An exemplification of how Barnes Theoretical Cross-curricular Models can develop the Cross-curricular Responsibilities of Literacy, Numeracy and Digital Competency in a Year 2 Foundation Phase class

Successful Futures

Within the new curriculum for Wales there are cross-curricular responsibilities of Literacy, Numeracy and Digital Competency (Donaldson, 2015). These responsibilities are required from every teacher to be implemented in each of the six Areas of Learning Experiences (AOLE's). These responsibilities are important for critical thinking, learning and life skills which should be continually developed and reinforced across the curriculum. Ensuring that high levels of digital skills are established will allow an inclusive modern workplace to be created for the future prospects of our pupils (FutureLab, 2010). Ensuring that children develop literacy, numeracy and digital competency skills is crucial for access of a broad and balanced curriculum. (Rose, 2009)

Assessment and Progression of the Cross-Curricular Responsibilities

There are numerous assessment opportunities to ensure progression and development of Literacy, Numeracy and Digital Competency skills within any cross-curricular approach. Observation of the child's progression will allow a holistic view of the development of the child. Children's work allows the facilitator to ensure that the child has developed the fundamental skills to be able to transfer across AOLE's. Assessment for learning strategies such as self and peer assessment will allow collaboration and for deeper knowledge and understanding to be consolidated (Black et.al, 2006). Lastly mid term planning will allow the LNF, DCF and AOLE's skills to be monitored and assessed as the child develops through the academic year. A theme-based approach will allow the skills that have not been met to be consolidated. However, progression from a cross-curricular approach will ultimately be assessed if children are able to transfer the learnt skills into a variety of learning contexts.

Barnes Theoretical Models

Dr Jonathan Barnes is an educator and researcher and he considers the range of models that teacher's can use to promote cross-curricular learning within their pedagogical teaching styles. He states that there are seven different models that facilitators can use to promote cross-curricular learning, these models are: theme-based, multi-disciplinary, tokenistic, single-transferable, inter-disciplinary, opportunistic and double focus. The two chosen models are opportunistic and theme-based as these allow a natural and interesting flow of cross-curricular learning to be formed within the learning environment. The opportunistic model (refer to figure A below) was chosen as it allows the teacher to provide unpredictable and child-led learning to be summoned from a powerful, personal learning experience. The theme-based model (refer to figure B below), was chosen as it creates an authentic learning experience and can generate learning through numerous subjects and experiences. It typically generates deeper understanding and allows skills to be transferred from one learning context to another (Barnes, 2015).

Figure A

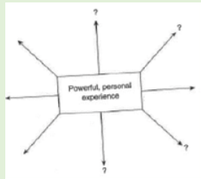
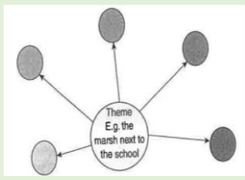


Figure B



Using these cross-curricular approaches in the classroom environment allows children to experience powerful learning environments where subjects are not solely taught explicitly (Didau, 2014). As Barnes (2015) further recommends that not all pupils will respond to the same teaching method, therefore using a cross-curricular approach will cultivate an engaging learning environment and develop positive engagement. However, within a theme based and opportunistic cross-curricular approach there are limitations, for example, if the learning intention is not powerful then the link may limit the learning (Hayes, 2010 and Barnes, 2015).

Theme-based model

Development of Skills

Literacy: **Oracy. Elements** – *Developing and presenting information and ideas.* **Aspects** – *Collaboration and discussion.* **Share activities and information to complete a task.**

Numeracy: **Strand** - *Develop Numerical Reasoning*. **Element** - *Identify processes and connections*. **Identify steps to complete the task or reach a solution.**

Digital Competency: **Strand** – *Data and Computational thinking*. **Element** – *Problem solving and modelling*. **Predict the outcome of simple sequences of instructions.**

Activity

The series of lessons will be over a period of two weeks where children will be involved in a rotation of carousel activities on the topic of Road Safety. The AOLE's involved covers a multitude of skills. This activity involves children creating their own set of instructions for Bee-Bots to travel from one place to another around the village that they had previously created in a Creative Development session. Within this activity children will not solely learn to create their own digital instructions, but would be able to collaborate and improve their Oracy skills by using instructional language and develop their numerical skills by identifying steps to complete the problem and using directions to navigate the Bee Bot around the village.

