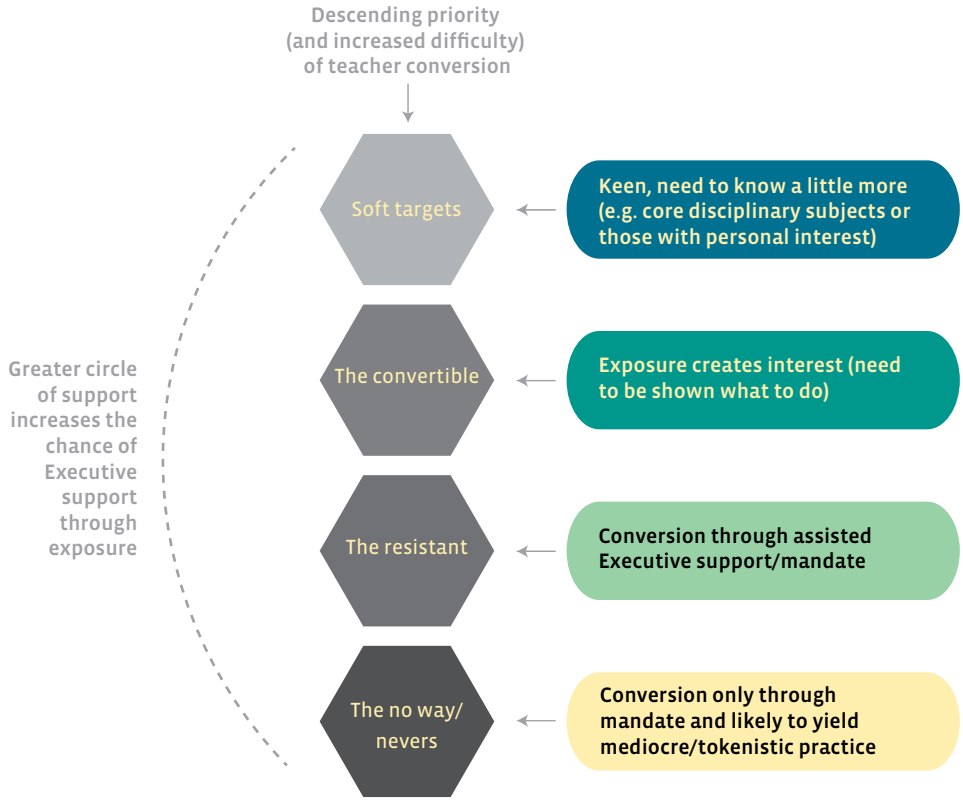
Both the quantitative and qualitative research confirmed that the principal (or one of his/her executive team) has the greatest influence to facilitate a whole-school approach to EfS (60%). In almost all cases observed through the research where the principal had been the instigator for change and been responsible for facilitating a whole-school approach to EfS, a positive directive was provided by the principal to teachers, communicating that *EfS was a not a burden, but a benefit.* Where principals encountered initial resistance from teachers, this resistance quickly turned to support through positive encouragement and direction. In cases such as this, change towards a whole-school approach can occur more rapidly than if left to a passionate teacher, parent or other staff member.

The principal develops the character of the school by determining school priorities and focus at the local level. This is balanced by top-down directives from federal and state governments and the principal's 'line manager', the principal's wider lobby groups such as parents, other members of the executive, students, collective teacher lobbying, school performance metrics such as the MySchool website etc.

7.2.4 THE TEACHER CONVERSION MODEL

The four levels of teacher engagement are described in the research as: soft targets, the convertible, the resistant and the no way/nevers. The latter can only be 'converted' via mandate, often counter-productive, but the principal can facilitate a teacher's journey through the other three stages.

TABLE 6:
THE FOUR LEVELS OF TEACHER ENGAGEMENT



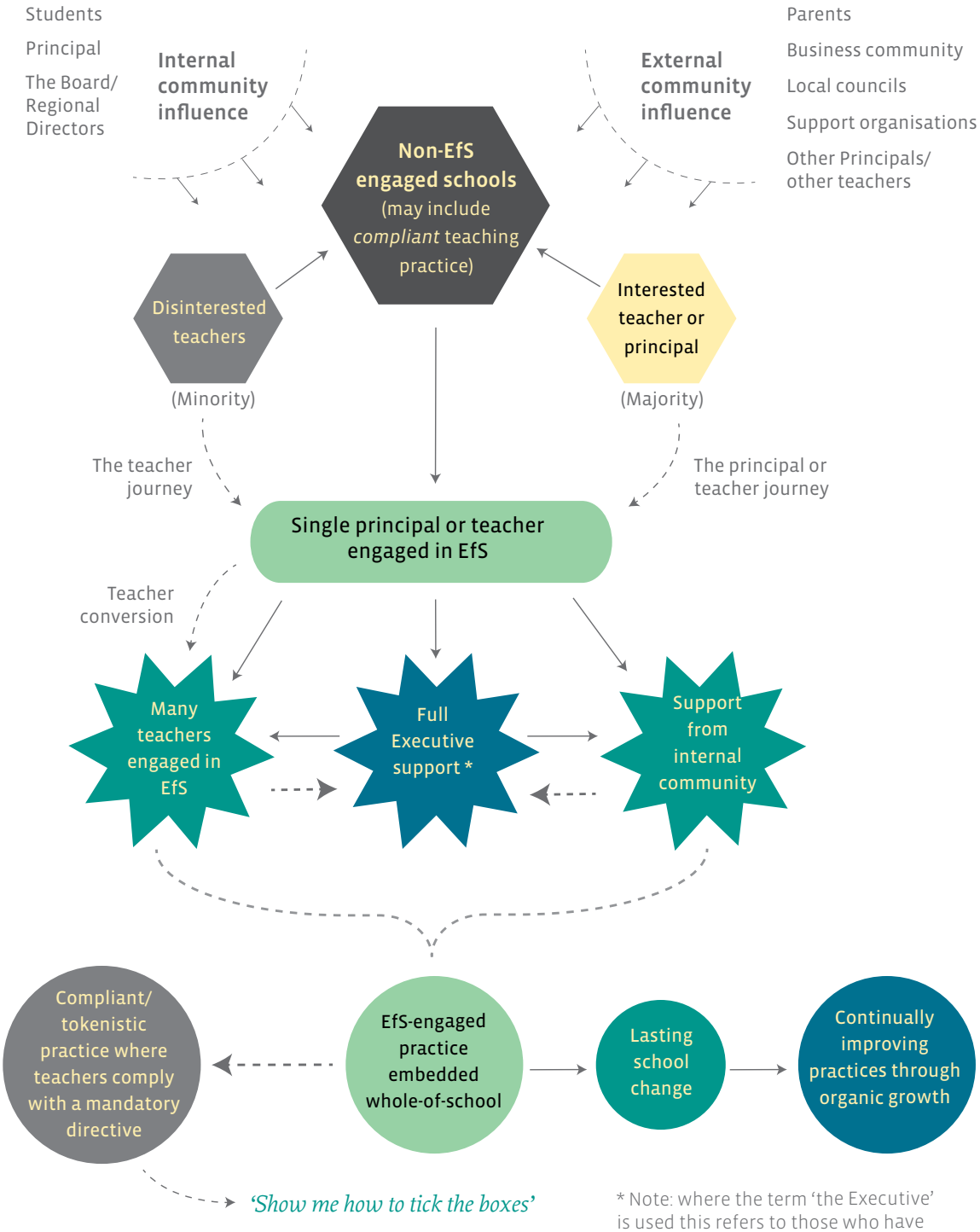
Four important strategies can be used to facilitate the conversion of those teachers in the 'no way/never' category who consider EfS irrelevant to their subjects and/or personal values, boring, or too much time and effort to incorporate:

