

How adults really learn– or what we think we know about how they learn!

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Introduction

The fascinating thing about theories of learning is that there are lots of them. This enables us to select from those that seem plausible or apposite to the needs of our students. Learning is an inherently complex process experienced by a wide range of individuals; we ought not therefore to expect one idea or theory to account for all that we understand by the term learning.

As teachers, what we tend to do is to consider all the ideas about learning and synthesise our own 'theory of learning' and arrange our teaching around that. This process may be quite unconscious. The purpose of this section is to bring those theories back into consciousness (and give them 'the round of the houses!').



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Some 'classical' ideas about adult learning

We start learning from the moment of birth. Some commentators argue that certain actions result from instinct, not learning. If you watch a newborn baby it appears to instinctively respond to the source of food – however at what point learning takes over – and the baby learns to associate food with a particular place, smell, or person is more difficult to determine. Some commentators might assert that all human actions (or behaviours) are the result of learning and that what we call instinctive behaviour is actually learned (at a very early stage). You might wish to consider what you think about this.

Some writers (Brown, 1994) believe that all behaviour is stimulated by something. For example, our baby cries when hungry. Following this line of thought, if the behaviour is responded to (or reinforced) then learning results – when our baby cries, someone picks him up and feeds him, so he learns that crying results in the satisfaction of his hunger. This view of learning is described as '**behaviourism**' and there has been a good deal of research around the notion that teaching (and assessment) is concerned with supplying an appropriate stimulus and reinforcement of resulting learner behaviour.

The behavioural approach appears to work well where the learning of skills and practices is concerned. Here the teacher can provide reinforcing

feedback to students and encourage actions to be practiced and learned. For example, a behavioural approach is used to underpin the development of vocational skills and learning and is conspicuous in the design of National Vocational Qualifications at a variety of levels.

Behaviourist approaches tend to work less well when the material to be learned is complex, requires analysis from a variety of perspectives or requires innovation or development.

Reinforcement may be either positive or negative; reinforcers can be teachers, peers or self. It is believed that learning is just as likely to result following negative feedback as it is following positive feedback. Hence the old adage – 'you learn best from your mistakes'. We are not sure whether we agree with this – what do you think? Learning from mistakes (and achievements) seems more likely when the student is required to think about (or reflect upon) the learning. Extreme reinforcements do seem to be memorable – we can often recall the triumphs and the catastrophes more readily than the mundane competence of doing well enough to succeed/survive/pass. The mention of 'remembering' brings us to thinking about the mind or '**cognitive processes**' concerned with how people learn.

If the behavioural approach tends to promote

(predetermined) outcomes in learning (or products, abilities, skills or competences) then we might expect that a cognitive emphasis would place understanding and the attachment of meaning to the fore. For example we can observe whether a person can throw and catch a ball (skills learned through reinforcement and stimulus) but we can only appreciate the person's knowledge (of velocity, wind speeds, hand and eye coordination etc) by finding out what the person knows about ball catching and by asking him/her to describe, analyse, evaluate, recall, assess, explain what they understand. These cognitive strategies or thinking processes (describe etc.) enable students to be able to understand about ball catching without, necessarily, being able to demonstrate that they can actually do it. So potentially we have a separation of the cognitive (thinks about) from the behavioural (being able to do). In reality the cognitive and the behavioural are difficult to separate and often take place simultaneously. However, being able to both practice something and understand why and how it is done, arguably suggests more learning has taken place than either one or the other alone. In HE, students' cognitive strategies are often presented as learning outcomes – training students to think and problem-solve lies at the heart of many programme specifications. (You might be interested to note at this point that there is debate about what cognitive strategies are – and indeed

what constitutes intelligence. For example, Gardner (1994) asserts that there are 'multiple intelligences' and formal education tends to overlook forms of intelligence other than verbal intelligence.) Teachers who tend to subscribe to a cognitive view of learning would assert that being able to do something is not as sufficient as being able to know why you do it, because the 'knowing why' process is thought to aid replication and render the learning relatively permanent.

