

Overview

Thursday, November 28, 2019 9:32 AM

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Assignment Title: A portfolio which illustrates a critical reflection of progress made on the planning and implementation of three pedagogical principles

Pathway: PGCE Secondary Biology

Link to OneNote: https://uwtsd-my.sharepoint.com/:o/g/personal/1903084_student_uwtsd_ac_uk/EiS-oOYJp1RDrUCZunPOth0B_0yOUCriRPHPYOcZ7jCCqw?e=2JVC7w

Assessment for Learning (AFL)

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Example 1

This example of AFL was taken from a Yr7, band A lesson. It was the plenary used in their first lesson of the topic 'States of matter'. This activity was used to assess whether the learners had understood the content of the lesson. The nature of a 'true or false' activity allowed me to quickly assess whether the majority of the class had understood and whether I could move on with the topic next lesson as I could look around the room, and check the answers (if a red or green card was shown). Although I tried to include a range of statements for the class to evaluate, potentially, there could have still been an aspect of the topic that learners didn't understand that I wouldn't know about as there wasn't a statement on it, and therefore the learners may not be ready to move on with the topic.

States of Matter – True or False

- 1) A solid always keeps its shape **TRUE**
- 2) Gases are hard to squash **FALSE**
- 3) In a liquid, the particles cannot change places **FALSE**
- 4) Gases have the most energy **TRUE**
- 5) The shape of a liquid does not change **FALSE**

Pupils had to show a green or red card if they thought the statement was true or false respectively.

The answer would then appear on the board once I had seen all pupils answer.

Example 2

This example is a starter activity that I gave to a Yr7, band A class at the start of their second lesson on nanoparticles. I had the learners complete these questions to activate prior knowledge (APK) from the last lesson, and to ensure they were ready to move on with the topic. The questions were differentiated using Blooms Taxonomy (REF) into a bronze, silver and gold level, however, as this was a band A class, I expected the majority of them to be able to answer the questions. The second and third questions were quite broad, so when the pupils were feeding back their answers, it allowed a lot of the content from the last lesson to be revisited.

3 mins

- What is a nanoparticle?
- How are nanoparticles used in nanotechnology?
- Why are some people against the use of nanoparticles?



A time limit was set to one minute per question.

The questions that the learners had to answer in their books.

The questions grade; bronze, silver & gold.

Example 3

This example of AFL was used in a Yr9 band B lesson at the end of the topic of diffusion. The activity consisted of learners working in pairs to create three statements on the topic; two which were true, and

one which was a lie, the rest of the class would then have to decide which one was the lie. I chose this activity as a plenary as it required learners to think about what they had learned from several lessons, and not only remember the content, but also manipulate it into something false, so it required an extra level of thinking, rather than just remembering. It worked as an effective plenary, recapping the topic and ensuring that the learners were ready to move on which was important at the end of this specific topic as was key to understanding the next, osmosis, however, it was a more lengthy activity so took up more of the lesson than a typical plenary.

Diffusion – Two Truths & A Lie

In pairs or threes, think of **three statements** about **diffusion**

???

Two that are true
&
One that is a lie



You have two minutes, then you will read these out to the class, and we will all decide which ones are true, and which is a lie

Learners had to create three statements on the topic; two which were true, and one which was a lie.

The rest of the class would then have to decide which one was the lie.

Cross Curricular Responsibilities

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Example 1

In this example, numeracy skills were needed to complete the task. Learners had to calculate the density of blocks, by weighing them and calculating the volume. This activity was for a Yr7 band B class in a lesson about density, in the topic of 'States of Matter'. The activity was used to practice the equation for density and volume which pupils will need to know for their exams further in their schooling.

Task A

- Calculate the **density** of these blocks made from different materials
- Use the **balance** to measure the masses of the blocks
- Use the equation below to **calculate the volume**

$$\text{Volume (cm}^3\text{)} = \text{Length (cm)} \times \text{Width (cm)} \times \text{Height (cm)}$$

- Use a **calculator** and record your answers to **1 decimal place**

Learners had to calculate the density of blocks.

To do this they also had to calculate the volume.

Learners had to use prior numeracy knowledge to round their answers to one decimal place.

Example 2

This example was taken from a Yr8 band B class, during which they were learning about sustainability and different types of energy sources. In this task they had to use Chromebooks to research the problems associated with using Crude oil in cars, and other alternatives which could be more sustainable. They then had to put this information into a report in word. This task enabled learners to work on their digital competency and allowed learners to have a more hands on approach to their learning. Learners enjoyed the task as it was a bit different from the usual style of teaching and writing in books

Sustainability – Crude Oil Research Report

With oil running out fast and population of the world so dependent on transport, it is clear we need to find an alternative to petrol/diesel cars and quickly!

