

Unconsciously competent ?

How we teach and how we learn

Introduction

When you were learning to fly, did you ever wonder why you felt you were taking 3 steps forward and 2 back?

If you are an instructor you may have been occasionally surprised to see your star pupil in a depressed state, and asking if he will ever get the hang of some particular aspect of his training.

Have you ever been frustrated because you seem to be unable to explain how you do something?

This paper presents a useful model for both pupils and instructors. It can also provide insights into why some more experienced pilots have accidents. Why do expert pilots sometimes make basic errors with very serious consequences?

The consciously competent model

This model is often used by professional trainers to explain the frustrations inherent in the learning process. The creator of the model is unknown, but the model is in regular use.

The model describes 4 distinct stages of learning. Imagine you have just started to learn to drive a car.

(1) Initially you may underestimate the difficulties you will encounter, perhaps your friends have already learnt how to drive and you consider yourself equally competent. This phase is described as the **unconsciously incompetent stage**---you don't know what you don't know.

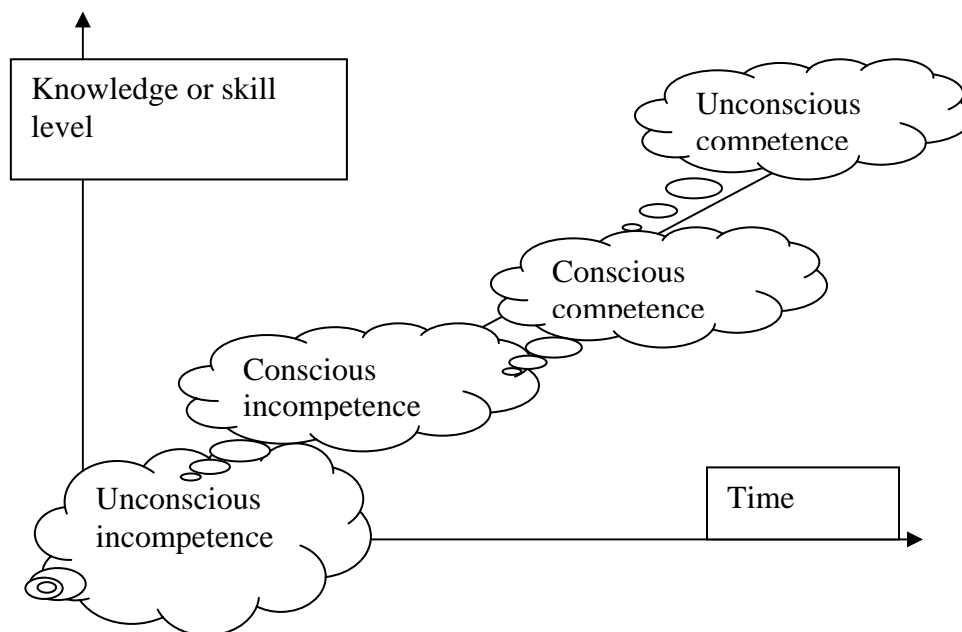
(2) As you crunch the gears you begin to realise there is a little more skill required than originally envisaged. This phase is described as the **consciously incompetent stage** ----you now know what you don't know.

(3) Eventually you master the particular skill of "changing gear", but it still requires all of your concentration if you are to consistently do it well (listening to engine note, watching speed, timing your actions). This phase is described as the **consciously competent stage**----you now know what you know.

(4) After a time you begin to apply this skill without thinking, as the new skills are internalised. At this point in the learning continuum, you may be unable to explain how you do it. This phase is described as the **unconsciously competent stage**---you don't know what you know.

Here are the 4 stages

1. Unconscious incompetence (Hasn't realised there is something to learn)
2. Conscious incompetence (becomes aware of the requirement to learn)
3. Conscious competence (Acutely aware of the newfound skill or knowledge)
4. Unconscious competence (Forgets he knows as the skills become internalised)



By the time we have the competence required to become an instructor, we will normally have become unconsciously competent. This means we will not make a good instructor until we are able to return to the consciously competent condition. Much of the instructor training is directed at making new instructors consciously competent again.

We might consider how we change gears in a car. An experienced driver will probably have to consider long and hard before he can teach someone else. At the same time the “would be” driver has not quite realised how difficult it is. The instructor/pupil relationship can become frustrated because the instructor considers the skill to be obvious and natural, and the student has not yet realised it is more difficult than he imagined.

This principle works in flight training. The instructor must be aware of his own internalised skills, and accept the stages the student will go through. Students sometimes describe their progress as 2 steps forward and one back, this normally happens as the student realises there is yet another skill to be acquired on his training road.

