

Play, learning and the brain



Play, learning and the brain



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Introduction

This course examines the subject of brain-based learning, with a particular focus on the development of the young child's brain and is of particular relevance to those who work with young children. We begin by looking at the structure and functions of the brain, and the impact that sensory deprivation can have on these. We consider the implications of current understandings of brain development for teaching and learning, particularly in an early years setting, and finish by exploring the value of play (particularly outdoor play) in children's learning and the development of their brains.

This OpenLearn course provides a sample of postgraduate study in [Education, Childhood & Youth qualifications](#).

Learning Outcomes

After studying this course, you should be able to:

- demonstrate an awareness of current understanding of the structure and function of the brain
- understand and critically analyse the linked concepts of brain-based learning and brain-based education
- understand the role of play in brain development
- recognise practical strategies for developing the curriculum to facilitate children's learning through play and other rich learning experiences.

1 Play, Learning and the Brain

'Teaching and learning are an odyssey into the neural architecture of the human brain.'

'A baby is born with over 100 billion brain cells. At birth only 25% of the brain is developed. By age three 90% of the brain is developed.'

(Catherwood, 2000)

'Brain-based learning' (BBL) is receiving increasing attention in the popular and professional fields. But what exactly is it? Before we explore the idea further it is important to understand the brain as we currently know it. The diagram of the brain (below) will remind you of some key ideas about its various areas and functions.

If you wish to view this animation in a separate window please click on 'Launch in separate player'

Interactive content is not available in this format.

Our brain and the spinal cord together make up our central nervous system. The spinal cord goes from the brain down to the lower part of the back. It is responsible for taking messages to the brain from the rest of the body, and from the brain to the rest of the body. When we look at the brain image we can see three main parts:

- the cerebrum;
- the cerebellum;
- the brainstem.

Each of these parts controls a number of important functions.

The cerebrum is the largest part of the brain and it is found at the front of the head. It controls our sense organs – touch, vision, hearing, temperature – and it initiates and coordinates movement. It also has a role in problem solving, reasoning, emotions and learning. All thoughts, memories, and imagination occur in this region. In this diagram the cerebrum has been displayed to show the lobes and their function.

If you wish to open the quiz in a separate window please click on 'Launch in separate player'

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[Interactive brain quiz](#)

Activity 1

See for yourself some of the 'facts' we know about the brain by taking part in a light-hearted quiz (above).

The very rapid growth of the brain during the first years of life raises some important questions about the quality of early experiences for children's overall development.

Before you move to the next section you may like to think about what is meant by the term 'developed' and whether the quotation from Catherwood on this page means that the brain can only develop a little more after the age of three.

2 What is brain-based learning and teaching?

Neuroscientists now have more sophisticated ways of examining living brains than was ever possible before. It is now possible to obtain images of the brain that show activity as it occurs. The importance of the first years of life has always been recognised by early years practitioners but the new information about the brain deepens our understanding about why this might be.

Perry and Pollard (1997) reported on the effects of sensory stimulation, or the lack of it, on early brain development. Using data from CT scans, physical measurements and documentary sources they explored the brain development of a group of neglected children. As an example of what can happen in an extreme case of sensory deprivation they published the startling images shown below.