1. Professional development in EfS mandatory for all teaching staff to help them to understand ways in which they can integrate EfS into their teaching practices.
2. Having engaged teachers 'reach out' to other teachers encouraging cross-disciplinary working (e.g. woodwork teacher builds a chook pen, eggs from the chooks can be used in home economic lessons etc.).
3. Communicating (and demonstrating) to resistant teachers that teaching EfS is fun and does not take a lot of time or effort. Provide them with suitable signposting to classroom-ready resources and best practice guidelines etc.
4. Where these more organic strategies fail, **most often the principal is the only person who can instigate behavioural (not necessarily attitudinal) change through mandate.**

7.3 THE SCHOOL JOURNEY

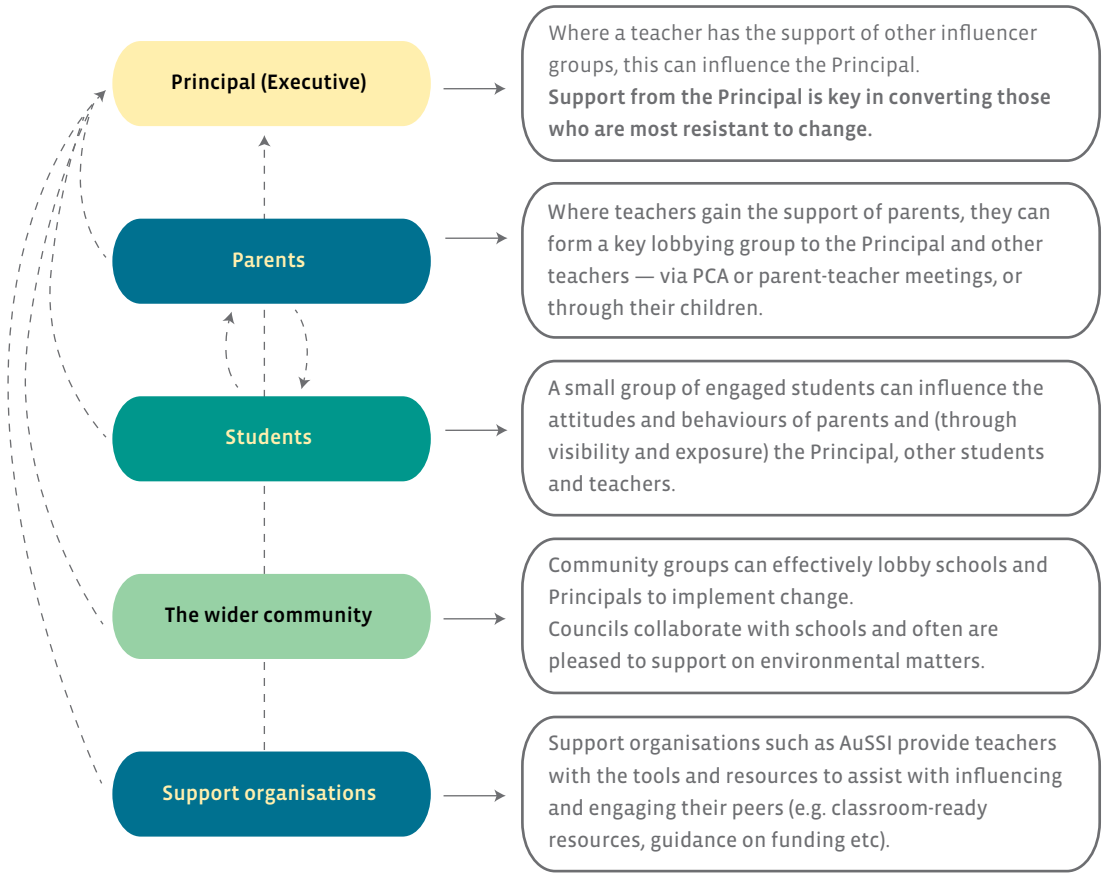
Schools comprise teachers, students, the executive and related stakeholders such as parents, community members etc. Whilst each of these groups may be on their own EfS journey, a whole-school approach to EfS brings all groups together to form the school's unique journey. This journey is best undertaken as a whole-school approach, explained in detail in section 7.4 and shown diagrammatically in Figure 10. It is interesting to note, however, that where a school may actually be on its journey could be different from where teachers perceive it to be.

FIGURE 10:
THE RESEARCH-CONFIRMED SCHOOL JOURNEY



* Note: where the term 'the Executive' is used this refers to those who have the authority to effect change (typically the school management eg the Principal or his/her nominees)

FIGURE 11:
STAKEHOLDERS IN THE SCHOOL JOURNEY



7.4 THE WHOLE-SCHOOL APPROACH

The whole-school approach (WSA) is seen as the most effective way of promoting and justifying EfS in schools. It is a complex process, however, and only a relatively few schools (in relation to the total school numbers) have been identified as being successful in this approach. There is a wide range of barriers to achieve a WSA (see below). Leadership support is vital. A whole-school approach is more difficult to implement in secondary schools than primary schools because of the organisational structure, focus and size.