Learning is said to have occurred when there is a change; a change in behaviour, a change in understanding or a change in action. Most teachers know that it is possible to change behaviour without actually changing minds! So how do we bring about real, lasting change in understanding? what we might view as real learning? Some writers (Entwistle, 1988) refer to this as 'deep' learning (as opposed to 'surface' learning) others (Ausubel, 1968) have used the description of 'rote' and 'meaningful' where rote learning is achieved through arbitrary associations of ideas - a process which tends to be superficial, and where meaningful learning relates to development of ideas which are already anchored (deeply) in what the learner knows. It is probably a generalisation, but most teachers appear to prefer the development of deep, meaningful learning to that which is surface and rote in nature - again because it suggests that learning is more permanent.

If we follow this line of argument an effective way of bringing about deep learning is to build on what the learner already knows or to help the learner construct new and extended understandings. This brings us to a range of ideas about learning known as '**constructivism**' in which it is asserted that all human knowledge is constructed; all subject disciplines are constructs - nothing that we view of as learning was given to us by nature - people-kind have made it into what is understood today. To continue this line of thinking, then the content of knowledge is borne out of human cultures and lived experience. As far back as 1959, Kant is quoted as saying we construct our own meanings by integrating new ideas into established ones,

But though all our knowledge begins with experience, it does not follow that it all arises out of experience. For it may be well be that even our empirical knowledge is made up of what we receive through impressions and of what our own faculty of knowledge supplies from itself. If our faculty of knowledge makes any such addition, it may be that we are not in a position to distinguish it from the raw material. (Kant, 1959, 25)

If this line of argument is accepted then the knowledge does not exist as an objective external to be learned, but instead is interpreted,

If we see that knowing is not the act of an outside spectator but of a participator inside ... then the true object of knowledge resides in the

consequences of directed action. (Dewey, 1960, 196)

As teachers, we are left to ask ourselves - is knowledge created or discovered? If we believe that knowledge is created we are probably closer to the constructivists, if we believe knowledge is discovered we are probably closer to the external realists. Of course there are likely to be times when such alternatives are not appropriate; we can appreciate both extreme positions and many more in between. For teachers, it is valuable to note that most constructivist thinkers would view the construction of knowledge (or learning) as an active process undertaken by both individuals and 'communities' of individuals and thus diverse perspectives will emerge.

Teachers cannot assume that all students have the same set of understandings or that their own ways of understanding are shared by their students ... teachers should drop the fashionable but misleading talk of students 'misconceptions' for this implies that there is a standard set of 'correct' conceptions that all learners should have. (Phillips, 1996)

And a final thought,

When one applies constructivism to the issue of teaching, one must reject the assumption that one can simply pass on information to a set of learners and expect that understanding will result. Communication is a far more complex process than this. When teaching concepts, as a form of communication, the teacher must form an adequate model of the student's ways of

viewing an idea and s/he then must assist the student in restructuring those views to be more adequate from the student's and from the teacher's perspective. (Confrey, 1990, 109)

Thus far we have asserted that students do things (behave or act), think things (by using cognitive strategies) and construct things (by interpreting and adding meaning) in their quest for learning. NB please be advised that all the foregoing is contested – often by heated debates in which differences of view provide vast amounts of exciting and challenging literature in education journals, theses and books! We will next take a look at two other recurrent themes in theories of learning – the first concerning the context of learning (or the setting) and then the feelings that learning arouses in students (the affective domain).

How many times have you been asked 'what were you doing when Kennedy (or John Lennon or ...) was shot?' and is it not interesting that twenty or thirty years on, you can still remember vividly? You have learned of the shooting and also learned to recall the whole setting in which the learning took place. This is thought to be because much of what is learned is specific to the situation in which it is learned. This phenomenon is referred to as '**situated cognition**' and the following claims are made for it:-

action is grounded in the concrete situation in which it occurs

- knowledge does not transfer between tasks

- training by abstraction is of little use
- instruction needs to be carried out in complex, social environments (Anderson, et al, 1996)

Situated cognition suggests that learning is contextualized (or context-dependent) and that replication of that learning (note: replication is assumed to be associated with permanency of learning) is difficult or impossible in a different context. Many teachers can agree with this, but can also probably think of examples where learners did manage to use their learning in a different context. Whether the context of learning is a valuable 'anchor' or an unhelpful 'straightjacket' seems to depend upon how the learning is undertaken. Critics of situated cognition suggest that much learning is, in fact, context-independent - reading and writing are the prime examples.

