

A Reflection and Critical Review of examples of implementation of three pedagogical principles in the first part of Professional Teaching Experience 1

Sunday, January 5, 2020 4:26 PM

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Student Number:

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Pathway:

Secondary PGCE - Mathematics

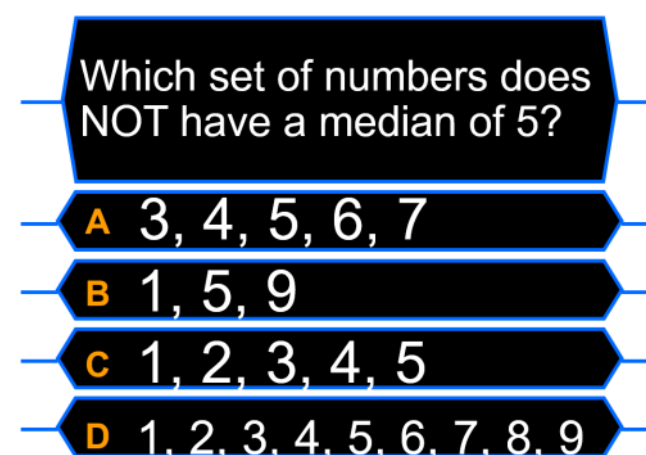
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AFL - Illustrative example 1

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ABCD cards were used as a plenary task during a lesson for an upper set Year 8 class about averages. The pupils were shown a “who wants to be a millionaire” style presentation with questions based on the lesson content. The reason for choosing this plenary task was that the multiple-choice element simplifies the answering process, and allows answers to be quickly and accurately assessed by the teacher. The pupils were engaged in the task and any misconceptions held by the pupils were easily identifiable and corrected (e.g. one pupil had confused the definitions of mode and median). Having completed the lesson, it was clear that pupils were beginning to get distracted towards the end of the task. In future I will reduce the number of questions from 15 to 10. I will also increase the difficulty of these questions to enhance engagement.



An example question from the lesson powerpoint



ABCD cards used in the lesson

AFL - Illustrative example 2

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Mini whiteboards were used as a mini-plenary task during a lesson for a middle set Year 7 class on symmetry. The pupils were given a series of questions requiring them to identify the number of lines of symmetry and rotational symmetry of 2D shapes. Pupils were also tasked with drawing 2D shapes that fulfil a prerequisite number of lines of symmetry and rotational symmetry. The reason for choosing this mini-plenary task was to engage pupils in the lesson content and allow answers to be quickly and accurately assessed by the teacher. The pupils were engaged in the task and any misconceptions held by the pupils were easily identifiable and corrected (e.g. a good discussion about why the letter “Y” isn’t a shape was held by the class). To improve on this task in future, I will ensure that there is sufficient equipment available for the task, as there was only enough whiteboards and pens for the class to work in pairs.

Whiteboard task

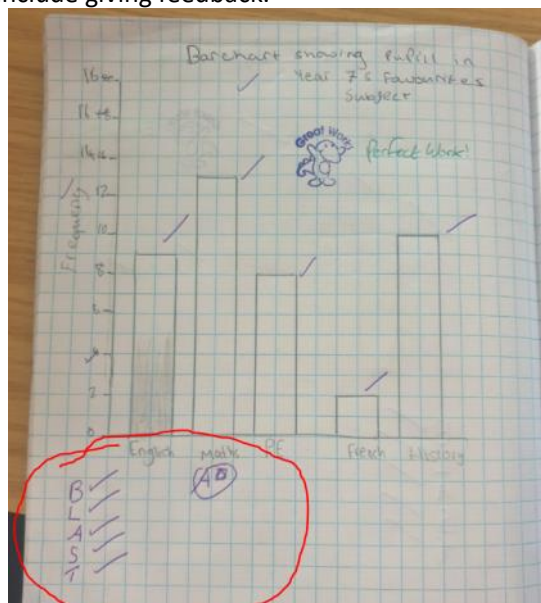
- Draw a shape with **ONLY** 1 line of symmetry
- Draw a shape with **ONLY** 2 lines of symmetry
- Draw a shape with 0 lines of symmetry

