



Teachers Handbook

CoRT thinking is the Edward DeBono curriculum for schools to teach thinking. CoRT has 6 modules that cover different areas of thinking. The lessons are practical to teach and the skills learned in the classes can have a lasting effect on the students. CoRT thinking is the most widely used curriculum for thinking in the world. Lets design a better world for tomorrow through better thinking.

Cort has 6 Modules



ATTENTION

Module 1 focuses the attention of the students on the issue at hand. The tools in module 1 help the student broaden their perspective on the subject in a deliberate manner.



ORGANISATION

The first five lessons in Module 2 deal with five common thinking operations. The next five lessons deal with the overall organisation of thinking so that it can be used in a deliberate and productive manner.



INTERACTION

Module 3 deals with two-people situations. The thinker is no longer looking directly at the subject matter but at someone else's thinking. The area is that of argument, debate, conflict, opinion, etc.



CREATIVITY

It is too often assumed that creative ideas come only from inspiration and that there is nothing else that can be done about it. Module 4 covers the basic creative techniques, procedures and attitudes.



INFORMATION

Information and feeling underlie all thinking. Thinking depends on information and is strongly influenced by feeling. Module 5 deals with information processes, such as questions, clues, guessing, belief, ready-made opinions and the misuses of information.



ACTION

Module 6. In this set of ten lessons the structure takes the form of a framework. The purpose of the framework is to divide the total thinking process into definite stages, each of which can be tackled in turn.

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Part One

A. INTRODUCTION TO CoRT

B. AUTHOR'S NOTE

A. INTRODUCTION TO CoRT

The CoRT thinking Lessons are now the most widely used materials for the direct teaching of thinking as a basic skill. The lessons have been in use since 1970 and in the intervening years a great deal of experience in the direct teaching of thinking as a skill has been accumulated. I write this because it is not difficult to devise new programs which seem exciting at first but which do not withstand the test of time and use. Excitement and novelty are no substitute for practicality and experience.

The CoRT Thinking Lessons, in six modules, are now in heavy use throughout the U.S.A., in the U.K., Ireland, Canada, Australia, New Zealand, Israel and Malta. In Venezuela, after a year's pilot program, the CoRT Thinking Lessons have been added on to the curriculum of every school in the country. A number of other countries have already expressed interest in following this example.

The success of the CoRT Thinking Lessons has depended on two things: an increasing interest in the teaching of thinking as a basic skill and the practical, hands-on nature of the lessons. There is a growing feeling amongst educators that thinking is a skill that should be given direct attention.

It is felt that thinking is a skill that can be improved by focused attention and the practice of some basic skills. The old idea that skill in thinking is developed as the by-product of attention to specific subject areas such as Geography and History is no longer tenable.

Some thinking skills concerned with the sorting of information can be taught as a by-product of such subjects but these are only part of the broad range of thinking skills required in life. For example the thinking required for action must include consideration of priorities, objectives, other people's views and the like. Descriptive thinking is not enough.

It used to be felt that a person with a high I Q would necessarily be an effective thinker.

This does not seem to be the case. Some people with high IQs turn out to be relatively ineffective thinkers and others with much more humble IQs are more effective.

I have defined thinking as:

The operating skill with which intelligence acts upon experience

If IQ is the innate horsepower of a car then thinking skill is equivalent to driving skill. Because of this realization many schools for the exceptionally gifted are now using the CoRT Thinking Lessons in a deliberate attempt to avoid the “intelligence trap” which occurs when a high IQ is not accompanied by effective thinking Skills.

To be effective, thinking does require an information base, but it is absurd to suppose that if we have enough information it will do our thinking for us. Only in very rare instances can we ever have such complete information that thinking is superfluous. In most cases we have to supplement inadequate information by use of our thinking skills.

I have lectured to hundreds of thousands of industrialists, scientists, engineers, architects, teachers, public servants, and many other groups. Again and again there arises the complaint that nowhere in their education had they been taught how to think.

There need not be any complicated mystique about thinking. The CoRT lessons have been designed to be practical and usable, in a wide variety of situations ranging from the jungles of Venezuela to IBM corporate headquarters in Paris. They have been used in elite schools and in schools in disadvantaged areas. On the whole they have been used by teachers who have not had any previous training in the use of the lessons. The basic format allows the lessons to be used over a wide range of ages (6 years to adult) and abilities (IQs of 75 to 140). This is not as surprising as it may seem, for the CoRT lessons are concerned with the basic thinking processes and these are the same at any age. The lessons are designed to be simple and practical.

