

Using cross-curricular models to promote literacy, numeracy and digital competence in year one

Introduction

According to Roy (2016), the phrase ‘cross-curricular’ is difficult to clarify since there are a wide range of definitions for the concept. Simply put, cross-curricular methods combine different subjects in a way that is engaging and enjoyable, as said by Dalton (2019). Dalton (2019) then mentions that if used in the correct manner, cross-curricular learning can provide several benefits such as improving children’s knowledge, understanding and skills and increasing motivation throughout interconnected topics.

Models of cross-curricular teaching (Barnes, 2015)

Although there is a shared definition of involving more than one subject, Barnes (2015) identifies models of cross-curricular teaching. These include:

- Tokenistic
- Hierarchical
- Single-transferable subject learning across the curriculum
- Theme-based
- Multi-disciplinary
- Inter-disciplinary
- Opportunistic

There is no ‘correct’ way to implement cross-curricular learning. However, criticisms have been made of tokenistic approaches by Barnes (2015), who mentions that this model should not be considered a cross-curricular approach. ISM (2019) note that the tokenistic model is an exercise that is completed for the sake of it and does not add any value to learning. An example of this is singing the song ‘heads, shoulders, knees and toes’ in a science lesson.

Throughout this poster, Barnes’ (2015) theme-based and opportunistic models will be utilised for a year one class, incorporating literacy, numeracy and digital competence skills. Benefits and limitations will be discussed, as well as the future of the cross-curricular responsibilities in Wales.

Benefits and limitations of the theme-based model (Barnes, 2015)

✓ Benefits of using the theme-based model

- Using integrated themes allow teachers to be creative whilst exciting children as they relate to real life (Tuffelmire, 2017).
- Students’ problem-solving and thinking skills can be fostered through using theme-based models, as well as critical reasoning (Seefeldt, 2005).

- Units of work that are based on themes are suited to all learning styles and can provide higher learning outcomes (Nurlaela et al., 2018)

✗ Limitations of using the theme based model

- In light of the advantages, there is a possibility that teachers may use themes inappropriately. Many teachers are solely focussed on facts and may rigidly adhere to a topic, ignoring children’s interests (Kostelnik et al., 1991).
- Effective theme based learning can be extremely demanding and time consuming for teachers both while planning and implementing (Cameron, 2001).

Benefits and limitations of the opportunistic model (Barnes, 2015)

✓ Benefits of using the opportunistic model

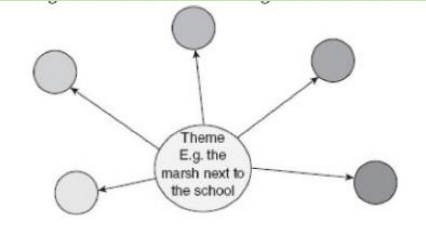
- Child-led experiences can lead to an increase in thinking-skills and meta-cognition (ATL, 2016).
- By taking control of their learning, children can become responsible citizens while learning new problem solving skills (Kumon, 2012).

✗ Limitations of using the opportunistic model

- Opportunistic approaches include an element of risk and uncertainty, as said by Barnes (2015). This may be ideal for teachers who are comfortable in unpredictable environments, but not for those who are not.
- Severs (2019) argues that academic studies and child-led approaches do not go hand in hand.



Theme-based model (Barnes, 2015)



A diagram representing theme-based learning, taken from Barnes (2015).



Reduce, Reuse and Recycle theme

Barnes (2015) outlines that authentic themes can be used to generate learning throughout several subjects, but that more than two of three subjects should be included. It should be noted that no subject should be included unless it is essential to ensuring that children have a deep understanding of the topic. Throughout ‘Successful Futures’, Donaldson (2015) outlines that there is extensive support for the current Welsh curriculum to move away from specific subjects and for more emphasis on learning to be placed on areas of learning or themes/skills. Scholars such as Handal and Bobis (2004) and Lipson et al. (1993) discuss that a rationale for utilising theme-based approaches in classroom is they provide students with meaningful experiences. Montessori believed that children learn best through deep and meaningful tasks (Pound, 2019). The theme of ‘reduce, reuse and recycle’ has been chosen as it is in line with the ‘Knowledge and Understanding’ Area of Learning found in the Foundation Phase Framework where it states that students should be given opportunities to ‘recognise how people’s actions can improve or damage the environment’ (WG, 2015, p.41). The theme-based model will be applied in the year one classroom over a period of a week.

Sorting Materials Activity

The first activity that students will undertake involves understanding the importance of reducing, reusing and recycling for the Earth. Studying a theme based on recycling is in line with the WAG (2010) ‘Towards Zero Waste’ commitment, thus aiming to reduce waste by 1.2% a year until 2050 and manage waste along with using resources efficiently. An activity which can be undertaken by year one children, involves identifying which materials can be recycled and which cannot. The importance of group work is noted in the Foundation Phase Framework (2015), where it is stated that children should be given opportunity to work in groups. In small groups, children will collect different materials which will be scattered around a large area, such as the school hall and sort them into specific boxes which will be labelled as metals, plastics, paper and glass. Within the Literacy and Numeracy Framework (LNF), year one children should be able to ‘sort and classify objects using more than one criterion’ (WG, 2019a). Once the children have collected the different materials, each category will be counted by the children and presented in a pictogram using the programme j2e which the children will have access to through Hwb. Year one children are expected to represent data, using ‘pictograms where the symbol represents one unit’ (WG, 2019b).

