Education for Sustainable Development within Textile Technology: A Case Study of Two Schools.

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Abstract

Education for sustainable development (ESD) is an international theme for the United Nations Educational, Scientific and Cultural Organization (UNESCO). It is also a key part of the National curriculum for design and technology (D&T) in England. Textile recycling projects are a popular example of sustainable education within secondary (11-18) D&T curriculum, across the East Midlands.

However, at the last Pupils Attitudes to Technology conference (PATT27) von Mengerson (2013b) criticised the limitations of textile recycling projects and posed the need for further enhancement (p. 356). This echoed comments made by Stables (2008) who called for a need to address pupils' superficial awareness of environmental issues and Wilkinson's (2013) argument that sustainable curriculum should be enhanced through greater criticality.

This paper reports on a small-scale case study designed to shine a light on year 9 (13-14 yr.) education for sustainable development, evaluating current schemes of work (SOW) and pupils' perceptions towards ESD. As part of this research the aim was to provide guidance to enhance the critical aspect of ESD within future textile technology curriculum.

The case study is part of a collaborative action research project between a teacher educator, working in a UK University, and a secondary D&T teacher, working at a University partnership school. Findings from the case study have already been used to plan interventions and new curriculum for both trainee teachers and year 9 pupils.

The paper concludes that SOW need to provide a more varied educational experience of recycled textiles linked to the knowledge, concepts and skills associated with reprocessed materials and to draw on the pupils culture of clothes swapping.

Introduction

Sustainability became part of the design and technology curriculum in England, in 2005 (National STEM Centre, 2009) and it continues to be in the new National Curriculum (Department for Education, 2013). Internationally education for sustainable development (ESD) is a theme of UNESCO's 'Education for the 21st Century' (UNESCO, 2014). In this study we consider how this significant topic is played out in secondary schools being mindful of Stables (2008) work that identified pupils' superficial awareness of environmental issues

and the need to change attitudes towards environmentalism within a school context.

The School of Education at an English university in the East Midlands was allocated in-house 'Green Impact' funding to set up small-scale research projects between initial teacher education (ITE) academics and partnership schools. The two researchers involved in this project have experience of introducing D&T sustainable development activities primarily using textiles. The most common form this takes in schools is as a textile recycling project, which, we have seen motivate pupils in relation to the concept of recycling design.

For this reason, we have approached this small-scale research project with the aim of shinning a light on current Year 9 ESD within a textile technology context, at two local partnership schools. We will do this by answering the research questions: (1) what does, ESD within Year 9 textile curriculum look like at two schools? and (2) how do the Year 9 pupils perceive sustainable development (SD) across both schools.

Literature Review - Sustainable design curriculum

What does ESD look like within the D&T curriculum? We started off by looking at the current literature. To do this successfully we decided we had to review the literature in order to:

1. explore current practices and messages in other countries and subjects in order to identify significant tension related to ESD within the D&T curriculum, and
2. examine key resources currently used by D&T teachers when teaching about sustainability.

The new curriculum required pupils to be taught:

1. to be critical of the impact of products on daily life and the wider world;
2. to understand the impact of design and technology developments, on individuals, society and the environment; and
3. about the responsibilities of designers, engineers and technologists.

As has already been commented this has been a focus of the previous curriculum yet Stables (2008) and Hardy and Barlex (2013) argue it is rarely seen in schools, is superficial and a 'ritualized treatment of the 6Rs' (p. 216). Petrina (2000) proposes a D&T curriculum that includes knowledge and understanding of "resource streams" and " wakes", developing responsible designers that are aware of the cost of our ecological footprint (p. 229).

Specifically within the teaching of textile design, Fletcher (2013), argues that design education must address the issues of design for obsolescence that appears to have been built into the culture (p.140). However, as Petrina (2000) suggests the predominant pedagogy in D&T is for creating more stuff, in contradiction to the new curriculum's content. This is not unique to England and von Mengerson (2013b) writes about the popularity of recycled textile projects within the Australian curriculum, which she feels is limited and could be enhanced through skills associated with repair.

