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## **Models for Change: Mainstreaming Sustainability in Teacher Education in Australia**

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### **Abstract**

How do we mainstream sustainability in teacher education? This paper reports on a research study that examined the understanding of change that underpins various initiatives seeking to mainstream sustainability in teacher education, both in Australia and internationally. We identified three main models, and argue that the most complex model, the Whole-of-System model, offers the greatest change of success in efforts to mainstream sustainability in teacher education in Australia.

### **Paper**

Recognising the vital role that teacher education plays in achieving changes in schools (UNESCO-UNEP 1990; Hopkins 2001; UNESCO 1997; UNESCO 2004; UNESCO 2005), this paper reports on a research project undertaken by the Australian Research Institute in Education for Sustainability (ARIES) that examined various efforts to mainstream Environmental Education and Education for Sustainability in teacher education, in Australia and internationally (Ferreira, Ryan and Tilbury 2006). A range of initiatives and the approaches to change or 'models' underlying these initiatives were examined in order to understand which approach or model may prove the most successful in mainstreaming Education for Sustainability in pre-service teacher education in Australia.

At present, Environmental Education and Education for Sustainability are not widespread in Australian schools (Tilbury, Coleman and Garlick 2005; Linke 1980; Gough 1997; Henderson and Tilbury 2003). There are some efforts to remedy this situation, however. For example, the Australian Government's *National Environmental Education Statement for Australian Schools* (National EE Statement) (Curriculum Corporation 2005) and the Australian Sustainable Schools Initiative (AuSSI) (Department of Environment and Water Resources) are making progress in this area. However, the uptake of such initiatives and ideas is dependent on teachers who are both knowledgeable about sustainability and have the capacity to implement the whole-school approaches to sustainability promoted by AuSSI and the National EE Statement. Unfortunately, pre-service teacher education in Australia is failing to prepare teachers well for this task (Tilbury, Coleman and Garlick 2005; Spork 1992; Gough 1997; Greenall 1981; Cutter-Mackenzie and Tilbury 2002; Gough 2004). This is not surprising given that Education for Sustainability does not feature as a mandatory component in teacher education programs in Australia (Tilbury, Coleman and Garlick 2005). In their initial training, teachers may learn about sustainability in Science, Geography, or Studies of Society and Environment curriculum components of their program. However, sustainability seldom, if ever, features in educational leadership, management, psychology or sociology classes thereby limiting the potential for whole-school approaches to be taken up in schools. Our study recognised the need to address this and to find an effective process through which to mainstream Education for Sustainability within pre-service teacher education programs in Australia, across the whole teacher education system.

Our research study thus set out to review Environmental Education and Education for Sustainability initiatives targeted at the pre-service teacher education level. We sought to identify the approaches to change that underpin such initiatives and to review their effectiveness in achieving change within the pre-service teacher education sector. Our goal was not to review good practice but rather to identify strategies that could lead to changes within pre-service teacher education. Our study examined over twenty key initiatives, both nationally and internationally, and identified three models or approaches to the professional development of pre-service teachers underpinning these initiatives. These were what we termed the Collaborative Resource Development and Adaptation model, the Action Research model and the Whole-of-System model.

### *The Collaborative Resource Development and Adaptation Model*

The Collaborative Resource Development and Adaptation model was the most frequently used model in all the initiatives we considered for review. Indeed, the development of quality

resources and training in their use seems to be the default model for those seeking to influence the professional development of pre-service teacher trainees and the teacher educators who teach them not only within the Environmental Education profession but also more generally. This could be due to the tangible outcomes such as kits or resources offered by this model and the fact that it may be able to target a wide audience. We found that the collaborative resource development and adaptation model generally seeks to bring about change at the level of curriculum by developing resources that may assist in re-orienting the content and processes of curriculum towards sustainability. Environmental educators, however, often innovated upon the basic model by engaging the potential users collaboratively in the development of the resource and by ensuring the easy adaptation of the resource to suit other contexts, as Figure 1 below illustrates.

We found that the success of this model in effecting widespread curriculum change is largely dependent on the potential users firstly being aware of the materials and secondly having an interest in engaging with the material. In addition, we found that if possibilities exist for engaging stakeholders in the collaborative development of the resource, be they internal to an institution, or across multiple institutions, the impact of the program is likely to increase as they have greater ownership of and buy-in to the project. A limitation of the Collaborative Resource Development and Adaptation model, however, is that it seeks to bring about change at the level of individual programs by adding new content or improving pedagogy. In seeking to work within and through current systems and structures and isolated individuals, this model does not seek to bring about system wide change.

#### INSERT FIGURE 1

##### *The Action Research Model*

The second model we identified was the Action Research model. This model seeks to bring about change by engaging directly and 'deeply' with those practitioners who have control over the content and teaching processes of particular courses. It seeks change through linking curriculum innovation, professional development and innovative pedagogy. The initiatives we reviewed targeted teacher educators who would be able to act as agents of change within their respective teacher education institutions. One of the aims of the reviewed initiatives was to build capacity for these teacher educators to be leaders in their institutions in advancing the sustainability agenda.

