

Critically analyse and evaluate interdisciplinary approaches to teaching and learning

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Abstract

The brief for this work requires students to reflect on the content of their humanities modules, their academic reading and their professional experience in school. This article focuses on the notion of interdisciplinarity and considers how this can be distinguished from multidisciplinary and how it relates to learning within subject disciplines. Drawing on a range of theoretical and practical perspectives, the article considers arguments for and against interdisciplinary teaching in primary schools. The general arguments are illustrated by evaluative accounts of experiences in schools, which demonstrates the importance of careful planning in determining the success of such an approach.

Keywords

Interdisciplinary teaching; multidisciplinary teaching; subjects; primary curriculum; knowledge

Introduction

Learning that crosses subject boundaries is an important and ever developing theme in primary education. However, the National Curriculum has tended to promote discrete subjects with subject areas being conveyed as separate bodies with little meaningful connection between one another (Jacobs, 1989). This raises the issue that the fragmented school day, organised into discrete time units governed by separate academic disciplines is not an accurate reflection of the reality children face when leaving the school. Instead, the environment around us often presents problems that one must endeavour to solve using a collection of different knowledge and materials from a range of different skillsets. Thus, there has always been an argument within education that focuses on the need for a more free-flowing curriculum. The idea of an interdisciplinary outlook on learning and teaching, which is still in development in many ways, was traditionally defined by Newell and Green (1982) as 'inquiries which critically draw upon two or more disciplines and lead to an integration of disciplinary insights' (Haynes, 2002; 17). Teachers will effectively use language, principles and pedagogies associated with various disciplines to investigate a central theme or topic (Jacobs, 1989). The fundamental idea is that the reduction of rigid subject boundaries allows for pupils to undertake investigative and creative approaches to learning to foster engagement and encourage imagination. Such an approach makes a virtue of children's ability to construct an amalgam of concepts both within and across subjects, in conjunction with giving them the opportunity to develop expansive life experiences and to create an educational approach which is relevant and meaningful to children. Advocates of the interdisciplinary approach state that by delivering the curriculum as an integrated whole, children will learn holistically; whereas if the emphasis on the traditional subject specific separation of the school day continues, it can develop subject-related barriers in children's minds which hinder their ability to make connections between knowledge outside of the context it was initially learnt in.

Interdisciplinarity

Klein (1990) acknowledged that interdisciplinarity is widely appealing in its goal but stressed the confusion it may cause. Moran (2010) reiterated this more recently by highlighting the ambiguity of the term 'interdisciplinary', especially due to its co-existence among related terms such as multi-disciplinary and cross-disciplinary. Jones (2009) defines the conceptual

differences between the terms, stating a multi-disciplinary approach teaches topics from one or more disciplines parallel to one another, and cross-disciplinary (or cross-curricular) is when links to other subjects are made but one subject still dominates. For the purpose of this essay, it is the concept of interdisciplinarity which will be critically reflected upon in its approach.

One of the difficulties creating an interdisciplinary approach is the risk of falling into the cross-curricular perspective, whereby the emphasis of the planning remains on separate subjects, although there are some connections made. The humanities provide a wealth of opportunities to include the learning of skills and knowledge required across the curriculum and subjects. Enquiry based learning in history and geography requires children's engagement in real life problems and often requires children to apply skills and knowledge from across the curriculum. Enquiry develops thinking skills, enhancing learning through creativity (Pickford et al 2013). It has been acknowledged that creativity for learning is not only a way of thinking, but a way to improve children's learning and raise standards across the curriculum (Lloyd and Smith, 2004). Thus, pitched correctly with meaningful interdisciplinary links, the humanities can provide the basis for the development of enquiry, in turn naturally encouraging key skills such as communication, information processing, reasoning and logical thinking, empathy and problem solving (Pickford, et al 2013). Such skills can be transferred beyond school and into later life.

The core curriculum subjects are in no doubt threaded through history and geography. Literacy can be used to develop historical and geographical vocabulary, as well as the use of secondary sources such as diaries to stimulate empathy based discussions and creative writing. Story books can be used as a means to identify with different places or time periods. Mathematics is used to analyse and communicate information, providing a relevant focal point for data collection. Maps and graphs are used in a way which is meaningful for children and maps are considered to be 'one of the most powerful mechanisms of geographical enquiry' (Bridge, 2004:105). Science has strong curricular links to geography and encourages the generation of hypotheses and investigations, ultimately developing creative thinking and critical reflection (Pickford et al 2013).