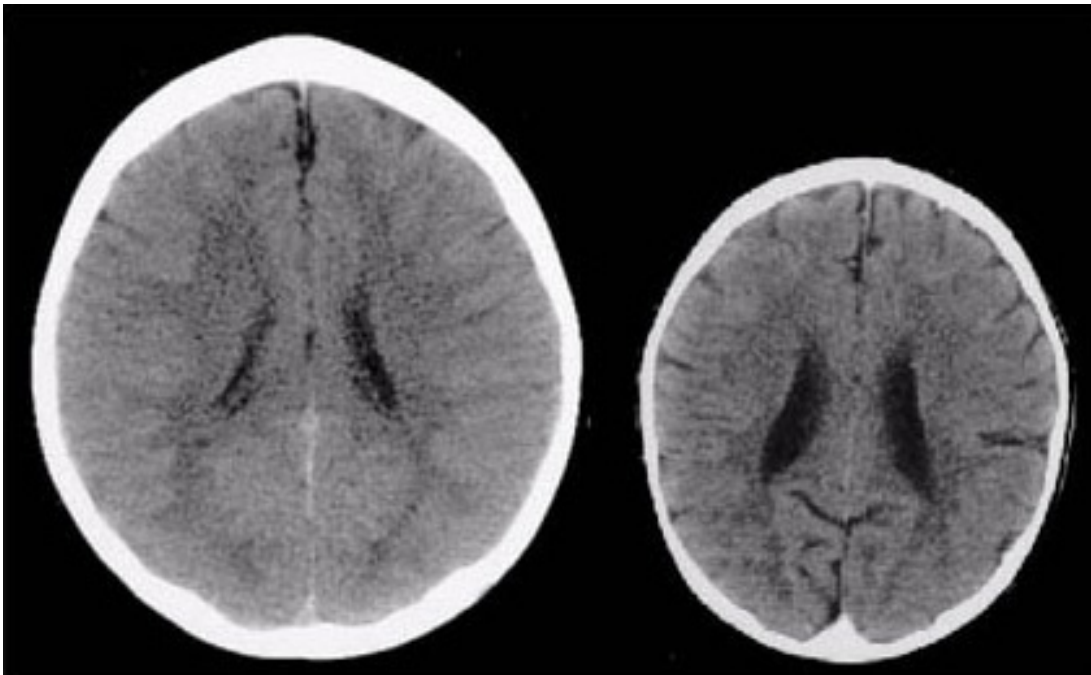


Figure 1 An example of the effect of sensory deprivation on the brain

These images illustrate the negative impact of neglect on the developing brain. The CT scan on the left is from a healthy three-year-old child with an average head size (50th percentile). The image on the right is from a three-year-old child following severe sensory-deprivation neglect in early childhood. This child's brain is significantly smaller than average and has abnormal development of the cortex (cortical atrophy) and other abnormalities suggesting under-development and mal-development of the brain. The contrast is marked but it is important to remember the comparison is with a very extreme example.

Research such as that by Perry and Pollard (1997) suggests that new information about how the brain works will help us to develop more effective learning strategies. Now complete Activity 2, which will take you more deeply into the key ideas behind brain-based learning and the ways these can be linked to educational practices.

Click on the link below to read about how children learn

[how children learn](#)

Click on the link below to read 'Overview of brain-based learning' by Wilson and Spears

[Overview of brain-based learning](#)

Click on the link below to open the activity sheet (required for the activity below)

[Activity sheet](#)

Activity 2

First click on the top "View document" link above to read the first article 'Making connections: how children learn'. Keep a note of any points that are new to you or that you found surprising in any way, as you will need these for the next activity.

The next article (click on the second "View document"), 'Overview of brain-based learning' by Wilson and Spears, looks in a little more detail at brain research and links this to learning and teaching. It suggests ways in which educators could enhance their practice by drawing on this new information. Look particularly at the Twelve Design Principles and at the ways in which it is suggested learning can be maximised. Keep a note of three points that interest you in this reading and which relate specially to young children.

Using the Activity Sheet (found under the third "View document" link, above):

- evaluate your own provision according to the Twelve Design Principles;
- consider how you would make changes to enhance learning;
- note any points about brain development that are particularly pertinent to you and your setting.

3 Are there any problems with adopting brain-based approaches to education?

It is apparent that there is a great deal of overlap between what is termed BBE (brain-based education) and what has been considered 'good' early years practice (e.g. contextualised learning).

But are there any problems with the way in which research into brain development and function has been used by educationalists to develop the distinctive approach labelled 'brain-based education'?

As could be anticipated with any new idea, BBE has both its advocates and others who urge practitioners to take a more cautious approach. Activity 3 presents some alternative perspectives and may help you decide which view you find most convincing.

Click on the link below to read the interview with Renate Caine, required for the activity below

[A Conversation with Renate Nummela Caine](#)

Click on the link below to read Fran Ellers' account, also required for Activity 3.

[New research spurs debate on early brain development](#)

Activity 3

To help you decide, click on the "View document" link above and read the extract from the interview with Renate Caine, an advocate of connecting brain-based learning to education.