- **Immersion of skills to be developed in a cross-curricular context.**
- **Active learning is facilitated.**
- **Initiates transferrable skills such as teamwork.**
- **Theme-based work allows understanding of others, local issues, the community, collaboration and global issues. (Rowley and Cooper 2009)**

- **Within a theme based model, not every pupil will have an interest in the learnt theme.**
- **Assessment of curriculum skills can be difficult to track.**
- **If a student is absent from an activity then they may miss a connection or an important learnt skill.**
- **With the teacher facilitating the theme then the pupil's voice is not regarded.**
- **Teacher subject knowledge may not be sufficient to fulfil the potential of the activity (Barton, 2010)**

Opportunistic model

Development of Skills

Literacy: **Writing**: **Elements** – *Organising ideas and information*. **Aspects** – *Meaning, purposes, readers*. **Write for different purposes.**

Numeracy: **Strand** - *Using Number Skills*. **Elements** – *Managing Money*. **Use different combinations of money to pay for items up to £1.**

Digital Competency: **Strand** – *Producing*. **Element** – *Creating*. **Create and edit multimedia components in order to develop text, image, sound, animation and video for a range of tasks.**

Activity

After the children experienced an educational visit to Dinefwr Castle, the children were curious to develop their knowledge of World War 2 from visiting the hospital wing. This allowed an opportunistic opportunity to further develop their curiosity for child initiated learning. The children the next day arrived into an immersive room where their senses were met by the noise of the sirens, the smell of smoke and visuals of soldiers and the trenches. The literacy activity allowed children to create their own diaries of experiences of the war by sending letters back to loved ones and their families. The numeracy activity allowed children to budget their own rations with a specific amount of money therefore, the pupils collaborated and debated on what food and resources they should buy. This allowed children to question and respect the views of others which are important key skills to develop. The children wanted to use the Green Screen to act out role play scenarios of news readers, soldiers in No Mans Land and in the trenches. Children were able to create their own backgrounds on Greenscreen and then implement it within iMovie to present to the class. To celebrate the children's work the pupils invited their families to a celebration assembly.

- **Child-led learning and interests are facilitated.**
- **An array of skills and knowledge can be provided in a meaningful, natural way.**
- **Unpredictable and child-led learning to be summoned from a powerful, personal learning experience.**
- **Barnes (2015) suggests that cross-curricular approaches generates creative thinking within a powerful context and learning environment.**

- **Many teachers have limited experience of cross-curricular opportunistic work within their teacher training or feel they do not feel creative enough to allow this learning.**
- **Subject progression is difficult to assess if one or more areas of learning are being developed within an opportunistic experience.**
- **Subject knowledge of the facilitator may hinder the learning experience.**

The recommendations for cross-curricular learning should be interlinked within each teacher's pedagogical style. There are many cross-curricular approaches such as Barnes (2015), Savage (2011) and Hayes (2010) to name a few. However there also needs to be a firm balance between cross-curricular teaching and didactic teaching when teaching the cross-curricular responsibilities, this is due to ensuring that children learn the fundamental skills and are then able to apply them in a different context.

Recommendations for teachers and Welsh Government:

- Teacher's should be provided with deep subject knowledge on Initial Teacher Training, to be able to implement a cross-curricular approach effectively within the classroom environment e.g digital competency skills and application of the skills.
- Welsh Government, Estyn and stakeholders within schools should support and promote the confidence for teacher's to use a wide range of pedagogical approaches and support them by ensuring they have time and professional development opportunities to support this.