In teaching the CoRT lessons the idiom is: simple, practical, clear, focused and serious. At all times the teacher must avoid over-complication and confusion. Both teacher and students must have a clear idea of what they are doing. The emphasis is on practicality not on exotic philosophising.

Examples and illustrations must be clear. The teacher must focus very sharply on the aspect of thinking that is being learned. This is the opposite of waffle, drift and “interesting” discussion. The idiom of training in a sport is not inappropriate.

Above all the teacher must be serious about the importance of teaching thinking directly as a basic skill. It is not something to be dabbled in an off-hand experimental way.

The general method used is what I call the “glasses method.” If you have poor eyesight then you cannot see the world clearly. With glasses you see the world clearly and as a result your actions are more appropriate and your behaviour more effective.

The specific purpose of the CoRT 1 lessons is to broaden perception so that in any thinking situation we can see beyond the obvious, immediate and egocentric. Experience has shown that students who have been through the lessons develop a much broader view of situations.

B. AUTHOR’S NOTE

Many years’ experience with these materials has taught me that teachers will want to use these Teacher’s Notes in two distinct ways. The first is as a guide to the specific lessons. The second is an introduction to the subject of teaching thinking in general and also to the particular method used here.

The teacher should if possible read the section “Teaching Method” before starting the lessons. However, once this background material has been read it becomes of less importance than the actual guidelines for running the individual lessons.

As an additional aid to teaching the lessons, teachers are referred to the section “An example of running a CoRT 1 lesson”.

Edward de Bono.

Part Two

A. BACKGROUND TO THE TEACHING OF THINKING

(The different models)

- 1) THE NATURAL APPROACH
- 2) THE LOGIC APPROACH
- 3) BY-PRODUCT
- 4) DISCUSSION
- 5) PUZZLES AND GAMES

A. BACKGROUND TO THE TEACHING OF THINKING

The idea of teaching thinking directly as a subject in its own right may seem very obvious. And so it should.

However, there have been various approaches developed over time to teach thinking, most of which have been an outgrowth of the natural ability to think (commonly referred to as the natural approach). A comment on these methods is given below, followed by a detailed description of the essence of the CoRT method.

1. THE NATURAL APPROACH

“We don’t need to learn thinking as a special subject because thinking is part of every subject. For instance in history we have to think what the teacher wants us to say.” The student who made the above statement was right. Thinking is part of every subject because it is part of life. It is as natural as walking or breathing and we do not really need to be taught these things.

One of the most common objections to the direct teaching of thinking arises from the assumption that thinking is natural and needs no special attention. Everyone supposes themselves to be excellent thinkers and to perform as a matter of course the various thinking operations put forward in the thinking lessons. The objection is difficult to disprove because one cannot easily convince people that they are not thinking the way they imagine themselves to be. The only way is to use experimental evidence.

For example, most people claim that they are open-minded and always look at both the positive and negative aspects of a situation. However, on many

occasions, the author has carried out a simple experiment in which people are asked to look at an idea which appears false at first sight. The ratio of negative to positive responses is consistently around 120:1.

When the people are deliberately asked to make positive comments, they are able to do so. Quite clearly, it is not natural to look for the positive aspects of something one does not like. A conscious effort is required.

Two groups of 12-year-old students were asked to write an essay on the idea of weekend imprisonment for minor offenders. One group had completed the first thinking lesson (PMI, which concerns the examination of both positive and negative aspects of an idea), While the other group had not. The group which completed the lesson gave three times as many arguments against their final verdict than the other group. In other words, the CoRT group was far more likely to see both sides of the idea.

The total number of arguments was also almost doubled. The experimental results shown also indicate that direct attention to thinking can have striking results. Nevertheless, in spite of results like these, people will still maintain that thinking is natural and best left alone.

Running is also natural but an athlete can be coached to a much better performance. A natural performance may well be below potential. A natural performance may only be adequate to deal with a very familiar situation but inadequate for anything new. This certainly applies to thinking. Are we right in claiming that the natural ability to think is anywhere near the full potential? We can now look at the various methods that have been used to try and improve upon the natural ability to think.

