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Teaching mind state control

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***Abstract:** A university lecturer describes how he used knowledge about the way the brain works to give students skills in controlling their mind states so as to perform better in a variety of educational and non-educational settings. Student evaluation was high and the method can be used in any subject area.*

***Keywords:** Thinking; mind control; intrapersonal intelligence.*

Introduction

Have you ever walked out of a meeting and, a few minutes later, realized there was something you should have said but didn't? In a lecture or tutorial have you tried, unsuccessfully, to get students to think? Have you faced a simple puzzle that, try as you may, you cannot solve but when the answer is given, the answer is "obvious"? If your answers to these questions are "Yes" then you are entirely normal. For many years this kind of thing annoyed me but I thought I could do nothing about it (for myself or my students). I was wrong.

Gardner (1993, 1999) provides a context for looking at this issue with his concept of multiple intelligences. His basic seven kinds of intelligence are:

1. **Linguistic** intelligence: a sensitivity to the meaning and order of words.
2. **Musical** intelligence: the ability to understand and create music.
3. **Logical-mathematical** intelligence: ability in mathematics and other complex logical systems.
4. **Spatial** intelligence: the ability to "think in pictures", to perceive the visual world accurately, and recreate (or alter) it in the mind or on paper.
5. **Bodily-kinesthetic** intelligence: the ability to use one's body in a skilled way, for self-expression or toward a goal.
6. **Interpersonal** intelligence: an ability to perceive and understand other individuals -- their moods, desires, and motivations.
7. **Intrapersonal** intelligence: an understanding of one's own thinking processes.

The difficulties outlined in the first part of this section are to do with our thinking processes. Understanding these comes under Gardner's seventh category: intrapersonal intelligence. By helping students to understand their thinking processes and then achieve a modest level of control over those processes, they become better able to avoid some of the common difficulties that we all face at one time or another.

In this paper I will explain how I set about doing this for my students on the basis that you might like to try the same thing with your students, even though you are probably teaching an entirely different subject.

The academic setting

The academic setting in which I introduced mind state control (MSC) was a final year undergraduate elective in a marketing major at a New Zealand university. The course itself is coded MARK 304 and the title is “Thinking Skills for Marketing Practitioners”. Before this course, all students had studied basic introductory marketing, consumer buyer behavior, marketing research and possibly two or three other marketing electives as well as a range of non-marketing courses. They had a good grasp of declarative marketing knowledge. The objective of this course was not to add to this but to build thinking skills so that students would be better able to use this declarative knowledge.

The class comprised sixty-five students aged about twenty-one with a gender balance of about 2:1 females to males.

The course comprises twelve modules that run over a semester of twelve weeks with a two-week break half way through. MSC was covered in module six.

The course is taught partly by standard transmission teaching and partly by an experiential-discovery method. Using MSC as an example, the transmission component was a two-hour lecture on the background and central concepts of mind state control (see MacGregor, 1992; Earles, 2004, or type “brain waves” into your favorite search engine).

Students control the experiential-discovery component in the six days after this lecture. It involves students experimenting with MSC concepts and then reflecting on these experiences. This practical side is written up in a personal learning journal and discussed within each student’s voluntary study group of about three students. In addition, I spend between twenty minutes to an hour discussing a student’s work on a one-to-one basis at approximately three weekly intervals.

The precise nature of experiments is left to each student to devise since their personal circumstances vary and experience in devising simple experiments is part of the course. For example, some but not all, have part-time jobs and of those that are employed, some but not all work in marketing. Many who have part-time jobs prefer to test out ideas on “safer” targets such as flat-mates and family members. I will explain these experiments in more detail after the next section.

Mind states and mind state control: a brief introduction

Although the way the human mind works is a complex and difficult subject, it is possible to simplify some aspects of how the brain works and, from this, derive insights and some useful heuristics. I intentionally keep things very simple. I am not teaching neuropsychology. I am simply trying to use some basic scientific findings for the benefit of my students so if you find my explanations to be naively simple then you are right.

