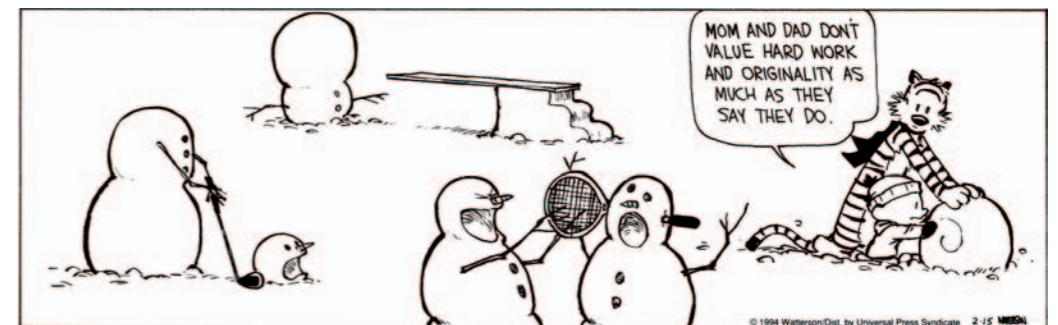# Implicit theories & pedagogy

Wendy Dow

Wendy Dow

Wendy Dow is a lecturer in Educational Studies at the University of Glasgow. Her main research interests are the effect of implicit theories on pedagogy and learning. She has worked collaboratively on a range of projects in design & technology education and has carried out research in a number of areas pertaining to the field. She has acted as a consultant to the European Commission on a project to increase interest in mathematics, science and technology across Europe.

What are implicit theories?

In the cartoon above, Calvin has worked out an important aspect of life - that what people say and how they actually feel deep down doesn't always correspond. This is also reflected in many common sayings in our culture.

'Practise what you preach!' 'Actions speak louder than words.' 'He talks a good game.'

> **?** How many times have you heard this kind of thing said - or said it yourself? And there are many other similar sayings that you will be able to think of that suggest that very often what people do or say does not match what they actually think or feel at a deeper level. Why do you think this should be?

You might suggest that we are just hypocritical or that we often consciously hide our true feelings to protect ourselves or others. This may certainly be the case at times, but quite often people are quite *unaware* that what they *say* differs quite a lot from what they actually think and consequently how they actually act. The concept of implicit theories can offer some important insights into why this should be so.
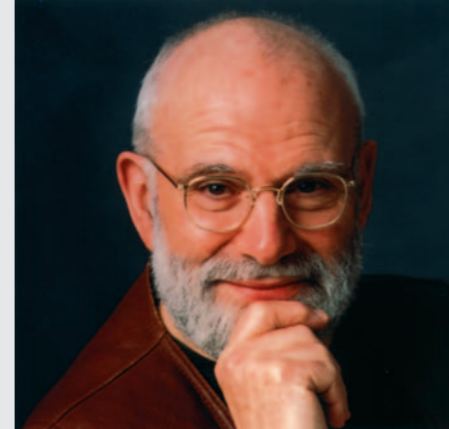
02 Careful research can often be wildly at odds with the implicit theories that people hold to account for everyday things and events in their world.

03

03 Oliver Sacks.
(Photograph ©
Nancy Crampton.)

Research (done mainly in psychology) suggests that we all hold what are called 'implicit theories'. These are sets of beliefs or assumptions that we are not necessarily fully conscious of and that we may even find hard to put into words. Nevertheless these theories or beliefs can have an enormous impact on how we act and react in everyday situations. They are different from the kind of theories that you will have learned about in teacher education courses or from textbooks about teaching and learning.

Researchers and academics develop theories based on the careful collection and investigation of evidence over time. These 'expert' theories that are the result of this careful research can, however, often be wildly at odds with the implicit theories that people hold to account for everyday things and events in their world. For example, experts may insist that research clearly demonstrates that we don't catch a cold through going out with wet hair, but try convincing your mother or grandmother of that!

To translate this into classroom practice, if you were to ask teachers what kind of teaching methods were best for effective learning in the classroom, it is most likely that they would talk about the kind of methods that they have been taught in initial teacher education courses, or have read about in books on education. These explicit

or espoused theories are the expert or academic ones. They will also be able to give very good reasons why these methods are, indeed, currently considered the most effective. They will even genuinely believe that their teaching is closely informed by these very methods. But if you have the chance to observe these same teachers in action in a busy classroom situation, especially when the pace is frantic and things are happening very quickly, you may well find that many act in ways that are not in fact compatible with the academic theories they have just espoused. What is more, they are probably not even aware that this is happening. This is not hypocrisy! It is just that their *implicit* theories, rather than the expert, academic theories they have learned about, are the ones that are guiding how they act.

