

Behaviourist and cognitive approach to learning theories



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The two main influential learning approaches are the behaviourist and the cognitive approach to learning theories.

This report critically evaluates how learning theories are applied in the 14-19 Applied Science classroom. It examines how behaviourism, although an outdated theory, is still relevant in the modern classroom and is still used in developing the rewards and sanctions policies of the modern school. The impact of Piaget's theory of cognitive development is evaluated and what possible difficulties might arise if they were applied exactly as Piaget dictated. The impact of adhering rigorously to Piaget maturational stages is criticised and how it might not be possible to adhere to set ages for progression in a school. Kolb, Vygotsky and Bruner's constructivist approaches are compared and shown that, when applied to a motivated class they work as they were originally intended and yet when applied to a more disaffected class, they aren't as easily applied.

The science classroom is an inherently dangerous place for students to work in (Frost, Turner 2005, p. 168). It is therefore necessary to instil a level of 'discipline' in the students, to ensure they minimize the dangers to themselves and others in the science classroom. It is necessary to 'condition' (Child 1997, pp. 114-121) the students to behave when certain commands are issued. Behaviour theorists believed that the mind was a blank slate 'tabula rasa' and that we could observe the response to stimulus that happened to an organism.

Watson thought that a response is more likely to be connected to an environmental event (stimulus), if that stimulus-response is repeated

regularly and with a short period of time between them (Child 1997, p. 115). Thorndike showed that the student is less likely to repeat negative stimulus-responses, which therefore means that there will be an increase in the positive stimulus-responses, until a correct response is repeated regularly. The stimulus-response is then reinforced whenever a positive result is produced.(Child 1997, pp. 114-121). Skinner made several conclusions from his findings in Operant Conditioning (Child 1997, pp. 119-121). The steps taken in the conditioning process must be small. Regular rewards are required at the early stages, but once the conditioning is reflexive, rewards can be given less regularly. The rewards must come immediately or shortly after a positive response to ensure maximum effectiveness (feedback) (Child 1997, pp. 114-121)

When discussing learning theories, it's necessary to mention Pavlov due to the importance held in his work, even if it doesn't really directly affect the classroom. Pavlov pioneered the idea of classical conditioning with his famous experiment where he taught dogs to salivate, when a stimulus was applied, just before food was given to them. The dogs eventually associated the ringing of the bell with the arrival of food and salivated in anticipation of the food arriving (Child 1997, pp. 116-118). Pavlov's work does not directly link to teaching in the classroom, but it does apply, in that the students may be conditioned, to have a memory or a response to an event that happens within the classroom environment.

During my lessons I tried to implement Watson, Thorndike's and Skinner's theory of Operant Conditioning in the classroom to modify the behaviour of the class. The goal was to condition the students to reflexively stop talking
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when I moved to a certain area of the room; using the theory that the students would repeat behaviour that received a positive response, and not repeat behaviour that received a negative response. I initially started to modify their behaviour by moving to the left of the front desk, holding my hand up and waiting for silence in the same spot, every time I required them to stop talking and listen. Initially it was necessary to ask for silence and remind them that I was waiting to talk. In some cases it was necessary to issue a sanction as per the science department's rules of two warnings, then issuing a detention or keeping them in for part of their break if, if they didn't stop talking quickly enough. If the class stopped talking quickly, they would be rewarded with praise and if the lesson had gone well a class reward of a game or competition at the end, if it was appropriate. Positive feedback about performance is said to have a positive effect on future performance. Skinner called it reinforcement; Thorndike called it The Law of Effect.(Child 1997, pp. 115-121)

McAllister et al. (1969) found that praising students not only acted as a positive reinforcement of behaviour, but that the praise may have also worked by causing peer group pressure in the class to reduce inappropriate behaviour, because the negative behaviour reflected on the class as a whole (McAllister et al. 1969). Bandura's Social Learning Theory would say that the student's were not only being conditioned to respond to the teacher, but also learning from their peers actions as to what was appropriate behaviour in the classroom.(Atherton 2009)

By the end of the six weeks, the students were starting to respond to the successive approximation as described by Skinner (Child 1997, p.
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121) positively and required reminding less that I was waiting to talk to them. It was evident that they much preferred the positive response of listening and being allowed to continue with whatever activity I had planned, to the negative response of not listening and receiving a sanction, before continuing with the activity I had planned. It could be said that they were suffering from Learned Helplessness (Atherton 2009a) and had given up on being able to change the lesson by negative behaviour.

Due to the need to provide a safe working environment in the classroom, I also worked on the class responding to the command 'STOP' when they were carrying out laboratory work. The idea being that if 'STOP' was said loudly to the whole class, that they automatically stop what they are doing, stop talking, turn to where the teacher is in the classroom and prepare for instructions that are important or safety related.

" In the early stages of conditioning, continuous reinforcement is needed to establish the Stimulus-Response link." (Child 1997, p. 119) The difficulties whilst trying to implement these theories was down to the amount of time involved in getting the students responding to the stimulus positively. The theory of being able to reward the students for responding positively and sanction them if they don't isn't appropriate in this situation, due to the serious nature of the command. If the students don't respond to it, it could ultimately end up with dire consequences in an emergency situation.

