Learning Landscapes: a form of formative assessment supporting assessment without levels

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ABSTRACT *Learning Landscapes* are assessment tools that can be used formatively to map progress in specific skills in the classroom and can contribute to learning without levels. *Learning Landscapes* can help both teachers and students recognise specific aspects of behaviour linked to a specific skill that provide evidence of their success in that skill. They can also be used to target next steps and therefore have a strong formative potential and can contribute to assessment without levels. Issues of gender and other diversity concerns can also be incorporated.

Background

Formative assessments are important in promoting pupils' learning and in engaging them in their education. *Learning Landscapes* are a form of formative assessment where sheets are filled in by pupils in a way that allows them to have some form of control over the direction of their development. They encourage reflective practice, of which a record is kept. *Learning Landscapes* were originally formed during research into improving gender relationships in the classroom (Matthews, 2006) and were then developed during the Strategies for Assessment of Inquiry Learning in Science (SAILS) EU project (SAILS, 2016) that researched how to assess enquiry in the classroom. This article looks at the theory and practice of using them, based mainly on the teachers who took part in the SAILS project.

I will start by outlining the main principles of formative assessment, as it is important that any method incorporates these principles. This will form the basis for understanding *Learning Landscapes* as a method of assessment.

I am indebted to Stephen Phillips of Therfield School in Leatherhead for the term '*Learning Landscapes*', which was developed during the SAILS EU project. All of the anonymised examples in this article are from Paul Barber, formerly of the John Roan School in Greenwich, who was a teacher on the SAILS EU project.

Principles of formative assessment

There has been a lot of evidence to show that formative assessment is important in helping pupils learn (Black *et al*., 2004; Black and Wiliam, 2006; Wiliam, 2011). Formative assessment is a process that has at its root an understanding of pupils' learning needs so that teaching can be adjusted appropriately to improve educational achievement. The information gained should be useful for pupils and teachers. There are many aspects of formative assessment and Wiliam (2011) identifies these as:

- sharing learning intentions;
- eliciting pupils' learning achievements through discussions, activities and tasks;
- providing feedback that helps the pupils move on in their learning;
- enabling pupils to use each other to learn;
- enabling pupils to own their learning and become self-reliant.

One characteristic of formative assessment that contributes to Wiliam's aspects is the generation of dialogic opportunities where pupils can discuss in groups of varying sizes. Discussions can help pupils develop ways of helping each other so that they can learn together and be supportive (Heritage, 2010). In an empathetic culture, pupils are more likely than they would be with a teacher to feel understood and supported and so to express doubts and uncertainties about their knowledge and skills. Through discussions and helping each other learn, they can develop self- and peer reflection skills that enable them to

see more clearly those aspects they feel they are successful in and those they need to strengthen. These elements are also embedded in the summary by Harrison and Howard (2008) of what they consider to be the key elements of Assessment for Learning (AfL) (Figure 1).

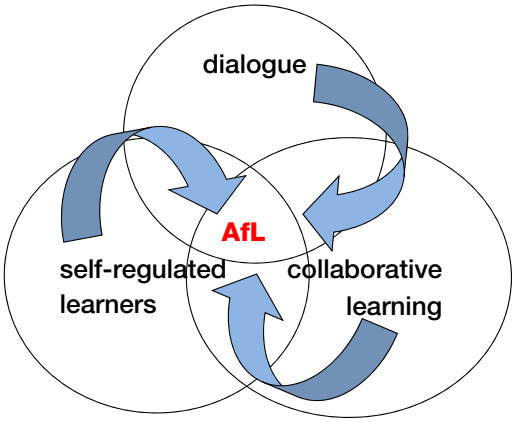

Figure 1 The essential aspects of Assessment for Learning (AfL); after Harrison and Howard (2008)

One aspect brought out in the diagram is that of pupils becoming self-regulated learners, which is important for them to be able to develop the skills for self-assessment and being intrinsically motivated. As pupils become more self-regulated, they can gain confidence and self-esteem. Good self-esteem can contribute towards helping pupils learn and be more likely to approach new situations and challenges with positivity. Hence it is important that, during collaboration and feedback, teachers are aware of how communications are phrased so that the pupils' self-esteem is maintained (Assessment Reform Group, 1999). Also, if pupils develop a higher self-esteem, they can then possess an internal logic of control which can help develop a growth mindset (Dweck, 2000; Ricci, 2013).