Research & produce an **A4 report** on **sustainable alternatives** to petrol/diesel using Chromebooks. Which alternative do you think will realistically be our **replacement method of transport**?

This APK from the last lesson where learners learnt about crude oil formation & problems associated with it.

This was the brief of the task, to research and write a report on crude oil & its alternatives using Chromebooks.

Example 3

This example was taken from a lesson plan for a Yr7 band A & B class. The topic was states of matter and the subject was methods of separation. The task involved a list of words that learners had to find in the text and infer the meaning of them from that. The text explained the theory behind methods of separation. Learners also had a dictionary if they got stuck and needed more assistance. As an extension activity learners then had to use the dictionaries to find as many different meanings of the words on the list as they could, to demonstrate the importance of context. This task was successful as it allowed learners to discover the definitions themselves and understand the text which explained the methods of separation without them having to copy it down in a way that could be conceived as boring. The task

also developed learners vocabulary and their literacy skills using dictionaries.

Time	Activities/Methodology/Key Concepts (Teacher's Role – including key teaching points and key questions)	Pupil Tasks (Pupils' role -including differentiation strategies, engagement in formative assessment and homework)	Resources (Including Health and Safety requirement)
Opening phase (with links to prior learning)	Starter – I will have a series of statements on the board and two pictures that could be the meaning of one word. Hook – I will put a series of pictures on the board which put together make a key word.	Starter - Pupils will need to engage in the starter by choosing which picture is the meaning I am referring to in the statement. Hook – Pupils will need to try and guess what the key word is by looking at the pictures I have put on the board.	Workbooks
Teaching & Core Learning	I will read out the main text with the key information which is in their booklets. I will then introduce the 'dictionary hunt' task.	Pupils will need to find the word listed in the text and infer the meaning of it. Once this has been done for every word listed pupils will need to think of other meanings for the words, they can also use a dictionary to find other meanings. They can work in pairs for this.	Workbooks & Booklets
Plenary	I will ask the pupils to write down three things, one thing they have learnt, one they have done well & one thing they would like to find out more about.	Pupils will need to write down three things; one thing they have learnt, one they have done well & one thing they would like to find out more about.	Workbooks

This was the literacy task described in the lesson plan.

Employing a Blend of Approaches

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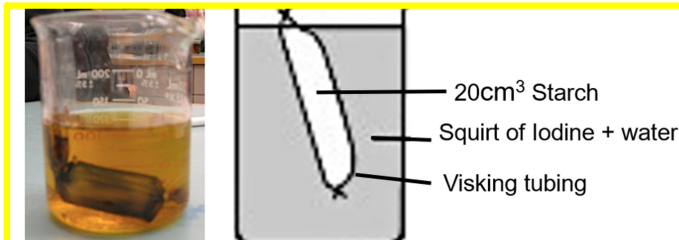
Example 1

This is an experiment that a Yr9 band B class carried out to show how diffusion works. It worked well as it supported the theory that they had learnt in the previous lesson, and gave a visual element to something theoretical.

Diffusion Experiment

1. Fill the **beaker with 10cm³ iodine solution** (a small squirt) and the rest **water**.
2. Fill a **visking tube with 20cm³ starch** using a 10cm³ syringe
3. Use the stopwatch and time for **30 minutes**
4. Observe and record the **colour change of iodine**

This was the methodology that the learners used to carry out the experiment.



Learners were also given a visual aid of the experiment set up to aid understanding.

Example 2

This example is of a task that a Yr8 band B class had to complete in the topic of sustainability. The lesson focus was clean water, and how water is purified to become safe to drink. This particular task involved learners using the knowledge they had acquired about water treatment plants to design their own small scale water treatment plant in the lab. To do this, the learners had to be creative and use initiative, they then had to test the plant, and solve any problems that might have occurred using problem solving skills. This task could be quite hard depending on learners ability, however it was engaging and allowed all learners to have a go and experiment with ideas.

Task 2

- How could you make a small-scale treatment plant in the lab?
- Design a model showing how it links to each stage of an industrial water treatment plant
- You will then have a go at test the water to see how you've done!

This was the brief that learners were given for the task. I explained this further to them and then assisted them throughout the task.

Once learners had completed the task, they had to test their water treatment plant and improve on it.