The whiteboard task presented to pupils

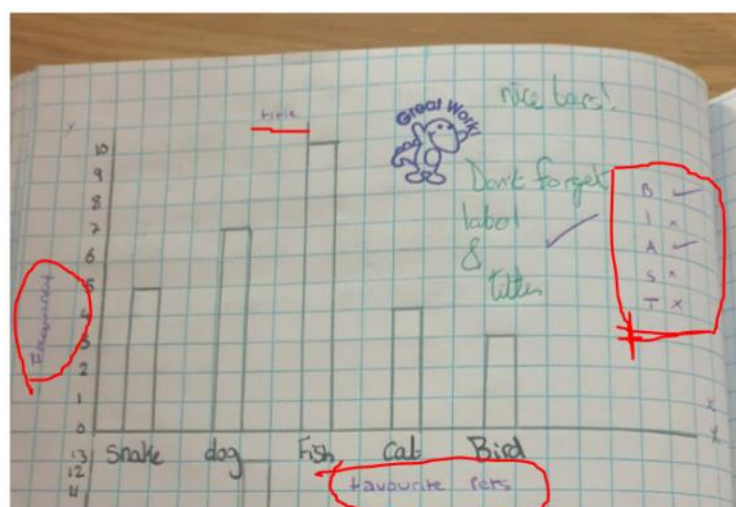
AFL - Illustrative example 3

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Peer assessment was used as a mini-plenary task during a lesson for a middle set Year 7 class which covered bar graphs. The main task of the lesson required pupils to draw two bar graphs from data tables using rules introduced at the start of the lesson (BLAST). The work was then peer-assessed by pupils using purple pens, and the work double checked by the teacher to ensure that pupils had marked their peers' work appropriately. The reason that this mini-plenary task was chosen was to engage pupils in the lesson content and allow them to recognise good and bad examples of bar graphs. The pupils were engaged in the task and the work was completed to a high standard by the class, and any errors were correctly identified by peers. However, during the peer-review element of the task, some pupils were thorough in their marking whilst others simply gave ticks / crosses and provided no further feedback. To improve on this task in future, I will provide pupil with a clearer mark scheme for them to follow which will include giving feedback.



Example of peer assessment (purple pen)



Example of peer assessment with corrections to work (Purple pen)

Cross Curricular - Illustrative example 1

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Incidental Welsh is used at the start of all lessons, such as asking pupils to write the date and title in Welsh. Pupils have been encouraged to ask for things in Welsh when able but as of yet very few pupils have done so. Commands are given in class to gain attention when transitioning between and starting new tasks. To improve the use of Welsh in the classroom, a rule could be established that all pupils must ask for equipment in Welsh.



Lesson Plan Phase 1

Lesson Plan – Step 1 Cynllun Gwers – Cam 1

Student-teacher	Huw Brace	Class:	7/2
AoLE or Subject	Mathematics	Date:	10/12/19
Lesson Focus:	Multiplying and dividing negative numbers		
Meaningful links to Curriculum	Ambitious Capable Learners		
Meaningful links to: Cross Curricular Responsibilities	Welsh – Incidental welsh to be used during lesson		
Personal Targets (Linked to QTS and identified in weekly review)			

Incidental welsh being incorporated into lesson plan

Cross Curricular - Illustrative example 2

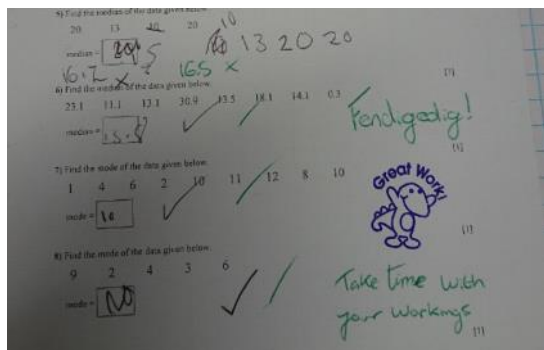
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During a department meeting, it was recognised that, as a priority, the literacy framework should be improved. This requires staff to include “sp.” notes while marking pupils’ workbooks and worksheets to signify a spelling mistake. I have incorporated this into my marking to some extent, but further efforts can be made to improve the quality of my marking with regards to the literacy framework.

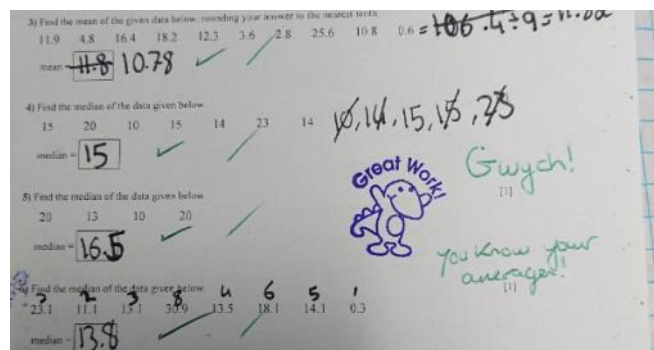
Cross Curricular - Illustrative example 3

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Further to speaking Welsh during the lesson, written Welsh is provided to pupils in the form of praise and feedback in their workbooks. This is done so that pupils see the Welsh language in written form and being used in real life contexts. Currently Welsh feedback is being given with an English translation below so that pupils can understand the praise and assimilate the vocabulary.