One test often used to determine whether learning is tied to a learning context, has been to see if the learning 'transfers' to other settings. An important test of transfer for HE teachers might include how far learning in the university transfers to learning that is required in the workplace or to higher levels of learning. You might want to give some thought to whether learning in your students appears to transfer to settings such as placements, or to other settings, such as more difficult units, projects or personal time management. Educational researchers are divided on the matter of transfer. 'Singley and Anderson (1989) showed that transfer between tasks is a

function of the degree to which the tasks share cognitive elements' (Anderson, *ibid*). Klahr and Carver (1988) found that transfer (from one task to another) hinged upon arranging teaching around the components of the tasks that are common. There is also evidence that transfer is more likely to take place when the students are advised to think about using learning from elsewhere. There is an oft-quoted example of a group of medics who were presented with a problem of how to treat a tumour without affecting the healthy tissue nearby; they were provided with a story about an army general who attacked the enemy from a variety of positions, the attacks converging on the centre of the enemy. Apparently the story did not encourage transfer and the medics did not think of using converging laser treatments, until they were asked if there were any parallels with the story about the general; then there was some evidence of transferring the learning from the story to the practice problem.

As teachers we are thus required to make explicit the links between related learning events – concepts that are obvious to an experienced teacher may not be so readily available to an inexperienced student. Where links and associations are not drawn out in teaching – learning may be more likely to remain context-dependent or situated.

What is needed to improve learning and teaching is to continue to deepen our research into the circumstances that determine when narrower or broader skills are optimal for

effective and efficient learning.
(Anderson, et al ibid)

Of course the situation that learning occupies is not wholly comprised of intellectually stimulating events, it is also a place for emotions to be experienced. The place of feelings or emotions in learning is sometimes referred to as the '**affective domain**'. There is a common-sense view that suggests that learning is more likely to take place when learners are positively disposed to the subject and derive intrinsic pleasure or interest from it. However, students' disposition toward learning is affected by several important aspects:-

- students' self-concept (and self-esteem) in relation to themselves as a learner – previous learning in schools, colleges and workplaces can undermine current learning, particularly where early experiences have been negative or unsuccessful
 - the so-called 'hidden curriculum' can influence the way in which students see themselves as learners – this may be particularly important in relation to widening participation initiatives, where students from diverse educational, social and cultural backgrounds may hold attitudes and values that appear to differ from that of staff or other students
 - teacher expectations have been demonstrated to have a powerful impact on students' self-concept and motivation levels
- anxiety – the fear of failure, concerns about the future, or worries about personal or domestic problems can have enormous impact on students' approach to learning. It is sometimes believed that small amounts of anxiety can be stimulating but that too much anxiety can be 'paralysing' and lead to inaction. For teachers, the difficult task is knowing when anxiety levels have reached a point where learning stops, as individuals vary in their capacity to manage stress, uncertainty and what is sometimes referred to as 'cognitive noise'
 - motivation to learn varies from student to student and within the same student over periods of time – it is a very dynamic feature of learning and teaching and there is thought to be a very strong affective component to it. Motivation is sometimes described as actions brought about by intrinsic or extrinsic pressure; and is often associated with attainment of a valued goal or need. For example the motivation to achieve a good degree is a strong extrinsic pressure likely to encourage engagement; fascination with the nature of the subject is a strong intrinsic pressure which is equally likely to encourage engagement with the material

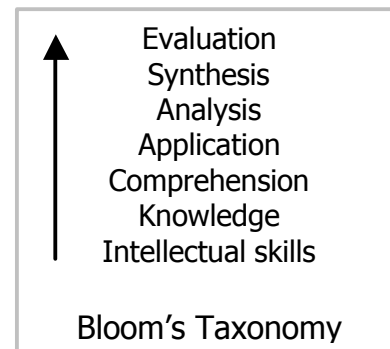
How adults learn

We now turn to some ideas about learning which attempt to

reveal the processes individuals experience – some of what follows might be described as theories, some more aptly as models and others – simply ideas drawn from practice.

