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Secondary learning

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Contents

Introduction

In this free course, *Secondary learning*, you will examine some of the key debates and issues around knowledge, learning and pedagogy. You will have your own preconceptions about knowledge, learning, intelligence and the role of the teacher, and it is important that you are open to examining your views and to considering the evidence behind new developments. Section 1 considers the nature of knowledge. Section 2 focuses on learning and some of the main theories of learning. Section 3 considers the implications of these ideas for teaching and pedagogy.

This course is generic and is designed for people who are learning to be a teacher, are in their first few years of teaching, or who are working in an educational setting and are interested in learning more about some of the theory that underpins good teaching.

At the heart of education are knowledge and learning. Both are complex but how they are viewed has profound effects on what happens in formal educational settings such as classrooms. Together they are manifested in classroom 'pedagogy', defined as 'the science and principles of teaching: instruction; training' (*The Chambers English Dictionary*, 1983, p. 938). Leach and Moon (2008, p. 6) defined pedagogy as 'a dynamic process informed by theories, beliefs and dialogue but only realised in the daily interactions of learners and teachers and real settings'. Pedagogy is essentially, therefore, what goes on in the classroom, underpinned by a complex mixture of the values, beliefs and past experiences of the teacher, as well as the context in which they are working.

How teachers teach depends on their views of knowledge and learning. A teacher, therefore, needs to be clear about the values and beliefs that underpin what he/she does. Learning to be a teacher involves examining and articulating beliefs about knowledge, the subject and how people learn. In this course you will examine ideas about knowledge and learning, and how these manifest themselves in the classroom.

Now listen to an introduction to this course by its author, Kris Stutchbury:

Audio content is not available in this format.

As you work through the activities you will be encouraged to record your thoughts on an idea, an issue or a reading, and how it relates to your practice. Hopefully you will have the opportunity to discuss your ideas with colleagues. We therefore suggest that you use a notebook – either physical or electronic – to record your thoughts in a way in which they can easily be retrieved and re-visited. If you prefer, however, you can record your ideas in response boxes in the course. In order to do this, and to retrieve your responses, you will need to enrol on the course.

This OpenLearn course is part of a collection of Open University short courses for teachers and student teachers.

Learning Outcomes

After studying this course, you should be able to:

- articulate different views of, and aspects of ‘knowledge’ in the context of a subject
- outline what it means to learn
- summarise some of the key learning theories and how they manifest themselves in the classroom
- identify how theories of learning are manifested in classroom pedagogy
- explain what is meant by ‘active learning’ and ‘student-centred learning’.

1 Knowledge

Knowledge is fundamental to teaching and learning. However, when people speak of 'knowledge', what do they mean by the term? Is there a shared understanding of the concept?

It can be helpful to think in terms of different types of knowledge. From a philosophical perspective, knowledge is typically divided into three categories:

- personal knowledge
- procedural knowledge
- propositional (declarative) knowledge.

Personal knowledge

Personal knowledge can be thought of as 'knowledge by acquaintance' – the kind of knowledge someone claims to have when they say things like 'I know Beethoven's music' or 'I know Mrs Smith'. The importance of personal knowledge has been promoted through the concepts of 'critical thinking' and 'critical pedagogy', whereby knowledge is conceived of as not fixed and 'given' but as something that is personally constructed through the process of the learners' active interaction with their world and with those who teach them. Personal knowledge has tended to be undervalued in formal educational contexts, as it is individual and tacit – and therefore not easily open to 'packaging' as curriculum content or to being assessed. However, the value that a teacher attaches to personal knowledge will impact on how they teach.

Procedural knowledge

Procedural knowledge can be thought of as knowledge of **how** to do something – the practical skills of being able to ride a bike, kick a football or mend a leaking pipe, for instance. People who possess procedural knowledge are not necessarily claiming that they understand the theory that lies behind the activities they undertake but that they possess the skills to enable them to do these things.