2. THE LOGIC APPROACH

Logic is sometimes taught as a subject in its own right. There is no doubt that it is a valid subject, but it is limited in its usefulness for teaching the general subject of thinking. Logic can tend to become an abstract semi-mathematical game in itself. A person may learn all the rules but find it impossible to apply them in real life situations, where most of the thinking takes place during perception.

The old emphasis of logic was on syllogistic structures, and although this has an obvious usefulness in argument, it is only a tiny part of practical thinking. Excellence in logic does not help with making decisions, planning, guessing, defining objectives, etc.

The modern emphasis treats logic as a pure system allied more to computer science than everyday living. There are many practical aspects of thinking which are impossible to fit under the Logic subject heading. To be fair, the subject never claimed to deal with practical thinking.

3 BY-PRODUCT

The traditional view is that the ability to think is developed as a by-product of using the mind to learn such subjects as the classics, science, mathematics, history etc. It is true that in these various subjects students do have to use their thinking. The amount of thinking they have to do vary very much with who is teaching the subject but the thinking is all of a certain type - analytical, critical and organising.

For instance, in science the emphasis is on collecting facts before reaching a conclusion, whereas in real life a practical decision may be called for when there are few facts at hand. It is probably true that a very gifted and determined teacher can use any subject as a basis for teaching thinking, but this remains a cumbersome and inefficient way of doing it. In most subjects, the sheer knowledge content of the subject makes it easy for the student to substitute this knowledge base for thinking. It is very difficult to focus on process if content can by itself determine the line of thought

4. DISCUSSION

There is a growing tendency towards open-ended discussion subjects which come under such headings as General Studies, Liberal Arts, Social Studies, Humanities, etc. Such topics as the environment, drugs, population, traffic, and interpersonal behaviour are discussed directly or in connection with the film-strip or other resources. This approach is valuable because it encourages interest, awareness and fluency. It allows students to have their own ideas and develop confidence in expressing them. But the format is not in itself adequate for teaching thinking as a skill.

Inevitably, the emphasis is on the content and on people's ideas about the content. It is more like a debate than a thinking lesson, and debates are not especially good at teaching people to think, since the skills involved are rather specialised. Furthermore, general attitudes are notoriously difficult to communicate.

5. PUZZLES AND GAMES

These can be extremely useful for illustrating points and for making thinking visible. They can also be useful for reducing attitudes that obstruct thinking and also for building up useful attitudes. The author very often uses puzzles and games for this purpose. Puzzles are much less useful than games because the skill is very difficult to transfer.

Games or situations which require a repetition of the same thinking process can certainly develop useful thinking skills, but by themselves they are not enough. Their main purpose is to make the student conscious of thinking as a process and of some of the different types of thinking.

B. CRYSTALLISATION

- 1 TOOLS, NOT ANALYSIS
- 2 ARTIFICIAL
- 3 STRUCTURE
- 4 ARRIVING AT THE SECOND STAGE
- 5 CONVENIENCE
- 6 SUMMARY

Introduction.

The essence of the CoRT Thinking Method is to focus attention directly on different aspects of thinking and to crystallise these aspects into definite concepts and tools that can be used deliberately.

A person in a dark room stumbles over the furniture. As the light improves definite items of furniture become visible. It is now easier for this person to move around and make use of the furniture. The crystallisation of certain aspects of the amorphous process of thinking into definite concepts is a similar process - but an intentional one.

So the general open-minded attitude that involves looking at all aspects of an idea is crystallised into the PMI. With the PMI a student learns to look for the Plus, Minus and Interesting aspects of any idea presented to him or her. The general open-minded attitude is not easy to teach, not easy to learn and not easy to transfer. But doing a PMI is very easy.

Similarly most people believe that they look at all the consequences of all action or a decision but in practice this is rarely the case. To persuade them to look at consequences is at best a lengthy business. To teach them to do a C&S is much easier because a general attitude can now be treated as a definite operation. Most of thinking takes place in the perception stage and is therefore a matter of directing attention.

You cannot direct attention to a general attitude no matter how valuable but you can direct attention to a specific concept/operation and this is even easier if it is converted into an actual tool. The purpose of crystallisation is two-fold. The first purpose is to allow students to look directly at a process as a deliberate tool instead of having to look only at content. The second is to allow them to use process as a deliberate tool.