If we have several trainees learning as a group a very interesting situation can occur. The first student to grasp the new skill (consciously competent) is able to explain how he achieves it to his fellow trainees. Often the instructor can facilitate the trainee discussion and speed up the learning process for the remainder of the group.

The table below attempts to identify the four stages. Remember for effective learning to take place, the instructor must be consciously competent and the pupil must be consciously incompetent. The use of the word “incompetent” is not derogatory; it merely defines the state of knowledge acquisition.

Unconscious incompetence	Conscious incompetence	Conscious competence	Unconscious competence
We don't know what we don't know	We know we don't know	We know we know	We forget we know
We see our pals learning to fly, and want to join them.(social needs)	We realise there is more to it (aileron and rudder co-ordination), and become frustrated and concerned that our pals will assume we are not capable.(ego needs)	We have just acquired our new skill knowledge, and are able to explain in fine detail. (assists socialising, reinforcement and meets ego needs)	The skill or knowledge becomes 2 nd nature. We no longer need to think about it. It is too easy to imagine we have some natural talent (Ego threat)
The instructor raises awareness by introducing the new subject area.	The instructor is needed for moral support. You can do it, look what you have achieved already, everyone goes through this stage.	The instructor will do well to stand back and allow (under gentle guidance) the pupil to explain to the rest of the group.	The instructor MUST look closely at how he achieves various tasks, and FORCE HIMSELF to become consciously competent.
Student not ready to learn.	Student ready to learn	Student ready to teach, instructor ready to teach	Instructor not ready to teach.

Part of the instructors' role is to ensure he is familiar with how a task is performed, and create the environment for his pupil to learn. This often means the instructor spends hours trying to understand exactly how a task is completed, so that he can become an effective teacher.

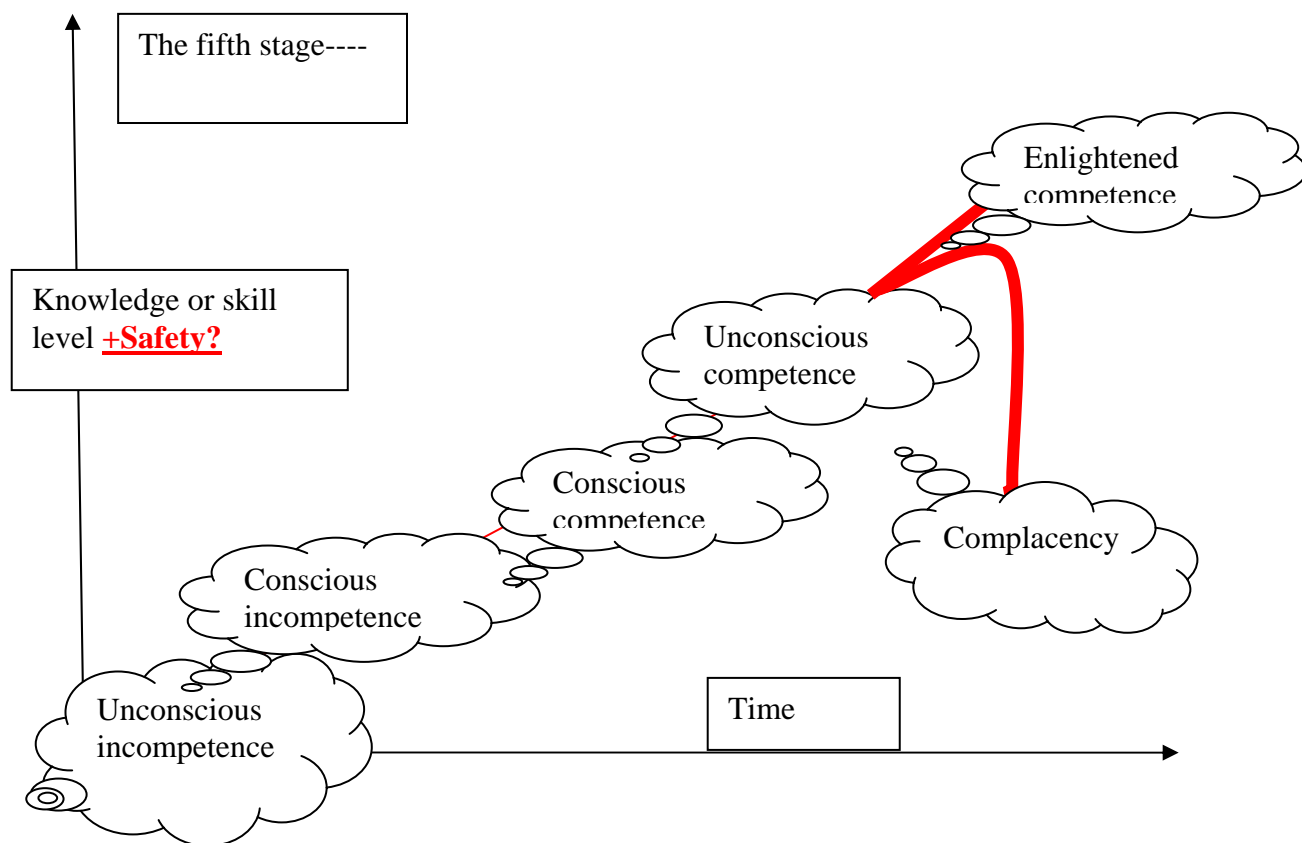
It is too easy, and unforgivable, for an instructor to assume his skill is some inherent talent that he was born with and cannot be taught. The warning signs are not being able to answer questions like; how did you know.....? Or how do you.....? If the instructor cannot answer the question, he is probably unconsciously competent, and has some thinking to do.