Example of welsh being used in marking of pupils work



Example of welsh being used in marking of pupils work

Building on prior knowledge - Illustrative example 1

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For all lessons taught (with exception to the first lesson of a new module), the starter questions are based on the content of the lesson prior. This is used to engage learners at the start of the lesson by asking them to recall the content of the previous lesson. This style of starter is used with the intention of combatting the Ebbinghaus forgetting curve hypothesis. By recalling prior knowledge, it is thought that the chances of pupils retaining the content of the lesson is increased. Starter questions are designed to engage pupils, with time being allocated to go through answers to check their work and address any misconceptions that may be held by the pupils. To improve the quality of starter sessions, it would be beneficial for more time to be allocated to the task but this isn't always possible.

Time	Activities/Methodology/Key Concepts (Teacher's Role – including key teaching points, differentiation strategies and key questions)	Pupil Tasks (Pupils' role –including differentiation, engagement in formative assessment and homework)	Resources (Including Health and Safety requirement)
Opening phase (with links to prior learning)	Power Up – 10 mins Questions will recall the main activity done in the last lesson (Time as a decimal). Register will be taken while the class are doing the activity.	Pupils will answer questions in their books Pupils will be invited to partake in discussion about the questions with reference to prior lesson content.	Powerpoint Workbooks

Inclusion of prior lesson questioning in lesson plan (Perimeter of compound shapes)

Perimeter of compound shapes



Dydd Sul, 5 Ionawr 2020

Write the following times as decimals

- 2 hours 30 minutes
- 4 hours 15 minutes
- 1 hour 45 minutes
- 7 hours 6 minutes

Convert the decimal time into hours

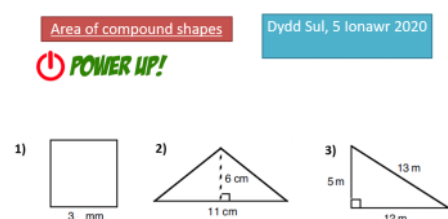
- 3.1 hours
- 6.5 hours
- 7.3 hours
- 2.9 hours

The starter questions used in Perimeter of Compound Shapes lesson

Building on prior knowledge - Illustrative example 2

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During a lesson on area of compound shapes, pupils were initially asked about how they would find the area of a square and a triangle. Once the formulas had been recalled the lesson progressed onto compound shapes. Through the use of visual aids, compound shapes were broken down into their basic components (squares, rectangles and triangles) to provide appropriate scaffolding for pupils to complete the task. While some pupils were able to access the content of the lesson without any additional exposition, a significant proportion of the class struggled with the concept and were unable to complete the more difficult questions on the worksheet. Following the lesson, my mentors advised that this topic is a significant milestone in understanding of 2D shapes and can require significant levels of further scaffolding to improve success in the lesson. To address this, I will break down the lesson into chunks, so as to increase introduce the pupils to increasingly complicated compound shapes with worked examples.



Starter question used to recall appropriate knowledge for lesson

Worked Example



Scaffolding employed in form of worked examples

Building on prior knowledge - Illustrative example 3

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When starting new modules, pupils complete a diagnostic test to assess current understanding of topics. This information is collated and used by teachers to design lessons at an appropriate level to enhance learning. The lessons will be designed with the goal of building on current level of understanding within that topic. Check-up tests are used at the end of modules to assess level of learning within the topic by posing similar questions in the diagnostic. A large majority of pupils show improvement on the check-up test compared to their diagnostic; this is a strong indicator that improvements are taking place.

Critical Reflection - Introduction

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As part of the PGCE course curriculum in Wales, students are required to complete two placements in local schools. These Professional Teaching Experiences (PTE) are designed to give students appropriate exposure to classroom environments where they will be able to test and implement pedagogical principles that have been taught in lectures prior to placements. The PTE took place in an English-medium school located in South Wales, which had 1,721 students on roll between the ages of 11-18 as of 2017. The age of pupils taught in classes during this placement was between 12 and 15 years old. The school will hereafter be referred to as "School X".

