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Paper Title  Sustainability Sidelined: A Study of Education for Sustainability (EfS) Policy Implementation in Australian Schools

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Title: Sustainability sidelined: A study of Education for Sustainability (EfS) policy implementation in Australian schools

Abstract:

In light of recent Australian policy and curriculum initiatives aimed to prioritise Education for Sustainability (EfS) practices, this study evaluates the Australian Capital Territory (ACT) Education Directorate’s smart meter website, which aims to provide teachers and students from 86 primary and secondary schools access to data on energy, gas and water consumption. While sustainability, or Education for Sustainability, has been ‘prioritised’ as a cross-curriculum aim in the Australian curriculum, it has been sidelined, lost in the storm of Literacy and Numeracy outcomes and testing. With no accountability, no assessment, and no specific curriculum of its own, the priority of EfS becomes tokenistic. This study seeks to explore the voices of the teachers and school leaders and the systems that influence their practices.

1. Objectives:

This paper seeks to investigate how various factors, such as policy, whole school approaches and individual attributes influence teachers’ uptake of Education for Sustainability (EfS). As a ‘cross-curricular priority’ in the Australian curriculum, the implementation of EfS is unmonitored, unassessed and therefore lacks an equitable status alongside other subjects such as Maths, Science, English, and History.

In 2008, the Australian Government’s National Solar Schools Program (NSSP) offered eligible primary and secondary schools the opportunity to compete for grants to install solar and other renewable systems. With 86 schools participating in this program, the ACT government chose their preferred Data Collection, Storage, Visualisations System (DCSVS) (Department of Resources Energy Tourism, 2013). This DCSVS was made available to primary and secondary schools in ACT through a smart meter website, allowing teachers and students to access data on energy, gas and water consumption and compare these features over time and between schools. The ACT government has invested considerably in offering schools access to smart meters and a central website to promote EfS through energy efficiency education. The centrally mandated policies that frame this initiative are
meant to offer support and resources for teachers to include energy education as part of their curriculum.

The proposed research aims to evaluate the Australian Capital Territory (ACT) government’s Data Collection, Storage, Visualisation System (DCSVS), in light of policy and curriculum objectives to prioritise sustainability across content areas. Given that government initiatives can often be tokenistic and rhetorical, this research attempts to explore how systems such as policy, whole school approaches, and teachers’ attitudes and beliefs influence EfS practices.

2. Perspectives and conceptualisation of the study:

Background to the study

Global engagement with sustainability has increased proportionately in response to the environmental issues cropping up worldwide. Education is often seen as the main means to bring about lasting change by developing an informed citizenry. This is reflected in Australia through the increased emphasis on sustainability in school curricula (Wilson, 2012), and the inclusion of sustainability as a cross-curriculum priority in the national curriculum (ACARA, 2016). As such, EfS is often referred to as a ‘meta’ issue in the cross curricula priorities in ACARA (Buchanan, 2012). While the need for education as an agent of change remains undisputed - this rhetoric of ‘societal change’ to be reflected through education is not ‘enacted through practice at personal level’ (Buchanan, 2012, p. 112). In addition, the lack of coherent and universally accepted definitions for sustainability and sustainable development impact its equal acceptance. The Brundtland Report (World Commission on Environment and Development, 1987) that sought to offer a universal definition fell short in highlighting ‘whose development’, ‘what resources’ and ‘what compromises’ meant (Almeida, 2015).

In Australia, Education for Sustainability has been part of the national agenda for over 30 years (Department of Environment, Water, Heritage and Arts, 2009). One of the first major moves towards joining the global trends was in 1984 with the National Conservation Strategy for Australia that focused on educating communities towards sustainable
development and conservation (Gough, 2012). The Australian government set up the national advisory council, network and research program in 2000 in recognition of the need for EfS and to develop policies that are based on sound research based on practice. The Melbourne Declaration on Educational Goals for Young Australians (2008) was a key policy statement involving education ministers and key stakeholders across all states in Australia meant to provide a common framework for education. In acknowledging the role of education towards building a ‘democratic, equitable and just society’ the declaration stated that “Complex environmental, social and economic pressures such as climate change that extend beyond national borders pose unprecedented challenges, requiring countries to work together in new ways. To meet these challenges, Australians must be able to engage with scientific concepts and principles, and approach problem-solving in new and creative ways” (Ministerial Council on Education, Employment, Training and Youth Affairs, 2008, p. 04).