The 'implicit' nature of implicit theories

What exactly do we mean by implicit? Just as there are certain actions that we perform automatically without even thinking about them (like putting one foot in front of the other when we are walking or changing gear when driving) there are certain beliefs, attitudes, theories or assumptions that are automatic and which, without us thinking about them, or being particularly aware of them, can strongly influence how we act.

In his book "**An Anthropologist on Mars**", the neurologist Oliver Sacks gives a good example of the implicit nature of these thoughts or beliefs (or in this case memories) that can have such an impact on our actions. Sacks describes a patient whose short-term memory had, because of a brain tumour, completely disappeared. Although he had no problem remembering events prior to the onset of his illness, present events left absolutely no trace in his memory. Each day Sacks would visit his patient, shake hands with him and introduce himself. Each day the patient, who had no recollection of who this visitor was, acted as if Sacks was a total stranger. On one occasion the neurologist, as an (admittedly rather cruel!) experiment, concealed a needle in his hand, and as the patient shook hands with him, he stuck the needle into the patient's palm with enough force to make him exclaim and draw his hand away in obvious distress and pain. After this incident, although the patient clearly continued to have no memory of who Sacks was when he entered the room each morning, as soon as Sacks held out his hand, the patient would draw his hand sharply away. When asked why he was reacting in this way, he was completely unable to give a reason. The explanation is that although he could not say *explicitly* what was causing him to act in this way, at some deeper level there was *implicit* memory of the pain that Sacks had caused and it was this implicit memory that was now influencing his actions.

In the same way, the implicit theories we hold can influence us in numerous important ways.

Where do our implicit theories come from?

Clearly the example given above is an extreme one. Nevertheless, even when our brains are totally healthy, we are quite often equally unaware of the influence of our implicit theories on our actions. Part of the reason for this is when and how our implicit theories are formed.

It is generally believed that our implicit theories are formed at a very early stage in our lives. We get our ideas about how the world operates, about such things as the relative importance of effort and ability in achieving success, about how important it is to be competitive or collaborative, and about what kind of personality qualities are desirable from the ideas parents and teachers pass on to us from a very early age. Primary school teachers in particular have an important part to play in the kinds of implicit theories children develop about such things as the nature of knowledge, whether or not everyone can succeed, how challenging tasks are interpreted and whether or not such things as ability and personality are fixed or can change over time.

04 Two ways of
-   organizing a
05 classroom.
    (Photograph 05
    by MadMaven/
    T.S.Heisele.)
06 Views of
    knowledge.

| Knowledge is absolute	Knowledge is tentative & uncertain
Exists outside the 'knower'	Cannot exist independently
Consists of isolated facts	Consists of integrated concepts
Is handed down by experts	Is constructed
Is acquired quickly by some	Is gradually acquired by all

07 Entity and
   incremental
   theory.

| **Entity Theory**	**Incremental Theory**
Intelligence is innate	Intelligence is acquired
Intelligence is fixed & stable	Intelligence is flexible
Intelligence is global	Intelligence is context specific
Intelligence can be measured by tests	Intelligence can be demonstrated in many ways

Why are implicit theories important?

The implicit theories which we develop through these early interactions are important because they impact upon all aspects of our lives and in turn influence many aspects of our own teaching. This applies to general issues as well as to those specific to the design & technology classroom. The kind of implicit theories that we as teachers hold are particularly important because of the messages that we in turn can give to children.

Even such a simple thing as the way our classroom is laid out will give powerful messages about what we implicitly believe.
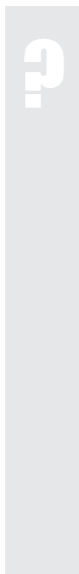
> **?** Think of a classroom you know well. Where is the teacher's desk? Is it clearly visible at the front of the classroom, or is it hardly discernible among the pupils' desks? Is there even a separate desk and (more comfortable) chair that clearly belongs to the teacher? Are the pupils' desks arranged to face the teacher's desk?
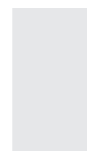
> Are they arranged so that pupils are encouraged to work predominantly as individuals or as groups?