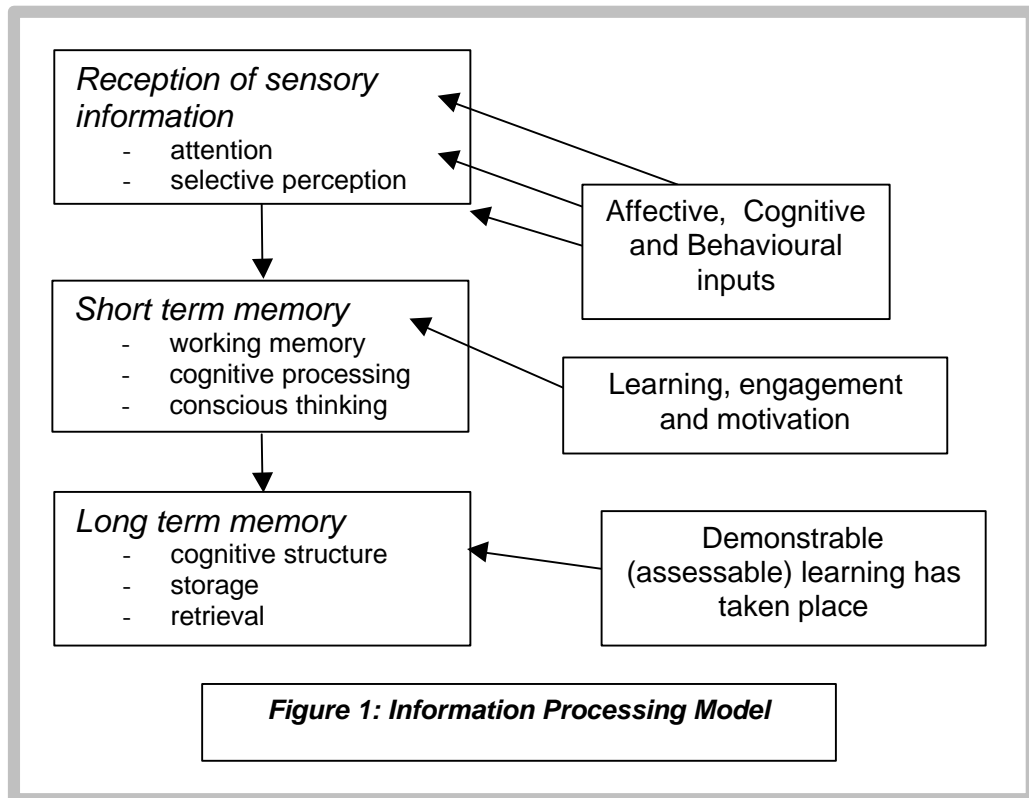
An **information-processing** model, like the one shown in Figure 1, underlies a lot of writing about learning

Another writer (Bloom, 1956) presents what is now a well-known 'taxonomy of educational objectives' as a hierarchy. Bloom would assert that teachers cannot expect students to be able to evaluate, for example, if they have not attained the subordinate



objectives.

Blooms taxonomy suggests that you can divide cognitive skills into increasingly higher order skills, implicit in which is a form of development in the student's intellectual capability. Alternatively, the '**gestalt school**' (the word 'gestalt' is German for pattern, or form) suggest that students seek patterns and make attempts to integrate ideas into meaningful perceptions or 'wholes'. An extension of this idea leads to a view that some learning can appear to be 'insightful' – or in other words students can suddenly 'see' or grasp an idea



or issue as a whole and not just a series of component parts – the whole being more than the sum of the parts. This approach to thinking is assumed to be valuable in problem-solving and is thought to owe much to previous learning. Teachers who subscribe to a gestalt view of learning might expect the kind of learning which appears to need a 'leap in imagination' or a synthesis of conflicting evidences or a problem-solving approach.

There is a major body of literature about the importance of **language** in learning and some teachers might argue that without language there can be no learning. Words are used as symbols for real artifacts and concepts. For example, what is meant by the term 'home' varies according to the listeners' perceptions of what

homes are like. The meaning of the word 'home' is borne of previous experience, and is modified by knowledge or experiences of different types of home (ideal, poor, supportive etc) – hence the word as a symbol for a physical place gradually becomes representative of a bigger concept concerned with a way of living and locus of personal identity. Writers like Sapir might argue that language is an outward facet of thought – it is pre-rational and it helps someone express a thought – but it is not the end product itself. The end product would be building concepts and words are instruments in that process. Interestingly the meanings we attach to words change over time and not just in popular parlance. Think of words like cool, gay, spin – and how they have changed their meaning in

recent years. New words are continually being invented to represent concepts in the real or virtual world – think of words like hyperlink, globalisation or operationalise! Was it Vygotsky who said,

The relation of thought and word is not a thing but a process, a continual movement back and forth from thought to word and from word to thought.