Example 3

This example was taken from a Yr8 band B class who were learning about sustainability and the different types of renewable and non-renewable energy sources. The task was to put all the information they had gained from the previous lessons about the advantages and disadvantages of the energy sources into a leaflet. Learners were given a success criteria to complete the task well, and needed to be creative and critically analyse all the information they had and synthesise that into the key points. The task was

effective and learners put a lot of effort into their leaflets as they enjoyed designing them. It also helped to cement their knowledge gained over a few lessons.

Task 1

- Create a leaflet using the information you acquired last lesson on renewable & non-renewable energy sources
- Make sure you include different types and the advantages & disadvantages of energy sources
- Your leaflet needs to be eye catching so the reader will want to read it
- It will also need to be neatly presented & informative



This was the brief that learners were given to complete the task.

This information was part of the success criteria learners were given.

Critical Reflection

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The Professional Teaching Experience (PTE) is a vital aspect of training to be a teacher. The PTE consists of a trainee teacher spending a total of approximately twenty-four weeks in a school, where they effectively learn on the job, gradually training them so they teach fifty percent of a fully trained teacher's workload. It allows a trainee teacher to gain professional experience in teaching whilst experimenting with different techniques and finding their feet in the educational environment. For some, it can be their first glimpse into the classroom since they were in one as a student themselves. A key element of the PTE is for the trainee teacher to trial different pedagogical approaches. Pedagogy, as defined by Tes Editorial (2018), refers to the way the content of the curriculum is delivered to a class by the teacher, and thus optimising this delivery is essential to a good lesson. Donaldson (2015) describes it as the core of being an excellent teacher and combines knowledge and judgement to consistently deliver exceptional teaching in all contexts.

Pedagogy is at the heart of what is arguably the most significant reform in education that Wales is currently undergoing, as the findings of Donaldson (2015) begin to be applied to the new curriculum and implemented in schools across the country. There are four key purposes of the new curriculum in Wales (Donaldson, 2015): to create ambitious, capable learners; to create ethical, informed citizens; to create enterprising, creative contributors and to create healthy, confident learners. These aims will be achieved by effective teaching and the execution of twelve pedagogical principles which have also been developed by Donaldson (2015). Three of these pedagogical principles will be examined in this report, showing their importance in achieving the four purposes, how myself as a trainee teacher has implemented them in lessons during PTE, and the success of these examples in implementation. The three pedagogical principles that will be explored are; good teaching and learning means employing assessment for learning (AFL) principles; good teaching and learning regularly reinforces cross-curriculum responsibilities, including literacy, numeracy (LNF) and digital competence (DCF), and provides opportunities to practice them; and good teaching and learning means employing a blend of approaches including those that promote problem solving, creative and critical thinking.

AFL in education is essential and when used effectively should support the needs of the learner (Gardner, 2012) and is a key professional skill (Black & Wiliam, 2006). AFL focuses on how pupils learn and enables them to know how to improve and most importantly must support the learning and not be an add on to essentially tick a box (Black & Wiliam, 2006). If used effectively, AFL can prevent the teaching and learning from getting out of synchronism, as learners learn at different rates, and also prevents topics which are conceived to be 'easy' being rushed by a teacher if not all learners fully understand (Stefanakis & Meier, 2010). The very nature of learning means that knowledge is built upon, very rarely is a topic covered and then never revisited, thus it is essential for learners to understand the basics or they will never be able to understand the more complicated theory which is examined in national assessments such as GCSE's and A – Levels.

There are two main types of assessment: formative and summative. Formative assessment can be defined as a way to assess learning continuously through the teaching-learning process, whereas summative assessment measures the learning at the end of particular topic or time frame, (Bloom, 1969; Bennett, 2011). Both methods of assessment must be employed to successfully educate learners. Although summative assessment has been used more traditionally, formative assessment is crucial as not all learners will fully understand the content of the lesson, and sometimes, as well planned as a lesson may be and as experienced as a teacher can be, the aims of the lessons may not be met, and the only way to know this as a teacher is to continuously assess learner's understanding throughout and at the end of the lesson when the aims should have been achieved (Wiliam, 2010).

It has been proposed that establishing effective group work improves the quality and effectiveness of AFL in the classroom (Welsh Assembly Government, 2010), and also ties into one of the twelve pedagogical principles; good teaching and learning encourages

collaboration (Donaldson, 2015). To be effective as group work, the task must be relevant and thus engaging, suitable and accessible for all learners, and have parameters which give realistic expectations and do not limit learners (Welsh Assembly Government, 2010). Group work transfers the responsibility of teaching to the learners themselves and they must simultaneously learn and teach their peers (Freeman, 1995). Moreover, if groupwork is incorporated in AFL strategies, if there are gaps in some learner's understanding, the way a peer may explain the topic would most likely be in a different way to the teacher, and the learner who is struggling may respond better to a different perspective. This therefore means that all learners have the same level of understanding and the teacher can continue with the topic.