- The main barriers to schools being involved in Education for Sustainability. as identified by the participants in this research were: it needs a motivated teacher; crowded curriculum; the time required; lack of training available; lack support materials/ funding; it is difficult to measure outcomes and schools are dealing with a rigid timetable (EcoChange 2012).
- A whole-school approach to EfS was identified by participants in the research as the best way to overcome these barriers. There were not many examples of successful whole-school approaches identified at the schools that participated in this research (EcoChange 2012).

- Document reviews and stakeholder interviews show that taking a 'whole-school' approach has been strongly promoted as the most effective strategy for implementing environmental EfS in schools. Schools with an existing ethos and values around sustainability have reportedly taken this approach more readily than schools without an existing commitment to sustainability. One stakeholder reported that an overall attitude change was occurring, with schools and students now seeing environmental management as their role. Evidence from the case studies and reports indicates that schools and students are assuming responsibility for environmental sustainability, both within the school and outside. A whole-school approach has been described as requiring a cultural shift in schools and school communities and is now promoted across the education sector for other issues. The evidence indicates that schools understand this whole-school approach to EfS (DEWHAb 2010).
- Survey data shows that the leadership behaviours most significant for the successful adoption of EfS are:
  - support and encouragement of the EfS/ Environmental Leadership Team
  - enthusiasm about achievements and successes
  - active assistance to build on achievements and keep going
  - removing barriers and empowering people to change; they are 'enablers' (ACT Government 2010).
- Key themes in case studies of 12 schools were: a framework for practice was established; student engagement and empowerment was noticed; engaged teachers went from 'champion' to 'motivator'; a local network was established (Sustainability Victoria 2009).
- Through our research we came to understand the incredible complexity of whole-school approaches to EfS and, in particular, of action competence. This complexity means that we can only offer very tentative responses to our research question. When we discussed each case study school in depth, we found that the particular nature of its whole-school approach could be seen to be embedded in the social and cultural climate of the school and its community (Eames *et al* 2009).
- There are many documented barriers to implementing school-based sustainability ... Through interviews conducted with principals and key staff, the authors found lack of time, direct funding for innovation, teacher conceptual understanding, resistance from some fellow staff to sustainability education, and being positioned as a 'greenie' were presented as barriers to effective practice. The research reveals how innovation, determination, trust, and active principal support enabled the teachers to push ahead. Other educators experiencing difficulties with implementing sustainability education will likely find this discussion useful (Evans *et al* 2012).
- Results indicated that effective whole-school sustainability education requires: visionary, committed school leadership; collaborative governance that invites participation from all staff; a few core staff to spearhead projects; contextualised professional learning opportunities; and authentic engagement of student voice (Salter 2012).

Who else needs to be engaged to ensure a whole-school approach?

› It is not only teachers and the school executive who need to be engaged in EfS to ensure a whole-school approach.

› Sustainable teaching practices often extend beyond the classroom. Adopting a whole-school approach requires the endorsement and engagement of other school staff — typically referred to as the 'internal community' including:

- **School canteen manager** — sourcing local produce
- **School canteen staff** — managing food waste (being used for composting)
- **Grounds staff** — assistance with litter pick-up, maintenance of pupil gardens during vacation
- **Cleaning staff** — assisting with litter pick-up, recycling etc.
- **Office managers** — acting in accordance with the sustainable school principles e.g. recycling
- **Librarians** — section/shelves dedicated to sustainability

'As a librarian, I can support what the teachers are doing and provide the resources in assistance to the teachers so they can actually implement'.

› Teachers made it very clear that where the internal community has *not* been engaged, a whole-school approach cannot be claimed or maintained.

› The 'internal community' also refers to students. Student engagement can be driven through exposure and encouragement using a similar step-by-step approach outlined in the **teacher conversion model**.

› The importance of support organisations **cannot be understated**. They play a vital role in a school's initial and continuing engagement with EfS, through the provision of key support services such as networking, access to best practice EfS examples, provision of classroom-ready support materials, and sign-posting to funding opportunities and grants.

› While some engaged schools claimed to have achieved a whole-school status through self-discovery and self-sufficiency, the majority did so through the assistance of AuSSI, QESSI or similar support organisations.

Many schools claimed that without the guidance and support from these support organisations, it would have been very difficult for a teacher (or the school) to initially engage with EfS. This sentiment was echoed strongly in Tasmania, where engaged schools felt the removal of the AuSSI program and funding would now present a further impediment to implementing a whole-school approach.

What does a true whole-school approach look like?

Teachers claimed that where EfS is school-embedded, the following indicators would be present:

1. **EfS is integrated into all or most subjects, but probably in different ways:**
   - The use of resources that have a sustainability context e.g. Maths examples, English comprehension and reading materials, foreign language development topics
   - Sustainability investigations aligned to curriculum e.g. Science, Geography, Economics, Ancient History, Indigenous perspectives etc.
   - **Problem-based learning to cover big ideas** e.g. projects, debates, specific events — at classroom, year or school level.

2. **EfS engagement is evidenced physically in the school through:**
   - **Active involvement of the school community in EFS related activities** e.g. recycling, vegetable gardens, water and energy conservation programs, student extra-curricular activities etc.
   - **Active links of the school community to the wider community with regards EfS** e.g. school-community committee, involvement with place-based learning, support of local and worldwide sustainability programs.