Propositional knowledge

Propositional knowledge is sometimes caricatured as being simply about the acquisition (through memorisation) of isolated facts, such as the date of the Battle of Hastings or that the angles of a triangle add up to 180 degrees. However, a higher order of propositional knowledge is 'conceptual knowledge'. This is demonstrated through an understanding of the interrelationship between 'facts' within a larger framework. These frameworks might, for example, be scientific or mathematical theories, the rules of Western musical harmony or the syntactical rules of a particular language.

It is important to remember that these categorisations are underpinned by ideological and value judgements about what is important knowledge. They provide a way of thinking

about knowledge rather than a detailed description of a reality. It is also important to note that they rarely exist independently of each other. For example, in order to have personal knowledge of someone, you need to possess some propositional knowledge about them. The relationship between the three different types of knowledge is outlined in Figure 1 below.

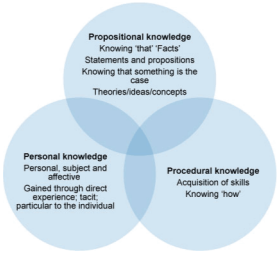

Figure 1 Types of knowledge (adapted from Burnard, 1996)

Activity 1 Considering different types of knowledge

Allow about 30 minutes

For each type of knowledge, identify some examples from your subject. Do not restrict your thinking to the way in which your subject presents itself in school but also consider how your subject is presented in the wider world.

Also think back to the experiences of your subject that you had as a student.

- Do you think one category of subject knowledge had a higher status than another? If so, why do you think this might have been?
- Did an emphasis on specific kinds of knowledge lead to particular approaches to teaching?

Provide your answer...

1.1 Knowledge and teaching

In school, views of knowledge are understood to be encapsulated in the schemes of work. These will almost inevitably reflect the examination syllabus and any statutory curricula requirements that happen to be in force, as well as current political agendas and initiatives. They will also reflect the values and beliefs about the subject held by the teachers in the school and the relative importance attached to different types of knowledge.

Activity 2 What is important in your subject?

Allow about 30 minutes

Collect the curriculum documents for your nation and/or schemes/units of work used in your subject in school. To what extent do they reflect your own views about what is 'important' knowledge in your subject?

Discuss with a more experienced colleague:

- what they consider is important knowledge in their subject
- why they hold these views
- how they reconcile any perceived tensions between their own views of knowledge and those articulated through any statutory curriculum.

Consider how their views and perceived tensions might influence how they teach their subject.

1.2 Knowledge and learning

Your view of knowledge will influence your view of learning. The American philosopher and educationalist John Dewey argued that knowledge is actively constructed by the learner and teacher working together (Dewey, 1910). This is different from empiricist and rationalist beliefs that view the 'the learner' and 'knowledge' as separate entities. Knowledge is seen as an object waiting to be 'learned' and 'understood' by the student and learning is an essentially passive process. The teacher does not seek to make connections between knowledge and the learner's individual and personal world; little importance is attached to personal knowledge or to the higher order forms of procedural and propositional knowledge. The Brazilian educator Paulo Freire describes this view of knowledge as leading to the 'banking' concept of education, where the teacher is considered to be the possessor of knowledge and the children the receptacles for that knowledge:

> Education … becomes an act of depositing, in which the students are the depositories and the teacher is the depositor.
>
> (Freire, 1970, p. 53)

With this view, the teacher's pedagogical role is:

> to 'fill' the students by making deposits of information which he or she considers to constitute true knowledge.
>
> (Freire, 1970, p. 57)

The potential consequences for children's experience of learning through such an approach were vividly described by Charles Dickens more than 150 years ago:

> a plain, bare, monotonous vault of a school-room … and there arranged in order, ready to have imperial gallons of facts poured into them until they were full to the brim.
>
> (Dickens, 1854)

Figure 2 A Victorian classroom

The learner plays little part in deciding what for them is important knowledge, in constructing knowledge or in influencing the way in which knowledge is acquired. In contrast, Dewey promotes the idea of 'experiential education', through which students and teachers work together to construct knowledge and skills through making direct connections with the student's and the teacher's worlds. The most influential aspect of Dewey's thinking is the idea that education should not focus on knowledge content per se, but rather on the child as learner and their active engagement with knowledge as a process of discovery.