Formative assessment should be a process where pupils and teachers use group work and dialogue to clarify and develop understanding. In this process, pupils' understanding of their current beliefs or frameworks should be raised along with being confronted with other views (cognitive conflict). This could help pupils become self- and co-reliant and open to change. According to constructivist theory, these activities are also integral to how pupils learn.

Hence, it is important for these principles to be built in to a method of formative assessment.

Learning Landscapes

A *Learning Landscape* is a list of skills, processes or content to be learnt, with each item in a randomised order. An example is where one learning intention would be for the pupils to develop teamwork skills. The example in Figure 2 contains categories to illustrate the range possible:

Teachers can make their own *Learning Landscape* by selecting categories from this list (which only covers some possibilities) that are appropriate for their class. Alternatively, teachers can develop their own using language appropriate to their pupils.

In the example in Figure 2, an individual pupil would write in some of the squares how well they had done, although *Learning Landscape* can be used individually, in pairs or in groups. The pupil has to explain why they think they did well in a few categories, and then, using a different-colour pen, complete a couple of categories in which they feel they would like to improve. It is important that the pupils are *not* allowed to use ticks or numbers, but must justify what they think in writing. This also means that they have to think about what they were doing and make explicit to the teacher and/or other pupils what they think they did.

Details of their use and pedagogy

One of the key points about starting with the pupil is to find out whether they know what the terms on the *Learning Landscape* mean. One way of doing this is to ask the pupils to fill in their descriptions of any terms the teacher wants to check that the pupils know on a rubric. Rubrics are a complementary tool used here to help check on the meaning of terms. An anonymised example of a pupil writing what they think 'explanation' means is shown in Figure 3.

In this case, the pupil has confused what an explanation is with the length of the explanation. Whether or not the people listening to the explanation can understand it is not referred to centrally. This procedure can show up misconceptions or alternative frameworks. The use of rubrics can help the pupil think about the development of the concept and can help pupils and teachers discuss and formulate what higher levels of performance would look like. However, rubrics are hierarchical, tend to be linear and can be mechanistic. In contrast, the aim of *Learning Landscapes* is to be more holistic and nuanced

Individual assessment: how you did in the group Name:_____ Date:_____

Choose between 2 and 4 heading to write under it what you did well. You can add any that have been missed out. Then choose 1 or 2 you feel you want to improve and explain using a different colour pen.

Listen positively	Resolve ideas	Work towards a common goal	Be friendly
Be supportive	Share tasks	Reach agreements	Collaborate
Empathise	Work with boys/ girls/different groups	Contribute ideas without domineering	Peacemaker
Manage emotions	Be curious	Use resources without taking over	Democratic leader
Defend viewpoint with consideration	Give constructive feedback	Addition:	Addition:

Figure 2 Teamwork *Learning Landscape*

while enabling pupils to foreground different areas from each other.

To give an example, learning to drive a car is a holistic process. When learning to drive a car, one has to get in the car, learn to use the clutch, accelerator and lights, and gain a road sense. All of these are necessary and, although some may be more complex than others, they do not form a hierarchy – they are all part of the whole. Some people may learn a good road sense before being able to use the clutch properly, and others the other way round. There is no set order, although people often try to impose one. It is not a linear mechanistic process but part of a journey. The assessment of learning to drive a car is a holistic one, even if broken down into parts. It can come down to how safe the passengers feel.

To reflect this, the layout of *Learning Landscapes* should be random and not imply a linear progression. Figure 4 shows an example of one that has been filled in.