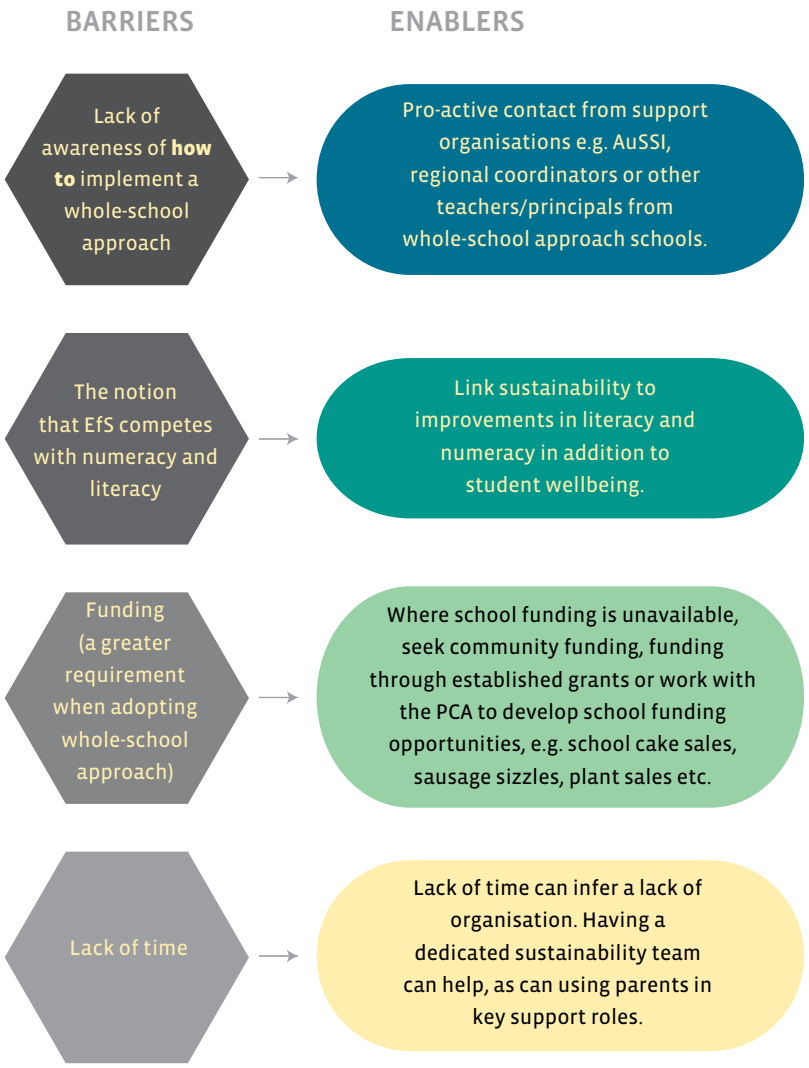
Reaching and maintaining a whole-school approach

Not all engaged schools had adopted a whole-school approach. It should be noted that this was not through lack of trying, or desire — but simply that to achieve a whole-school approach can take a long time. In many cases, currently non-engaged schools considered they would never (in the absence of a strong mandate) achieve a whole-school status.

Where teachers THINK their school is on their school's journey may not actually be reality. In fact, the research revealed that nearly half (44%) of unaware teachers (81%) *assume* that at least one or more teachers in their school is teaching EfS. Principals were more likely to perceive that their school had achieved a whole-school approach (18% compare with 8% of primary teachers and 3% of secondary teachers).

The comments in the previous paragraph emphasise the crucial importance of raising the profile of EfS in the school. When asked to rate how their school was currently performing with regard to providing students with the *knowledge, skills, values and worldviews necessary to act in ways that contribute to more sustainable patterns of living* the average rating was only 4.9 out of 10. The research identified four main barriers and enablers to instituting a whole-school approach to EfS, shown in Figure 12.

FIGURE 12:
THE FOUR MAIN BARRIERS AND ENABLERS TO IMPLEMENTING A WHOLE-SCHOOL APPROACH TO EfS



8. Lasting school change

Lasting and ongoing school change towards a whole-school approach to EfS is essential for the truly 'sustainable' school across curriculum areas, operations, governance and financial management. Personal sustainability, where all stakeholders are valued for their individual contributions to the wellbeing of the school now and into the future, is also essential. Enablers to bring this model about are shown in Figure 13.

Support networks are also essential for teachers (see Figure 14) as they come to terms with the amount of time and effort required to embed EfS into their teaching. As mentioned in the introduction to this report, the ultimate outcome is for teachers to view EfS as relevant, engaging and fun for their students and not merely an 'add-on' to what they teach but rather a seamless integration of EfS that fits easily into their subject disciplines.

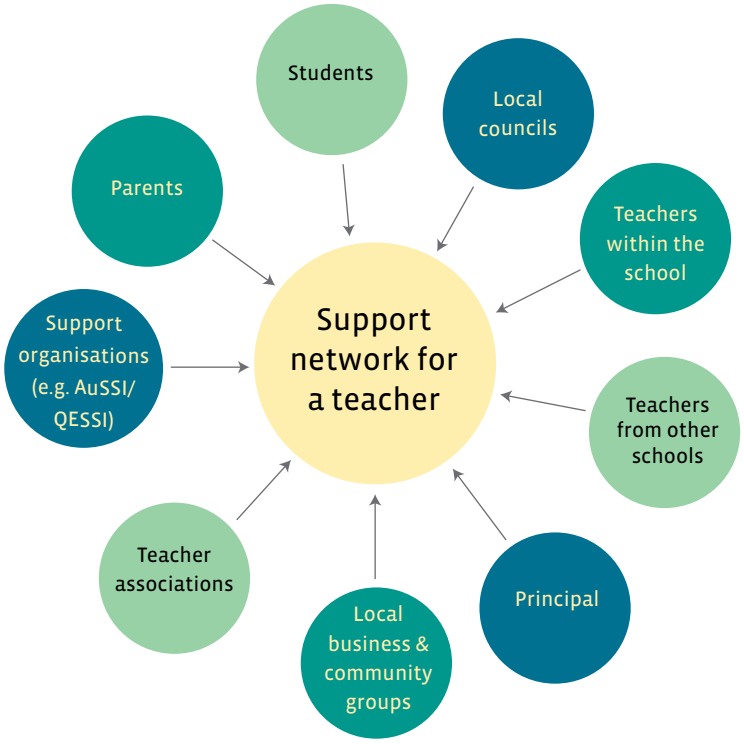
Without the support and engagement of the full school community, both internal and external, the majority of schools will not be able to achieve whole-school status.

Where full community engagement exists, i.e. everyone is on board — from parents to the local business community, and from teachers to the school management team, an intrinsic level of accountability can facilitate lasting school change. Effectively, where one group within the community begins to disengage, other members of the community will put sufficient pressure on them (this may be in the form of support) to ensure they get back up to speed.

'You need to create a culture of value — engaging and making it relevant to the community'

FIGURE 13:
ENABLERS FOR LASTING SCHOOL CHANGE

FIGURE 14:
SUPPORT NETWORKS FOR TEACHERS



Importance of a support network

› In theory, a large support network is available to teachers which can provide support and assistance at each stage of the teacher journey.

› In practice, and notably where a teacher is the first teacher undertaking the journey, support is unlikely to be universal. Obtaining support from some groups may be more difficult and time-consuming (through the need to communicate and educate) than others.

'There's lots of help out there and you don't have to feel alone'.

One of the ways in which the ties binding the community can be strengthened further is by providing dedicated support roles and responsibilities to those in non-teaching roles (e.g. parents as sustainability co-ordinators, developing a sustainability forum including local businesses). It is also essential to assign roles so that a group takes responsibility for the maintenance and progress of the school towards whole-school sustainability.