Reflection point

How were you expected to learn your subject at school?

Was that different from how you learned out of school?

What assumptions about how learners acquire knowledge underpinned the way(s) in which you were taught at school and university?

In order to support students in developing knowledge and understanding, a teacher needs to plan strategies and respond to learners effectively through taking into account the diversity in the classroom and the learning needs of individuals. To do this effectively, it is helpful to understand some of the main theories about learning and how these might manifest themselves in the classroom. This is addressed in the next section.

2 Theories of learning

If the focus of education is not on knowledge content but on the child as a learner and their active engagement with knowledge, then learning theories provide a way to think about how the child might learn. Having knowledge of different learning theories will enable you to analyse and reflect on what is happening in the classroom.

Reflection point

Think about your own learning:

- When do you find learning easy?
- When do you find learning difficult?
- What strategies do you use to help you learn?

It is beyond the scope of this course to go into detail about all learning theories, so what follows is an introduction to some key theories relevant to teachers.

2.1 Behaviourism

Behaviourism defines learning as a change in the behaviour of the learner. It originated in the early part of the twentieth century from the work of Watson, Thorndike and Skinner (e.g. Skinner, 1974) and is based on the premise that learning can be broken down into discrete elements, which can be separated out, taught, practised and fitted together again.

This type of learning might be considered appropriate for learning certain types of knowledge, such as multiplication tables, or certain skills, such as threading a sewing machine. This is because the knowledge or skill can be demonstrated through the student's observable behaviour – the multiplication tables can be recited or the sewing machine can be threaded.

Figure 3 Learning skills

The main principles underpinning a behaviourist perspective of learning are that:

- learning is best achieved through the teacher taking control of the learning process, breaking down tasks and actively reinforcing the correct response
- learning outcomes are standardised and measurable
- people learn not for the intrinsic value of learning but for extrinsic rewards, such as certificates, merits, gold stars or parental approval

- behaviour that is reinforced positively (for example, by praise or recognition) is likely to be repeated
- behaviour that is reinforced negatively (for example, by being ignored) is less likely to be repeated.

Although behaviourist theory is now considered outdated, and not consistent with Dewey's conception of knowledge, it has proved extremely resilient and can be seen in many classrooms today. Much of the language in National Curriculum guidelines and other government documents can also be associated with behaviourism.

In the classroom, praising or acknowledging students for following the school's 'hands up' policy to respond to questions, while ignoring those who shout out answers, is a way of attempting to modify behaviour. However, students who are told off for misbehaviour may see this as positive reinforcement (because it has brought attention) and may be encouraged to misbehave further in order to attract more attention. Alternatively, ignoring misbehaviour (providing it is low-level and not dangerous) may lead to the student changing their behaviour.

Reflection point

Can you think of an example of teaching you have seen or experienced that characterises the behaviourist approach?

How did the teacher act?

What did the students do?

What were the students expected to learn?

Behaviourism has been criticised for not giving consideration to changes that cannot be observed, such as changes in attitudes and thoughts, as well as for its view of the learner as passive in the learning process.

2.2 Constructivism

Dissatisfaction with the limitations of behaviourism led researchers to look for ways to explain the unobservable changes that took place when learning occurred. These developments were rooted in the work of Piaget, in the 1920s, and developed by others, including Von Glaserfeld (2002).

Learning, according to constructivist theory, occurs when knowledge is constructed by the individual as a result of their experience in the world. Piaget's (1953) view was that children's intellectual development progresses through distinct stages, and that they make sense of the world in different ways as they grow older. Piaget proposed four stages of development, which he termed:

- sensori-motor (around 0–2 years)
- pre-operational (around 2–7 years)
- concrete operational (around 7–11 years)
- formal operational (around 11 years onwards).

Piaget believed that everyone passes through these stages in the same order but that the age at which this happens can vary from one child to the next. 'Assimilation' (when new

knowledge is assimilated into children's existing understandings and schema) and 'accommodation' (when existing schema have to be reorganised to accommodate new knowledge) are key concepts within this view of learning.