These things can tell a great deal about a teacher's implicit beliefs about how knowledge is constructed and evaluated, where knowledge resides and how it occurs as well as implicit theories about personality and motivation.

Views of knowledge

Classroom structures that emphasise teacher control suggest an implicit theory of knowledge as absolute, (i.e. there are right and wrong answers) that it is passed on by experts (the teacher) and that pupils learn best through listening, watching and absorbing this expert knowledge. It also suggests an implicit view of pupils who are lacking in motivation - unless kept under constant and strict surveillance - who are intrinsically lacking in curiosity or interest and who are unable to construct knowledge for themselves. Structures that emphasise pupil autonomy and interaction, on the other hand, suggest very different implicit theories - ones in which knowledge is uncertain and constructed through active interaction both with the environment and with others within social situations. It also suggests an implicit view of pupils as self-motivated, curious and interested in learning for its own sake.

You can also tell a lot about implicit theories by little things like the kinds of questions teachers ask.

> **?** Think about the kind of questions you ask pupils. Are they predominantly questions to which you, the teacher, already know the answer? Is the role of pupils therefore to find out (usually in competition with each other) which particular answer you are looking for? Or are they predominantly questions to which there are several possible answers, with no one answer being 'correct'? In this case are pupils encouraged to discuss with their peers the various possibilities before making a contribution?

Again the first scenario suggests a very different set of implicit theories about both what knowledge is and how learning occurs from the second. Similarly, the kinds of tasks that pupils are asked to do and the degree of choice they have over what tasks are completed and in what order can give insights into the kinds of implicit theories held.
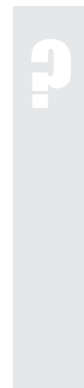
> **?** Think about the kind of tasks you ask pupils to do. Are these open or prescribed? How much choice do pupils have either in which tasks they complete or the order in which things are done? What does this tell you about your implicit theories relating to knowledge and learning?

Entity and incremental theories

Carol Dweck and others have identified and explored the implicit theories that people hold about certain important personal attributes such as intelligence and morality. This research suggests that two distinct assumptions can be held. We may, on the one hand, implicitly believe that such attributes are fixed and unchangeable and that they affect all areas of our learning. Dweck calls this an entity theory. On the other hand we can implicitly assume that these are context dependent and can change and develop over time. This is called an incremental theory. Carol Dweck sums up the two theories as shown above.

08 Carol Dweck.
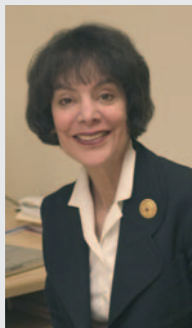
Performance goals encourage:	Learning goals encourage:
Competition	Self-improvement
Comparison with others	Personal growth
A focus on appearing competent	Knowledge and skill acquisition
Avoidance of challenge	Acceptance of challenge
A focus on ability	Acknowledgement of effort
External control (e.g. by rewards)	Self-control
Helplessness in the face of difficulty	Optimism in the face of difficulty
Low self-expectations	Constructive self-criticism
Low persistence	Persistence

09 The impact of emphasizing performance or learning goals in classroom situations.

Whichever view we hold will have important implications for how we act. If we implicitly believe that intelligence is fixed and unchangeable, we are likely to react differently to pupils in a number of ways than if we have an implicit belief in the flexibility of intelligence - without necessarily realizing that we are doing this.

For example, our implicit theories about intelligence can subtly influence who is given praise - and for what.

> Think about who and what you praise in your classroom. Is it the pupils who get the right answers and complete work correctly or those who take on challenging tasks and persevere in the face of difficulty despite making lots of mistakes? In other words do you encourage ability or effort? What do you think the implications of this will be?

If we hold an implicit entity view of intelligence, we will consider success to be a result of ability. This means we will automatically regard some pupils as intrinsically 'brighter' or 'smarter' than others

and will see some as less capable of learning. Those who are considered able are more likely to feel encouraged and competent while those who are not are more likely to feel written off, overlooked or perceive themselves as failures. In turn, pupils who develop entity views of their own intelligence are more likely to avoid challenging tasks since failure at these will be interpreted as lack of ability. They are therefore less likely to persevere when the going gets tough. They will be concerned with how they perform compared to others rather than how much they are learning and improving in the subject. They will play safe and avoid risk in an attempt to appear competent at all costs. If we hold an incremental theory of intelligence, however, and encourage this in our pupils, we will more likely create an atmosphere where learning (rather than performance) is emphasized, where pupils will put success down to effort and where there is acceptance of challenge and perseverance in the face of difficulty.