The 'STOP' command in particular was a difficult one to implement due to its infrequent use and the seriousness of its use that was implied to the students. If the command was overused, then it would lose its importance as

something serious, but on the other hand if it wasn't practiced enough, the students would not respond appropriately when the command was issued.

Another interesting situation that arose was from the attention-monopolising students, in that the more demanding students are prepared to put up with the minor inconvenience of the negative reinforcement if they get the attention time from the teacher. (McAllister et al. 1969)

Seeing the students more frequently, I am sure that they could be conditioned quicker and show the innate response more readily than when I was only able to see them a few times a week.

Behaviourism is evidently still relevant in the modern school (McQuillan 1998), even if it is a somewhat outdated theory. Schools still have their sanctions policies based around Operant Conditioning and negative reinforcement with various levels of warnings and detentions in place for negative behaviour. This will remain effective for as long as policy makers allow these sanctions to be used. However, Skinner's belief that we are all blank slates and what goes on inside our black boxes (Child 1997, pp. 119-121) when we learn is not important, is not relevant anymore. (Child 1997, pp. 113-121) The students I have worked with and taught are all very unique in their personalities and show completely different ways of learning. To say that the learning processes they go through are only related to external stimulus and their response to that stimulus does not correlate with what has been observed in the classroom.

Constructivist Theory has played a big part in the current educational environment in schools. Driver and Easley introduced constructivism as it is <https://assignbuster.com/behaviourist-and-cognitive-approach-to-learning-theories/>

known now to the science community in 1978. (Solomon 1994, p. 3) They stated what was previously an inaccessible theory for science, accessible to the scientific educational community. The 14-19 classroom allows us to look at how Piaget's Theory of Cognitive Development is applied.

Piaget observed that children go through four distinct stages of cognitive maturation (Burton 2001, pp. 237-239)

Stages of Cognitive Development (Atherton 2009b)

In the 14-19 classroom, according to Piaget's theory, all the students have reached the Formal Operational stage of cognitive development and are capable of developing hypothetical situations and understand abstract concepts. Students should be able to apply their understanding of a situation and in theory be able to hypothesise what would happen in a given event.

(Child 1997, pp. 191-207)

From experience it is clear that not all students reach the Formal Operation stage at the same time and in fact the 11 year and up boundary is not as clear cut as that (Child 1997, p. 202-203). Within my Year 9 KS3 classes the majority of the students were at the Formal Operation stage of development and were capable of taking an abstract idea, such as levers and moment of a force and applying their knowledge and understanding to derive the equation for calculating the moment of a force themselves. A complex operation that required the students to both assimilate and accommodate (Child 1997, p. 192) the new information they were processing, a task which some found difficult, but all were able to eventually complete.

With the Year 10 Applied Science class only a small portion of the class were at the point where they could process abstract information or make a hypothesis. Unlike the year nine class they had to be walked through every new concept step by step (Burton, 2001 p241). When they were given the task of hypothesising why something had happened, for example, where did the glowing light from heated calcium carbonate come from, they were unable to comprehend that the glowing was not related to the heating itself, but was actually an endothermic reaction. Even with a step by step explanation and clearly showing how the reaction was occurring, only a small portion of the class were able to assimilate and accommodate the schema.

'Teaching at middle and upper school level should begin from concrete considerations, building up, where applicable, to more abstract reasoning.'(Child 1997, p. 203). Piaget's theory of distinct maturational stages poses an interesting problem for teachers and educational authorities. Should a student be moved into a more advanced class or year because of their age, or should they move up a level when they reach a stage in their learning ability? From experience with the two different classes, it's quite apparent that these boundaries are not as clear as Piaget was led to believe. If a school was to teach students based on their stage of cognitive development; how long could a student be held back for, before the age gap between their classmates was too much? Some students may after all never reach the Formal Operations stage.

Vygotsky's theory says that the child's higher mental processes are developed through the child working with other more knowledgeable persons than themselves.(Kozulin 2003, p. 19). He theorised that there was a Zone of <https://assignbuster.com/behaviourist-and-cognitive-approach-to-learning-theories/>

Proximal Development (ZPD) that was the boundary between a child's Zone of Actual Performance and their potential level of understanding. The child can access their ZPD with the assistance of a more 'competent' (Kozulin 2003, p. 20) person guiding them.(Chaiklin 2003, p. 43)

Vygotsky's Social Constructivist theory moved away from the didactic approach of teaching, which often led to students developing their own misconceptions and not being able to apply their scientific knowledge 'flexibly' to new situations (Karpov 2003, pp. 67-73), to a more socially guided, active approach to learning, where students learnt from their teacher, peers and themselves.