1. TOOLS NOT ANALYSIS

The crystallisation of different aspects of thinking into definite tools does not follow an analysis of thinking into its component parts. The tools are related to the practical application of thinking and it is this that is crystallised into a tool. Thus the tools may at times overlap.

2. ARTIFICIAL

It is true that such labels as PMI C&S CAF etc. are highly artificial. But this is deliberate. To crystallise a rather vague intention into a visible tool that can be used deliberately is artificial. If the labels were not artificial they would not work. Phrases like “look at consequences” or “evaluate an idea in terms of positive, negative and interesting features” are too general and too vague. They are also too cumbersome. It is necessary to have something crisp and definite.

It is also necessary to have something new; otherwise people will pay no more attention to “looking at consequences” than they have always done. Some teachers will find these devices rather awkward to use at first. But students do not seem to have this problem and they use the short-hand labels without self-consciousness.

3. STRUCTURE

Some people object to the idea of imposing any structure on thinking, for they feel it should be unconstrained and free. This consideration of structure is a very fundamental one. It is absolutely essential to distinguish between two

sorts of structure. One sort of structure is imprisoning. Being confined to a room, being trapped in a channel, being expected to follow a certain routine are all examples of restricting structures. But a lawn-mower, a hammer, a cup, a ladder and notation are all examples of liberating structures. They are tools which we can use when we want to. They are tools which make it easier for us to do certain things. It is a mistake to regard all structure as confining. Some structures are very liberating in the sense that we can do more with them than we could have done without them.

4. ARRIVING AT THE SECOND STAGE

The first stage is the deliberate recognition and use of the artificial tools. As skill develops in the use of tools, they can be used in different situations. The deliberate use of the tool always carries with it the attitude behind its use. In time, the attitudes themselves become the tool and the actual tool can drop away. In fact when children, who have had the thinking lessons, tackle actual situations they find themselves using the tools without having to mention them by name. The artificial labels act as a carrier or package. You may need a package to carry food around but you do not eat the package. It is this second stage - habitual and confident use of the various thinking operations - that is of course the aim. But the deliberate crystallisation stage is a necessary one. Without it, everything stays in the realm of well-meaning, vague, undefined and unusable intention.

5. CONVENIENCE

Quite apart from the theoretical reasons for crystallising various thinking operations into deliberate tools, there are simple reasons of convenience. Labels such as PMI, CAF, etc. can be used quickly and without cumbersome elaborations.

6. SUMMARY

Three basic methods can be used for finding one's way around a strange town.

1. Learn to use the fixed and predictable routes of buses, subways, trains, etc.
2. Get to know the town street by street until you can find your way anywhere.

3. Develop some general-purpose habits like buying a map, asking directions, getting taxis, finding your way to the main shopping area, etc.

The first method is what is called the algorithmic method: using preset and reliable routes for arriving at a solution. It is, of course, the basis of mathematical procedures. The second method is the content method: acquiring piece by piece as much knowledge about the situation as you can. (It is the basis of most of our subject teaching in education - for instance history, geography, science, etc.)

The third Method is the general operations method and is the one used by CoRT in its teaching of thinking. The general operations do not solve the problem but make it progressively easier to solve. The general operations have the advantage that they are transferable to any new town, whereas the content method is not transferable at all and the algorithmic method may or may not fit a particular situation

C. THE THREE BASIC PRINCIPLES.

1. THINKING AS A SKILL THAT CAN BE DEVELOPED,

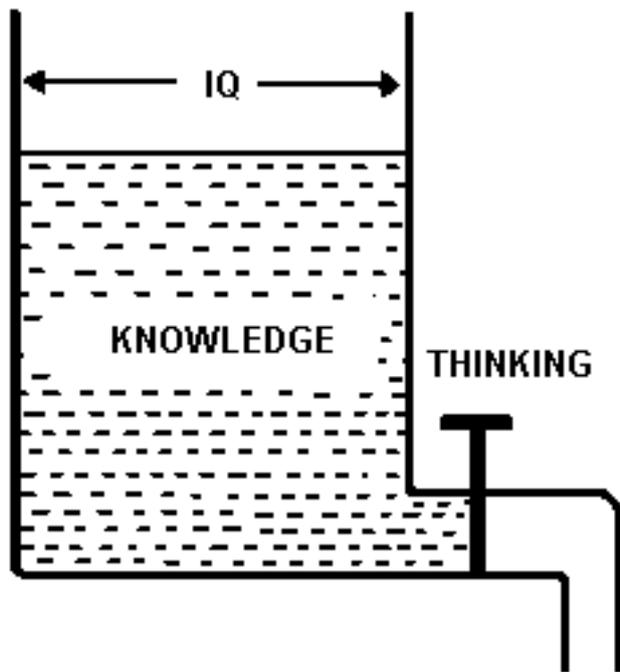
- a) Knowledge
- b) Intelligence
- c) Thinking
- d) Thinking Skill and Ability
- e) Acquiring the Skill