Many parts of the human body work in cycles. Probably the most obvious is breathing. Another obvious one is the heartbeat. We can exercise a fair degree of control over our

breathing rate and some control over our heartbeat. What is less well known is that the brain also has a “beat” or, using the metaphor of the computer, a clock speed. Right now, sitting there reading this paper, you are probably breathing at the rate of nine breaths per minute, your heart is ticking at about 65 beats per minute and your brain’s clock speed is probably running at about ten cycles per second (cps).

In normal people, the brain’s clock speed varies from between 0.5 cps to about 28 cps. This range has been divided into four bands as given in table 1.

Table 1: The four common mind states

Speed	Name	Mind state
0.5 ~ 3.5 cps	Delta	Deep sleep
3.5 ~ 7 cps	Theta	Dreaming
7 ~ 14 cps	Alpha	Relaxed awake
14 ~ 28 cps	Beta	Wide awake

Purely out of interest, a clock speed of zero means that you are dead and one in the range 0 ~ 0.5 cps means that you are in a coma. Clock speeds over 28 cps are known to exist (gamma) but there is limited agreement as to their relevance to ordinary life.

The two important mind states that I focus on are alpha, the relaxed state, and beta, the wide-awake state. Let’s take beta first. In this state your mind is ticking over very fast. You spend much mental energy on cycling through your senses, sight, hearing etc. monitoring your environment, largely because you perceive it as threatening in some way or it is essential to your survival that you maintain an alert, aware state. For example, you are driving in heavy traffic under bad weather conditions, late for an appointment and nearly out of petrol. Your mind will be ticking at close to 28 cps. In the beta state you are able to multitask. That certainly is true under these driving conditions: steering, speed control, monitoring the movements of other cars, watching the petrol gauge, thinking about your appointment, thinking about your route, perhaps talking to a passenger or listening to the radio ~ and all more or less at the same time.

The alpha state is quite different. You are relaxed. You are focusing on one main thing with just a minor awareness of things going on around you. Perhaps you are watching a television program, reading a good book or even reading this paper. Hopefully you are sitting comfortably with good lighting, at a neutral temperature and without too much intrusive noise. Under these conditions you will be able to lock on to a single task and you will lose track of time. Your mind will be ticking over in the range 7 ~ 14 cps. If close to 7 cps you will be virtually day dreaming and almost impervious to what is going on around you, especially requests that you do the washing up.

It turns out that creative tasks and memory work are difficult to do in the beta state and easy or at least much easier in the alpha state. Let’s go back to that point in time when you walked out of a meeting and you thought of what you should have said. According to mind state control theory, in the meeting you were in the beta state (essential to your survival) whereas when you left you calmed down and switched into the alpha state. You suddenly were able to “think”.

I tested student stress levels in my lectures and found that I was the least stressed person in the room. I am one of those annoying lecturers who likes to “pick on students”. Of course I don’t

see it that way: I am only trying to get involvement and interaction. But my students know that at any point in a lecture I might ask any one of them a direct question. This keeps them awake and alert but also in the beta state. If I ask a question it needs to be simple. Anything that requires deep thought is unlikely to be rewarded with the same simply because that student's brain is ticking over rather fast.

The same thing goes for seeing simple solutions to simple problems. At high brain clock speeds it just is not easy to make the necessary mental leap.

Well that is the theory side and explains some of the problems we all face in our daily lives. But what can we do about it? Is brain state control possible or are we merely at the mercy of our speeding brains? While the direct control of brain speed is possible through drugs (for example coffee in most people speeds up the brain and alcohol slows it down) or through the use of special electronic devices, I encourage students to use what I regard are more "natural" ways of control.

The first and simplest is control of circumstances. Let's take a situation in which you are in a stressed, beta state and are asked to come up with some creative ideas. The simple solution (which I grant is not always possible) is to defer your response until you have had time to relax, get into an alpha state and come up with the relevant ideas. Many successful students know the study conditions that are right for them. Some like to have music in the background: some like silence. Some like a comfortable sofa: some prefer to be at a table with an upright chair. And so on. It is a case of knowing what the right conditions are for getting into the alpha state, the best state for study, remembering and creativity.