The above table summarises the impact of emphasizing performance or learning goals in classroom situations.

Our implicit theories can even influence how we react to the way that pupils behave. When a pupil disobeys an order, for example, or acts in an apparently aggressive manner, our immediate reaction can give us some insight into the kind of implicit theories that we hold. If we immediately come to the conclusion that this is a disobedient

or aggressive person, we are implying that these are personality traits that are global and fixed - i.e., an entity theory of personality. We will be more likely to keep an eye on the pupil, expecting him or her to be disobedient and aggressive in other situations. If our immediate response is that the pupil didn't obey because s/he didn't understand the request or wasn't listening, or was acting in an aggressive manner because s/he was frustrated or some other reason related to the context in which the behaviour occurred, then this suggests a very different implicit view of personality - one that regards it not as fixed and global but flexible and context dependent - in other words, incremental. In this case we will have very different expectations for the future behaviour of the pupil. This in turn will influence how the pupil acts.

> Think of some incidents from your own experience. What was your *immediate* reaction? What does this tell you about your own implicit theories of intelligence and personality?

What areas of design and technology can our implicit beliefs impact upon?

Our implicit theories can influence all aspects of our classroom practice but there are some

aspects that are particularly relevant to the teaching of design & technology. For example, just as we can hold entity or incremental theories about intelligence and behaviour, we can hold similar theories in relation to creativity, a construct which is considered central to the teaching of design. We can implicitly regard creativity as something that someone has naturally, a personality quality that is global and fixed and which can be easily measured (just like intelligence). That is, we can implicitly hold the theory that there is such a thing as a creative person and that creativity will manifest itself naturally whatever the context. Or we can implicitly see it as something which can be acquired by all pupils, a quality that can be developed through practice and instruction within a supportive, collaborative context. Again, what we implicitly believe will subtly influence how we teach and how we react towards individual pupils in our class.

If we hold an implicit *entity* view of creativity we are more likely to control and structure tasks for all but those considered most 'creative'. We are more likely to be concerned with developing carefully structured time frames for completion of the work and with guiding pupils through a carefully structured, linear design process. Within this framework, the artifacts of pupils perceived as 'less creative' may be used for demonstration purposes in an effort to help them 'keep up' with the rest of the class whilst the artifacts of those regarded as naturally creative may

be held up as examples of best practice which others will never aspire to meeting! The focus of the final evaluation is more likely to be the *product* rather than the *process* of design. Risk-taking will be subtly discouraged and challenge kept to a minimum while social comparison and competition will flourish. If we hold an incremental view of creativity, on the other hand, we will encourage all pupils to develop their own ideas at their own pace and within their own time frame. Design will be regarded as an idiosyncratic and messy activity and evaluation will more likely focus on the process and progress of each individual rather than comparison with others. Within this framework, the emphasis is on individual pupil choice, challenge and risk-taking. Within this ethos, social comparison and competition will be discouraged.

? Think about your own design & technology classroom. How does it compare to the two different scenarios described? If some of your teaching is based on a rotational circus so that you get a group for only a limited period of time before the pupils leave and you begin teaching another group, what effect will

? that have on the way you teach? Over such a sequence of lessons do some pupils produce a product quickly and then need to be found additional activities whilst others just never finish? Is there a way of using time so that both product and process can be given appropriate emphasis in ways that encourage creativity, autonomy and risk-taking for all?

The very nature and purpose of design & technology education and its place and role in the curriculum is another area where implicit theories will exert a subtle but important influence. For example, if design & technology education is implicitly seen as a haven for less academic pupils, or a means of producing a future work force with manual skills, it will be presented very differently than if it is implicitly regarded as an entitlement for all.

? How do you think these different implicit beliefs might influence the way that design & technology is regarded and presented?

? Read through the examination specifications for the focus areas you teach. Are there any clues as to the implicit theories adopted by the examining body? If so how might these influence the classroom?

