Creation of interactive activity pods at a Recycling Education Centre

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Abstract

This paper describes the creation of interactive, educational activity pods at an education centre at a recycling depot. The project originated from a new waste management contract between Cheshire West and Chester Council (CWaC) and May Gurney (now Keir Waste Management), which included the provision of educational facilities. Representatives from May Gurney and the council’s waste management team approached the Faculty of Education & Children’s Services looking for input into the proposed education centre to be set up in Winsford, Cheshire.

An already existing module on Education for Sustainable Development (ESD) was modified to enable trainee teachers on a specialist global learning route of an undergraduate programme to devise and create interactive exhibits and activities for the Centre. These outlines and prototypes were displayed in an assessed exhibition at the University. Here trainees shared their plans and ideas, which were taken away and transformed into professionally presented, durable activities and pods. Although a quite unique opportunity to create learning resources about recycling issues, the process described in the paper illustrates ways in which HE, the private sector and LAs can co-operate effectively for mutual benefit and the benefit of learners. Trainees’ ideas also illustrated ways in which the, sometimes quite abstract, concepts of ESD can be translated into engaging activities with implications at local and more global levels.

Introduction

Reduction of waste and raising the proportion of waste that is recycled are key environmental objectives and policies of the UK government. Within the recycling policy, significant objectives include raising the quality of recycled material and improving household collection services (DEFRA, 2014). Following the Household Waste Recycling Act 2003, which required local authorities to provide every household with a separate collection of at least two types of recyclable materials by 2010, a range of kerbside collection schemes by local authorities have evolved and developed. These have led to a vast, though variable, improvement in recycling rates in the UK – in 1983/84, only 0.8% of waste was recycled; in 2012/13, the figure was 43.2% in England (DEFRA, 2013). The improvement has not been without controversy, however, with UK local authorities changing the frequency of household waste collections and also taking a range of approaches to collecting recyclables (WRAP, 2011). Nevertheless, kerbside recycling is considered to be ‘a key non-monetary initiative to encourage recycling’ (Abbott, Nandeibam & O'Shea, 2011).
For councils and other waste producers, an important driver for increasing recycling rates is landfill tax. This was introduced in 1996 and is increased yearly; helping the UK to meet the EU’s Landfill Directive (1999). The tax aims to make landfill disposal a more expensive and unattractive option than recycling. It also makes alternative waste treatment technologies, such as Energy-from-Waste (EfW), more financially attractive (letsrecycle, 2014).

A key way of implementing the policy of improving the quality of recycled material is source separation, where ‘materials are separated at the kerbside, usually into a specially designed lorry with different compartments for different materials’ (Friends of the Earth, 2009). According to Friends of the Earth (2009), this has a number of advantages over the collection of mixed or commingled recyclables, including less contamination and increased revenue from sale of materials. Source separation puts the onus on householders, however, to sort materials into separate bins or containers. Although WRAP reports that this is not a serious issue for most – ‘87% of survey respondents who have to separate out different materials indicated that they do not mind that task’ (WRAP, 2009) – the success of source separation will depend greatly on the commitment of householders.

Communication and education about recycling will be key factors in gaining and maintaining this commitment: as reported by RECOUP (2013) ‘Consumer education is a key driver to behaviour change’. A US study in 2010 found that ‘cumulative expenditure on recycling education increased recycling rate, at the 10% level of significance. Spending one dollar per person per year will increase the rate of recycling by approximately 2%’ (Sidique et al, 2010). The message about recycling must be coherent (Mee, Clewes, Phillips & Read, 2004) and, according to research by Strong (1998, cited in Mee & Clewes, 2004) ‘communication with and education of parents via their children is likely to be beneficial to recycling rates’. Primary school children have high levels of environmental understanding (Strong, 1998, cited in Mee & Clewes, 2004) and their pester power and influence could have a significant impact on their parents’ commitment to recycling and source separation.