Cross curricular teaching, defined as "*A sensitivity towards, and a synthesis of, knowledge, skills and understandings from various subject areas*" (Savage, 2010), is a key pedagogical element in the classroom. The LNF and DCF are at the heart of cross curricula pedagogy and are perceived to have a need to improve as these skills are increasingly becoming a necessity in both education and adult life (Donaldson, 2015). These skills need to be reinforced not only in their respective subject lessons, but also need to be understood in all areas to facilitate pupils in their work later in life (Donaldson, 2015). This is of particular importance in Wales, as poor literacy and numeracy skills have been highlighted as a key hinder to socio economic regeneration (Hopkin, 2015).

The importance of teaching the "three r's" - reading, writing and arithmetic, has long been the focus of education and valued as one of the most important aspects of teaching (Fox & Halliwell, 2015). However, the implementation of LNF in the reformed curriculum focuses on repeating and reiterating the skills throughout the curriculum (Donaldson, 2015). The use of cross curricular literacy and numeracy tasks has been found to mutually benefit all subject areas (McClune, 2012). Nevertheless, the relationship between the subjects must be fully understood to clarify the similarities, differences and how LNF can be used effectively (Kleve & Penne, 2012). It has been shown that the implementation of LNF has increased the results of pupils in Wales in these subject areas, however the continuation of effective LNF strategies needs to continue (Hopkin, 2015).

With the importance of digital and communication technology constantly becoming more prominent in society, the gaps in learners digital capability and the differences in these between schools is becoming more apparent (Hatlevik & Christophersen, 2013), and perhaps why the DCF was a key aspect of the new curriculum reform in Wales. In order for digital competence to be encouraged and developed in education for the learners, the teachers must be therefore be confident and capable digitally and provide ample opportunities for learners to develop their digital competence in lessons (Søby, 2013).

Blended teaching promotes creative and critical thinking, and problem solving, it adds value to education, and accommodates the variety of learner's needs (Alammary *et al.*, 2014; Donaldson, 2015). Learners must be engaged in lessons as it is the key to the learning process (Jonson - Reid, 2010). In order to be engaged in the learning, the environment must be stimulating for the learner (Donaldson, 2015). Collaborating with peers, having to evaluate and solve problems during lesson activities, coinciding with teacher guidance and the end product being assessed, can both help achieve the lesson outcomes and help prepare learners with skills they will need later in life (Donaldson, 2015).

Problem solving skills are vital for everyday life and thus a vital skill for the next generation being taught in schools today (Karatas & Baki, 2017). Not only is it essential that teachers create differentiated tasks that provide a variety of different problems, but also that learners can discuss their various ideas and assess the effectiveness of them (Karatas & Baki, 2017).

Although an important skill in both higher education and life, critical thinking can often be overlooked and taken for granted (Aizikovitsh - Udi & Cheng, 2015; Carter & Bray, 2019) and thus it is vital that it is encouraged and developed in lessons. Critical thinking involves applying already gained knowledge to new situations, synthesising and evaluating new opinions and analysing new situations (Aizikovitsh - Udi & Cheng, 2015). Therefore, it is essential to promote critical thinking in a variety of lessons, in a variety of different ways to help learners and make them more well-rounded citizens who are ready to contribute to the country, thereby fulfilling the overall aim of the curriculum reform in Wales (Donaldson,

2015).

Furthermore, creativity in education is also very important as it drives learners forward and prepares them to drive the world forward later in life, as creative thinking allows citizens to drive the country forward economically and socially (Collard & Looney, 2014; Suciu, 2014), and directly feeds into the key purpose of the new curriculum in Wales, to create enterprising, creative contributors (Donaldson, 2015). Once again, group work can enhance the desired outcomes. Group work related to creative tasks diversifies outcomes, increases motivation and produces work to a higher standard than if an individual was to carry out the task solely (Suciu, 2014).

To conclude, the three pedagogical principles examined in this report; good teaching and learning means employing assessment for learning principles; good teaching and learning regularly reinforces cross-curriculum responsibilities, including literacy, numeracy and digital competence, and provides opportunities to practice them; and good teaching and learning means employing a blend of approaches including those that promote problem solving, creative and critical thinking, are vital parts of the teaching – learning process, and must be continuously worked on professionally. AFL is crucial to the learning process, and the learners understanding must be assessed continuously in a formative way, as well as in a summative way to measure overall knowledge and understanding (Bloom, 1969; Bennett, 2011; Gardner, 2012). Moreover, the incorporation of literacy, numeracy and digital competency skills in the form of LNF and DCF is becoming more and more important in today's modern world, and the improvement of these skills in the future workforce will help Wales develop economically and socially (Donaldson, 2015; Hopkin, 2015). Furthermore, the idea of using a blend of approaches in teaching when designing tasks to promote problem solving and critical thinking for learners will not only improve results in school, but also prove vital tools in further education and in everyday life (Donaldson, 2015; Karatas & Baki, 2017).