The Melbourne Declaration set the background for the Australian National Curriculum (ACARA, 2010), which clearly sets sustainability as a cross-curriculum priority to be taught through infusion with other disciplines. While the policy places emphasis on EfS how this is being implemented and supported across schools is highly understudied and contentious. This is especially true given that most of the focus continues to be on Literacy and Numeracy which remains the focus on standardised assessment tasks.

In line with its support for EfS the Australian government launched the NSSP to promote energy education in primary and secondary schools. One of the five objectives of NSSP was to ‘allow schools to provide educational benefits for school students and their communities’ (DRET, 2013, p. 85). In a report by the Department of Resources Energy Tourism (DRET), it is reported that even with the implementation of the NSSP and the Australian curriculum’s prioritisation of sustainability across content areas, less than 50% of surveyed schools nation-wide incorporated the subject of energy efficiency in their learning materials (2013, p. 88). It is therefore timely that three years after this national report and eight years after the start of NSSP, that the current DCSV solution used in ACT schools is evaluated both in light of the objectives of the NSSP and the curriculum prioritisation of sustainability. This study focuses on the equitability of EfS in the curriculum by exploring the events, patterns, structures, and paradigms that influence teacher and school leader practices.
Theoretical framework

The UN Decade of Education for Sustainable Development (2005-2014) may have prompted a groundswell of awareness about the urgent need for sustainable living (Davis, 2010), however, in reality, the world’s resources and ecosystems are still in rapid decline (Goekler, 2003; Lapp & Caldwell, 2012). Therefore, a different way of looking at the world is needed. As researchers, we consider the use of systems thinking is a valuable theoretical framework in which to position this project because it provides the opportunity to be ‘big-picture thinkers, able to consider the multidimensional and complex nature of the world and its problems...’ (Lapp & Caldwell, 2012, p. 492). Dominic (2015) takes this notion further by suggesting that systems thinking is a relevant way to think about contemporary environmental problems because it demonstrates the interconnectedness of societal issues. He contends that we need to consider a broader world view of multiple perspectives, rather than a ‘one size fits all’ solution (Dominic, 2015, p. 1). Similarly, Goekler (2003) had argued earlier that systems thinking allowed for a ‘new vision’ in which to seek solutions around sustainability, and states further:

Systems thinking is simply a perspective, a language and a set of tools for describing and understanding the forces and interrelationships that shape the behaviour of systems. A system is defined as a collection of parts that interact to function as a whole and continually affect each other over time. Systems are not only interconnected, but they are coherently organised around some purpose. (p.12)

Goekler’s (2003) understanding of systems thinking is a useful starting point for this study, particularly in the way he highlights the interdependency between the elements embedded in a system, for example, through an ‘iceberg model’ (p. 11).
For this study, systems thinking represents our understanding that individuals do not work in isolation, instead they operate within a range of ‘systems’ that may encourage, enable, distract or constrain teachers/school leaders/school communities toward understanding, determining, negotiating, and implementing Efs in practice.

3. Methods:

This study evaluates the Australian Capital Territory (ACT) government’s Data Collection, Storage, Visualisation System (DCSVS) by exploring the DCSVS as a ‘system’ alongside policy, whole school approaches and teacher beliefs that in turn impact Efs practices. The guiding research questions for this study include:

1. How is the DCSVS implemented and used in the classroom?
2. How is the DCSVS implemented, used, and promoted by school leaders?
3. What links are made between the DCSVS and the sustainability curriculum aims?
4. What are the attitudes towards the DCSVS and how could it be improved to further Efs educational outcomes?

By incorporating a mixed-mode design, our research is able to draw on both qualitative and quantitative approaches ‘to answer different questions within the research topic’ (Kervin,
Vialle, Howard, Herrington, & Okely, 2016, p. 35). Given that an anonymous online survey is used to collect data from 86 ACT primary and secondary schools with up to 3000 teachers and 500 school leaders (e.g. principals, sustainability leaders, and business managers), the researchers chose to approach the data quantitatively in order to collect and generalise information from a large number of respondents, including the frequency of DCSVs use, purpose of use and attitudes. However, the survey also incorporates open-ended, qualitative questions allowing for deeper meanings and understanding of teachers’ EfS practices and worldview of sustainability which may not be captured through the quantitative data. Therefore, a mixed-mode design was vital to answering the research questions of this study.