The Project

When the newly constituted unitary local authority of Cheshire West and Chester Council (CWaC) took over responsibility for waste management from Cheshire County Council and three district councils (Ellesmere Port and Neston Council, Chester City Council and Vale Royal Borough Council) in 2009, tenders were invited from contractors for a new cross-borough waste collection service, which would have source separation as a key element and ‘Recycle First’ as its slogan. Previously the three district councils had each taken a different approach to the collection of recyclables. Initially eight bidders tendered for the contract, with one bidder (May Gurney, now Keir Waste Management) making recycling education, through the setting up of a dedicated education centre, a significant feature of its bid. May Gurney had made successful bids in other local authorities and recycling education had also been a key feature of those bids.

The bidders for the waste collection contract went through a process of competitive dialogue with the CWaC waste management team. Bids were scored against criteria with the balance between quality of the bid and price split 60:40.
A shortlist of three contractors was selected for the final tenders – two of these amalgamated, so that two bids were finally submitted to the members of the council for consideration and final decision. May Gurney was the successful bidder at the end of the process – the company agreed to take on the transfer of risk, in terms of commodity prices for recycled materials, required by CWaC and also to work with the waste management team on public engagement and education. They also accepted the target of 63% of CWaC waste being recycled by 2014 – at the time of writing; this target has not been met (currently, 58%), though the rate has risen significantly from 40% at the start of the contract.

Once the contract had begun, the CWaC waste management team and May Gurney identified a smaller project team to work on the development of the education centre, which would be located at one of the recycling depots. The team consisted of Jody Sherratt, Recycling Awareness Manager, and Liz Ellis, Recycling Awareness Officer, from CWaC and Richard Booth, Recycling Engagement Coordinator from the contractor. Liz brought expertise with her from other waste education projects, including the Junior Environmental Officers (JEO) Club – this involved most primary schools in the CWaC area with each school having children designated as JEOs, with a brief to raise awareness of waste and recycling issues amongst their peers.

The team discussed initial ideas and decisions were made at an early stage about the use of interactive activity areas or pods in the centre. Target audiences of primary-aged children and adult community groups were identified and members of the team visited other local centres and related sites for ideas and inspiration. These included the education centre at Wrexham Recycling Park, the Museum of Science and industry in Manchester, Viridor EfW plant in Bolton and the education centre at Gatewarth Community Recycling Centre in Warrington. A survey was sent out to JEOs and link teachers in CWaC primary schools to gather their views on what the centre and its pods should contain – details of this survey’s findings can be found in the Appendix.

At this point in the education centre’s evolution, the team decided that the hands-on involvement of teachers and/or trainee teachers in the development of the centre would be particularly valuable, especially in relation to turning the wealth of ideas from the JEOs into engaging activities. Through links with a tutor in the University of Chester Geography Department, the team contacted Tony Pickford in the Faculty of Education & Children’s Services, subject leader for the Global Dimensions specialism in the four-year B.Ed undergraduate primary initial teacher education programme (Pickford, 2009).

With the advent of a new three-year BA with QTS programme, the specialism was working with a final cohort of trainees in year two of the B.Ed programme in 2012-13. In common with other specialisms, it featured four dedicated 10-credit modules in years 1 and 2 of the B.Ed plus opportunities for trainees to focus on a more narrowly defined aspect of the theme in the Specialist Subject Application (SSA) modules in years 3 and 4. The title of the specialism derived from four distinct dimensions of global learning that formed the basis of the initial modules: three temporal dimensions (past, present, future) and one relating to practice (Learning Outside the Classroom or LoTC). The temporal dimensions drew on related subject pedagogies from history, geography, religious education and science, with contributions from the skills and processes of ICT and design.
technology. They provided distinctive lenses through which global issues could be explored and analysed, as well as contexts for the exploration of key ideas and concepts, such as the relationship between issues at local and global scales.