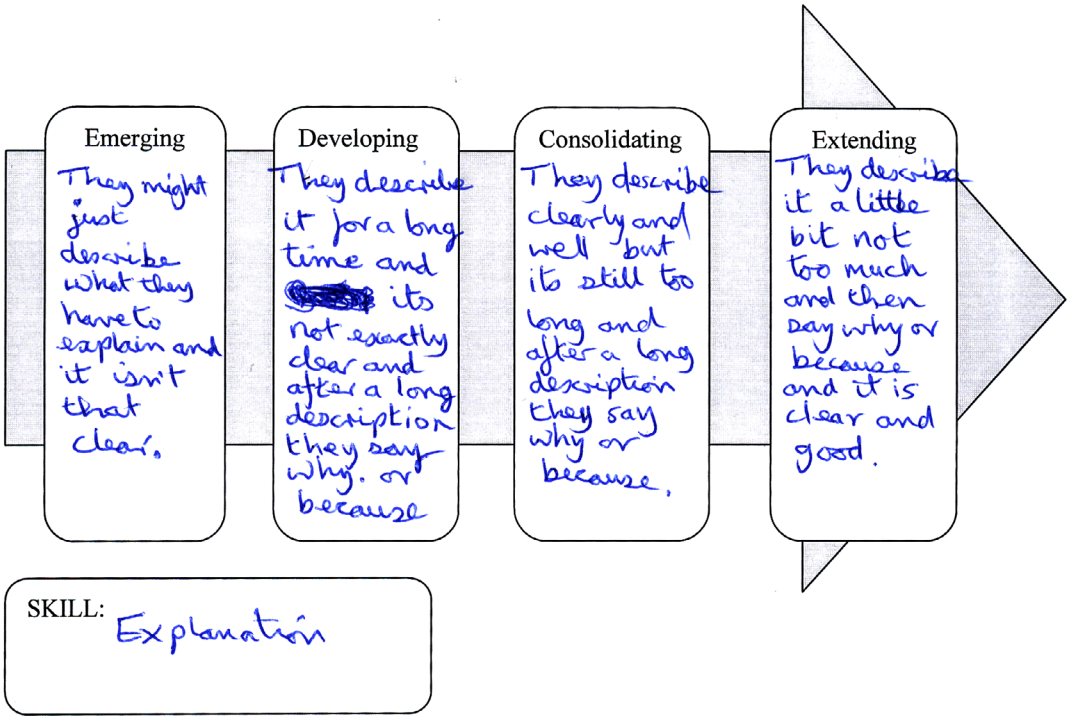

Figure 3 An example of a rubric for pupils to give their meaning of 'explanation'

The pupil has filled in some squares and explained why she thinks she had progressed in certain areas, or described what she did. The areas were filled in using different colours for the achievements and for the targets so that they are easy to identify. Through using *Learning Landscapes*, the pupils are making explicit their thoughts and feelings and indicate what they feel is their level of development or understanding. They are also taking part in developing their own targets and using language that has meaning to them. When pupils fill in the sheets at a later date, the teacher can provide a calibrated level of performance to get the pupils to think more deeply about progression.

From the pupils' writing, the teacher can gauge what they think. In this case, the pupil has indicated four targets. In general, if only one or two are set, pupils are more likely to work towards achieving them, as having many targets can undermine their self-esteem as it takes time for targets to be attained. It is possible that pupils can set the same targets the next time. They should not be encouraged to continually set more targets or they become unachievable. However, some pupils may decide to stick to the same targets so that they do not have to work to progress. This is where teacher observation and checking, along with pupils' feedback, can prevent pupil-coasting.

In this case, collaborative learning was a feature of the activity and so dialogue was involved. However, the *Learning Landscape* was filled in individually. This is useful as the pupils have to verbalise and make conscious what they were thinking. It is common that pupils will talk informally as they fill in the sheet. If pupils look at each other's informal comments and discuss them, it can help pupils to reflect.

Learning Landscapes will create even more dialogue if they are done in pairs or in groups, as the pupils may be challenged about their perceptions. For example, in Figure 4 the pupil asserts that she was enthusiastic, but the other members of the group may not agree with this, and may have experienced her actions as trying to get the others to do as she wanted. If a pupil's justifications are discussed with those they were working with, such disagreements, and agreements, about how a pupil has communicated

Egg experiment

LEARNING LANDSCAPE – Personal qualities not often measured by tests.

