SCIPD - Visit to the Netherlands

Final report

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INTRODUCTION

Technological developments in society is a new topic within Curriculum for Excellence and I hoped that in undertaking this trip I would gain a broader and more in depth knowledge of the topic and consequently I would be able to teach it with greater confidence and authenticity.

In particular I was looking for information to assist in teaching the third and fourth levels as highlighted below:-

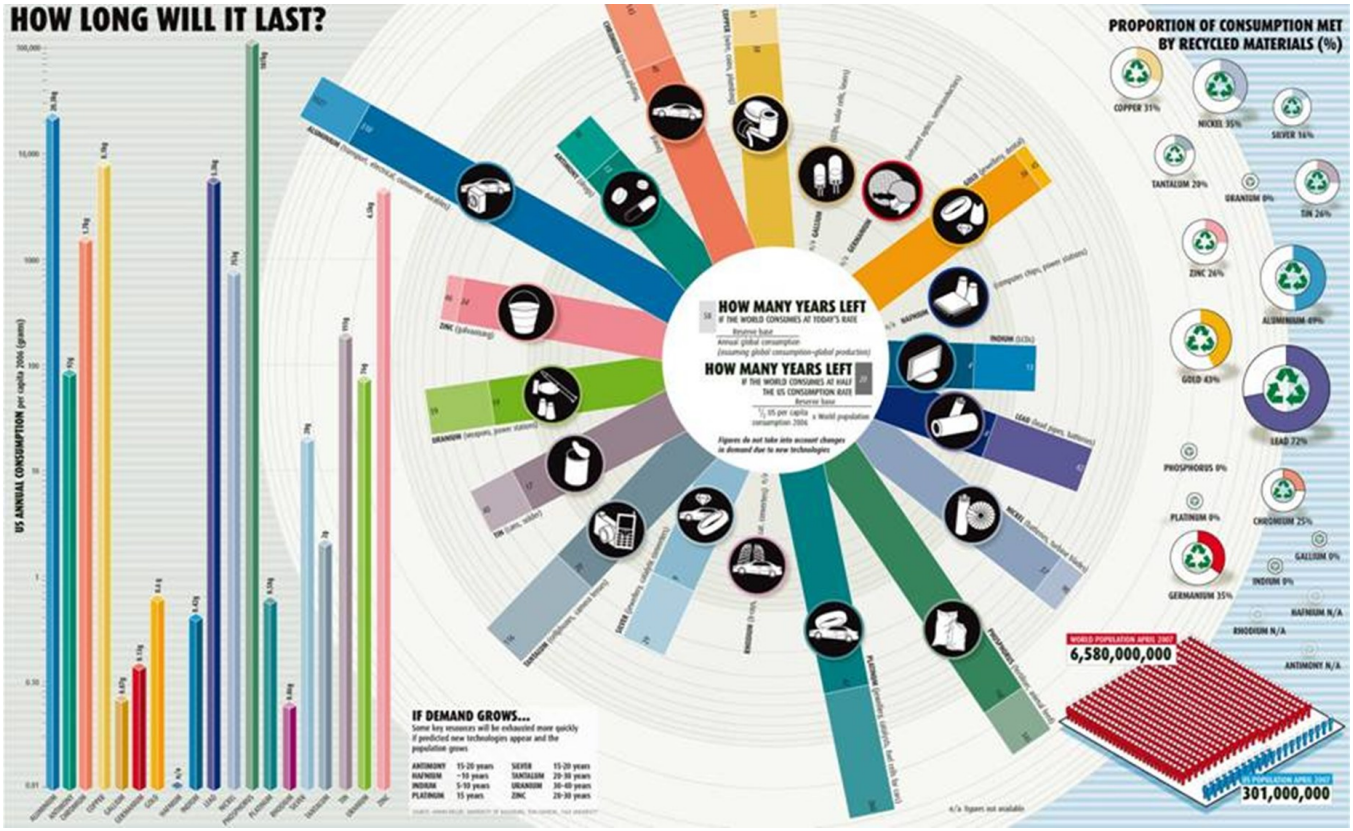
Technological developments in society

Early	First	Second	Third	Fourth
I enjoy playing with and exploring technologies to discover what they can do and how they can help us. TCH 0-01a	By exploring and using technologies in the wider world, I can consider the ways in which they help. TCH 1-01a			I can compare traditional with contemporary production methods to assess their contribution in the world around me and explain the impact of related technological changes. TCH 4-01a
	I can work with others to generate, discuss and develop imaginative ideas to create a product of the future. TCH 1-01b	When exploring technologies in the world around me, I can use what I learn to help to design or improve my ideas or products. TCH 2-01a	From my studies of technologies in the world around me, I can begin to understand the relationship between key scientific principles and technological developments. TCH 3-01a	Having investigated a current trend of technological advance in Scotland or beyond, I can debate the short- and long-term possibilities of the technological development becoming a reality. TCH 4-01b
	By exploring current news items of technological interest, I have raised questions on the issues and can share my thoughts. TCH 1-01c	I can investigate how an everyday product has changed over time to gain an awareness of the link between scientific and technological developments. TCH 2-01b		I can debate the possible future impact of new and emerging technologies on economic prosperity and the environment. TCH 4-01c
Within and beyond my place of learning, I can reduce, re-use and recycle resources I use, to help care for the environment. TCH 0-02a	Throughout all my learning, I take appropriate action to ensure conservation of materials and resources, considering the impact of my actions on the environment. TCH 1-02a	Having analysed how lifestyle can impact on the environment and Earth's resources, I can make suggestions about how to live in a more sustainable way. TCH 2-02a I can investigate the use and development of renewable and sustainable energy to gain an awareness of their growing importance in Scotland or beyond. TCH 2-02b	From my studies of sustainable development, I can reflect on the implications and ethical issues arising from technological developments for individuals and societies. TCH 3-02a	I can examine a range of materials, processes or designs in my local community to consider and discuss their environmental, social and economic impact, discussing the possible lifetime cost to the environment in Scotland or beyond. TCH 4-02a

The trip consisted of a mix of visits to Dutch companies and schools, with explanatory presentations designed to provide information on Cradle to Cradle Technologies and the Dutch education system. The balance of these was very effective and allowed us to look at how the principles of the Circular Economy were being implemented and taught in the Netherlands.