Kolb's four stage experiential learning cycle, is similar to both Vygotsky's theory of a ZPD and Bruner's theory of scaffolding the learning. Kolb's cycle builds on the learner's concrete experience and goes through three distinct stages, reflective observation, abstract conceptualisation and active experimentation, before returning to the now new concrete experience,, (Burton 2001, p. 246)

Similarly Bruner theorised that students built on their past experiences and that by applying a spiral curriculum, they would be able to return to subject areas and build on them when they were more capable of dealing with the more complex areas of the curriculum. He saw the teacher as a guide, leading the student through the learning process by scaffolding their learning with appropriate material and as the student progressed less scaffolding is required.(Burton 2001, p. 241)

When applying these theories it is important to be aware that students are all at different stages of learning. Some students have a more advanced understanding, which puts them in a completely different ZPD, concrete experience or stage in their scaffolded learning, to students who have a lower level of understanding.

With the KS3 class the students were all in the 5-7 range for target grades, therefore it was a lot easier to plan how they were going to progress in the lesson. A clear understanding of where they were in relation to their ZPD or their concrete knowledge was available and it was therefore a lot clearer, what was required to get them to a new Zone of Actual Performance or to the next stage in Kolb's cycle. They had all reached Piaget's formal operation stage and were able to develop their knowledge independently.

With the GCSE Applied Science class it wasn't as easy to apply the theories. The students target grades ranged from G-A., therefore ascertaining where their concrete knowledge lay or where they were in their Zone of Actual Performance was quite challenging. Such a large spread of stages meant it was often necessary to take a didactic approach to try and provide a basic foundation level of knowledge for the lower attaining students, so that they could access the lesson. In some cases students were never able to access the lesson due to their complete disaffection from the subject or school in general. Most of the class had not reached the formal operation stage and some struggled in the concrete operational stage at times. A good example being when one of the students struggled with the concept of limestone having nothing to do with the fruit.

Finding the middle ground, where the higher attaining students wouldn't be bored waiting for the lower attaining students to get on task or understand what to do was extremely challenging, and at some points, felt completely pointless trying to apply social constructivist theory to the lesson planning with such a wide range of grades in the class was one of the key problems when trying to apply these theories to the lessons.

It was however (in retrospect) interesting being able to see two different sides to how social constructivist theory is applied in the classroom. With the higher attaining, less disaffected KS3 students, it was a lot easier to see how the theories could be effectively applied to their lessons, how they benefitted from the teacher acting as a guide and their interest in the lesson meant that they were able to access it and move forward in their learning. It was always clear at which point in the learning process each student was at and what was required to move them onto the next level in the learning cycle.

With the more disaffected, lower attaining students, in the GCSE Applied Science class it was so much harder to effectively apply these theories in the lesson. I tried on several occasions to teach lessons where I acted as the guide through their learning process; the students (in theory) would build on their experiential learning and move forward in their knowledge and understanding of the subject. In fact what happened was that the students panicked at the thought of not having the teacher dictating to them each step of the lesson and what they must do. The concrete experience for some was so limited that they were unable to apply it to the lesson and very quickly, if they were not given step by step instructions as to what to do next, they would be off task and cause other students to go off task as well.

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Therefore it seemed that the behaviourist theory, in particular Skinner, was being followed, as the positive reward was completing the step.

Within the GCSE class there were several students who were classed as having Special Educational Needs (SEN), this ranged from Social Emotional Behavioural Difficulties (SEBD) to Dyslexia and Dyspraxia. Since the revised national curriculum was brought in to effect in September 2000, these students have had the right to a place in the classroom alongside students without any SEN.(Peacey 2001) Students with SEN are to be included in the lessons and not treated as separate entities to the non-SEN students.

Effectively inclusion was brought in to ensure that all students had access to exactly the same educational opportunities as other students.

To see inclusion in practice is very different to reading about it on paper though. Within the class the students suffering from Dyslexia and Dyspraxia, worked fairly diligently, and although at times they found it a struggle organising themselves for course work or in taking notes, they caused little disruption to the other students. They had the extra help required and were catered for in examinations and course work; they were effectively being included.

The students who were listed as having SEBD on the other hand, would have appeared to an outsider to relish in the opportunity to be able to disrupt learning; they spent more time being removed from the class than learning itself. Yet if their backgrounds were to be looked into, it would be apparent that it was an achievement being in school that day and it was quite

understandable that science was not their top priority, when they might not have even had breakfast that morning.

Their inclusion in the lesson was negatively impacting on other students who were not on the SEN register and did not need to be specially included into the class to due to disruptive behaviour. This leads to the question 'When should a student not be included in a classroom?', which at this point in my limited experience, I am unable to answer.

In conclusion, behaviourism is still always going to be prominent in the modern school as a way of leading students towards becoming more disciplined and focused in their studies, via the rewards and sanctions policies on which they are based.

When applying the cognitive learning theories, it is necessary to be aware that not all of the students are going to be starting at the same level, some may well be significantly below the level of other students and are only grouped together because of their age. Therefore the materials to be taught are not necessarily going to be accessible to all of the class all of the time unless they are developed to be inclusive for all the students, which is the current aim of the government.(Peacey 2001). The only viable option would be to group classes closely by attainment level as opposed to age, which is unlikely to happen.

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