As a teacher, what do you think about that? How shared is the language used in teaching and learning settings?

Words are not the only things we use in teaching to assist in learning – visual representations are frequently used (icons) and so are experiences in which students actually take part (act). It could be said then, that teachers deploy three major

channels to represent the world,

- enactive (knowledge from doing, participating)
- iconic (knowledge from seeing or imagining)
- symbolic (knowledge from words or symbols)

Some channels will appeal to some students but not to others – for example, students with sight problems might be less able to use the iconic and students whose first language is not the taught language might have difficulty in learning symbolically. If you add to this, students’ preferences for how they learn some of whom love watching powerpoint presentations and others hate it; some relish group discussions and others shrink from participation..... you need next to give some thought to **learning styles**.

A great deal of educational research work has been carried out to try to identify learning styles and how to best respond to differences. Empirical

researchers have used many devices to measure learning preferences and there are numerous learning styles inventories that aim to classify styles and suggest teaching and learning approaches. One of the most well-known is the Learning Styles Questionnaire (LSQ) developed by Honey and Mumford and deriving from work undertaken by Kolb. The LSQ uses over 80 dichotomous items to plot whether a learner’s style is that of activist, reflector, theorist or pragmatist. Kolb had earlier identified two bi-polar measures – that of concrete experience – abstract conceptualization and active experimentation – reflective observation and constructed learning styles termed accommodator, diverger, converger and assimilator. Swailes and Senior (2001) provide us with Figure 2, which integrates both Honey and Mumford and Kolb.

The uses made of the LSQ have included direct application to

teaching and learning – for example, if a student’s LSQ revealed him/her to be an activist – then the teaching response would be to facilitate a primarily ‘hands on’ approach, whereas if a student was revealed to be a theorist, then the knowledge- based components would be to the fore.

Whilst the LSQ has a superficial appeal to common sense – we all have different learning preferences and starting points (or styles) – it has been rigorously critiqued from a number of perspectives. One such critique provided by Swailes and Senior (ibid) suggests that the LSQ, far from predicting learning styles actually indicates a preference for stages in a learning process; furthermore they found there is no real evidence for a category of theorist at all. Sadly perhaps (for those looking for guidance on meeting student need) Swailes et al suggest that there really needs to be more

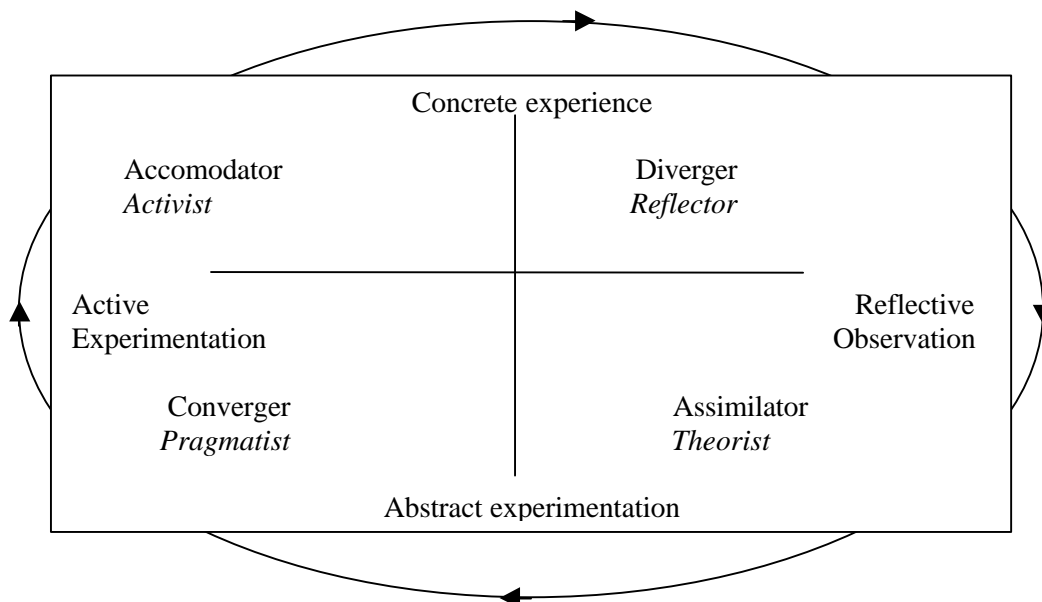


Figure 2: Learning Styles (Swailes and Senior (2001))

research aimed at distinguishing between learning preferences, learning strategies, learning styles and the learning process. Back to the drawing board then.....