2. MOST PRACTICAL THINKING TAKES PLACE IN THE PERCEPTION STAGE

3. THE TOOLS METHOD IS USED TO TEACH THINKING

1. THINKING AS A SKILL THAT CAN BE DEVELOPED

The Experimental Results section shows that the deliberate teaching of thinking can have an effect on the way students think about a situation. Even though in some cases thinking was taught very briefly as little as 35 minutes in an experiment reported for CoRT 1, there was an improvement in thinking skill. This is hardly surprising because if you set out to train a skill by deliberate attention, something is likely to happen to that skill. Most teachers would accept this point. Nevertheless, to appreciate why it is necessary to teach thinking one must have a clear understanding of the relationship between knowledge, intelligence and thinking in education. The diagram used here may help to illustrate this relationship.



The water in the tank represents the sheer volume of knowledge put into the tank by first- or second-hand experience. A large volume of knowledge will also generate a skill: control, appropriateness of response, etc. We can consider these three aspects of education in more detail below.

The intrinsic nature of the tank represents intelligence and all the so-called innate qualities of mind (and personality). These innate qualities affect thinking in the same way as the diameter of the tank affects the head of pressure acting on the tap. For instance, in a narrow diameter tank the same volume of knowledge will lead to a higher head of pressure and more flow out of the tap over a given period than in a wider diameter tank.

a. Knowledge

Education already focuses on this since most subjects are knowledge subjects. There is no substitute for knowledge. On the other hand, knowledge is not a substitute for everything else.

Complete absolute knowledge would make logic and thinking unnecessary. Thinking is the use of knowledge to achieve a purpose that cannot be achieved immediately.

b. Intelligence

This refers to “innate ability, whether inherited or acquired through early environment. This innate ability is a potential which had to be expressed in an operating skill (such as thinking) to be effective. Thinking is related to IQ as driving a car is related to the car itself. It is a mistake to assume that the more able do not need to acquire thinking skill.

Tape recorded discussions and essays show that more able students are indeed more articulate but not especially skilled at ordinary thinking. There does not seem to be much that education can do about innate abilities (possibly because we define innate abilities as those about which education can do nothing), but education can attempt to develop thinking skill. An increase in this skill can help to make up for deficiencies in the other two areas.

c. Thinking

The last aspect of this education “trinity,” thinking represents the practical use of knowledge for a purpose (or pleasure). Thinking skill is not a substitute for knowledge or IQ, but a way of enhancing them. Well developed thinking skill may make good use of limited knowledge or ability.