Wilkinson (2013) is troubled by her findings from a study of the Ontario school curriculum and revealing a "prevailing ideological discourse of neoliberalism that continues to prioritize values of individualism and economic competiveness" (p. 503) and calls for a more critical education. Her conclusion is that teachers need to "prepare technologically literate citizens" (p. 504). Walshe (2008) supports Wilkinson's argument and suggests that "teachers consider spending time in lessons not only understanding the complexity of sustainability, but encouraging students to make more direct links to their own lives, perhaps thereby encompassing a more political, 'who decides?' dimension to sustainable development" (p. 555). However, this can be difficult for D&T teachers and von Mengerson (2013a) argues that curriculum need to be enhanced.

There is a similar situation in geography reported by Walshe (2008) who identified that

pupil's did not "explicitly consider the political aspect of sustainability" (p. 552). She also identified that pupils need to see the relevance of sustainability "for their life" (p. 553) and an awareness that sustainability was about things "lasting into the future rather than considering the possibility of changing or improving futures" (p. 554).

Von Mengerson (2013a) stresses the need "to continue clarifying sub-themes that argument the term 'sustainability'" (p. 344). This leads us to look at the resources available to help teachers with ESD. Practical Action, a non-governmental organisation, was awarded European development funding to create a framework for use in the classroom. A working group was formed in 2006 with partners from Loughborough University and the Centre for Alternative Technology. The group produced the 6Rs as "an approach to help students think about sustainability" (Practical Action, 2014) and UK examination boards adopted these in 2007. The 6Rs are:

> RECYCLE: Reprocess a material or product and make something else.
> REUSE: Use a product to make something else with all or parts of it.
> REDUCE: Cut down the amount of material and energy you use as much as you can.
> REFUSE: Don't use a material or buy a product if you don't need it or if it's bad for people or the environment.
> RETHINK: Do we make too many products? Design in a way that considers people and the environment.
> REPAIR: When a product breaks down or doesn't work properly, fix it.
>
> (Practical Action, 2014)

This resource is the most common approach seen in schools and other resources are rarely used. A relatively new resource from the Ellen MacArthur Foundation provides case studies and resources relating to the circular economy (Ellen Macarthur Foundation, 2012), however, neither of the authors has seen these in use.

Methodology

Within this research we used a case study methodology to explore sustainable textile design within two UK schools. Cohen et al. (2011) describe case study research, as an investigation that reports on "real life, complex, dynamic and unfolding interactions of events, human relationships and other factors in a unique instance" (p. 289).

The research followed British Educational Research Association (BERA) guidelines for 2011 and met with the authors' University ethical clearance procedures, which included participant anonymity and data protection.

In order to explore sustainable textile design within two local partnership schools, we used two sets of data: (1) schemes of work (from both schools) and (2) focus group interviews (used with 5 pupils in each school). These are detailed below:

(1) Schemes of work. Teacher's produce schemes of work (SOW) that plan out what they will teach over the course of several weeks. They also outline lesson-by-lesson subject content. Both schools' provided SOW for their planned recycled textiles project during the teaching year 2013-2014. The SOW had been written using the National Curriculum 2006.

(2) Focus group interviews (Cohen et al., 2011). We conducted two semi-structured focus group interviews with Year 9 pupils, at both schools. We asked the pupils the following questions: (1) Did they enjoy learning about SD in textiles? (2) Do they think designers need to consider SD within textiles? and (3) What do pupils do with their clothes after they don't wear them anymore?

Due to the nature of the focus group, we do need to be mindful that “some participants may dominate the group and their behaviour may lead to a false sense of consensus” (Wilson, 2012).

Data analysis
We discussed earlier about the adoption of the Practical Action 6Rs, by D&T teachers working in the East Midlands. As early career researchers, with limited experience of coding, we decided to use a deductive method (Miles, Huberman, & Saldana, 2013) and chose to use the 6Rs as code themes for data analysis.

Findings
This section explores some of the results from the two SOW from School A and B and then combines this information with findings from the two interviews.