Design & technology is a complex subject involving a wide range of activities chosen to meet the particular learning criteria. Some will develop making skills, some designing skills, some technical or aesthetic understanding, some appreciation of the relationship between technology and society. Achieving breadth and balance across this range within the context of national curriculum requirements or the demands of an examination specification is no easy task. Some of the decisions you make will be as a result of your implicit beliefs, but others will be made for you by others. These others will in turn be influenced by their own implicit beliefs. If design & technology education is regarded as essentially vocational, or suitable mainly for less academic pupils, for example, there is likely to be a greater emphasis placed on practical tasks, on skill development and on the production of 'well made' artifacts at the expense of other possible aspects. However, if design & technology is seen as an entitlement for all, there will be a clearer recognition that all young people live

in a technologically mediated world and that one of the functions of design & technology lessons is to enable them to engage in informed debate about the nature of this world and how it influences their lives. There will also be the recognition that the act of designing and making is primarily a powerful means of cognitive growth for all as opposed to an activity preparing some young people for a career in the manual trades. These differing positions will almost certainly influence teaching methods. A practical, vocational model, for example, automatically lends itself more to methods involving teacher demonstration and transmission of facts and skills, with pupils following similar carefully prescribed learning outcomes. An entitlement model, on the other hand, lends itself more to methods which encourage active participation through collaboration, reflection and debate.

How can we tell what our own implicit theories are?

If, as I suggested at the beginning of this chapter, our implicit theories are difficult to express and may not even be within our conscious awareness, you may well be wondering how we can possibly know just what implicit theories we hold. There are a number of ways that can help us become more aware of our own implicit theories, although it must be stressed that this can sometimes be difficult to achieve.

Metaphors often used when talking about education.

10 A lion tamer.
11 A gardener.
12 A coach in a race.

Uncovering our own implicit theories can also be uncomfortable - especially if we really did believe that we were indeed 'practicing what we preached'. It is probably only through attempting to explore these, however, that we have any real hope of fully controlling what governs our actions in the classroom.

Since implicit theories appear to develop at an early age, one way of making implicit theories more explicit can come from exploring early memories of our own educational experience.
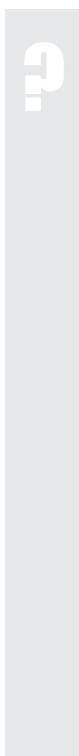
? Think about your earliest classroom experiences. Think about how the classroom was set out, what qualities were encouraged by the teacher, what kinds of things attracted praise, and how you were made to feel about learning. This can help to give you clues about the kind of implicit theories that you now hold. Talk to a friend or write in detail about these early experiences. This can go some way to helping you determine what kinds of implicit theories you absorbed from your earliest

classroom experiences. You can do this with both general classroom experience and your early experiences of design & technology classrooms.

Another way is to explore the kind of *language* that you use when talking about your experiences of school, both as a pupil and a teacher. When we talk naturally we tend to use metaphors without really being aware that we are doing this. An exploration of the metaphors we use in ordinary everyday conversation when talking about such topics as teaching and learning, schools and pupils, can often give us important insights into the implicit theories we hold.

The pictures above suggest some of the more common metaphors that are often used when talking about processes pertaining to education. It is not that we explicitly think about teaching being like becoming a lion tamer in a circus or a gardener or the coach in a race, but the kind of language we use can help us see what implicit theories lie behind the pictures that the language conjures up.

? Think about all the words and images relating to gardening that are used in describing schools or the

processes of teaching and learning. Write these down.

You probably thought of things like ideas 'taking root', 'budding' and 'flowering'. You have probably remembered that we talk of early schools as 'nurseries' or 'kindergartens'. Metaphors of growth and nurturing abound as children 'blossom and grow'; and ideas either 'bear fruit' or 'wither on the vine'. However, if you think about this more deeply, a number of different implicit assumptions also come to mind. If we extend the metaphor we can learn a lot more about the possible implicit assumptions underlying the discourse. Gardens, for example, can differ dramatically in how formally they are laid out and where the focus of control for growth lies. Are all the plants that are of the same type grouped together? Are plants laid out in neat rows? In either case what happens to the weeds, or those plants which for whatever reason don't seem to fit in? Are some plants more highly prized than others, and therefore more carefully nourished? Where does the control over growth reside? Are plants carefully watered, pruned, fed and weeded or left to flourish in a more wild and natural state? Are plants allowed to support each other symbiotically, with intervention from the gardener only when necessary? What are the implications of these different types of garden for when there is no gardener constantly present to nourish and tend? In the former scenario, does growth stop

and do the plants wither and die helplessly because all nourishment has come from a source outside them? By a detailed unpicking of this kind of extended metaphor, we can begin to get a clearer idea of the different implicit theories underlying them.