If we are presently concerned with how adults learn – then we might fare better looking at the thinking about why adults do not learn – or as is sometimes termed, '**barriers to learning**'. As teachers, our planning and preparation strategies need to take account a wide range of possible inhibitors.

The barriers to learning provide a very negative list of characteristics – which when assembled together appear to describe 'the student from hell.' However barriers to learning may be experienced by anyone at times, and teachers might be better encouraged to consider the following as prompts in their (initial) assessment of students' needs, rather than absolute categories.

- low self esteem
- lack of confidence
- low or uncertain motivation
- inattentiveness or lack of attendance/participation
- poor listening skills
- under-developed study skills
- anxiety or fear or insecurity
- incomplete prior knowledge/poor entry qualifications
- previous experience of failure/difficulty in learning
- social separation
- domestic, financial or personal worries
- low expectations of self
- unrealistic expectations of self

- unwillingness to ask for help
- physical or health conditions
- mental health conditions
- specific learning difficulties etc

It is interesting here that the last three on the list might be termed 'disabilities' but that there are a great many other barriers likely to inhibit learning – which are arguably just as far-reaching as any 'disability'. NB labeling of students has been demonstrated to have very negative consequences for their attainment, so whilst a framework for analysis can be useful in determining appropriate teaching responses, caution is necessary when attributing characteristics. Such characteristics are often transitory or capable of effective management.

Further, adult students are unlikely to begin learning at exactly the same place and so teachers are charged with bringing about learning from differential starting points. How big the differences are is sometimes not evident until the programme is underway and planning has been undertaken. You might wish to consider whether your planning schedules permit revisions following early assessment of the cohort or identification of particular learning needs. Indeed students with specific learning needs or physical or mental health considerations are best addressed before the programme begins.

Students progress along many different dimensions simultaneously (the academic, the social, the personal and the economic) and it is likely that

they will value their learning experiences in different ways too. Increasing students' positive views of their learning can be a powerful way to counter the negative impact of barriers. The highly individualized nature of students' responses here is illuminating:-

"...I think it was a really good course, it taught me a lot but...you gave me the confidence to aim higher, to really change my life"

"I found some of the written work difficult because I haven't done anything since I left school. I left school with (...) qualifications ... but I think my spelling got better during the course"

"So for me the course gave me a chance to study again and a belief in my own abilities"

(Ash, 2002)

Some writers (McGivney, 1999, Sargant, 2000, Eraut, 1998) have identified that confidence building is a pre-requisite to effective learning and that progression is likely to be impeded by a lack of confidence.

Attempts to measure progression amongst students has included devices to measure 'value added,' in other words, the measurement of the learning itself rather than the ultimate outcomes attained. Such attempts are as yet rudimentary but the thinking is consistent with the notion of '**inclusive practice**' by which practices and procedures are aimed at working with and through barriers to learning. A great deal has been written

about making teaching and learning practice more inclusive (Tomlinson, 1996). The debate is closely associated with political and social drives to widen participation in HE and an assumption that a broader range of diversity requires an equally broad response from teachers.

In summary

The foregoing has been intended as a thumb-nail sketch of some thinking about how adults learn. It is unapologetically short, and you may wish to pursue some of the references. "The

fascinating thing about theories of learning is that there are lots of them" (above), but also, a tantalizing feature of ideas about learning is that they are not generally predictive. A student who is confronting a range of barriers and impediments can achieve as well or better than one with ideal learning strategies and circumstances.

Two students I have worked with recently illustrate this:

- student A experienced dyslexia in considerable degree – she achieved a first class degree and is

now working as a teacher of science in a secondary school

- student B was driving buses in London a few years ago – she is now a senior research fellow and her PhD thesis won a national prize

We suspect that we do not really know how adults learn – but what we do know is that the capacity and potential of individuals is breathtaking – a teacher's privilege is to develop that capacity and help students reach their potential.

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