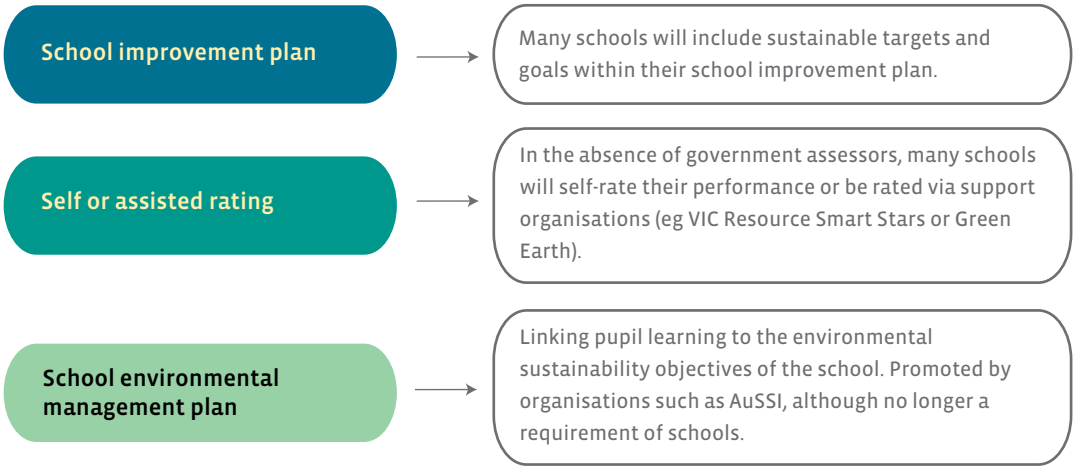
Where there is no mandatory requirement to demonstrate the extent to which EfS is integrated into the teaching curriculum, there is unlikely to be widespread or lasting engagement with EfS beyond tokenistic practices e.g. having a recycling bin in each classroom.

'If it's just a tick box, it won't work'.

'At present, teachers can go into depth or just give brief surface information, and feel justified'.

Where a strong desire (from the principal or engaged teachers) exists to ensure widespread good practice, a number of techniques are currently adopted to facilitate accountability as shown in Figure 15.

FIGURE 15:
ACCOUNTABILITY MECHANISMS FOR EfS COMPLIANCE



Continuing PD is important to ensure lasting school change. What is today viewed as good or best practice can quickly become outdated and old practice. Where this does occur, this is not viewed as particularly engaging for students.

Once teachers adopt good teaching practices, continuous PD will ensure that they do not return to the default position which is adopted currently by many non-engaged teachers — that of 'teaching the same thing in the same way for the last 10 years' e.g. teaching the rainforest module **again**.

Pre-service teaching training in EfS is also regarded as important in order that the next generation of teachers come prepared and with the right value systems to ensure lasting school change.

9. Findings and recommendations

The research found that 92% of teachers surveyed think that sustainability is important, of value to students, and should be integrated into the curriculum.

The key findings of the research elucidate the barriers and enablers for teachers and schools on their 'sustainability journeys'. The findings and recommendations that follow focus on the enablers to support teachers and educators to incorporate sustainability more easily and effectively into teaching and learning with reference to the ACARA Organising Ideas for sustainability as a cross-curriculum priority, that is, to progress along the teacher journey map for EfS.

The recommendations need to be taken as a complementary suite of actions. If taken together as a package, particularly as part of a whole-of-school approach, this will provide a durable pathway to continuously improve and support the abilities of teachers to integrate EfS into their teaching and improve student learning outcomes.

1 / FINDING 1

Low level of awareness of sustainability as a cross-curriculum priority amongst teachers.

There is a considerable lack of awareness and comprehension of sustainability as a cross-curriculum priority (80%) to the extent that:

- 40% of Australian teachers say they are unaware of sustainability as one of the three cross-curriculum priorities within the Australian Curriculum
- 40% of Australian teachers say they have a lack of comprehension and understanding of the concept and relevance of teaching sustainability within the Australian Curriculum
- The largest knowledge gaps were considered to exist with regard to:
  - the extent to which teachers were expected to integrate sustainability into their teaching practices (i.e. breadth and depth)
  - where teachers can access resources to help them integrate sustainability into their teaching practices.

Amongst Australian teachers who reported their schools had *no* teachers currently engaged in EfS (15%), the most effective enabling strategies to facilitate the first teacher becoming engaged in EfS were considered to be professional development events and funding (60%) as well as the **development of a 'getting started pack'** (54%).

Despite the low level of awareness of sustainability as a cross-curriculum priority, the vast majority of Australian teachers think that teaching sustainability is important, and will be of benefit to students:

- 85% considered it important to personally integrate sustainability into their own teaching practices
- 74% considered that students would benefit from being taught about the concepts, knowledge, skills and values of sustainability.

→ / RECOMMENDATION 1

Develop an EfS 'getting started pack'.

For the 80% of teachers not fully comprehending EfS, a 'getting started pack' was considered the most effective enabler. The 'getting started pack' should provide:

- a clear definition of what Education for Sustainability is and why it is important to integrate it into teaching practices
- guidance on how and where sustainability should be integrated into teaching practices (*notably* for subjects where the link is not clear e.g. Maths, PDHPE, Art)
- guidance on how to evaluate current teaching programs to identify where sustainability may already be taught
- sign-posting to appropriate tools and resources
- examples of good and best practice (including visual stimuli, visits from representatives from other schools and/or 'experts' e.g. AuSSI or local council).

2 / FINDING 2

Only one third of teachers aware of EfS know how to integrate it into their teaching practices.

The majority of Australian teachers have yet to integrate sustainability into their teaching practices (91%). The research reveals that:

- fewer than 1 in 10 (9%) of Australian teachers say that they are currently teaching sustainability in a way that addresses the ACARA Organising Ideas for implementing sustainability as a cross-curriculum priority ‹www.australiancurriculum.edu.au/CrossCurriculumPriorities/Sustainability›
- only 2.3% of Australian teachers say they are currently teaching sustainability to a standard which *exceeds* the ACARA Organising Ideas for implementing sustainability as a cross curriculum priority.

Of the 60% of teachers who were aware of EfS, only 1 in 3 (34%) knew what was required of them with regard to integrating sustainability into their teaching practices. The remaining 66% claimed to either not know or were unsure of what was required of them.

Where Australian teachers claimed that their schools had many teachers engaged in *EfS* (33%), about 75% claimed that **access to best practice resources/teaching materials** would be the **most effective** way to encourage all teaching staff in the school to become engaged with integrating sustainability.