Activity 3 Piaget's theory of development

Allow about 15 minutes

The video clip below outlines Piaget's theory of how children develop. As you watch, pay particular attention to the sections on concrete operational and formal operational thinking. Identify how children learning in this way might influence teaching. List what you might look for when observing teachers and students in classrooms.

View at: youtube:QX6JxLwMJeQ

Provide your answer...

Comment

Piaget's theory of development applies to individuals. It can be a helpful way for a teacher to think about learning when they are working with an individual, helping them to understand a new concept. If the learner is struggling to grasp an abstract idea, finding ways to make it more concrete can be helpful.

In secondary schools, constructivist learning theory relates to young people as they move from the concrete operational stage (7–11 years) to the formal operational stage (11 years onwards). Of course, not all children develop at the same rate: some will develop their thinking more quickly and some more slowly. Teachers taking a constructivist view of learning theory will:

- think about what the child already knows, so that new knowledge can be related to existing schemata (assimilated or accommodated)
- look for any misconceptions in the child's existing knowledge and provide learning activities that enable the child to understand the limitations of their current conceptions
- prepare learning tasks and activities in which the learners can actively participate; participation might be physical, such as a science experiment, or mental, such as problem solving.

Critics of the theory argue that individually constructed knowledge may not be valid, leading to misconceptions or misunderstandings. Others suggest that teachers can underestimate children's capability; for example, if their stage of development is not properly recognised or their 'readiness' to learn is not responded to. Constructivism has also been criticised for focusing on the individual learner rather than on the social context in which learning takes place, which led to development in the theory.

2.3 Social constructivism

Social constructivism maintains the importance of the central role of the child as an active learner.

However, this theory regards learning not as an individual activity but as a social one, in which language plays a crucial role in developing understanding and learning is not considered to be limited by a child's stage of development.

Vygotsky (1978) was an important contributor to this theory. He identified the gap between what a child can do as an unaided individual and what they can do with the help of a more knowledgeable other. He called this gap the 'zone of proximal development' or ZPD. Bruner (1978) later used the term 'scaffolding' to describe the way that the more knowledgeable person can support the child's cognitive development. This more knowledgeable person might be the teacher but might also be other students, classroom assistants, parents or outside groups. Seen in this way, children's learning is not bounded by the school but is a continuous process that has a particular focus at school.

Figure 4 A girl and a teacher looking at a book

Activity 4 Defining social constructivism

Allow about 30 minutes

Audio content is not available in this format.
Interview with Harry Daniels (The Open University, n.d.)

Listen to the audio interview with Harry Daniels, Professor of Education, Culture and Pedagogy at the University of Bath in which he explains social constructivism.

Identify examples from your own learning or teaching, or from your observations of students, that support this theory. An example would be where 'scaffolding' was used or where a more knowledgeable 'other' person was involved.

Provide your answer...

This theory of learning has significant implications for teachers, such as knowing the current learning of each student and, through careful scaffolding, enabling the student to progress by providing just the right amount of help. Here, then, the teacher does not adopt a passive role in relation to student learning but actively intervenes to help the student move forward. However, this is not easy. How can we be sure that the intervention falls within the ZPD and does not lie beyond it or, indeed, does not ask too little?

These theories of learning are well established and, as you will have seen, manifest themselves in school in many ways. In the next section we will discuss more recent theories that can also contribute to your understanding of how children learn.

2.4 Situated cognition

Situated cognition theory, developed by Lave and Wenger (1991), takes social interaction a step further. This theory does not regard learning as the acquisition of knowledge but rather that learning a subject is a process of becoming a member of that subject's community. Learning, therefore, is seen as an active process and occurs when 'learners' participate in real-world situated contexts. It involves not only knowledge but also the behaviours and values inherent in the community; context and culture impact on learning, the implication being that learning experiences need to be culturally and contextually authentic.

Following this theory, the role of the teacher is to set up learning environments where students can be initiated into the practices, community and discourse of the subject – that is, not learning history but becoming historians. Similarly, your learning – seen through this theory – is about becoming a member of the community of teachers, feeling a sense of belonging and having an ability to communicate with others in the community through shared meanings.