Creativity 11/14 we had creativity because everyone had the same idea for there material for the eggs to be dropped in. We chose jelly.	Collaboration 11/14 We all worked as a team and all helped eachother, for example chloe recorded data I got all materials, Amy and	Leadership 11/14 I had a bit to much leadership for example I took over the experimelit when I should of let other people do it.
Critical thinking 11/14 We weren't really critical if something went wrong	Endurance gerald done the experiment with help from me and chloe.	Compassion
Resilience	Reliability 11/14 I could of been more reliable because my team expected me to bring the right material. However the jelly was really runny.	Courage
Motivation	Enthusiasm 11/14 I was enthusiastic because I brang materials from home. And played big parts in the experiment	Independence 11/14 I had independence because I got materials from home.
Problem-solving 11/14 We all problem solved because when we ran out of metre sticks we used rulers. And when the jelly went wrong we used a different material.	Self-awareness 11/14 I was self-aware. Because when the jelly was runny I realised I had done it wrong. And was self-aware.	Resourcefulness 11/14 Because when we ran out of metre sticks we started to use rulers
Curiosity	Self-discipline	Spontaneity
Questioning	Empathy	Tenacity 11/14 I could of had more tenacity because when the jelly didn't work we just chose a different material and gave up

Figure 4 A filled-in *Learning Landscape*

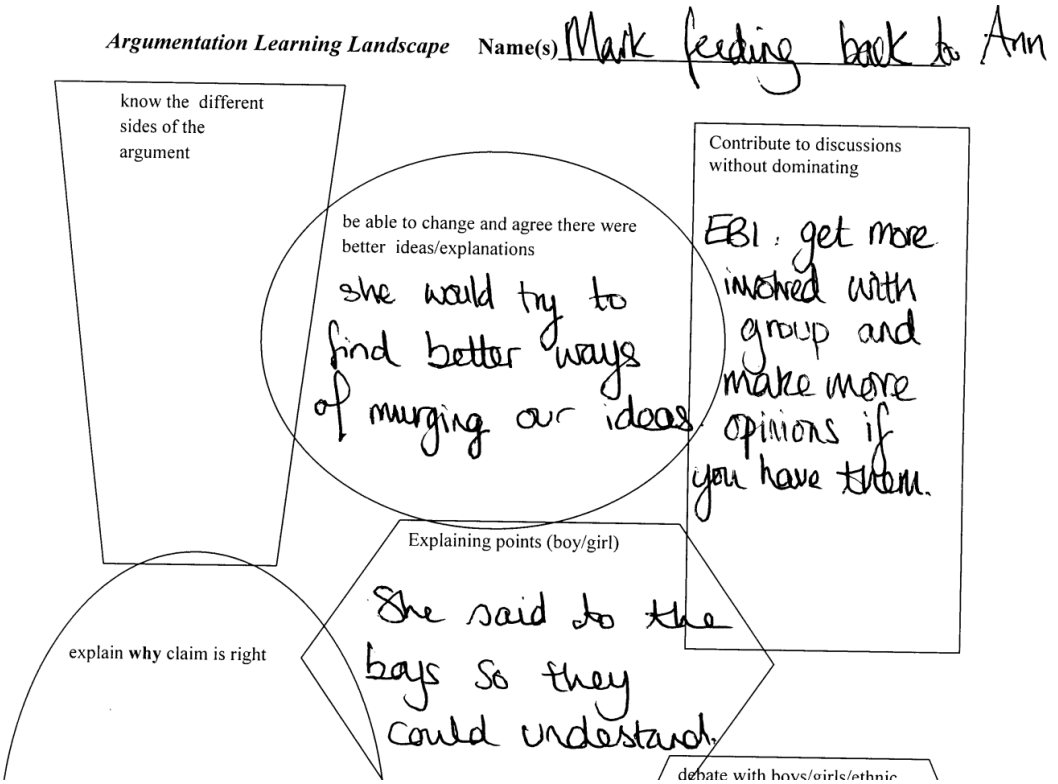

Figure 5 An example of part of a *Learning Landscape* completed by one of a pair of pupils

with the others can be discussed and this should lead to greater learning.

Filling in the *Learning Landscapes* in a pair or group situation should ensure that discussions will bring out how others felt about the same situation. This is essential for the development of emotional literacy in order to develop empathy, to listen carefully to others and to consider what they say (Matthews, 2006). Figure 5 shows part of an example of paired work. In this case, pupils had done some group work in mixed sex groupings and they were then put into pairs. They were told that they had to evaluate each other and that they would then discuss together how they felt, and how much they agreed with each other. The instructions were that they should:

1 not talk to each other while filling in the sheet;
2 make three or more comments on what the other person achieved and was able to do, explaining why they thought that;
3 give comments on one or, at most, two areas where the person could improve their performance and explain how they might do this;
4 when writing the comments, they should:
   (a) be constructive,
   (b) be specific,
   (c) be careful about the language so as not to hurt the other pupil's feelings.