In an initial meeting with the project team in the summer of 2012, the subject leader identified the first module in year two of the specialism - entitled ‘Teaching Education for Sustainable Development (ESD)’ - as a very appropriate context for developing ideas and activities for the education centre. The module already focused on solutions to environmental problems and issues, especially the contribution that education can make to awareness raising and action in the environment. Focusing on the teaching of Education for Sustainable Development (ESD), the module began with a trip to the Centre for Alternative Technology (CAT) at Machynlleth in Powys. During the visit, trainees focused on a chosen environment threat and explored the solutions offered by the Centre. On their return from CAT, trainees worked in groups to create a resource for teaching about their chosen threat/solution at key stage two, in the context of the concepts of ESD (Hopkins & McKeown, 2002). Skills from Design Technology and ICT were used to make an assessed exhibition, which presented their ideas to an educational audience. The process of designing, making and preparing was then explored through a critically reflective essay. Learning outcomes for the module were:

1. Explain how technology may offer some solutions to current environmental threats;
2. Describe the principles of sustainable development and the concepts of ESD;
3. Plan and prepare teaching and learning activities to apply and develop, at least, one ESD concept;
4. Use ICT tools to model problems and solutions;
5. Critically analyse approaches to teaching and learning ESD.

In the meeting with the team and subsequent email contacts, the subject leader and his team of tutors decided that the focus of the module would be narrowed down to education about waste issues and recycling, whilst retaining the focus on ESD concepts – all of which could be addressed through the lens of waste education. A module modification was submitted to the Faculty’s Board of Studies and amended learning outcomes were identified for the final run of the ‘Teaching ESD’ module in 2012-13. These revised outcomes were:

1. Describe the principles of sustainable development and the concepts of ESD;
2. Plan and prepare teaching and learning activities to apply and develop, at least, one ESD concept;
3. Devise a resource for teaching and learning about a specific ESD issue;
4. Critically analyse approaches to teaching and learning ESD.

Module content would begin from the concepts of ESD and go on to explore links with waste-related issues, especially recycling of materials. Drivers behind
recycling would be explored as well as underpinning concepts, such as the circular economy (WRAP, 2014) and the ‘zero waste economy’ (DEFRA, 2014). Different aspects of recycling would be highlighted making links to possible activities to be devised for the education centre, including food waste, composting and waste electronics. Given the over-arching theme of the specialism, module content would also make links to global aspects of the waste theme, including recycling in the developing world (Wilson, Velis & Cheeseman, 2006). Although no longer formally identified, the technology learning outcome in the original module would remain a feature of the third learning outcome through the identification of technology-related recycling solutions and the use of technology enhance learning (TEL) in the resources/activities made by the trainees.

The module began in October 2012 with an introductory session covering the content outlined above. Assessment requirements of the module were also presented and explained:

Component 1: A group exhibition of a resource to help in the teaching of an ESD concept related to waste reduction, re-use and/or recycling. Word Limit: 1500 words or equivalent. Learning Outcomes: 1, 3 & 4. Weighting: 75%

Component 2: An individual rationale for the teaching and learning approaches used in the resource and exhibition, informed by research, reading and inspection evidence. Word Limit: 500 words (+/- 10%) Learning Outcomes: 1-5. Weighting: 25%

Teachers Standards Addressed: Part 1 1c, 2b, 2d, 3a, 3b, 4a, 4b, 4c, 4e, 5a, 5d, 6a, 6b, 8b, 8d Part 2a

Assignment Guidance

Component 1: Working with others (max. three), you must produce a resource for teaching and learning about issues relating to waste. It should also help in teaching and learning about the concepts of Education for Sustainable Development. For more inspiration, a survey of children taking part in the Junior Environmental Officer programme in Cheshire West and Chester schools is available in the module Moodle space. It shows clearly what they (and their teachers) would like to see and do in the Education Centre. Your exhibit should present your resource to a professional educational audience, not children – you are selling it to teachers who will use it at the education centre or who may wish to use it in their schools. It should be entirely freestanding as a display requiring no additional presentation to convey your ideas.

Component 2: Your individual rationale must be informed by background reading. This will include core texts and may also include texts on teaching and learning drawn from other subject sessions. You should also draw on relevant experience from SBL.