Quite often we use metaphors that give us a powerful insight into our view of knowledge and education without even being aware that we are actually using metaphor. Listen to the kind of language that you use (or that others use) in the classroom or in casual conversation in the staff room. Do you, for example, talk about children having to try hard to *'catch up'* or describe them as *'falling behind'*? When talking about learning do you think that some children can *'pick things up easily'* or *'catch on quickly'*? These may demonstrate implicit theories of learning as a competitive race and knowledge as something which is factual, concrete and 'out there' rather than learning as collaborative and knowledge as socially constructed, uncertain and contested. The kinds of metaphors we adopt can therefore powerfully define all areas of our teaching including how we structure our classes, how we view knowledge, how we define and structure instruction and the kinds of pupil-teacher interactions we encourage.

? Think of the different metaphors that are used when describing schools (e.g., a factory; a zoo;

a prison). What implications do these different metaphors have for how learning and teaching is viewed? Reflect on the kind of metaphors that you use automatically, when talking about your pupils or your classroom, and consider what these tell you about your own implicit theories.

Can we change our implicit theories and if so how?

Becoming aware of our implicit theories is clearly not an easy task. It can take a lot of hard reflection on our own actions and careful analysis of our own discourse to begin to become aware of the implicit theories we hold. But what if we do begin to have an insight into our implicit theories? Can we then control them, or even change them to bring them into line with the theories we espouse?

Implicit theories *can* be difficult to change, partly because we have generally held them for so long and partly because once established they form frameworks within which new information and experiences are constructed and evaluated. New information which backs up our implicit theories is therefore much more easily noticed and remembered than

information which appears to challenge or contradict them. This type of information is more likely to be automatically rejected or ignored. This doesn't mean, however, that we are at the helpless mercy of our implicit theories. As they are evident in action, a careful and reflective analysis of our actions can help determine how great a mismatch there is between what we actually do and what we think we do in classroom situations. The greater the mismatch between the two, the greater is the need for a conscious attempt to change. If, for example, you really believe that you adopt an active, constructivist approach to learning but actually spend much of your time making sure that you know everything there is to know about a topic before you feel confident to teach it, then your implicit theory of learning may be rooted in an expert transmission model which is very different from the one you espouse. The evidence will be in the way you teach. Do you use your expert knowledge to guide pupil conversations so that they construct for themselves an improved understanding or do you use your expert knowledge to provide correction? Being aware of this can help you to consciously act in a different way, a way that is more consistent with the kind of teacher you would really like to be.

? Ask a colleague whom you trust completely to observe you in the classroom. Ask them to note down

details of the content of your lesson, the teaching methods you use, the kinds of questions you ask, what you give praise for, the kind of help you give, the language you use etc. (If possible a video tape of your lessons can be a powerful vehicle for this type of analysis). Give some really deep and careful thought to how much your actual actions reflect the theories you espouse as opposed to those you hold implicitly.

Of course even when we become aware of our own implicit theories and how they are influencing our actions, that may not be the whole story. Things will still be complicated by the fact that the people who are responsible for writing policy documents, and for running schools and design & technology departments, will all have their own implicit theories and these may well be in conflict with the implicit theories which you hold. Although this can clearly cause enormous problems, unless you are first of all aware of what your *own* implicit theories are, you are unlikely to be able to even begin to address this particular problem.

An important first step, therefore, is to attempt to become familiar with the implicit theories which influence your own actions in the classroom. Only then will you be in a position to determine to what extent they are in accord or in conflict with the implicit theories underlying policy and the organization of particular schools and departments. With reflection and through practice over time, you will therefore, hopefully, become more confident that, unlike Calvin's mom and dad, you are taking the first steps towards ensuring that you do indeed 'practice what you preach'.

Further reading

If you want to explore the idea of implicit theories in more detail (and find out more about what your own implicit theories might be), then I would recommend the following books. These are very accessible and interesting as well as being highly informative.

Dweck, C. (2000). "Self Theories: Their Role in Motivation, Personality and Development". Columbia: Columbia University Psychology Press.

Yero, J. (2002). "Teaching in Mind: How Teacher Thinking Shapes Education". Hamilton, Montana: MindFlight Publishing.