→ / RECOMMENDATION 2

Provide readily accessible classroom-ready resource materials for teaching sustainability.

Fifty-six per cent of teachers not knowing how to integrate EfS into their teaching claimed that classroom-ready resources would be the most effective way to help them develop the knowledge they needed to integrate sustainability into their teaching practices.

The most appropriate and efficient distribution mechanism for providing classroom-ready resource materials for EfS is a national online website. The most important aspects of such a website would be one which provided:

- teachers with a clear definition of what Education for Sustainability is and why it is important to integrate it into teaching practices
- guidance on how and where sustainability should be integrated into teaching practices
- guidance on how to evaluate current teaching resources and programs to identify where sustainability may already be taught
- examples of good and best practice teaching
- ready-to-use resources and materials that are linked to the Australian Curriculum;
- sign-posting that is easy to use and intuitive.

As identified in the research, there are many EfS related resources available that teachers can use with their students. In fact, the number of resources has become overwhelming, hence the need for readily accessible and classroom-ready resources. Education Services Australia (ESA) manages the online database called Scootle, which links to and makes discoverable a huge number of such resources for teachers from K–12 across all subject disciplines. This includes a facility that enables teachers to rate resources as well as an indicator of the frequency of access to the resource. The database tags content in the resources which are related to the cross curriculum priority of sustainability — consistent with the design and content tags in the Australian Curriculum by ACARA. The discoverability of the resources is driven by content filters for the online database and by application of standard terms defined in the Schools Online Thesaurus (ScOT).

3 / FINDING 3

Professional development in EfS is a major enabler for teachers no matter where they are on their EfS teacher journey.

Teachers at all stages of the teacher journey considered that professional development (PD) was a major enabler for integrating EfS into their teaching practices:

- 60% of respondents claimed that the most effective enabler of *EfS awareness* would be professional development
- Likewise, 62% of respondents considered PD for sustainability was an important enabler of *comprehension of EfS* (just behind the 64% who thought a 'getting started pack' was an important EfS enabler)
- 54% of teachers nominated PD for sustainability as an enabler *to facilitate knowing where and how to integrate EfS into teaching practices.*

→ / RECOMMENDATION 3

Scale up the delivery of relevant professional development for teachers at all stages of their EfS journey.

The key aspects of professional development in EfS include providing teachers with:

- a clear definition of what EfS is and why it is important to integrate it into teaching practices
- clear guidelines as to *how* and *where* sustainability should be integrated into teaching practices (*notably* for subjects where the link is not clear e.g. Maths)
- sign-posting to appropriate tools and resources
- examples of good and best practice (including visual stimuli, visits from representatives from other schools and/or 'experts' (e.g. AuSSI or local council)
- continuous and staged professional development in EfS to match where they are on the teacher journey (refer to figure 6)
- more conversational and networking styles of professional development, as distinct from online courses.

Audit and gap analysis

Phase 1 of this research also gathered data on the current state of PD in EfS and EfS training for pre-service teachers nationally. However, data collection has been difficult due to the ad hoc nature of EfS PD services across state jurisdictions and because very little is known about EfS pre-service teacher training in teacher training institutions apart from the courses identified for this report. An **audit and gap analysis** is recommended to:

- obtain a more complete picture of both EfS PD services and EfS pre-service teacher training across all state jurisdictions
- ensure scaled-up, relevant PD addresses critical gaps as identified in the research.

Funding for professional development in EfS

As there is currently no dedicated funding for professional development for practising teachers in EfS, it is recommended that funds be provided for this purpose. The Australian Government has provided funds in the past for specific purposes for schools, for example, through their Quality Teaching Program and Smarter Schools National Partnership, initiatives designed to support the Melbourne Declaration's educational goals for the 21st century. These funds are devolved through state education departments across the three school sectors.

4 / FINDING 4

Teacher support networks play an important role in helping teachers integrate EfS into their teaching practices and are the most effective form of professional development for time-stressed teachers.

Amongst teachers who had not integrated sustainability into their teaching practices in line with the ACARA Organising Ideas, the most effective enabling strategies were considered to be:

- having *more time* (35%)
- professional development funding/events for sustainability (35%).

The research highlighted that support networks are particularly important as an enabler by providing guidelines and examples as to *how* teachers can incorporate sustainability into their teaching (42% teacher support). Thirty-five percent of teachers who had not integrated sustainability into their teaching practices considered that more PD funding and events, facilitated by personalised networking, would be an enabling strategy for EfS. Amongst teachers who considered that their teaching practices *exceeded* suggestions in the ACARA Organising Ideas (only 2% of teachers surveyed), the three key enablers that would allow them to do more were:

- access to grant funding for sustainability-related projects (40%)
- the *opportunity to learn from other teachers* (38%)
- PD funding/events for sustainability (36%).

→ / RECOMMENDATION 4

Provide more support networks for teachers both within (internal) and outside (external) the education system.

The three enablers identified above would be significantly enhanced through better support networks for teachers. Networking styles of professional development are more aligned with a sustainability perspective which values diversity, partnerships, relationships and behaviour change rather than purely knowledge and skills. Examples include:

- The *peer-learning model* of professional learning currently used by the school environment networks in NSW and Victoria, most often run by local government officers.

- A *mentoring scheme for new teachers* so that they don't feel so isolated when they find challenges in implementing EfS in their new schools. Such a scheme could be developed and implemented through professional organisations such as the Australian Association for Environmental Education (AAEE).
- Local government specialists such as water catchment officers, nursery staff, wildlife officers, waste officers, sustainability officers etc. assisting with school sustainability programs and projects by providing resources such as water quality testing kits, plants etc. and attending and co-organising events such as discovery walks, plantings, waste audits etc with teachers. Some council officers also have classroom-ready resources and programs they can assist teachers with.

The role of external organisations (e.g. AuSSI, QESSI, Sustainable Schools NSW, local government, community based organisations) in supporting teachers educating for sustainability could include providing:

- professional development (PD) events for schools
- schools with a support network (e.g. connections to other schools teaching sustainability)
- schools with a clear definition of what EfS is and why it is important to integrate it into teaching practices
- schools with clear guidelines as to how and where sustainability should be integrated into teaching practices
- examples of good and best practice teaching
- ready-to-use resources and materials that are linked to the Australian Curriculum.

5 / FINDING 5

A whole-school approach to EfS was considered the most effective model to implement EfS in schools across all disciplines, over and above piecemeal implementation by individual teachers.