Teachers aligned with situated cognition theory:

- model the behaviours of the subject community, showing interest and enthusiasm in the subject and ways in which members go about their work (for example, art teachers who practise art in the classroom)
- set up tasks and activities rooted in 'real-world' contexts, allowing students to practise working and behaving as members of the community.

The principles of situated cognition can be observed in practice in many classrooms.

Reflection point

Think about what it means to be a member of your own subject community:

- What knowledge, skills, behaviours and attitudes are involved?
- What activities might take place in your subject that would help students to develop as members of the subject community?

2.5 Embodied cognition

This is a relatively recent theory, emerging in the 1980s through the work of Lakoff and Johnson (1980), although it has roots in earlier discussions in philosophy, psychology and artificial intelligence.

The theory proposes that cognition (thinking) develops through physical interaction with the world (Thelen, 1995). Lakoff and Johnson argue that our learning and understanding is dependent on our perceptions and our experiences through our sensori-motor systems

– we learn by doing/experiencing. More simply, think about learning situations in which we 'doodle' or pace the floor or gesticulate; these are all examples of physical activity supporting cognitive activity.

Embodied cognition theory appears similar to that of situated cognition, but whereas that theory regards cognition as concerned with abstract representations of the world, embodied cognition theorists believe that there is more to cognition than mental representation.

Figure 5 Learning through physical experience

This theory seems to imply that a teacher would:

- provide an environment rich in artefacts, tools and equipment
- set tasks in which students are engaged in activity involving their senses (touch, sight, hearing, and so on).

As with the other theories, this one has its critics. Other theorists argue that the complex world in which we live requires us to develop meaningful representations, in which case not all learning needs to be physically embodied.

Activity 5 Learning theories in action

Allow about 1 hour

This activity will help you to think about how learning theories can influence classroom teaching.

Download the word document, Learning theories in practice, and complete the table by adding:

- one or two key points about each learning theory
- one example of how the theory might influence classroom practice.

Information on 'Embodied cognition' has been completed for you as an example.

2.6 Learning styles

The concept of 'learning styles' has been described as students' 'tendency to adopt a particular strategy in learning' (Mutiu and Moldovan, 2011, p. 578) based on their personal characteristics, and suggests that different modes of learning suit different students. It has also been termed 'learning preferences' or 'learning strategies'.

Some people believe that these ideas have implications for the classroom because a student's preferred learning style may affect the way in which they respond to your teaching. Various schemes have been suggested and are popular in schools. However, despite the popularity of the concept of learning styles, there is very little evidence to

support the idea that learners learn more effectively if they have the opportunity to learn in their preferred style (Petty, 2009). You will consider this evidence in the next activity.

Activity 6 Learning styles

Allow about 1 hour

Watch the TED talk video below by Tesia Marshik.

View at: youtube:855Now8h5Rs

Note your thoughts in response to this talk as it progresses. What strategies would you use to help learners 'make meaning' in your subject?

Provide your answer...

There are many theories about learning and this section has touched on a few of the more established ones. The theories of learning described in this section not only suggest how this might be achieved but also provide a framework to help you to reflect on practice. No single theory should be regarded as 'right'; in different contexts, with different topics, with a particular group of students, all have something to offer.

As a teacher, your responsibility is to support your students to learn. You can't make them learn – that is up to them – but you can draw on the various theories of learning in order to create the conditions in which learning is likely to take place. New theories are emerging. For example, in recent years there has been a great deal of focus on neuroscience and what happens in the brain when learning takes place. This is an area that is advancing fast and is controversial. The concepts of '**learning without limits**' and '**growth mindsets**' have also impacted on views about learning. The Further reading section provides links and references that might interest you.

3 Learning theories in practice

Learning theories may not be the topic of discussion among teachers in the staff room but the terms ‘active learning’ and ‘student-centred pedagogy’ are often heard in the context of school teaching. What exactly do these terms mean and how do they link to learning theory?