The pupils would then change sheets to see what the other pupil had written, explaining how they had come to their decisions. At this stage it is important that pupils develop listening skills and, ideally, establish eye contact.

It is worth noting that the shapes used on the sheet make it less likely to be read from left to right by the pupil, so they are less likely to see it as a linear progression.

In this case, Ann was given the comment that she could get more involved and make her opinions known. In fact, Ann had said that she thought she was good at this. When the pair discussion took place, she said '*I thought I explained my opinions clearly, but it is an area*

for improvement, so I need to make it clearer.' If the feedback had not occurred, she would have thought that it was an area she was good at and so not seen any need to develop it. Often there can be a discrepancy between what one thinks occurred in a social situation and how others experienced or read the same interaction. To make such variations visible and open to discussion is part of learning to progress socially and emotionally. These techniques also follow the pattern that Matthews (2006) recommends for developing social and emotional relationships. These include that pupils should think and reflect on social processes and feelings, compare their views with those of others, and have time to reflect and come to understand each other's viewpoints and feelings. The power relationships in the groups can be made explicit as the pupils, when they fill in and discuss the *Learning Landscapes*, usually notice their interactions, and, if necessary, the teacher can comment on them. The framework justifies pupils and teachers making interactions explicit. Also, if in mixed sex groups, gender issues can be raised and pupils enabled to develop their understanding of each other (Matthews, 2004).

However, any feedback should be handled with care so that the pupils are supported by other pupils, made to feel they are capable of improvement, and can learn from failure. Understanding that one can learn from failure and hard work, rather than thinking that ability is 'natural', helps develop a growth mindset (Dweck, 2000).

The procedures used here are also valuable in any peer assessment.

Rather than being completed in pairs, it is possible for *Learning Landscapes* to be filled in by groups, who would then discuss how they had performed or understood.

It is possible for the teacher to ask the pupils to fill in the same sheet again, and it could be used up to three times, provided that the tasks or activities are appropriate to the categories on the sheet. The sheets are particularly useful for developing enquiry skills. Similarly, the pupils can keep the same target, depending on the enquiry/task.

Feedback

The purpose of feedback is to help pupils move forward in their learning. So far, I have explained how there can be self- and peer feedback on performance with discussions on how to improve.

While the class is in progress, the teacher can observe a group for a while and fill in a *Learning Landscape*. Teacher observations during a lesson do not have to cover the whole class but can focus on a few groups or even a few pupils on a specific stage of the tasks. Teachers are usually unable to observe every group. This does not matter as all the groups in the class can be evaluated over a period of, say, a term. Commonly, teachers are well aware of the interactions that take place and know when to intervene and when to leave well alone for pupils to sort out things themselves. With *Learning Landscapes*, teachers have the pupils' written sheets as an aide-memoire to help them formulate any feedback that needs to be given in addition to that done by the pupils, or the teacher may decide to do all the feedback themself. Teachers can use the information gained from these sources to develop the next set of lessons to improve learning. Pupils can be praised for giving decent feedback in a pleasant way. As with all feedback, it is more effective to give up to four positive comments for each one on improvement.

Learning Landscapes can be used for a range of topics and are particularly useful for those skills not commonly assessed, such as the social and emotional skills that are essential for developing the ability to engage in dialogue, to accept criticism, to listen closely to others, and to become self- and co-dependent. These skills are central to pupils being able to use each other to learn and to become self-reliant. In particular, enquiry skills, including planning, hypothesising and teamwork, can be developed; the examples above were developed during the SAILS project (Harrison, Howard and Matthews, 2016; SAILS, 2016). In addition, combined with other strategies, they can form part of improving gender and other relationships (Matthews and Sweeney, 1997; Matthews, 2006).

Assessment and progression without levels

The emphasis in *Learning Landscapes* is on the whole concept, such as teamwork or energy, although its constituents are important. This is coherent with social constructivism, with its emphasis on frameworks and overarching ideas.