The purpose of this report is to discuss how some of the pedagogical principles presented by Donaldson (2015) have been implemented into a student teachers' practice. A critical review of the literature surrounding these principles will be provided and used as a basis to evaluate the student's personal classroom experiences.

Critical Reflection - Good teaching and learning means employing assessment for learning principles

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DISCUSSION

There are various forms of assessment available to practitioners in the classroom, with summative and formative assessment being the two main types. They are used in classrooms to help the practitioner clarify the level of understanding of their pupils. Assessment has been outlined by Black and William (2009) as the means of measuring students' achievements and making decisions about the next steps of progression, in a way that is likely to be more effective than if no evidence was collected. Formative assessment is discussed by Donaldson (2015) as a means of guiding decisions made by practitioners with an end goal of maximising the time spent in the classroom.

Cowie and Bell (1999) define formative assessment as "the process used by teachers and students to recognise and respond to student learning in order to enhance that learning, during the learning". William (2011) highlights that any assessment can be formative when it influences the instructional decisions made by teachers, learners or their peers. The act of assessment during lessons promotes responsive teaching which is a more appropriate description for the act of practitioners adapting their lessons to suit the needs of the learner.

Rosenshine (2016) explains that the checks used as part of formative assessment also let teachers know if students are developing misconceptions. This is an invaluable tool to the responsive teacher as the development of misconceptions in new topics can be devastating to the child's progress at a later time. The instant feedback provided by formative assessment can assist a practitioner by informing them if the content of their lesson is being received as planned by the class.

However, it has been discussed that the fundamental concept of formative assessments may be flawed. David Didau (2014) highlights that formative assessment relies on the assumption that we can assess what pupils have learnt in the lesson, with future teaching being based on this assumption. David argues that it is impossible to differentiate between learning and performance through formative assessment as we are unable to discern if the outcome is a result of prior knowledge, short term memory recall or actual learning. Soderstrom and Bjork (2015) differentiate between learning and performance through the following definitions: Learning refers to the relatively permanent changes in an individual's knowledge or behaviour after instruction has taken place. Whereas performance refers to temporary variations of knowledge or behaviour that can be measured or observed during instruction or training. Soderstrom and Bjork (2015) go on to say that performance is often inconsistent and has very little correspondence with learning. This inconsistency may result in many practitioners to erroneously believe that success in short term performance is a step towards long-term learning without following up appropriately. Whilst the flaws of formative assessment are clear, William (2010) makes the point that whilst the long-term understanding of a pupil who answered a question correctly isn't guaranteed, the chances of any long-term learning decreases if they answered incorrectly. While formative assessment can be useful to gain an insight to a pupil's current levels of understanding by basic questioning, the pupil is unlikely to benefit unless the learning experiences presented to them as a result of the assessment are profound enough to promote deeper learning.

William (2011) recognises the effectiveness of diagnostic questions during expositions as a means of assessing if the class is ready to move on. He emphasises the use of these "hinge" questions to determine the direction of the lesson, with the teacher being able to interpret the responses from students in no more than 30 seconds so as to reduce the chance of students becoming off task and the consequent disruptive behaviour. While hinge questions don't provide the teacher with an indication of whether learning or performance is being displayed, the benefits of knowing whether pupils understand a topic at a specific point in time improves the chances of long-term learning taking place (Black and William, 2009).

CONCLUSION

Use of AFL in lessons has been a main focus point in lessons carried out in key stage 3, with almost all lessons making use of some form of formative assessment. In School X the main way in which AFL is implemented is through use of: whiteboards, ABCD cards and peer-assessment. These strategies appear to be very effective in identifying and recognising which pupils have been able recall the content of the lesson delivered to them up to half an hour beforehand. But as David Didau (2014) discusses in his blog, there is doubt as to whether we are actually measuring the pupil's learning and comprehension of the lesson content or simply their performance in the lesson. Due to School X's curriculum there are very few opportunities to re-visit previous topics before the end of topic test. It has been observed several times that a pupil has been able to answer a question in the classroom and learning has been presumed to have occurred; with the question then being answered incorrectly at a later date. Due to the nature of formative assessments, it is impossible to document these instances as the data isn't collected formally. More commonly with methods like whiteboards and ABCD cards, the practitioner will gauge if a majority of the class has an appropriate degree of understanding and take this as confirmation that learning objectives have been met. It is the practitioner's reliance on these styles of formative assessment that bring into question the validity of them. It could be said that if the work produced in the lesson will be marked by the practitioner at a later day, this would provide a clearer insight into an individuals' understanding or lack thereof of a topic. It may be argued that the time could be utilised more effectively by instead carrying out a rich task or delivering more content in the hopes of improving chances of learning.