Building Plastic Houses Activity

To start the next activity, there will be a large clear tub of water placed in the classroom filled with toy sea animals. This will be left for a week. After the week has passed, the children will be asked the question ‘how long do you think the plastic would take to disappear/dissolve?’. After learning that plastic bottles take 450 years to deteriorate and the effect they have on sea animals, the students could express how they feel about it, linking to literacy as year one children are required to ‘express an opinion on familiar topics’ (WG, 2019a). Students can discuss how bottles can be reused to prevent them from ending up in the sea. Discussion is known to improve learning (Bender, 2003; Davis and Hillman Murrell, 1993) and can be considered a form of active learning. Garside (1996) debates that active learning can help foster higher order thinking and critical skills. One way of reusing plastic bottles is to design and make mini houses, allowing children to ‘make choices when choosing materials and resources’ (WG, 2015, p.47). Literacy can also be linked through children imagining who could live in the plastic bottle house, creating a storyline surrounding this. Year one children should be able to ‘develop the use of a storyline within imaginative writing’ (WG, 2015). To develop digital competency, the children could create a puppet show to perform their script using dolls and plastic houses to set the scene. This will be recorded on an iPad. With increasing confidence, year one children are expected to ‘select appropriate software to complete given tasks in order

Example of good practice (Estyn, 2016)

Ty’n Y Wern Primary School has been known to use cross-curricular themes such as Welsh heritage projects and art festivals, which encourage pupils to take ownership of their learning (Estyn, 2016). Since 2011, their sector-leading practice has ensured that all pupils have opportunity to develop wider skills through an enriched curriculum. This is planned according to the LNF. Children are provided with a wealth of opportunities to use literacy, numeracy and communication technology skills (ICT).



Opportunistic model (Barnes, 2015)



Opportunistic cross-curricular teaching allows ‘children to dictate the depth and direction of learning in subject categories arising from a shared theme or experience’ (Barnes, 2015, p.75). Opportunistic approaches towards cross-curricular learning are child-led (Barnes, 2015). It is important to note that even when learning is child-led, the teacher still plays a crucial role in creating an engaging environment, as said by Holt (2019).

The importance of children playing a part in creating their own learning experiences is in line with Unicef’s Rights of the Child, where children should have the right to be heard (Unicef, 2011).

Woodland discovery

To utilise an opportunistic approach towards learning, the year one children will be taking part in a nature walk in the local forest or woodland area. The Foundation Phase Framework places great importance on outdoor learning, as it provides experiences for children to experiment, explore and to take risks (Estyn, 2011). Estyn (2011) identified that in around a third of lessons observed, opportunities were missed to include numeracy, literacy and ICT in outdoor tasks. Throughout and following the nature walk, children will be given opportunity to develop these cross-curricular responsibilities. According to Barnes (2015), teachers can design a series of ‘focussing exercises’, otherwise known as small activities that will help children have a sensory interaction with a place. To start the woodland discovery, the students may be asked what types of plants and animals they think would live in the forest. In small groups, through discussion with peers, students will be able to ‘contribute to conversations and respond to others, taking turns when prompted’ (WG, 2019a). The children could also predict how many plants and animals they can find in the woodland area, linking to numeracy, as year one children should ‘use knowledge and practical experience to inform estimations’ (WG, 2019a).

The children may decide to find out whether their estimations are correct. Using clipboards, students will explore their surroundings and record the number of animals and plants they have found by drawing pictures. Year one children will ‘collect information and represent it in pictures, objects or drawings’ (WG, 2019a). Once completed, children can identify the plants and animals they have found and share with the group. A part of the ‘Knowledge and Understanding of the World’ area of the Foundation Phase Framework, children should be given opportunities to ‘identify some animals and plants that live in the outdoor environment’ (WG, 2015, p.42).



Enquiring about habitats

After identifying various plants and animals, the children may enquire about the habitats that they live in. Questions often stem from children being interested in a topic. It is important for young children to enquire as it helps to make sense of the world around them, as said by the NSW Government (2018). An activity the students might undertake may involve designing and building a hotel for creatures that live in the forest, such as minibeasts. The Creative Development area of the Foundation Phase Framework presents that children should have opportunity to ‘explore, investigate and use the indoor and outdoor learning environments’. In relation to art, craft and design, children should ‘explore and experiment with a variety of techniques and materials’ and ‘make choices when choosing materials and resources’ (WG, 2015, p.47). Through designing a minibeast hotel, children will have opportunity to use their imagination when choosing materials. The Telegraph (2018) states that through using imagination, children are able to create visual images and ideas without being restricted by limits.



The photo above shows an example of a minibeast hotel.

In the following weeks, the class will be given opportunity to revisit their minibeast hotels to see what creatures are living inside. This could lead to discussion and activities to find out what the minibeasts needed to survive in their habitat. For example, sunlight, water and shelter. Digital skills can be developed by the children as they can record themselves on the iPad or computer, explaining their new-found knowledge. This links to the DCF, as year one children are required to ‘comment on work in relation to the success criteria, e.g. add comments using recording feature in software’ (WG, 2019b).

The Future of Welsh Education



Donaldson (2015) expresses in ‘Successful Futures’ that there is a range of competencies and skills that are the foundations of becoming well-rounded citizens of the modern world. These are: literacy, numeracy and digital-competence. It is stated that ‘the curriculum structure needs to ensure that children and young people develop high levels of competence in these aspects and have frequent opportunities to develop, extend and apply them across the curriculum’ (Donaldson, 2015, p.40). Emphasis is placed on literacy, numeracy and digital-competence within the ‘Curriculum for Wales 2022: Guidance’, where they support learning throughout the six areas of learning proposed in the new Welsh curriculum (WG, 2019c). From 2022, the DCF and LNF will still be available and will be updated to ensure that learners meet standards regarding literacy, numeracy and digital competence in the 21st Century (WG, 2019c).