Schemes of work
Both SOW provided evidence of the 6Rs: rethink, reuse and refuse. However, only SOW A contained content linked to recycle and SOW B contained content about reduce. Neither school mentioned repair within the SOW.

The two SOW encourage pupils to rethink through the need to “understand the environmental impact of the products they design” (School A) and “the importance of designing and selling products that demonstrate environmental concerns” (School B). These statements reflect the aims of the previous National Curriculum and potentially allow pupils to “design in a way that considers people and the environment” (Practical Action, 2014). However, as both SOW lead to the making of new products the aspect of rethink: “Do we make too many products?” (Practical Action, 2014) is not considered.

School A’s SOW refers several times to developing pupil’s skills and confidence in the “use of recycled materials”. However, there is no mention within the lesson-by-lesson content of reprocessed materials (see Practical Action 6Rs definition).

Focus Group Interviews
The Year 9 focus groups evidenced awareness of all 6Rs. All 10 pupils (School A: A-E and School B: F-J) made reference to aspects of rethink and the majority of pupils discussed refuse and reduce. There were fewer mentions of repair, reuse and recycle.

At the start of the interview we asked the Year 9 pupils if they enjoyed learning about SD in textiles? In School A pupils enjoyed working with recycled materials, which they described as “interesting” (Pupil C), “different” (Pupil C, D and E) and “imaginative” (Pupil E). Pupils from School B struggled with the word sustainable. They didn’t know what the word meant, and so the researchers explained what the word meant and the group decided to use the word environmental. During a conversation about environmental issues, pupils expressed the desire to learn about environmental issues in “more depth” (Pupil G) and find out about “the United Kingdom and what’s happening round here” (Student F) as opposed to global environmental issues.

When asked if they think that designers need to consider SD within textiles, the pupils felt that designers have a duty to look after the end user and consider the environment. Pupil F talks about products that:

> like are more comfortable for other people, not just yourself? Some people wear things that they like, but other people may not like it. So you've got to try and make it blend in with how other people feel comfortable in clothes so it would be better for the population and the environment.

Pupil C talks about:

> Well, if it's more sustainable and using more environmentally friendly materials then obviously you're going to feel better with the outcome because you've used materials and you haven't just thought about what you want but thought about what's better for the environment and what's going to be better for overall.

Pupils from both groups identify the benefit of using sustainable fabrics and fabrics that are "better for the environment" (Pupil G) when designing. Pupil D talks about textile materials that are: "stronger" and Pupil C considers how:

> It's important to know how things are made and why it's important not to just use any materials and that you should think about what they're using to get the best outcome.

No pupils mention alternatives to creating products or how they judge the sustainability of a textile material. Pupils at school B discuss the different energy sources taught in Geography and how D&T can help them to use this when designing products.

When asked what they did with their own clothes after they stopped wearing them, the pupils discussed a variety of outcomes. These included: passing on clothes, hording clothes and mending clothes.

Nearly all the pupils talked about how they didn't throw clothing away, but passed clothes on to family and friends (Pupil A, D, E, and F); or gave to local charity shops (Pupil B and G); or sold via car boot sales (Pupil D). Pupil F talked about how:

> I usually - it sounds a bit daft, but usually my cousin, she's nine, but she's really tall, just like me. I pass my clothes onto her, because my clothes are still in good condition, I look after what I've got. So because my cousin's tall and skinny compared to me, I pass my clothes onto her. So when she grows up and gets bigger she can wear what I've given her, or if it's too small for her or way too big for her, I do take it to the charity shop because my uncle and my nan are doing voluntary work at a charity shop, so they take it down for me, sort of thing.

This same pupil also talked about using charity shops:

> I have, I make dyed T-shirts usually and I did buy a plain white T-shirt from the charity shop. It was a V-neck T-shirt, it was a good price, it was my size. I already had the dye and everything to make it and then I do go around and wear it. There's nothing wrong with it, it's been washed, it's been cleaned, it's been dried, (and) so I don't see what's the problem with it. People look at it and think you got that from the charity shop, that's disgusting, you're a tramp, sort of thing. I'm like I'm not a tramp really, it's been washed, it's been cleaned, (and) you can't really say anything bad about it.