The foundation subjects can also be used to enhance learning in geography and history. With regards to art, different artworks can be said to be a reflection of the different times and places in which they were produced and provide a stimulus for examination and reflection. The investigation of the social, historical and political contextual background of a piece can induce a greater understanding of events related to its production and help children come to a fresh, and more informed, interpretation of the work (Pickford et al 2013). An example of such an interdisciplinary connection was provided in a university art session on Aboriginal art. The exploration of the Dreamtime art and associated stories allowed for geographical links and the discussion of why different materials such as sand, beans and sticks were used (related to place and available technologies). The idea that the art was transitory and temporary also gives scope to the discussion of life and death, and how stories are told through time. Aspects of citizenship can also be threaded through such topics with regards to the Aboriginal people's past and their current place in society, discussing their experience of prejudice and inequality. Hawkins (2012) comments on the breadth of geography-art engagements, describing them as 'invigorating and challenging', and provides examples such as landscape, identity, nature, home and urban politics.

Music also provides an alternative mode of investigation and exploration. During a university music workshop, we were asked to create a piece of music in response to a map of a small part of London. As a group, we used the place names on the map to form the basis of a song and used instruments to accompany it. This activity resonated with the piece of music 'Vltava' by Smetana which was composed to tell the story of the sounds of the Czechoslovakian river. Children could

create a musical composition in response to a geographical place. However, one may argue that activities such as those mentioned above could be considered to be cross-curricular rather than interdisciplinary. Wiggins (2001) appreciates the risk of music taking a subservient role in the quest for an interdisciplinary curriculum. He gives examples of common activities such as listening to songs from another country/culture or re-writing song lyrics that are often integrated into topics in a weak attempt to include music in order to achieve that breadth across the curriculum. These provide limited opportunity for the deep understanding of important musical elements and concepts. It could be said that such activities dilute the importance of music and some would argue the discrete, subject specific curriculum is most beneficial in achieving deep musical understanding. Wiggins (2001) reiterates this further by proposing that there are aspects of music education that are not duplicated anywhere else across the curriculum and cannot be replaced or properly understood by trivial inclusion in other units. It could be argued that if interdisciplinary links are superficial and do not lend themselves well to music as a discipline in its own right, it loses integrity or becomes seen as less important. Thus, it can be appreciated that links between some subjects are more natural than others. Hayes (2010) makes this point by arguing that links between music and geography are difficult to naturally achieve, whereas science and design and technology are more naturally complementary.

Interestingly, a study by Rovegno and Gregg (2007) found that when teaching a Native American folk-dance unit that was integrated with a geography unit called 'People of the Land: Native Americans and their Environments', children were 'engaged and captivated' learning about many aspects of each unit in an interdisciplinary fashion. Rovegno and Gregg's aim was to make relevant curricular connections with a focus on the constructivist view of learning whereby children develop deeper connections and thus deeper understanding, by experiencing aspects of Native American culture. Expanding on this point regarding the role of the constructivist view of learning, advocates in support of an integrated curriculum, such as in the interdisciplinary approach, base their opinions on work of constructivist theorists such as Bruner and Vygotsky (Haye, 2010). For Bruner, education is dependent upon the construction of our own knowledge through personal experiences, similar to the findings of Rovegno and Gregg's aforementioned study. More specifically, Vygotsky emphasises the importance of social constructivism whereby individuals 'scaffold' each other's learning and the development of new skills. A traditional, subject based curriculum however is based around the objectivist view where teachers dominate instructionally, passing on prescribed knowledge. The interdisciplinary approach is said to be based on the theory of sharing ideas, collaborative activities and experiential learning (Pickford and Garner, 2013), as per the constructivist theories.

Examples of interdisciplinary learning

This leads naturally onto the concept of outdoor learning as a means of facilitating interdisciplinary and creative environments. The Department of Education's 2006 Learning Outside the Classroom manifesto states that learning outside of the classroom can lead to deeper understanding of concepts that connect traditional subject confines with quality learning experiences based in real life situations. Achievement is said to be raised across the curriculum, as well as the development of social skills. Learning in an environment other than the classroom provides tactile resources which allow experiential learning (Waite, 2011) and involve the children working in real life contexts which are relevant and recognizable to them (Beames and Ross, 2010). Representing a constructivist pedagogy, children are regarded as active learners, thus knowledge is built through social interaction and direct experience (Waite, 2011) when learning outside the classroom is pitched correctly across the curriculum. A positive example of this is conveyed by the 'Outdoor Journeys' programme, developed by Beames in 2006 in response to the critiquing of then current outdoor education patterns in

Scotland. The programme is based upon children planning every aspect of a local journey and undertaking the journey after doing so. The idea is that children determine what they want to learn and how they want to learn it, with the teacher taking a less-directive approach. In effect, knowledge is co-constructed by the children and supported by the teacher. There are many curricular links that can be threaded through such a programme as 'much of what the children experience in the real world cannot be considered in isolation from the often fragmented and decontextualized subject areas in the curriculum' (Orr, 2004: 94). Thus, such localised projects have the capacity to be interdisciplinary, linking most, if not all, curriculum subjects (Rickinson et al, 2004). Bancroft et al (2008) goes on to recommend walks as a way to provide a relevant context to discover children's interests as a basis to build upon and enhance creativity.