A whole-school approach to EfS is defined as one where sustainability is embedded throughout the school — within the curriculum, operations and management, and is embraced by all school staff. This requires a commitment to EfS by a significant proportion of teachers and the internal school community as a whole, as well as by the education system and administrative authorities, exemplified through system-wide policies and actions, for example, by managing waste to enable recycling and composting.

What does a whole-school approach look like?

Teachers offered the following indicators for a whole-school approach to EfS:

1. **EfS is integrated into all or most subjects through:**

- the use of resources that have a sustainability context e.g. Maths examples, English comprehension and reading materials, foreign language development topics
- sustainability investigations aligned to curriculum e.g. Science, Geography, Economics, Ancient History, Indigenous perspectives etc.
- problem-based learning to cover big ideas e.g. projects, debates, specific events — at classroom, year or school level.

2. **EfS engagement is evidenced physically in the school through:**

- active involvement of the school community in EfS related activities e.g. recycling, vegetable gardens, water and energy conservation programs, student extra-curricular activities etc.
- active links of the school community to the wider community in an EfS context e.g. school-community committee, involvement with place-based learning, support of local and worldwide sustainability programs.

From other studies and findings a whole-school approach also has the following features:

- most teachers engaged in teaching EfS in the classroom and accessing school-based EfS projects/initiatives
- teachers accessing continual and staged PD in EfS
- support from the Principal
- staff with dedicated roles and responsibilities for EfS
- student engagement with EfS through curriculum and/or whole-of-school EfS projects
- regular planning for EfS (both strategic and succession)
- constant re-evaluation of the level of engagement of both internal and external communities
- evaluative measures of accountability e.g. for EfS projects
- ongoing commitment to the philosophy of EfS through incorporation of EfS as a goal in the school's management plan (not just in the school's environmental management plan).

The research confirmed that the following groups have a major influence in facilitating a whole-school approach:

- teachers
- parents and the wider school community
- support organisations and programs (e.g. AuSSI)
- the school leadership team (principal, curriculum coordinators)
- federal and state government education authorities.

The most effective strategies to enable lasting change with a whole-school approach were: considered by teachers to be:

- embedding sustainability support practices into the school culture (61%)
- embedding sustainability into a whole of school strategic improvement plan (57%)
- including sustainability learning across all subjects taught (55%).

Where teachers said that all teaching staff in their school were engaged in EfS (4% of respondents) sustainability was also in the school's annual improvement plan. Greater funding for support networks which can assist and provide guidance to facilitate a whole-school approach (41%) were considered to be the most effective enabling strategies.

Without a supportive principal, lasting change towards whole-school sustainability is unlikely. A passionate principal will facilitate other enablers for EfS, while a disinterested principal will be a key barrier. Even with the support of the principal and most of the enablers in place, it is hard to maintain a whole-school approach without an ongoing active plan.

Key enablers towards maintaining a whole-school approach include:

- direction from the school leadership regarding the importance of EfS
- clear communication and supporting guidelines for EfS at the school level
- engagement with the local community
- cross-curriculum teacher support through internal and external support networks and/or a dedicated support team in the school
- accountability mechanisms (e.g. a regular system-wide audit of sustainable teaching practices in schools)
- state assistance with the development of teaching units
- at least one passionate teacher to begin the whole-of-school EfS journey.

→ / RECOMMENDATION 5

Promote a whole-school approach as the most durable model for implementing EfS in schools and invest in programs which achieve this over the long term.

The achievement of a whole-school approach to EfS was considered to be a medium to long-term strategic objective for schools and one which the majority of survey respondents felt would take years to achieve.

In this context, the research indicates the value of the Australian Sustainable Schools Initiative (AuSSI) in promoting a whole-school approach. Based on the findings in this report, the reinvigoration of AuSSI, or similar nationwide program, is regarded as the best way to embed sustainability into all facets of school curriculum and operations. The whole-school approach embedded in the AuSSI framework has the potential to involve all students and staff in schools in some form of exposure to EfS, whether that be through a school vegetable plot, recycling or a student-led event such as a green day. This is superior to sending individual teachers to attend

a day course in EfS where they may or may not pass on their learning to their peers. A school environmental management plan (SEMP), as recommended in NSW, can provide 'a mechanism for managing change by providing structure, direction and momentum' (Larri p40) in schools, especially if the SEMP is written into the school's management plan. Other advantages of AuSSI are:

- flexibility — each school is different and will have a different EfS focus
- covers school governance, resource and curriculum areas thus providing opportunities for cross-curricula learning in social, economic and environmental sustainability
- cost-effective professional development for teachers supported by the peer learning model
- promotes experiential and cross-curricula learning in sustainability through visible, practical on-ground projects such as food gardens
- saves money through environmental initiatives (e.g. reduced energy use)
- enables partnerships with other EfS providers outside of the school
- promotes student leadership, entrepreneurial skills and enhanced learning.

In this context, it is recommended that government and/or non-government funding be allocated to the AuSSI program or similar, with the appointment of a national coordinator. Consideration could also be given to providing funds to the national Catholic Education Commission to enable more systemic Catholic schools to also access the whole-school ASSISI program, developed by Catholic Earthcare (see section 5.1). Victoria has the most systemic approach to embedding the AuSSI framework in schools. Funding from Sustainability Victoria generously supports the Resource Smart accreditation process for schools. It is recommended that this model also be adapted for use across Australia.

A database of support organisations, resources and schools already adopting a whole-of-school approach to EfS would also be very useful in helping teachers and schools to integrate EfS into their teaching and school.

Again as summarised in finding 5, key enablers towards maintaining a whole-school approach include:

- direction from the school leadership regarding the importance of EfS
- clear communication and supporting guidelines for EfS at the school level
- engagement with the local community
- cross-curriculum teacher support through internal and external support networks and/or a dedicated support team in the school
- accountability mechanisms (e.g. a regular system-wide audit of sustainable teaching practices in schools)
- state assistance with the development of teaching units
- at least one passionate teacher to begin the whole-of-school EfS journey.

6 / FINDING 6

Other people and organisations, including those outside of the school, can bring about behaviour change amongst those teachers who do not currently incorporate EfS into their teaching.

These 'other people and organisations' include:

- parents
- pupils/students
- the business community
- teachers from *other* schools actively teaching sustainability
- support organisations and programs (e.g. AuSSI)
- local government programs
- community support organisations.

→ / RECOMMENDATION 6

Provide targeted funding for effective community and business networks/ organisations which provide support for teachers to incorporate EfS in schools.