Two of the pupils spoke about how their clothes "just stay there (in the wardrobe)" (Pupil D). When the researchers talked about throwing clothes away, one pupil commented that

> I think that's quite selfish actually because if you just throw them in the bin then all of the time and money and hassle to make them has just disappeared, because if you don't want it anymore then you can pass it onto someone or give it to a charity shop or someone who needs it. Not just throw all the energy away (Pupil B).

When the subject got onto mending clothes, Pupil B talked about how her "mum normally sews them back up again until I've finally decided that I can't physically wear them anymore"

and Pupil E contemplated that he might mend a garment:

> Depending on the size - say there was a hole in a shirt - depending on the size of a hole in the shirt I would mend it but it depends how big it is.

One pupil talked about getting their "shoes repaired once" (Pupil F) and Pupil J discussed how:

> Shoes like mine are - trainer sort of shoes can't be heeled then. So I think - because you can get good ones from Clarks and stuff but if you get - shoes that you can get re-heeled are normally a lot more expensive than ones you can't.

Analysis and Discussion

On examination of the SOW and focus group interviews it is clear that the pupils have a wider experience of SD than the planned SOW might suggest. We will look at both sets of data collected, against each 6R to draw out points for discussion.

(1) Recycle. Practical Action (2014) defines 'recycle' as a reprocessed material or product. For example Polartec® is a textile material reprocessed from plastic bottle waste. The SOW at School A does not include content or resources about reprocessed textile materials and there appears to be a misunderstanding about the definition of the word (von Mengersen, 2013a). An explanation for this might be, that the SOW, refer pupils to use inspiration from existing products made by Gary Harvey. Gary Harvey is a contemporary fashion designer, who uses vintage old clothing to make couture garments. The website calls his garments "Re-cycled 'Eco-Couture' Collections" (Harvey, 2014). Therefore, pupils are experiencing 'recycle' as a concept linked to reusing waste textiles. Without the experience, of learning about reprocessed materials, the pupils understanding of 'recycle' is limited.

(2) Rethink. The SOW made no mention of the rethink question: do we make too many products? This reflects Wilkinson's (2013) findings in Ontario that call for a more critical education. A point of interest, however, is the use of fair trade fashion company 'People Tree' (School A) as an example of existing products. This resource has the potential to support pupils in seeing different business models of consumption (Fletcher, 2013; Petrina, 2000).

(3) Reuse. The pupils in School A referred to the reuse of an existing product (in this case, textile waste) as a recycled material (see discussion above about the misunderstanding within the SOW). They enjoyed reusing textile waste to make their new products. One of the pupils found the reuse of textile waste "interesting" because they got to look for waste textiles within their homes, making connection with their lives (Walshe, 2008). SOW may enable the connection with the pupil's home life, through the reuse of textile waste, however, it feels like there is a missed opportunity around curriculum content linked to the pupils' culture of passing on unwanted clothes. Teachers might need to recognise their pupils' sustainable behaviour within planned curriculum.

(4) Reduce and (5) Refuse. Pupils are aware of a need to make sustainable choices about material. However, their knowledge of 'how' to make sustainable choices about materials and processes appears superficial based on the pupils' lack of understanding about the ecological footprint needed to make judgments about the sustainable credentials of chosen textile materials. This supports previous findings from Stables (2008) and Petrina (2000).

(6) Repair. The SOW includes no mention of what to do when a product breaks down or does not work properly, and how pupils might fix it. This doesn't acknowledge the responsibility of the designer (Petrina, 2000), or address the issue of design for obsolescence (Fletcher, 2013). The pupils demonstrated some awareness of shoe repair and mending, however, this may have been linked to the socio-economic background of the

pupils and would require further investigation to decide if von Mengerson's (2013b) theory of ESD enhancement through skills associated with repair is achievable.

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