Methods such as differentiation and spacing of lessons are reasonable approaches in response to the results of formative assessments. However, these are only achievable if timetables allow sufficient time for teachers to revisit content. In addition, it would appear that use of formative assessment has the potential to misguide practitioners if they are unable to understand that the results may not indicate learning at all. Basing the future direction of a students' lesson on an assessment of content which has been taught within the last hour seems to be a test of short-term memory recall rather than that of deeper learning.

Critical Reflection - Good teaching and learning regularly reinforces Cross-Curriculum Responsibilities including literacy, numeracy and digital competence, and provides opportunities to practice them.

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DISCUSSION

In his review of the Welsh curriculum, Donaldson (2015) recognises that including cross-curricular elements within lessons is becoming more popular internationally. Pioneering countries such as Australia, Netherlands, New Zealand and Northern Ireland all incorporate “areas of learning” into their national curriculums to combine disciplinary learning. The characteristics of these areas are defined by the Cambridge Primary Review (2010) as ‘providing rich contexts, being internally coherent and ultimately having a core focus on disciplinary and instrumental knowledge through distinctive ways of thinking’. Donaldson (2015) emphasises that focus should be put on literacy, numeracy and digital competency as they are fundamental to learning and life in the modern age. The social nature of humans has allowed the following key aspects of society to develop: community, culture and (relatively recently) language (Mithen, 2005). Vygotsky (1978) was one of the first to recognise that children learn effectively through their social environment and that it usually encompasses a wide range of experiences from which the child can build upon. These theories were taken further by Bruner (1968) and Wood (2001) who introduced the phrase ‘scaffolding’ into modern pedagogy. Barnes (2015) concludes that practitioners should take heed of both social and physical environments that we expose our pupils to, ensuring that the interactions that may occur have an overall positive outcome, not a negative one. Barnes (2015) goes on to say that cross-curricular education is highly motivating to pupils when executed well. By tying powerful experiences to traditional subjects, major themes or global citizenship, pupil’s engagement in topics can be supported. These experiences are made even more powerful when professionals from the wider community are brought in to lead the tasks / activities. While the tasks are effective, it was observed by Barnes (2015) that lessons that effectively promote cross-curricular activities were founded upon lengthy and detailed planning in order to ensure that lessons were relevant to the goals presented by the presiding curriculum. It is this aspect of cross-curricular teaching that requires it to be a school-wide effort, if it is to show any significance in the new Welsh curriculum. The role of the Welsh language in the new curriculum has been clearly outlined by Donaldson (2015), including benefits such as improved efficiency in learning other languages and wider cognitive improvements. The review advises that the Welsh language should be introduced during the first year of secondary school or earlier where circumstances allow, through use of incidental Welsh outside of Welsh classes. It would appear that the recommendation prioritises convenience over effective learning of the Welsh language. It has been observed that immersion education yields the greatest results when it comes to learning a second language (Johnson and Swain, 1997). The Netherlands is a leading example of this with an entire year of Primary education being dedicated to the instruction of English. The apparent lack of emphasis on the Welsh language results in a nationwide lack of motivation in secondary school pupils when it comes to learning the language.

CONCLUSION

During my lessons I have made a conscious effort to include incidental Welsh when welcoming classes, giving instructions and general conversations with pupils. I am unable to accurately measure or record the effectiveness of my use of the language, with exception to the sporadic incidents where students have engaged with me in Welsh. It is these moments where I believe that my use of the language that has encouraged students to converse in Welsh when they may have not done so otherwise.

Critical Reflection - Good teaching and learning sets tasks and select resources that build on previous knowledge and experience and engage interest

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DISCUSSION

The foundation of Constructivism is that learning is the act of building new knowledge upon the foundation of previous knowledge. Philips (1995) infers that an individual's prior knowledge will directly influence the knowledge gained from new learning experiences. Within a classroom, constructivism sees the teacher as more of a guide or facilitator of learning. Oliver (2000) recognises that the teachers must ensure that pupils understand their pre-existing beliefs on a topic, and must choose appropriate activities and tasks for them to build their knowledge from. Scaffolding (Copple & Bredekamp, 2009) is a key aspect of constructivism, modelling key skills and providing appropriate hints during activities where the teacher can adjust the difficulty in response to the learner's performance.