3.1 Active learning

The notion of ‘active learning’ supports Dewey’s conception of knowledge and ‘experiential learning’, challenging the idea that learners will simply absorb knowledge transmitted by teachers. It is closely linked to constructivist theories of learning and the idea that students learn by actively engaging with the world. Depending on how old you are, and on your own educational experiences, you might not have experienced active learning when you were at school, which makes learning to teach in this way more challenging.

Learning through active participation always involves learners being cognitively active – engaging their minds in their learning. It might also involve an actual physical action (such as making a poster, building a model or doing an experiment) but will always involve cognitive action – ‘minds on’ as well as ‘hands on’. Just listening to a lecture is insufficient; understanding is actively constructed by the learner through thinking about the new material, processing information and making connections with previous learning or established ideas.

Reflection point

Think about a lesson you taught or observed recently. What did you/the teacher do to ensure the students were actively engaged in learning?

3.2 Student-centred pedagogy

The modern presentation of Dewey’s ‘experiential education’ is perhaps ‘learner-centred education’ or ‘student-centred pedagogy’. ‘Student-centred’ is a difficult term as it means different things to different people. A common view is that student-centred pedagogy implies a set of particular approaches, such as group work, practical work or discovery learning. This is unfortunate as it has enabled neo-liberal ministers of education to label a large proportion of the education community as ‘the blob’ (Garner, 2014), apparently demanding group work and promoting a lack of rigour in teaching and learning. To the Government ministers in the UK in 2010–2015 ‘student-centred pedagogy’ is associated with a lack of discipline and low expectations. To other governments it represents an aspiration, a vision of education that is very different from what is happening and therefore the means to achieve significant improvements in student outcomes.

Reflection point

What does ‘student-centred’ learning mean to you?

What would you expect to see in a ‘student-centred’ classroom?

Discuss your ideas with colleagues – how much agreement is there between you?

Michele Schweisfurth (2013), in a book that takes an international perspective on student-centred education, defined a set of ‘minimum standards’ for this type of education (2013, p. 146). These are:

- Lessons should be engaging to students and motivate them to learn.
- There is mutual respect between students and teachers, reflected in the way in which both behave.
- Learning challenges build on students’ existing knowledge.
- Dialogue is used in teaching and learning, with students having the opportunity to discuss their ideas.
- The curriculum should be relevant to students’ lives.
- The curriculum should be based on skills, attitudes and content and should support critical and creative thinking.
- Assessment should test skills and knowledge and not be based on rote learning.

The implication here is that ‘student-centred learning’ (or learner-centred education) is about a set of values rather than a set of approaches, and that teaching relies on building productive relationships between the teacher and the learners.

Activity 7 Student-centred teaching

Allow about 30 minutes

Part 1

With a colleague, consider the following questions:

- What is your response to Schweisfurth’s ‘minimum standards’?
- Consider these ‘minimum standards’ in terms of the learning theories that you have studied – how many are represented?
- How might the ‘minimum standards’ manifest themselves in your teaching of your subject?

Part 2

Thinking back over the last week, jot down some of the activities that you asked students to do in your lessons. How could you have made them more ‘student-centred’?

Provide your answer...

The ‘minimum standards’ draw on behaviourism, constructivism, social constructivism and social cognition. This is to be expected because if the primary concern is to focus on the learners, then different theories of learning will enable a variety of needs to be met.

A common misconception is that ‘student-centredness’ comes with a set of rules such as: ‘you should be doing group work’ and ‘you mustn’t talk to a class for more than 5 minutes’. This is not helpful. Badly organised group work with ill-thought out tasks is worse than the alternative and whole-class teaching can be ‘student-centred’. Student-centred learning requires a student-centred teacher and manifests itself through:

- what the teacher focuses on when planning
- the nature of communication with students
- the teacher’s attitude to students and their ideas and different needs
- how the teacher views students’ existing knowledge, experience and attitudes
- the teacher’s view of the learning process and the learner
- the teacher’s role as an educator
- what the teacher sees as important (values).

An effective student-centred teacher will help students to see the value of what they are learning and organise success so that the students believe they can learn. The teacher will structure content so that it has meaning to the learner, provide feedback and engage in dialogue about progress (Petty, 2009).