Sometimes the pupil will appear to stop learning for a time. This often happens to more mature students because they assume they know what they need to do and temporarily stop listening to the instructor. This is an example of unconscious incompetence, and the instructor needs to be patient as the pupil come to terms with the situation.

The fifth stage

Academics have begun to realise that the 4 stage model can be developed further. This new thinking can provide an interesting new perspective on accidents and complacency.

With high skill levels, we would normally expect a particular activity to become inherently safer. This isn't always the case, relatively straightforward tasks (turning final---recovery from a winch launch failure) are often undertaken incorrectly by fully trained and experienced pilots.



The unconsciously competent model and Safety

Academics argue convincingly that stage 5 is either a state of “enlightened competence” or “complacency”, a kind of fork in the road. Enlightened competence is a state where the individual has developed a heightened understanding of the particular skill or task, and is able to express it to others. Complacency is a state where no further learning takes place beyond unconscious incompetence.

These ideas can be applied to flight training and “primacy”.

For example Recovery from cable breaks.

We are taught to follow a “procedure”, lower nose to the recovery attitude, regain approach speed and check ASI, decide if landing ahead is a safe option etc. I believe that experienced pilots add to this by further learning, they learn how an aircraft feels when it is in normal flight (we call this kinaesthetic learning).

Unfortunately this additional learning is sometimes flawed. Seasoned instructors (enlightened competent) know that air speeds can be dangerously low during the pushover after a launch failure and yet the aircraft will appear to respond normally to control inputs. In this instance the stall speeds are temporarily reduced by significant margins because g loadings are below normal 1g levels.

The complacent pilot will interpret this normal feeling as the aircraft is not stalled. What happens is pilots allow their own new learning to override the taught procedure. (See note 1) The consequences are serious, and may explain why experts so often get it wrong. **Regular check flights are important because they ensure the pilot is following the procedure and not his senses.**

Another example. Failure to release when a wing goes down during the aerotow ground run.

We normally learn to aerotow using 2 seat trainers and a nose hook. We are taught to release immediately if a wing goes down or touches the ground despite the use of aileron.

We soon also learn unconsciously that steering is provided by the pull of the tug, and this opposes the tendency to ground loop. Other learning adds to a developing belief that the wing can always be picked up (eventually) with aileron. We see people take off with wings on the ground, we watch people successfully pick up a wing during take-off.

This additional learning is flawed because the pilot fails to understand how differing conditions affect aircraft handling. Hook position, wind conditions, surfaces, aircraft type, will all affect the ability of the pilot to pick up the wing. The pilot's skill is not normally a factor.

The situation becomes dangerous when something fundamental changes. The pilot transfers to an aircraft with a belly hook, and takes all his experience into a new situation that he does not fully understand. This time a wing touches the ground and he responds in his normal way, a cross wind and aft hook position conspire to catch him out and the aircraft groundloops. **Instructors must fully understand the differences in aircraft and situations before giving conversion training.**

In this case the pilot has inadequate knowledge but his experiences have persuaded him that he can handle any situation, and he unconsciously overrides his basic training. **Post solo raining gives the instructor the opportunity to strengthen the new pilots understanding.**

Note 1

From a sample of 12 annual check flights, 6 experienced pilots and 6 inexperienced pilots. Every pilot was given an unexpected medium height cable break. Every experienced pilot attempted to turn before he had established his safe approach speed, and every inexperienced pilot waited for the speed before attempting to turn.

The conclusion drawn was the inexperienced pilot relied solely on the procedure, whereas the experienced pilots relied on the additional kinaesthetic learning.