Session two was entirely off-site and featured visits to two key sites, as replacement for the CAT visit in the original module. These were the Gowy landfill site near Chester and Quinn Glass in Elton. The former was to provide a first-hand experience of the realities of disposal of waste by landfill and the latter to show how recycled glass is included in the manufacturing process at a large-scale, glass bottle manufacturer. The guided tour of the landfill site, led by its
manager, was a memorable experience, particularly in terms of the full sensory impact of a working site. Interestingly, the manager stressed that the site is much less busy than it used to be because recycling has greatly reduced the quantity of materials being dumped into landfill. The site had been due to close some years ago, but licences have been extended – reduction in waste coming onto the site has served to extend its life; to the annoyance of some local residents.

The third session of the module focused on a detailed briefing about the education centre, led by the CWaC/Keir team. The JEO survey results (see Appendix) were shared with the trainees and the themes to be covered by the activities/pods identified – these included the recycling vehicle, material processes, composting, food waste, global links and the 3Rs (reduction, re-use and recycling). The pod concept was explained to the trainees – centring on the idea of a carousel of interactive activities in the centre, which children could explore independently and/or with support from teachers and centre staff. Although the trainees had a degree of choice in terms of the themes and aspects of recycling to be covered, the project team and tutors ensured that activities would be developed for all the themes. The trainees split into self-chosen groups of three or four to begin initial discussion, brainstorming and planning of their activities.

Over the next three weekly sessions the groups developed and worked on their activities independently; preparing and assembling exhibits for the assessed exhibition in the final session of the module. Tutors supported the trainees as required, with design technology (DT) skills being taught as needs arose – a specialist DT tutor was available throughout these sessions and worked with specific groups on simple hydraulic systems and structures. The groups were prompted to think about how their activities would engage children with the content, promote higher order thinking skills and connect with the underpinning principles of ESD. Needless to say, as the exhibition day approached work became more intense and focused, both on the practical aspects of the exhibition displays and the supporting materials, including teachers notes and sample lesson plans.

The assessed exhibition was staged on 14th February 2013 in the Art/DT teaching room at the University’s Riverside Campus (photos of the exhibition are online here: http://goo.gl/dSBzMn). As required by the assignment brief, trainees engaged in self and peer assessment of the exhibits before tutors (supported by the CWAC/Keir project team) assessed the pod activity ideas against the module assessment criteria at undergraduate Level 5. These criteria were:

- Extent to which knowledge and understanding of the chosen environmental issue is displayed.
- Extent to which the resource meets the needs of the intended audience. Evidence that development of the resource has been informed by research, reading and inspection evidence.
- Evidence that development of the resource has been informed by evaluation.
The way the information you are communicating (via exhibition or assignment) has been organised.

The clarity with which your information and ideas have been presented. The accuracy of your use of English.

The extent to which you have used reading (and other sources) to inform your work.

Grades were awarded by the tutor team at group level – no groups requested individual marks, as all considered their exhibits to be team efforts. Marks ranged from 73% to 45%, with the majority of marks being at the 2:1 Level (60-69%). Although all the exhibits met the first criteria well, the activities were more variable in their appropriateness for the intended age-range and the degree to which they had been informed by evaluation and reading. Responses to the evaluative questions in the trainees’ module evaluations were generally very positive, with the field trip and the practical, hands-on approach of the module being valued by the majority of trainees. Several respondents remarked that they had benefitted from the teamwork involved in creating the exhibition.

With the exhibition now open to all, the CWAC/Keir project team spent some time talking to each of the groups about their exhibits. Trainees explained their ideas and intentions and the team gathered supporting materials that had been produced. Four exhibits were found to be particularly promising as the basis for pod activities:

- A large-scale model of a recycling vehicle with opening sections containing prompts, questions and information;
- An activity exploring recycling issues in relation to mobile phones – a black box containing simple circuits that lit bulbs when links between materials and recycling processes were made correctly;
- A sorting activity about composting;
- An activity focusing on food waste and the re-use of leftovers.

The CWAC/Keir team thanked trainees and tutors for their efforts and left with much to consider. The trainees had put together some inspirational ideas, but there was limited capacity in the education centre room that had now been designated, so only a few could be developed. It was decided that some of the ideas would be put aside to be developed into desktop games at a later date. Some of the planning, developed by the trainees, extended beyond activities in the education centre and it was decided to make these available on a Recycle First website for teachers to use at school.