Whilst we discovered that the Circular Economy has not been embedded into the Dutch education system to any great extent, the visits to the Dutch schools were informative and at times inspirational. However, the segregation of Dutch pupils into one of three streams, (roughly vocational, applied science & technology and academic) at the end of primary school (age 12) was quite surprising. As was the Dutch consideration that technological subjects were in the mid or lower level of these streams. The upper level school being geared towards university bound pupils. This education system was heavily discussed within the group and although movement between the streams was feasible, in general, it made us feel quite positive about the Scottish system.

Scotland, as a country, has a zero waste policy. This is influenced by a number of pieces of environmental legislation not least of which is the European Directive that states there should be no more landfill from 2015 onwards. Nevertheless, the practicalities of implementing a zero waste policy are fraught with difficulties. On the visit we discovered that the Netherlands is much closer to achieving the zero waste ideal than Scotland. As well as a more wide ranging waste management structure, there are a number of manufacturers in the Netherlands who have made significant efforts to develop their products and processes to meet the Circular Economy principles, a concept that directly encourages zero waste. The diagram below is the starting point that prompted some manufacturers in the Netherlands to develop their businesses to take account of material scarcity and create a circular economy.



The diagram looks at how long it will be before various raw materials will become so scare that manufacturers will no longer be able to source them. With certain materials it is now more economical to recycle materials than purchase new. In particular, with China stopping the export of some rare earth minerals, that are critical to technological development, recycling is the only way to obtain these materials. The problem is that the majority of products these days use a huge variety of materials in very close proximity with no consideration given to how the individual parts will be recycled at the end of the product's life. This is where the circular economy principles come in, placing the onus on designers and manufacturers to consider how all of the individual components used in a product can be fully recycled at the end of the products' life without diminishing the value of the raw material.

The visits to the manufacturers were very informative and we were welcomed with unstinting courtesy and helpfulness. The inspirational resources provided will be of great value in the classroom, they explain why and how the companies are implementing Cradle to Cradle technologies and included both videos and power point presentations.

The trip was supported by the Ellen MacArthur Foundation, who are trying to promote a better understanding of the Circular Economy and Cradle to Cradle technologies. They perceive the new Scottish curriculum to have the flexibility to introduce these ideas to our pupils. Their goal is to develop an awareness of these global issues and encourage the next generation to have a global conscience, when considering design itself and in their consumption of products.