Since the alpha state is a relaxed state, "natural" methods for getting into a relaxed state are worth knowing and trying. One very simple method is muscle tension and relaxing in time with a sequence of deep, slow breathing as used in some yoga classes. This can be combined with visualisation, calming music or "natural" sounds such as waves on a beach or a babbling brook and word scripts designed to calm the mind.

On the other hand, it is sometimes useful to shift into the beta state since one of the great advantages of that state is that you can do a large amount of routine work in a short amount of time. Here the methods are more or less the inverse of those designed to relax you. Discomfort actually helps and lots of things going on round you help to keep your clock speed up. But the actual work done in the beta state should not require much in the way of deep thinking. Because of that it is worth making careful preparations for beta state activities while in an alpha state.

So far I have not mentioned anything about the other two states: delta and theta. My students do not seem to understand how important sleep is to their mental welfare. They go to parties on Friday and Saturday. Often stay up to beyond 3am and then find it difficult to concentrate on work in the middle of the following week. Actual sleep control (getting to sleep and staying asleep for the necessary length of time that it takes the body to carry out essential maintenance) is usually not a problem for people in their early twenties. However, my students do not see the necessity of this and do not link their poor performance in sport, social and educational pursuits to lack of sleep.

As to the theta state, very few students are able to exercise any control in this area. We all dream and vary in our ability to recall our dreams. Research has shown that dreams are a

necessary part of sleep (Horne, 1988). Setting this aside, the theta state has other uses if you can focus your mind on a creative task when in it since the destructive effects of evaluation are usually at a minimum.

Mind state control: Experiments

An advantage of keeping MSC simple is that the concepts are easy to remember and apply to ordinary everyday life. After explaining the elementary theory of MSC, I outline possible experiments that students can do in the following week:

- Become aware of the situation you are in and the probability that, as a consequence, you are in an alpha or a beta state.
- In a given situation, ask yourself whether you or others are expecting you to do work that is appropriate or not for your mental state.
- Find a time when you are in a beta state and need to shift to an alpha state. Experiment with ways of making this shift and maintaining the alpha state.
- Find a time when you are in an alpha state and need to shift to a beta state. Experiment with ways of making this shift and maintaining the beta state.
- Become aware of your attitude to sleep, your patterns of sleep and investigate the effects of sleep on your performance.

The first experiment is a metacognitive task since it seeks an awareness of one's own mind. Fortunately MSC keeps this simple: the answer is alpha or beta. This small cognitive load was well within the capability of my students. What surprised me was the joy they derived from such a simple task. It was as though a veil had been lifted – an “ah ha” insight into life.

From a student's journal:

This is such an interesting topic; I explained it all to my mum on the car ride home the other day and didn't realize how much of it I had remembered.

The second experiment is a passive observational study. Students only have to evaluate whether what they or others are expecting matches the mental state that they have been framed into by the situation. It is only awareness. No action is required - yet.

From a female student who has a busy part-time job:

At work all day I am in beta state (except just after lunch for a bit). I do my job – I don't usually have to think too much about it – it's routine. I multitask. I get home and relax for half an hour with a ribena & ciggy.

Then it's back into beta. I cook dinner. While cooking dinner I get changed, wash my face, clean my room and do a load of washing. This is all routine of course.

From another student with a part-time job:

... most of the time at work I would be in the beta state ... I have to sort mail into the right cages, send out couriers, answer the phone, deal with any customer enquiries, receive couriers and sometimes keep my mind on the conversation I'm having with my colleagues. Most of these tasks I would have to do all within a certain time frame, so I

was constantly keeping my eye on the clock to make sure we weren't going to miss the deadline for when the mail had to be out.

The third experiment is the first one that involves trying to control one's mental state. This one is important for study since it involves building a relaxed state of mind. It is also important for getting to sleep.

From a student who works the night shift on our inter-island ferry and who had analysed her day quite carefully:

However my pre-bedtime brain state leaves a lot to be desired, especially as my shifts at work usually require me to go to bed pretty early. On reflection (after reading over my day) I seem to get myself awfully worked up just before bedtime, which doesn't really help. I need to do my rushing around well before bed; then relax for an hour; then go to bed in a more restful alpha state . . . I should try some breathing exercises.