Then click on the second "View document" link above and read 'New research spurs debate on early brain development', Fran Ellers' account of a discussion with Charles Nelson, a brain researcher who urges a more cautious approach.

Amend your notes to Activity 2 to include ideas from these readings.

Further Reading:

John Bruer has written a very important critique of brain-based learning and the links that are being made between this research and early childhood educational policy. You may be interested in reading more about his views. Click on the link here to find 'In Search of ... Brain-Based Education'.

4 Play and learning

'In play, the child always behaves beyond his average age, above his daily behaviour.

In play, it is as if he were a head taller than himself.'

(Vygotsky, 1978)

Why are early years practitioners convinced about the value of play?

It is interesting that although writers are able to state what children may learn through play in terms of dispositions, knowledge, skills and attitudes, there is less written on why play rather than any other form of activity is particularly valuable to the young child and their developing brain. BBL begins to address the issues of 'quality and play', as Activity 4 explores.

Three teaching elements are said to arise from the principles underpinning brain-based learning taken from the Wilson and Spears article, which you read in conjunction with Activity 2:

- orchestrated immersion in complex experiences;
- relaxed alertness;
- active processing (i.e. meta cognition).

There are many ways in which we can make judgements about 'quality' in early years settings including, for example, environmental factors, staff qualifications, staff turnover and the appropriateness of the programme provided. Most importantly, the learning experiences provided need to be developmentally and culturally appropriate in meeting children's needs. Additionally adults and children need to be able to interact with warmth in responsive and reciprocal ways.

To decide how you feel play can fulfil these criteria you should now go to Activity 4.

Activity 4

Observe a child engaged in what you would regard as high quality play.

As you do so, make notes describing the child's level of involvement, commitment, interest, perseverance and emotional state.

Now go to the next section.

5 Outdoor play and learning

Early years practitioners have always argued strongly for children to have the opportunity to play in both indoor and outdoor environments. But currently adult fears appear to be making outdoor play an 'endangered activity'.

The following list offers some good reasons for making sure young children have the opportunity for outdoor play time.

1. Play is an active form of learning that unites the mind, body, and spirit. Until at least the age of nine, children's learning occurs best when the whole self is involved.
2. Play reduces the tension that often comes with having to achieve or needing to learn. In play, adults do not interfere and children relax.
3. Children express and work out emotional aspects of everyday experiences through unstructured play.
4. Children permitted to play freely with peers develop skills for seeing things through another person's point of view – co-operating, helping, sharing, and solving problems.
5. The development of children's perceptual abilities may suffer when so much of their experience is through television, computers, books, worksheets, and media that require only two senses. The senses of smell, touch, and taste, and the sense of motion through space, are powerful modes of learning.
6. Children who are less restricted in their access to the outdoors gain competence in moving through the larger world. Developmentally, they should gain the ability to navigate their immediate environs (in safety) and lay the foundation for the courage that will enable them eventually to lead their own lives.

(The above points were taken from the *NAECS/SDE Position Statement: Recess and the Importance of Play (Appendix 2)*.)

Activity 5 now asks you to consider your own setting and identify the contribution your outdoor play provision makes to learning.

The activities that can be provided depend on the type of setting, the resources available and the practitioner's views about the place of outdoor activities in the overall development of the child.

Click on the link below to read Article 1 (mentioned below)

[Outdoor Experiences for Young Children](#)

Click on the link below to read Article 2 (mentioned below)

[Recess and the importance of play](#)

Activity 5

1 Click on the "View document" link above and select the article on outdoor play that you feel is most appropriate for your setting.

Article 1 is of a general nature, while *Article 2* focuses on school contexts. Read either *Article 1* or *Article 2*.

Make a list of the ways in which outdoor play is of *specific* value when considering children's learning and the development of their brains.

Draw on:

- what you know about the development of the brain;
- what you know about the ways in which children play outdoors.

2 You may find it helpful here to have an observational record or short video of children playing outdoors in your setting.

3 Now review and evaluate your outdoor play provision using the list of points you made at the start of this activity.

If it is possible to work with a colleague, please do so.

Conclusion

This free course provided an introduction to studying Education, Childhood & Youth qualifications. It took you through a series of exercises designed to develop your approach to study and learning at a distance and helped to improve your confidence as an independent learner.

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