4. Data sources and evidence:

Data was collected through the anonymous online survey program, Qualtrics. The surveys, one designed for teachers and the other for school leaders, were distributed to 86 ACT schools in July 2016. Primary and secondary teachers and school leaders (e.g. principals, sustainability leaders, and business managers, etc.) were invited to participate. The surveys were both quantitative and qualitative in nature in order to provide data that seeks to answer questions such as How often? Why? How? and make direct links to how the DCSVs is furthering sustainability practices and outcomes. This is in line with the aim of this research project which is to explore how the DCSVs is realised as a tool in classroom practice and to provide recommendations to further sustainability outcomes. The survey also gauges educators’ and school leaders’ access to the resources as opportunities afforded to them for better understanding, negotiating and implementing these resources into their everyday practices.

5. Results and/or substantiated conclusions:

The purpose of the study was to evaluate the ACT Education Directorate’s smart meter website while also capturing the perspectives of teachers and school leaders on this particular tool and how it is used to promote student learning. The findings identified from the data is presented under four themes:

1. Participants;
2. Website Use;
3. Accuracy and User-Friendliness of Website; and,
4. Sustainability as Cross-Curriculum Priority.

5.1 Participants

The survey captured the perspectives of 119 respondents, 66 teachers and 50 school leaders. Of the teacher participants, 49% were secondary teachers teaching Years 7-10 (n=31), 35% were primary school teachers teaching F-6 (n=5) and 5% early years teachers (n=3). The remaining 11% reflected 1 teacher teaching College Years 11-12 and a mixture of K-6 (n=2), specialist science and sustainability teachers (n=2), Years 6-8 (n=1) and support teaching staff (n=1) as can be seen in Figure 1.

![Figure 1: Age Groups the Participating Teachers Teach](image)

Of the 50 school leader participants, 46% were principals (n=23), 34% were business managers (n=17), 10% were deputy principals (n=5) and the following 10% (n=5) were a mixture of administrative staff (n=2), sustainability coordinator (n=1), business service officer (n=1) and 1 unspecified (See Figure 2).
5.2 Website Use

Teachers

An important finding from this study is that 82% (n=54) of the teacher participants were not aware of the website, with 9% (n=6) knowing about the website but do not currently use it and only 9% (n=6) using the website and finding it useful. The small number of teachers who use the website, explained that they used it for purposes such as linking to STEM curricula, motivating changes in behaviour among students and staff (e.g. turning off lights, etc.), and working with data that represents the ‘real use’ of energy and water in their school.

Surprisingly, only 6% (n=4) of the the teachers surveyed said they used the website to participate in Sustainability challenges, such as Parliament of Youth and Earth Day. However, one teacher explained that:

*We’ve used this website to show students real data and teach them how to analyse it. It was a very useful tool for students when justifying their proposals for Parliament of Youth.*
While most of the participants were not aware of or did not use the website there appears to be a genuine interest from the teacher participants in using the website in the future. Some teacher participants commented:

I will now investigate the website to see what it can offer and then plan appropriately from there. Our Sustainability committee may also use the data in their planning.

I am a new teacher, but now that I know about the site I can use it in Maths for calculations kW per hour, and per square metre, compare it to houses and other buildings.

Now I know about the website, I can use it as a resource in promoting sustainability.

A website such as this would link in very well with curriculum goals (Technologies).

School Leaders
While the majority of the teachers were not aware of the website, the majority of school leaders were aware of the website but only used the website for purposes relating to resource management. When asked to tick purposes that were applicable to their school, 66% (n=33) of school leaders said they used the website to identify problems (e.g. water leaks) and 32% (n=16) to improve energy efficiency and reduce energy consumption. On the other hand, 22% (n=11) stated they did not know the website existed and 18% (n=9) claimed that they did not use the website for any particular purpose. No one ticked that the website was incorporated into their school curriculum and only 4% (n=2) said they used the data to encourage student participation in Sustainability challenges (e.g. Parliament of Youth and Earth Day).
While the majority of qualitative comments related to how the website helped to identify leaks and inefficiencies and/or overuse, below are a few comments made by the school leaders who responded to the survey:

We rarely use website. Use of invoices appears to be more current.

Made us conscious of use but difficult to set targets.

It has definitely raised awareness and consequently students have engaged with programs such as earth hour and energy reduction campaigns to reduce energy consumption.

5.3 Accuracy and User-friendliness of Website

Teachers

While the majority of the teachers had never visited the website, those who had argued that the feature they used most was the ‘comparing time periods’ feature, with 12% (n=8) of teachers using this feature and with 6% (n=4) using the ‘comparing schools’ feature (see Figure 3).