While there are elements to the whole concept, they are not necessarily ordered. Pupils can work on various aspects of, say, teamwork

at the same time, and in different ways. The assessment can be seen as a hilly landscape with hills in areas where the pupil has achieved (this is where the name *Learning Landscapes* comes from). Hence, pupils can be evaluated on their development in the areas as they act on targets and advice in relation to the whole skill/concept without reference to levels. The teacher has to keep copies of the *Learning Landscapes* (which can be used up to three times). It is even possible to involve the pupils in the overall assessment but it would be time-consuming. As pupils can develop in different areas, direct comparison between them is not essential. The main reason for the areas to be in a random order is because different pupils do not develop in the same way, learn in the same order, or understand at the same rate. Hence, if the teacher were to put the elements down in the order that they thought indicated difficulty, pupils could believe that that is the order in which they should learn, even if it is not the best progression for them. Also, pupils could look at each other's sheets and compare to see whether they have progressed as much as other pupils. Not only could this affect their self-esteem, it would make them more likely to select 'higher order' elements to make them look better, even if this were not where they in fact were developing or felt they could develop. Randomising the order helps to emphasise that formative assessment is about personal development and moving forward rather than competition (Black *et al*., 2004).

Having a random order makes it possible to assess without levels; generally, levels are identified on the assumption that it is possible to define a linear progression. The latter can make teachers teach to an order that someone believes should be followed, rather than allowing flexibility for pupils to be involved in the decision as to where they are and what is required to move them forward (scaffolding), and so they are more likely to achieve.

Learning Landscapes offer a flowing approach that helps create a beneficial learning environment where collaboration between pupils is in the foreground, while competition is in the background. This flow and dialogue also involves the teacher and embodies a social constructivist view of learning and progression, as learning is seen as a social process and pupils learn the cultural understanding of the world around them. In all situations such as these, teachers should be aware of gender, class and ethnic considerations and to see these through the lens of interactions. To tackle issues arising from diversity, it is essential for teachers and pupils to be conscious of interactions and responsive in appropriate ways. It is easy for busy teachers to overlook such interactions but *Learning Landscapes* can make such interactions visible and open for discussion, as the interactions of the pupils can be seen by teachers and pupils and recorded on the *Learning Landscape*. For example, a heading in a cell, depending on the school context, could read 'Listening to girls and boys equally'.

Importantly, with *Learning Landscapes* the pupils are being involved in reflecting on what and why they are achieving, and then having to reflect on what, why and how they think they can achieve next. Hence, with teacher oversight and guidance, they are likely to develop the skills of being reflective and reflexive learners, which can lead to higher order thinking. One teacher related 'working scientifically' to the *Learning Landscape*, talked about the principles involved in both, and then asked the pupils to fill in all the areas in which they had achieved. In this case, it was done before starting a new enquiry but it could be done at any stage.

The use of *Learning Landscapes* can enable plotting of the changing landscape of pupil progression and facilitates the mapping of how well the pupil understands or develops skills. This can help the teacher to plan how to move learning forward. The evidence gained can be used with other assessments to feed into and give a deeper summative assessment that focuses on the improvement of skills without resorting to using levels.

Discussion

Learning Landscapes are a useful way of furthering formative assessment as they conform to many of the principles from Assessment for Learning and pedagogical approaches based on constructivist learning theories. In particular, they involve pupils using language to clarify meaning, learning and understanding. They incorporate pupil activity and target making, and encourage learners to help each other learn and develop. In sharing through *Learning Landscapes*, pupils can be confronted with alternative viewpoints and cognitive conflict. Pupils can help shape what

they learn next, while shaping the focus of the path to learning. Meanwhile, teachers are gaining information that can help them design lessons and activities to move learning forward. They can ensure development and make the *Learning Landscapes* more specific in aspects of content or particular enquiry skills.

Additionally, completing *Learning Landscapes* involves the processes required for developing emotional literacy and so developing the social and emotional skills needed to become self-reflecting and self-reliant when working with others. Doing this can help pupils see that learning and emotions are integrated and not separate (Matthews, 2015). It is common for pupils to see science as non-emotional. This is illustrated by a pupil who filled in a box on self-discipline as '*We should have worked on self-discipline because we got excited on the experiment.*' The pupil thought that excitement and science should not go together. Furthermore, it can help develop gender relationships through paying attention to the pupil–pupil interactions, making them explicit, and open to discussion for change. This has the advantage that girls and boys can start to be open about how they feel working together, improve their relationships and so accept each other as scientists.

As such, *Learning Landscapes* can be a useful tool to help teachers engage with and develop their formative assessment techniques to move pupils on in their learning.

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