Dissemination & Impact on my Practice

The information and knowledge gained on the course was initially disseminated to my colleagues through departmental meetings. The discussions related to how we could integrate this knowledge into our courses and look at developing projects that will actively involve the pupils in designing using circular economy principles. We are currently writing and preparing new Curriculum for Excellence courses for S1-4. We aim to incorporate aspects of the circular economy into these new courses to cover the new Experiences and Outcomes related to 'Technological Developments in Society'. This is an on-going project and as more information comes from the SQA we will have a better idea of exactly how this integration can be best achieved. The preparation of new schemes of work is time consuming and in order for a cohesive approach to be adopted within the whole department it is necessary for these changes to happen over an extended period. The resources provided by the Ellen MacArthur Foundation will make both the inclusion of the new topics and the transition much smoother.

The resources and contacts gained from the trip and the videos of their manufacturing techniques will allow both myself and department colleagues to teach aspects of the new curriculum more fully and with greater confidence. It will also add another dimension to the international links that Grove Academy have already established and promote pupil awareness of their responsibility as citizens not just within the school environment, but within the wider community and globally.

In the Department, I hope to develop a project that involves all pupils in one year group between S1-3. It will involve the use of a plastic grinder and Sheet Press. This would allow pupils to recycle their own empty milk bottles. The grinder will chop up the bottles and the chipped plastic can then be reformed into new sheets of material ready for use. I intend to integrate teaching innovative design (based on using the recycled sheet) with discussions on Cradle to Cradle technologies, production methods that minimise waste and methods to reduce the exploitation of the earth's diminishing resources. One of the main aims being to help develop a global conscience, with regard to consumerism, in the pupils. The main barrier to this project is sourcing finance for the initial outlay. Once the equipment has been obtained, all materials used will be recycled from the pupils' own household waste and therefore running costs will be extremely low. At present I am trying to set up a company/ charity within the school to give us greater access to funding bodies. This process is something I am unfamiliar with and at a time when there are so many alterations and new initiatives within our curriculum, I am aware that I am finding it difficult to find the time to learn and implement another layer.

The Wider Impact of the Visit

The Technologies area of the curriculum is considered to be a natural area for the development of Interdisciplinary Learning (IDL). After the initial dissemination of information to my departmental colleagues, I approached the IDL working group within the school in April/ May. I was advised that there was to be a new curriculum structure introduced in June, whereby all of S3 would be allocated a period of IDL each week. Following discussions with my PT and some timetable alterations, it was organised that I would be free on the allocated period to teach IDL. Once all of the teachers, who were opting into IDL, had been identified we were formed into two teams of teachers to consider the format and content of IDL in Grove. The Circular Economy is the topic I put forward for discussion and implementation and with the significant amount of resources supplied by the Ellen MacArthur Foundation there is a strong possibility that this will be the topic used from March onwards within IDL.

Additional information can be found at
http://www.ellenmacarthurfoundation.org/

I am in touch with the foundation on a regular basis, discussing various ways in which this topic could be introduced and the most appropriate activities. I am very aware that it is not just myself who is struggling with the volume of work generated by the Curriculum for Excellence at the current time. The likelihood of the Circular Economy being used in IDL is directly proportional to the ease with which it can be introduced. Sustainability is being written into many of the new CofE courses especially the Technologies. It is therefore in my interest as a subject specialist to be aware of and understand the philosophy. If, with this understanding I can facilitate the wider teaching of this subject in a much broader context (IDL) this would be beneficial to both the Department and the pupils.

Everything is still very much at the early stages of development and I would hope that over the next two years a comprehensive and cohesive approach can be developed towards the teaching of a 'Circular Economy', both within my subject area and throughout the school as Interdisciplinary Learning.

In Conclusion

I thoroughly enjoyed the visit to the Netherlands and feel I benefitted greatly from it. This visit has furthered my understanding of the role technology plays in society and has provided me with access to a wide variety of resources that are suitable for use in the classroom. These resources will allow pupils to consider the ecological and economic impact of technology in society at both local and global levels. The main barriers to the speedy introduction of the ideas into the Scottish curriculum will be; the time required to disseminate the information, to then plan and adopt a comprehensive and cohesive approach throughout the school and the sourcing of funding to fully resource the new topic.