In order for the interactive activity areas or pods to be created, design briefs were prepared. These were based on some of the ideas from the trainees’ exhibition, but also included additional requirements based on the potential and the limitations of the education centre setting, e.g. the need to cover a range of recycling issues, flexibility for different age-range groups, opportunities for hands-on interaction and durability. Keir approached several designers with the brief and a design firm, with a track record for creating hands-on interactives in
other settings, was selected. The pods took approximately four months to design and manufacture, arriving just in time for the education centre launch event.

The recycling education centre, located at the Keir working depot in Winsford, was officially opened by the Lord Mayor of Chester on 7th December 2013 (photos of the event and the centre are online here: http://goo.gl/2KPv1o). Tutors were present at the event and, later, some of the trainees visited to see how their ideas had been transformed into durable pods. Although not all of the trainees’ ideas were evident in the centre activities, some key pods were clearly inspired by exhibits from the assessed exhibition – these included a model recycling vehicle, a mobile phone pod and food waste and composting activities.

The centre is now open to visitors and, since December 2013, it has welcomed community groups, primary school classes and has hosted a Junior Environmental Club event, attended by year six children from 60% of CWaC primary schools. Information and bookings are accessed via a dedicated mini-site on the CWaC website: www.recyclefirst.info/education-centre.php. Initial feedback from visitors has been positive and early indications suggest that the centre will fulfill its role of educating visitors about recycling issues. Although visits are free, a limitation on the centre may its location: the recycling depot is on an industrial estate on the periphery of Winsford. All visiting groups will, therefore, have transport costs to factor in to their planning.

Conclusion

The recycling education centre project appears quite unique in the way that needs and opportunities came together in a particular place and time. Priorities of a local authority waste management policy were met through a contract with a private sector provider. A key element within these priorities, namely the need for recycling education, was then developed by both parties through a link with a higher education (HE) teacher training provider, which happened to have specialist trainees and a suitable module. Private sector funding enabled the trainees’ ideas to be transformed into durable resources for teaching and learning. There is an element of coincidence and serendipity about the project, which suggests others can learn little from it.

The project did embody some key principles, however, which may be applicable to other contexts. It recognized the key role of education in gaining and maintaining public commitment to recycling and the particular issues arising from source separation (RECOUP, 2013). It showed that public and private sector interests can work together to achieve agreed outcomes in relation to key aspects of ESD. Above all, it showed that teacher training in HE provides scope for trainees’ involvement in innovative projects, which exploit and develop their specialist knowledge and skills. The current transfer of teacher training into school-based programmes may limit opportunities for similar projects in the future.

The focus on recycling itself is not without controversy. The concept of a waste hierarchy (WtERT, 2009) places recycling very much in the middle of a list of preferred waste management measures – below avoidance and re-use. The European Union Waste Framework Directive (EU Directive 2008/98/EC) promotes
waste prevention initiatives in member states, rather than recycling per se. In the context of industry, Clelland, Dean and Douglas (2000) amongst others, argue that ‘end-of-pipe’ (EOP) measures, such as recycling, may have a counter-productive impact upon waste volumes – they argue that waste needs to be tackled at source, rather than by EOP approaches, which reduce incentives to prevent or minimise waste. In short, by promotion of recycling, we may inadvertently be promoting the creation of more waste. A greater focus on prevention and re-use may, therefore, be a developing priority for the recycling centre. Although the waste hierarchy approach raises some issues in relation to recycling, some research suggests that recycling can have a positive impact on waste volumes by raising awareness of issues during production and processing at source (Dutt & King, 2014). The participation of manufacturers and producers in recycling schemes may incentivise their adoption of less wasteful practices.

By making children in the primary school age-phase a main target audience, the education centre project acknowledged the key role these children have in educating their parents and communities about recycling (Strong, 1998, cited in Mee & Clewes, 2004). An obvious follow-up to the project would be research into the impact and potential of this strand of learning; which reverses the conventional expectation that children learn from adults. A key question might be: ‘How effective are the interactive pods and other education centre activities in equipping children with the knowledge and skills to positively influence and teach others about recycling?’
References


### Appendix

#### Junior Environmental Officer feedback form results

Recently a questionnaire was sent out to all our JEOs asking them for input on what they would like to see in our new Education Centre. We have received 19 replies and here are the results.