A positive feature of this model is that it engages with participants as researchers. Participants can thus tailor the focus of the initiative to suit their needs, thereby retaining a high level of control over the processes. While the model relies on someone to initiate it, it is not expert-led. Rather, the 'experts' sit to the side of the model, as illustrated in Figure 2 below. This model also engages these 'experts' in an action research process, allowing for them to be continually engaging with and reflecting on how effectively the model is working for participants- allowing for evaluation to be embedded as a core component of the model. The evaluation and reflection that occurs through the action research process feeds back into the process, thus ensuring immediate and ongoing improvement. Such ongoing and iterative cycles of evaluation and reflection were unique to the action research model and are, we believe, important in ensuring that learning from the project meaningfully informs further iterations. A limitation of the Action Research model is that it is very time intensive, requiring an ongoing commitment from participants. While this model seeks to embed change within a system, in practical terms it tends to do this only within one or two institutions, not within and across the whole teacher education system.

#### INSERT FIGURE 2

##### *The Whole-of-System Model*

There are very few examples of what we call the Whole-of-System model. This model views change as occurring within a particular context and thus takes a broad and multifaceted approach to engaging change. The approach is complex and requires a clear understanding of and engagement with all stakeholders within the teacher education context. This includes working at the interface of every contextual layer of teacher education from student and practicum school principals to program directors and external agencies, so that the

organisational culture and processes of each can be changed. The model is unique in that it seeks to bring about change from the bottom-up and the top-down simultaneously, as Figure 3 illustrates.

While the flexibility of this model is a positive feature because it does not prescribe solutions but instead enables contextually specific strategies to be developed, it can also be problematic if it results in an ad-hoc engagement that sees some areas receiving less attention than others. A more systematic approach would ensure that all areas, where change is being attempted, are equally dealt with in a coherent and consistent fashion. Another limitation of this model is that it relies on a broad range of equally committed people for it to work. However, this broad engagement and commitment is also the reason for its success. The Whole-of-System model is also limited in that it is difficult to co-ordinate the range of changes occurring and thus to monitor success. Although there are a variety of challenges in implementing the Whole-of-System model, if these can be overcome, significant benefits can result. Because the model looks beyond curriculum, practitioner and institutional change to focus on systems, initiatives based on this model reported greater degrees of success in achieving widespread change, than did the Collaborative Resource Development and Adaptation, and the Action Research models.

### **INSERT FIGURE 3**

#### *Conclusion*

We concluded our study by recommending an approach to the professional development of pre-service teachers that combines the best features of the three models. Our 'Whole of Teacher Education System' model seeks to simultaneously engage all stakeholders within a system, including teacher education accreditation agencies, policy makers, planners and practitioners, in the process of change to ensure that there is compatibility in purpose and vision, and thus less resistance to any proposed change. In addition, the recommended model utilises iterative action research cycles in order to strengthen and embed change. We believe that such an approach will help to target change at a number of levels in the teacher education system; will involve the agents of change from each of the key stakeholder groups in a process that enables them to see the relevance of sustainability to their work in teacher education; and will create multi-dimensional change within and across a teacher education system. We argue that this is important if we are to obtain a commitment to, and ownership of, any innovation across a system, and, in this way, to mainstream Education for Sustainability in teacher education in Australia.

A full copy of the research report is available online from [www.aries.mq.edu.au](http://www.aries.mq.edu.au)