Activity 8 Planning student-centred teaching

Allow about 20 minutes

Imagine you are working with a novice teacher.

1. Explain how to make sure that whole-class teaching is ‘student-centred’.
2. Explain how to ensure that group work is genuinely ‘student-centred’. What do you need to consider in your planning?

Provide your answer...

3.3 Drawing together the key ideas

This course has introduced ideas about knowledge and learning, and how these are brought together to create a student-centred classroom. In the final activity in this course, you will draw together the ideas raised in each section in order to analyse a lesson and to think about how it might be improved.

Activity 9 Analysing lessons

Allow about 1 hour

For this activity you will need a lesson plan in your subject or a set of detailed notes on a lesson you have observed. Some examples are provided, which you can use if you wish. If possible, work with a colleague.

Example lesson plans

Geography

Mathematics

Modern foreign languages

Music

Science

Read through your chosen lesson plan and then answer the following questions:

1. What knowledge is covered during this lesson? Think about what the students will learn and classify it according to the 'types of knowledge' described in Section 1. Was each type covered? Could the lesson be changed in any way to cover a broader range of knowledge?
2. Analyse the lesson in terms of the learning theories described in Section 2. How could the lesson be changed or developed to take into account a different learning theory?
3. Analyse the lesson in terms of Schweisfurth's 'minimum standards'. Was the lesson 'student-centred'? Did it involve 'active learning'?

Provide your answer...

Conclusion

As a beginning teacher studing this free course, *Secondary learning*, you may be preoccupied with planning lessons, classroom management, and learning the rules (written and unwritten) and routines that form the culture of the school in which you work. The purpose of this course was to encourage you to stand back and think about what it is you are trying to achieve. By developing a strong conceptual framework that includes a view of knowledge, learning and pedagogy, you will be in a position to reflect on your experiences and your developing practice and be proactive in learning to become the sort of teacher you want to be.

Further reading

Behaviourism

Exploring children's behaviour: An OpenLearn free course that contains information about behaviourism (you may have to register and sign in for this)

Skinner, B.F. (1973) *Beyond Freedom and Dignity*, London, Penguin: an account of behaviourism from one of its founders

Constructivism

Piaget Society website

Von Glaserfeld, E. (2002) *Radical Constructivism: A Way of Knowing and Learning*, London, Routledge

Social constructivism

Daniels, H. (ed.) (1996) *An Introduction to Vygotsky*, London, Routledge

Situated cognition

Lave, J. and Wenger, E. (1991) *Situated Learning: Legitimate Peripheral Participation*, New York, Cambridge University Press

Embodied cognition

Website on embodied cognition

Internet Encyclopedia of Philosophy: an article by Monica Cowart on embodied cognition

Lakoff, G. and Johnson, M. (1980) *Metaphors We Live By*, Chicago, IL, University of Chicago Press

Learning without Limits

Learning without Limits website

Hart, S., Dixon, A., Drummond, M.J. and McIntyre, D. (2004) *Learning without Limits*, Maidenhead, Open University Press

Swann, M., Peacock, A., Hart, S. and Drummond, M.J. (2012) *Creating Learning without Limits*, Maidenhead, Open University Press

The Growth Mindset

Mindset website

The power of believing that you can improve: TED talk by Carol Dweck

Dweck, C. (2006) *Mindset: How You can Fulfill your Potential*, New York, Random House

Developments in neuroscience

Collins, S. (2016) *Neuroscience for Learning and Development*, London, Kogan Press.

Sousa, D. and Tomlinson, C.A. (2010) *Differentiation and the Brain*, Bloomington, IN, Solution Tree Press.

Wolfe, P. (2010) *Brain Matters: Translating Research into Classroom Practice*, 2nd edn, Alexandria, VA, ACSD

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Acknowledgements

This free course was written by Kris Stutchbury.

Course image

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Figures

Figure 1: adapted from: Burnard, P. (1996) *Acquiring Interpersonal Skills: A Handbook of Experiential Learning for Health Professionals*, 2nd edn, London, Chapman & Hall.

Figure 2: Thislife Pictures/Alamy

Figure 3: Ken Walsh/Alamy

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