During my school based training, my fellow teachers and I set up an 'abandoned camp' in the middle of the school playground. The children were intrigued by this as they arrived at school and the day was centred on its presence. Classes were given the opportunity to explore the camp and endeavour to piece together an account of who it was left by, using artefacts found inside and around it. Various activities were developed from it, including the creating of old-fashioned log books, newspaper articles, videoed news reports and the creation of computerized and sketched maps to reflect the journey taken by the owners of the tent, deciphered from clues found inside. Instruments such as microscopes and magnifying glasses were used and children logged observations in a range of ways including sketches and tallies. Skills from across the curriculum were integrated into one and children were fascinated and engaged. Pascal and Bertram (1997) reinforce the importance of constructing activities that children enjoy as they found high levels of enjoyment can be considered as a signal that deep learning is occurring. Waite (2011) found enjoyment to be a common theme across all their outdoor learning case studies and positive emotional engagement in activities is critical in the possible transfer of learning to other contexts (Immordino-Yang and Damasio, 2007). Learning outdoors can introduce elements of awe and wonder across subjects and with the structure of classroom removed, it can appeal to those who may struggle with concentration in typical classroom surroundings. A child who is quiet and disengaged in the classroom may engage with materials differently in an alternative setting, suggesting contextual factors may affect pedagogical opportunities. Different aspects of children's personalities may be accessed in different situations and thus both indoor and outdoor learning opportunities may be necessary to provide a holistic learning experience (Waite, 2007). However, it is not without pedagogical concern. In the same study by Waite, it was found that children often reported outdoor learning to be about 'art' if it involved drawing, painting or sketching, regardless of the intended curriculum direction. This reinforces the importance of developing meaningful and explicit interdisciplinary links so learning is not diluted or misinterpreted.

A personal experience of an interdisciplinary curriculum occurred during my school based training placement through the employment of the International Primary Curriculum (IPC) programme. The IPC was developed to promote a global dimension within the curriculum to prepare children for life in an internationalised society. Bunnell (2010) states that IPC offers an innovative curriculum, with a wider scope for creative teaching. During my time teaching IPC to year 6, the topic of the Mayans was investigated through art (making Mayan headdresses) which also encompassed citizenship themes such as social class, drama (creating drama pieces representing different aspects of Mayan life, after using iPads to conduct research), as well as the typical subjects of geography and history. Rivers as a topic was also explored through making bridges and testing different weights (mathematics, science and D&T), junk modelling of boats using different materials (D&T and science), the exploration of flooding and the morality behind the giving of aid (Religious Education, science and geography) and the designing of information leaflets via computing. The children were engaged throughout and really identified with the range of different tasks set, without the realisation of the different aspects of the

curriculum they were working on. Overall, the programme worked well and encouraged a range of skills to be transferred across the curriculum.

A note of caution

It is clear from the arguments and examples discussed so far that the concept of an interdisciplinary curriculum can be said to engage learners, promote deep learning and add an element of fun to learning. However, there are arguments as to whether the blurring of traditional subject boundaries may lead to an erosion of the clear differences between academic knowledge and day to day knowledge (Young and Muller, 2010), with Paterson (2009) stating an interdisciplinary based curriculum can neglect the crucial importance of disciplinary structures. It raises the implication of how to ensure that the organisation of the curriculum is not merely a collection of themes with questionable subject links, with minimal curricular coherence (Humes, 2013). Thus, themes must be appropriate and not overtly subject to misconceptions or confusion. As Brophy and Alleman rightly state: 'Just because an activity crosses a subject matter line does not make it worthwhile; it must also accomplish important educational goals' (Brophy & Alleman, 1991: 66). It must also be mentioned that most of the current literature surrounding curricular integration is focused on the concept of multi-disciplinary rather than interdisciplinary learning. It must be acknowledged that interdisciplinary learning is harder to both define and implement, and usually transpires into cross or multi-disciplinary learning. This is a point made by Jacobs (1989), who stated that many units have the potential to become merely a sampling of knowledge from each discipline. The example of Ancient Egypt is given – there will be a history lesson on Egypt, an art lesson on Ancient Egypt based art, for example, but the subjects are not woven together as one. Bloom (1987) criticizes this method for lack of focus. Thus, a clear definition must be achieved and more research into interdisciplinary teaching, rather than one of the other multi-disciplinary models, must be conducted before it is accepted as the preferred method of curriculum organisation.

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