As recognised by Soderstrom and Bjork (2015), a pupil's performance during a task or lesson is not a strong indicator of learning. If a teacher is to assume that a child has learnt the topic after a lesson then they run the risk of assuming a pupil's prior knowledge in future topics. The Cognitive Load Theory (Sweller et al, 1998) puts forward the idea that instruction is only effective when a pupil's working memory isn't overloaded while processing new information. Martin (2016) discusses that the chance of content being misunderstood and misinterpreted by a student increases if working memory is overloaded. The result of this is a lack of information being encoded into long-term memory which would inevitably slow learning down. So, to ensure that effective learning takes place, the best course of action is to maximise the chances of pupil's committing their learning to long-term memory.

Summative test throughout the academic year can be used to assess the learning of pupils long after the instruction was given to them but is not necessarily an indication that students have truly learnt the material. Bjork and Bork (2014) point out that if pupils "cram" (an intensive period of revision / practice) for a test, the results may be effective when their performance on the test is recorded, but over time recall of material on the test will diminish substantially.

The act of providing students with lots of practice in a single cluster of lessons in hopes of achieving mastery of a topic has been outshined by the results of 'The Spacing Effect' (Bjork and Bjork, 2014). This refers to the finding that learning is better when exposures to information are separated over time (spaced apart), compared to a series of back to back sessions. Bjork and Bork (2014) have described it as one of the most robust effects observed in the history of experimental research on learning and memory. Willingham (2002) agrees with this, concluding that there is significant evidence that spacing out study times and /or sessions leads to better memory retrieval of material. The benefits of improved long-term learning include reducing cognitive load on a pupil's working memory, as suggested originally by Sweller *et al.* (1998).

CONCLUSION

In all of my lessons I have ensured that the starter questions were related to prior lesson content as a way to get pupils to recall prior knowledge, and as an easy start to the lesson. Initial impressions are that pupils are able to recall the material that was taught up to four days ago, with very low numbers unable to remember the content of the last lesson. This spacing of lesson content does appear to be successful as end of module tests show improvements across the classroom. But it is unclear if starter tasks relating to prior lesson content is the main cause of this. The concept of constructivism emphasises the influence that prior knowledge of a topic has on learning new topics, and that the practitioner must establish a learner's current level of understanding of a topic.

The main issues arising from implementation of this pedagogical principle is establishing a class' understanding of a topic. As schools have to adhere to limited contact times with pupils, the opportunities to employ effective learning through spacing of lessons are not always available to practitioners. The work schemes utilised by School X do not allow time for topics to be revisited before being tested on them. This imposes a challenge on the teachers by entrusting them to ensure that content is introduced and learnt in a single lesson. Whilst it should be expected for teachers to plan lessons appropriate to pupils, there are some occasions where unforeseen circumstances inhibit the pace of the lesson significantly. As an example, during my PTE I was teaching a class of Year 7's how to find the area of compound shapes. I had previously taught them how to find the area of squares and triangles, and erroneously believed that the students would be able apply this knowledge to the current lesson with minimal effort. However, in reality the students were unable to break down compound shapes into simple shapes to solve the problem, as they lacked a higher level of problem solving/ understanding. Due to time restrictions, I was unable to revisit the topic in any depth, and was only able to incorporate the content into a starter question in the next lesson. I am therefore unsure if the content was fully understood by pupils.

Critical Reflection - Recommendations for further work

Thursday, December 12, 2019 10:32 AM

Recommendations for further work

It is clear that the pedagogical principles proposed by Donaldson (2015) only scratch the surface of methods and techniques that are available to practitioners in the class room. With regards to my own lesson plans, I intend to include at least one type of diagnostic question (William, 2010) into my sessions, as it would appear that they are a highly effective method of assessment for learning. The insight into the pupils' understanding based on their answer choice is an invaluable tool for any practitioner if acted on appropriately. I plan to continue my personal development of the Welsh language so that I am able to converse with the pupils in a way that may pique their interest in the language. I hope this will help to encourage use of the Welsh language in my classroom and reduce the monotony of the overused phrases that pupils are able to recall back to the teacher but may not fully understand the meaning of. Due to restrictions in School X's curriculum, it would appear that methods such as spacing (Bjork and Bjork, 2014) are not always feasible. However, within my own classroom I feel that I am able to recreate this on a smaller scale by selecting my lesson starter questions based on content from 3-5 lessons prior. The increased gap between the lesson content being taught and being revisited will hopefully provide a better insight as to whether the pupils have consolidated the subject knowledge, and will help improve the planning of future lessons accordingly.

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