Ensuring some program budget support to build and maintain networks for teachers which are external to the immediate school, for example through AuSSI, NGOs, and local government programs, would help schools adapt the ACARA Organising Ideas for sustainability as a cross-curriculum priority in practical ways in their local contexts. This would also engage the broader school community in learning about sustainability, which in turn reinforces learning and helps ensure consistently high standards for teaching resources.

This opportunity will be explored further in Phase 4 funding of the EfS Project, which has the following objectives:

- develop and disseminate best practice models for the building of efficient support networks for teachers and school communities, drawing from the wider school community to enable effective delivery of EfS in Australian schools.
- identify and promote strategies which enhance the engagement and efficient contributions of local business networks, local government agencies and community based organisations, to contribute efficiently to building durable support networks for teachers and schools in the delivery of EfS.

7 / FINDING 7

There is no reference to competencies to teach EfS in the National Professional Teaching Standards developed by AITSL, nor are teachers aware of the opportunities for applying the National Professional Teaching Standards to EfS.

The National Professional Teaching Standards provide an opportunity to highlight the importance of EfS. Incorporating sustainability into all disciplines across the Australian Curriculum may be best served through either a specific competency standard in EfS or its inclusion as a focus area in one of the new standards, for example, under Standard 2: *Know the content and how to teach it.*

AITSL has already worked with groups interested in Asia literacy and early childhood education to identify how the professional teaching quality standards can highlight relevant content and pedagogies (see ‹www.aitsl.edu.au/initial-teacher-education/initial-teacher-education.html› for the work on Asia Literacy and ‹www.teacherstandards.aitsl.edu.au/Topics/EarlyChildhoodReport› for the work around early childhood educators).

→ / RECOMMENDATION 7

The Australian Institute for Teaching and School Leadership (AITSL) identify, in collaboration with teachers and practitioners engaged in EfS, how competencies for teaching EfS can be most effectively incorporated into the National Professional Teaching Standards.

There are a number of ways in which the competencies to teach EfS could be included within the National Professional Teaching Standards to ensure that trainee teachers understand EfS principles and have the confidence, skills and motivation to incorporate EfS competently in their teaching (and achieve the desired response of the project for teachers: *'This makes sense, this fits naturally and easily into what I teach'*).

The possible approaches are:

1. Competency in EfS is incorporated into all three domains (professional knowledge, practice and engagement) and across the seven standards.
2. Competency in EfS is added as an additional focus area under Professional Knowledge Standard 2: *Know the content and how to teach it*, to give it equal status with other cross-curriculum priorities listed under that standard (understanding Aboriginal and Torres Strait Islander peoples; literacy and numeracy and ICT).
3. Competency in EfS becomes a new stand-alone professional standard.

Some suggested elements/capabilities for teaching sustainability, applicable to all three of the above possibilities, include:

- the ability to engender hope for the future in their students
- an understanding of the holistic nature of sustainability and its applicability across all subject disciplines
- influencing and motivating skills to inspire school leaders, other staff and students to realise the value and need for EfS in schools
- relationship skills
- integrative curriculum-writing skills
- envisioning skills to help guide their school towards a more sustainable future
- teaching and learning strategies for EfS such as place-based learning
- recognising that EfS is much more than content knowledge, skills and values — it is also about how world views influence, inform and have consequences on thinking, decision making and actions.
- knowledge of experiential and inquiry based learning pedagogies.

The general consensus among academics and practitioners working in this field is that a stand-alone standard is preferable, as research has shown that for some 20–30 years interdisciplinary frameworks are not as effective in practice (refer to Miles et al 2006 and Cutter-Mackenzie 2010).

8 / FINDING 8

Education for Sustainability in pre-service teacher education is patchy and is often only included in courses by academics who have an interest in the area.

Currently, there is little communication between stakeholders working in the EfS teacher training area (Chris Watt pers. comm. 19/12/2012). To drive systemic change at the grassroots level, the links between EfS pre-service teacher educators and other EfS practitioners/teachers working in schools 'at the chalkface' could be strengthened. This could be achieved via a national consultative committee utilising networks such as the National Teacher Education for Sustainability Network.

→ / RECOMMENDATION 8

Facilitate systemic change in teacher education institutions by setting up a high-level National Consultative Committee on EfS involving all stakeholders to develop effective pre-service teacher training courses in EfS.

To successfully mainstream sustainability into pre-service teacher education in Australia, members of a consultative committee would need to be leaders in their organisations; they would need to be able to drive cultural and systemic change and be prepared to work collaboratively with other members of the committee to embed EfS training into all pre-service teaching institutions nationally.

The organisations that should be represented include:

- teacher education institutions
- teacher and student unions
- professional teacher associations
- teacher registration boards
- governance bodies of schools across the three sectors
- state/territory departments of education and environment
- federal departments and agencies with EfS roles e.g. ACARA, ESA.

Additionally, it is recommended that the National Teacher Education for Sustainability Network shares its views with Teacher Education Ministerial Advisory Group established by the Coalition Government to provide advice on how teacher education programmes could be improved to better prepare new teachers with the practical skills needed for the classroom. It replaces the planned 2014 review of initial teacher training which was to have been undertaken by the Tertiary Education Quality and Standards Agency (TEQSA) under the previous government.

The Terms of Reference for the National Consultation Committee on EfS would include:

1. ***Developing a foundation course in EfS*** to be run early on in the pre-service education program so that it informs any subsequent subject specialisations (Lynne McLoughlin pers.comm. 8/1/2013). The course should be informed by best practice in EfS training as discussed in this report and be developed by a team of academics who work in the field and have a track record of excellence in EfS education for pre-service teachers. The course should cover foundation values and attitudes towards EfS, the principles of EfS, how to get started in teaching EfS, and teaching and learning strategies leading to competency in EfS.
2. ***Determining the type, amount and source of data needed to embed of EfS into pre-service teacher training and into the teaching of practising teachers.*** Very clear terms of reference and a timeframe for the collection of data and analysis should ensure that relevant data is swiftly available for use by the committee in their decision-making role. For example, data identifying barriers and enablers to embedding EfS training into pre-service teacher courses across all jurisdictions should be collected. Databases of national education unions, professional teacher associations and state teacher registration bodies are available to be used to collect the data.

A valuable addition to the EfS Foundation course would be to develop strategies and/or professional learning to deal with individual and motivational factors that are barriers to the delivery of EfS in schools by new teachers. Ground-breaking work in this area by Paul Murray, University of Plymouth, as described in his book *The Sustainable Self*, has resulted in cross-disciplinary sustainability training for over 1,000 students and teachers in the higher education sector in the UK.

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