As a trainee teacher, I have used many methods to assess learning in lessons, most commonly as a plenary at the end of a lesson to ensure the aims of the lesson have been achieved, which is the most important aspect of a lesson. Personally, I have used a variety of strategies ranging from true and false statements (example 1), written answers to questions (example 2) to group work (example 3). The true and false statements shown in example 1 enabled me, their teacher, to gauge the general understanding of the class. Learners were required to show a green or red piece of card if they believed a statement was true or false respectively. Although this was an effective method of AFL, there was the chance that learners were able to copy their peers' answers resulting in a false representation of the class's understanding. Even though learners having to write their answers down may take more time, a teacher wouldn't have to mark each book individually. Peer marking can then be used where learners would swap books with the person next to them, and then mark the answers which are gone through as a class. This method of marking has been shown to improve the quality of learning and understanding as it allows learners to take greater control (Brown, 2015), thus making this an effective means of AFL. The ability to combine AFL and group work as shown in example 3 increases the effectiveness of the aim (Welsh Assembly Government, 2015) so is an excellent method to incorporate when planning a lesson. Furthermore, the task shown in example 3 involved the learners in their groups having to create a lie related to the topic, so not only did they have to understand the topic sufficiently to summarise it, but to create a lie relating to it adds an extra level of synthesising and thinking.

Again, there are many examples where I have used different tasks to develop literacy, numeracy and digital skills in the lessons I have delivered as part of my PTE. The ones highlighted in this portfolio include calculating the density of certain items developing numeracy skills (example 1), using Chromebooks to research a topic and produce a report on it to improve digital competence (example 2) and practicing using dictionaries to look up the meaning of different words and investigate homophones, thus refining literacy skills (example 3). The three examples I have included in this portfolio represent the three main skills; numeracy, literacy and digital competency, however these skills are continuously intertwined in every lesson plan I create and deliver. In science, learners are continuously introduced to new terminology and thus the task of using dictionaries to look up meanings of these new words not only helps to develop their vocabulary but also repeats dictionary skills

which they are taught in other subjects. Moreover, numeracy skills such as calculations, statistics in data and graphs are a necessity and thus continuously used. Hopefully, if these tasks are continuously used effectively, learners will improve grades in all subjects and when learners enter the working world, they will have the skills they need to drive Wales forward (McClune, 2012; Donaldson 2015; Hopkin, 2015).

Furthermore, there are ample times when I have used the pedagogical principle of using a blend of approaches to inspire my lesson planning to ensure that tasks will develop the learner's skills and engage them, so the subject topic is fully absorbed. In science, we are lucky that there are experiments that demonstrate theory, visualise it and also promote thinking in learners as shown in example 1. Additionally, a further example of an activity learners had to carry out in a lesson was to make a model of a water purifying plant, test this and then see how it could be improved (example 2). The final example was formed from learners having to synthesise all the information they had received over a series of lessons, critically evaluate it and produce a leaflet with the key information (example 3). The use of experiments allows learners to plan and think for themselves as well as work in groups and which has been shown to be more effective (Suciu, 2014). This approach was also shown in example 2 as learners had to create something encouraging problem solving and creative skills and then critically analyse their results and try to improve on that. The practical approach often helps learners absorb the information more effectively as engagement is improved (Spronken-Smith, 2005).

Looking into the future and moving forward and in order to meet the four purposes of the new curriculum in Wales designed by Donaldson (2015), the pedagogical principles which he designed and that are examined in this report must be continuously developed and implemented. As a trainee teacher it is easy to reflect on lessons, and examine the use of these strategies, and this skill of self-improvement must not be forgotten or lost when qualified. Continuous professional development is the key to being a successful teacher. The Successful Futures Report written by Donaldson (2015) which has formed the basis of the new curriculum in Wales has been a controversial innovation, but whether one agrees or not with the entire report, it cannot be disputed that if all learners leaving education have achieved the four main purposes of the new curriculum, then that will bring the country forward and in order to do that, every person who works in the educational sector must evaluate their methods in order to do best for the learner, themselves and the community of Wales.

References

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