Figure 3: Website features used by teachers
However, some teachers commented that the lack of accuracy made some of these features and the website as a whole invalid. For example, one teacher commented that while he liked the compare feature, the data was inaccurate:

[Name of school deleted] High has around 285 students at the moment. The site says 205. Update the school info. Like the compare function.

Another teacher recommended to improve the website that the information on the website needed to be accurate and/or updated:

Accurate data of water usage [needs to be improved]. it doesn't seem right. Or there are months of data missing.

Overall, the teachers who had visited the website, felt that the site was user-friendly (n=6) or somewhat user-friendly (n=5), with only 1 teacher feeling that it was not user-friendly.

School Leaders

Of the school leaders who had visited the website (n=33), over half felt that the website was somewhat user friendly (n=18), 13 school leaders felt it was very user-friendly, and two felt it was not user-friendly. In a similar vein to the teachers, there were some respondents who were concerned about the accuracy of the data on the website:

It appears (after I had a look this morning) that the only meter recording anything is the gas.
[Website needs to be improved to] Ensure data is accurate and our system is correctly using the data properly when making comparisons.

I have no way of knowing is the data is accurate. When making comparisons between school we seem to be well below.

Use of invoices appears to be more current.

5.4 Cross-curricular priority

Teachers

The limited number of teachers who use the website at all, and as an educational tool, appear to use it primarily in STEM subjects (Science, Technology, Engineering and Mathematics) curricula (See Figure 4). Just over a quarter of the respondents (n=17), said that the data was incorporated in Science or Science related subjects (e.g. Environmental studies, etc.).
In analysing Figure 4, it does not seem to support the aim of Sustainability as a cross-curricular priority, particularly through the use of an educational tool, such as the smart meter website. Part of the issue is simply that not enough educators know about the website and/or how to incorporate its use into their curriculum area. This raises concerns about sustainability as a cross curriculum priority and expectation for teachers to incorporate this in their everyday teaching practices without proper support and guidance on how to do this.
While many of the teachers have not used the website, many have commented on their future intentions of using this website as a tool now that they have been made aware of its existence:

I will look at the website and see how it can be used in Kindergarten.

Now that I am aware of it's existence, I will consider integrating use and data into health and civics.

Now I know about the website, I can use it as a resource in promoting sustainability.

Has a link been provided on the ACT Directorate website? Who is responsible for informing ACT teachers about this site? If I could receive their contact information I would happily email them to inquiry about this website.

School Leaders

With only 10% (n=5) of school leaders claiming that they use the website to link to sustainability curriculum, it might be suggested that this website is not being used (but could be) to link to the Sustainability curriculum and promote Sustainability as a cross-curricular priority within schools. Interestingly, the finding that suggested five school leaders said they did link the website with curriculum was in contrast with a previous finding in which no one indicated any links between the website and sustainability curriculum within the school (see section 2.2.).

One of the interesting findings in this study is that when school leaders were asked how their school supported understanding and use of this website, they responded with:
In all honesty professional learning for staff has been mainly around Literacy, Numeracy and Special Needs education specifically. Whilst the website clearly links to Maths and Science concepts, teachers are not aware of the site and what it has to offer learning.

We focus on literacy and numeracy along with student welfare and engaging parents. I'm not saying there is anything wrong with the website but it is a low priority....No offence but this website is not core business so I'll avoid it as long as I can.

6. Significance

This study is significant for education as a whole and EfS in particular. While policies and curriculum can in fact influence teachers, students and schools, this study seeks to identify how tokenistic approaches, such as the implementation of a DCSVs, are realised in classroom and whole school practices. While EfS has been identified as a priority in policy and the Australian national curriculum, the significance of this study is that it attempts to capture the voices of the teachers and school leaders who are expected to implement these policy and curriculum aims and who are central to the ‘systems’ at work around them. This research is also significant in its mixed-methods design in that it attempts to look at the big picture, yet providing an opportunity for distinct voices to be heard.

7. Conclusion

This study explores the influence of events (e.g. tools such as DCSVs), patterns (e.g. whole school approaches and administrative perspectives), structures (e.g. policies and curriculum) and paradigms (e.g. teachers’ worldview and attitudes) on EfS practices. While sustainability, or EfS, has been ‘prioritised’ as a cross-curriculum aim in the Australian curriculum, in fact it has been sidelined, lost in the storm of Literacy and Numeracy
outcomes and testing. With no accountability, no assessment, no specific curriculum of its own, the priority of EfS will continue to be discussed in policies as a tokenistic gesture until we begin to listen to the voices of the teachers and school leaders and explore the systems that influence their practices.

References