**Question 1**

Interactive displays have been planned to cover the following areas. Please tick those which you would find useful and add any areas that you would like to see covered.

<table>
<thead>
<tr>
<th>Area</th>
<th>Numbers</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recycling vehicle processes</td>
<td>11</td>
<td>58%</td>
</tr>
<tr>
<td>Recycling depot processes</td>
<td>5</td>
<td>26%</td>
</tr>
<tr>
<td>Material Processes</td>
<td>8</td>
<td>42%</td>
</tr>
<tr>
<td>The 3Rs</td>
<td>14</td>
<td>74%</td>
</tr>
<tr>
<td>Composting</td>
<td>16</td>
<td>84%</td>
</tr>
<tr>
<td>LFHW</td>
<td>15</td>
<td>79%</td>
</tr>
<tr>
<td>Recycling global impact</td>
<td>16</td>
<td>84%</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>26%</td>
</tr>
</tbody>
</table>

**Other**

Water

How to keep the environment a safe place
How to keep the environment a safe place for children

Garbage posters
2 arrows recycling logo made from recycled materials

**Question 2**
What activities would you like to see provided on a visit to the centre?

<table>
<thead>
<tr>
<th></th>
<th>Numbers</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composting</td>
<td>13</td>
<td>68%</td>
</tr>
<tr>
<td>LFHW</td>
<td>9</td>
<td>47%</td>
</tr>
<tr>
<td>What materials can be recycled</td>
<td>13</td>
<td>68%</td>
</tr>
<tr>
<td>How materials can be recycled</td>
<td>13</td>
<td>68%</td>
</tr>
<tr>
<td>What are materials recycled into</td>
<td>15</td>
<td>79%</td>
</tr>
<tr>
<td>other</td>
<td>8</td>
<td>42%</td>
</tr>
</tbody>
</table>

**Other**

Diagram of how to make waste into a product
Kerbside recycling – new scheme
Actual products made from recyclable materials
Who can spot litter and put it in the right bin
Throw rubbish in to the correct bin
Film about what will happen if we don’t recycle
Games to show what can be recycled
How to make paper and felt out of recycled materials.

**Question 3**
Please ask your teachers and mentors what they would like to see and find useful at the centre (classroom basics such as interactive whiteboard will be sourced)

<table>
<thead>
<tr>
<th></th>
<th>Numbers</th>
<th>Percentage</th>
</tr>
</thead>
</table>

12
<table>
<thead>
<tr>
<th>Ability to use the classroom independently</th>
<th>9</th>
<th>47%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff training</td>
<td>8</td>
<td>42%</td>
</tr>
<tr>
<td>Morning and afternoon events</td>
<td>14</td>
<td>74%</td>
</tr>
<tr>
<td>All day events</td>
<td>11</td>
<td>58%</td>
</tr>
<tr>
<td>Evening events (to cover after school clubs)</td>
<td>5</td>
<td>26%</td>
</tr>
<tr>
<td>Weekend events</td>
<td>2</td>
<td>11%</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>11%</td>
</tr>
</tbody>
</table>

Other
Workshops
All week events
2 comments referred to transport issues to the venue

**Question 4**
Have we missed anything? Is there something specific that you would like to see at the centre?

Binz and Recyclo mascots
How much material is wasted each year
Wow Facts
Graphs showing progress made over the last 10 years +
Future targets
What bugs live in the compost
All the different kinds of recycling vehicles
Be able to do recycling jobs on the visit
What is good and bad for the environment
Different types of bins
Films about the environment
Fake recyclable people holding bins and posters dotted around the centre
Decorate the walls with reasons not to pollute the environments
Rainforest and how global warming can affect them
What waste can harm living things
Lots of recycling bins
Saving electricity and solar panels
Garden area with lots of plants
Lego
Information about pollution
School displays and exhibitions.