The fourth experiment is similar to the third but in the opposite, and in my view, more difficult direction: moving from alpha to beta without relying on the situation you are in to do this for you.

From a student who, like so many of us, has difficulty motivating himself to do routine, boring jobs:

The one state movement I haven't mentioned much is alpha > beta. This is a big challenge for me. Like my problems suggest, motivation is an issue for me. So getting from alpha to beta is rather hard for me.

It's all about mind control. The best thing I can think of is to use aggressive positive thinking. You know you have a heap of things to do & once you move & get started it will all go from there. So when in alpha, think 'this must be done', 'I need to get this done'. 'The sooner its done the sooner I can do something fun'. Planning time to do this is also a good idea, as it helps with motivation. If you know in your mind that you have a time frame, then you are more likely to get up & do it.

The final experiment was in the area of sleep and I did not expect much in the way of interest or activity in this topic since students seemed to take such a cavalier attitude to it. How wrong can one be? Many students wrote more on this topic than the other four. One student did extensive tests on himself including an extended sleep deprivation experiment where he monitored his subsequent performance in a range of activities.

One area of particular interest was the amount of sleep that was needed as well as great interest in the age-old question of what helps and what hinders the process of getting to sleep. I had no idea there was so much material and advice on this topic until I read the research in student journals.

Here is a student who has difficulty getting to sleep, talking about a method of helping with sleep that involves making a list of issues that are on her mind before going to bed:

I tried the to do list. It actually worked. I thought it may make me think more, but my brain stopped thinking about things, & I switched off. Also, it helped me get going the

next morning. As soon as I get out of bed I read it & my mind started buzzing, helping me to wake up.

Discussion

An advantage of the journal system of teaching and assessment that I use is that students write quite fully about course topics and do so after experimenting with a concept or technique in their own personal setting followed by a personal reflection (November, 1996). Typical journals are about 150 pages in length. I also spend a great deal of time discussing work directly with individual students. This qualitative approach gives me a much deeper insight into the effectiveness of all the topics that I cover. A traditional quantitative survey would, by comparison, give me a much more superficial idea of how students reacted to MSC.

I found that all students were able to relate to and apply MSC in their normal lives and quite a few related it to their work situation. This is important because marketing practitioners spend a great deal of time in the beta state but, at times, have to be creative. Clearly, none of them could develop much in the way of advanced proficiency within the six days for conducting and writing up of experiments but at least my findings are based on experiments and thoughtful reflection rather than on opinions based only on two hours of lectures.

While this gives an overview of student response to MSC, it is better illustrated by the direct quotes from journals as given above.

Conclusions

To what extent can others use the work reported here? This is a difficult question and depends on your views about validity in educational research. To some, validity only derives from research conducted within the rigor of a scientific experiment (Usher et al., 1997). For a variety of reasons, I disagree with this stance although I do think that scientific type experiments have a place in higher education.

We can divide the academic community into two types: academics who are educational researchers and academics (like me) who teach but who conduct research in the subject they teach, it not being education. How does this second group set about taking important educational decisions such as what to teach and how to teach it? They should know about all the educational research that goes on but many of them do not. In New Zealand and Australia there are plenty of academics who have no idea what the initials HERDSA stand for and who have never read a single educational research paper. How, for example, does someone teaching art history decide what to include in a course. Well the answer is not simple but it is unlikely that he or she will use a carefully conducted scientific research study. They are much more likely to use their past experience, the past experience of others and sometimes a kind of gut feel that something might work well (Schon, 1987). However, over-riding all of this will be the actual experience of teaching the chosen material.

With MSC, I had a kind of gut feel that it might work well. I am happy with the results and will teach the same material next time but I cannot claim that others should incorporate MSC into their teaching. It might be that your objectives are different from mine. It might be that you have no choice – you have to teach declarative knowledge and nothing else. However, when reviewing the total offering in your undergraduate degree it is worth reading Gardner's

list of seven intelligences given at the start of this paper and asking to what extent you are covering these: especially the last one?

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