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## Figures

Figure 1: Collaborative Resource Development and Adaptation model

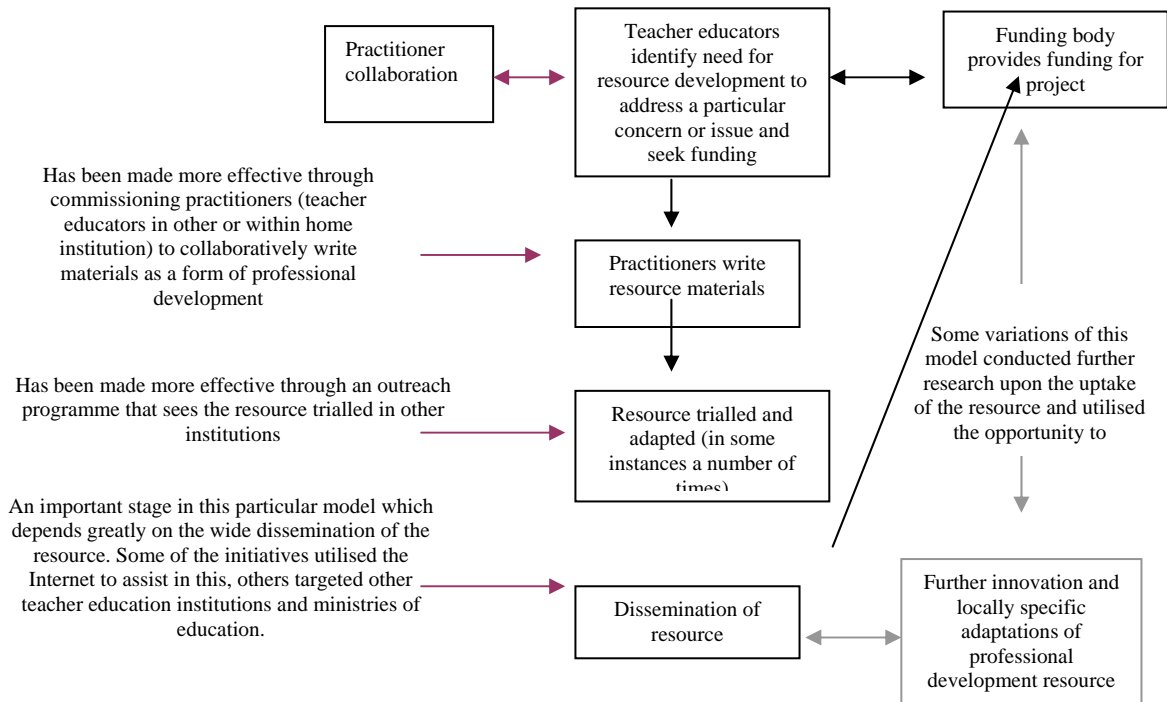


Figure 2: Action Research model

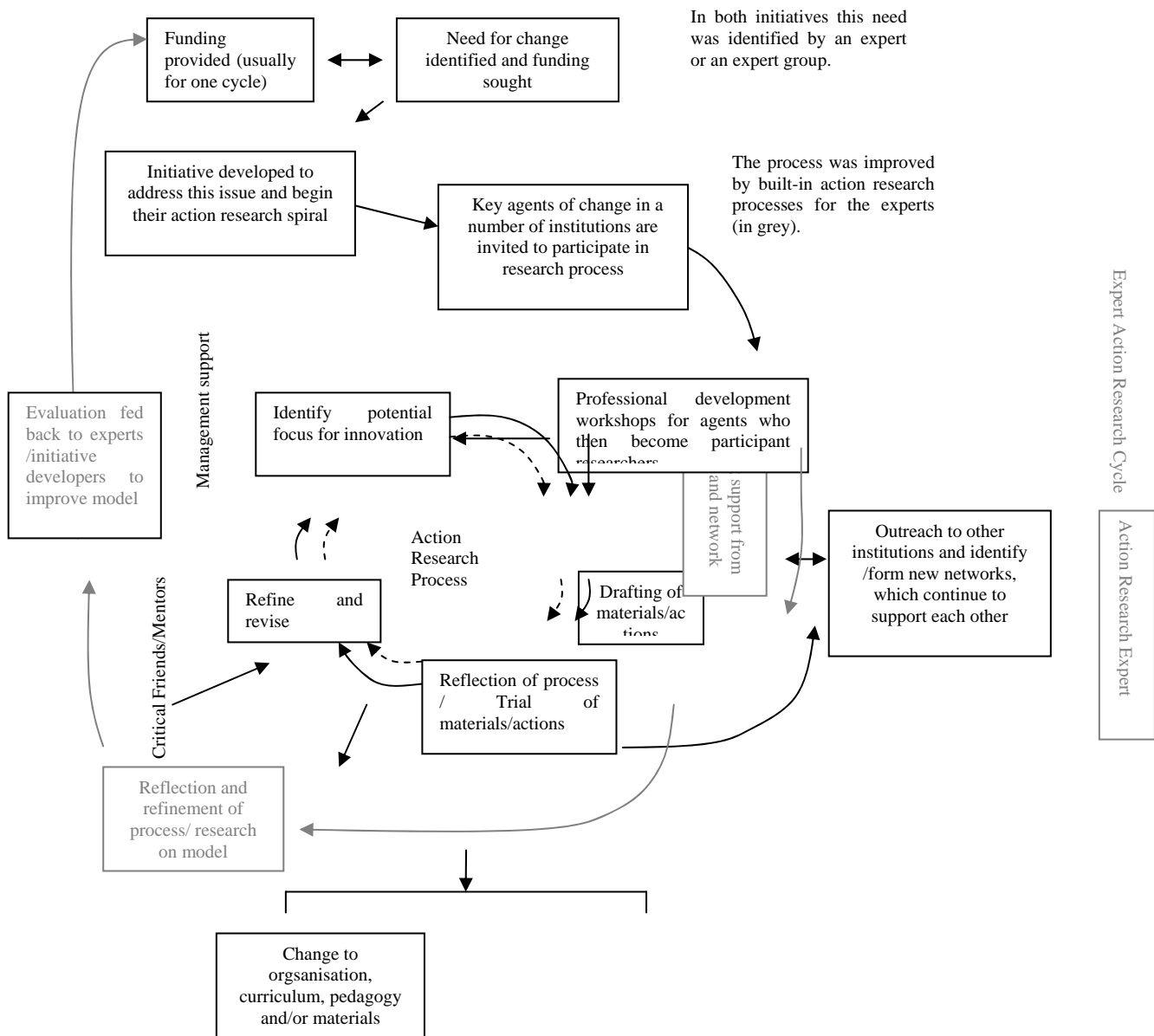




Figure 3: Whole-of-System model