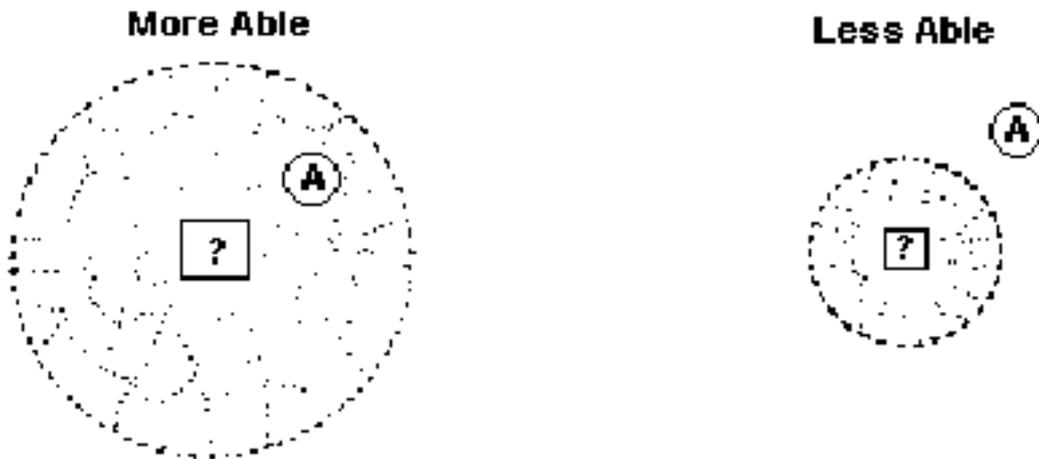
d. Thinking Skill and Ability

The figures shown here illustrate how skill in thinking relates to innate ability. Each figure represents a “scan area” in the mind. A scan area is the field of ideas, images and information that are brought into consciousness by a particular question. With the more able there is a wider scan. There is also a higher density of tracks representing more concepts and more experience.

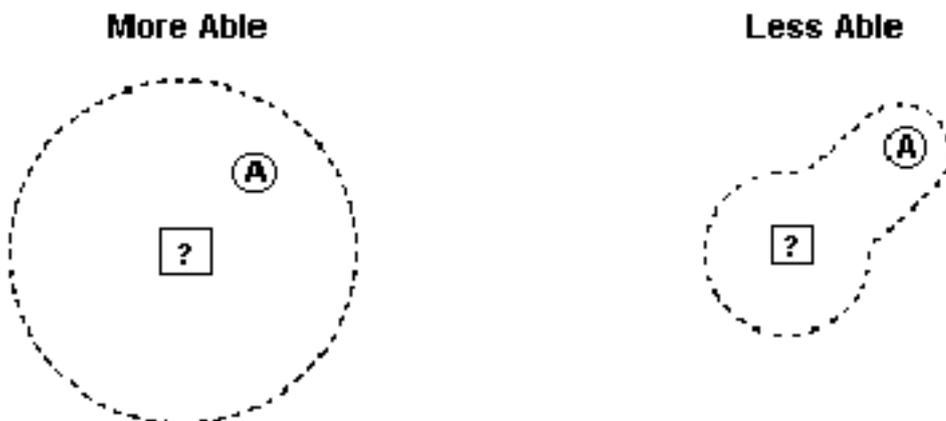
If the answer to the question (indicated by A) falls within this scan, then the more able person reaches it easily. The less able person with the smaller scan does not reach it. In the second situation the less able person has developed methods for directing attention (that is what thinking skill is about), and so reaches the answer as well.

In the third situation the answer lies outside the immediate scan area of even the more able person who fails to reach it. But the trained thinker may still be able to reach this answer by directing attention.

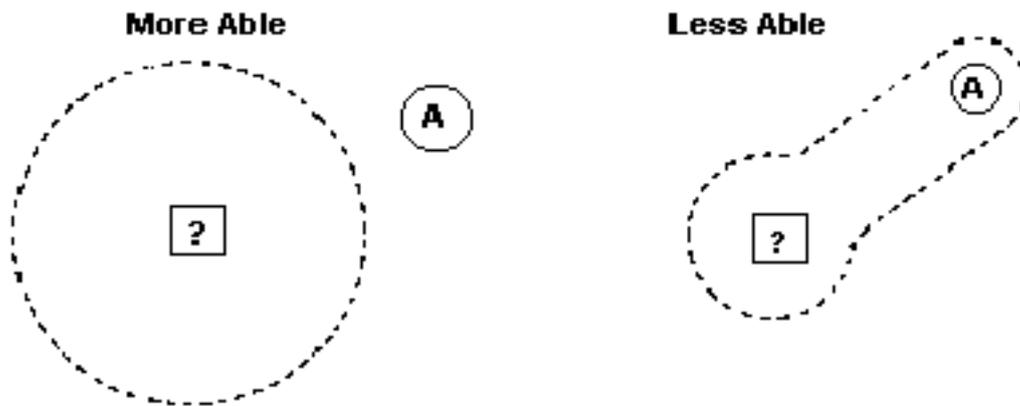
1. The answer falls within the larger scan of the more able person. The less able person cannot reach it.



2. The less able person has learned how to direct attention (thinking skill) and can now reach the answer as well.



3. The answer lies outside the scan of the more able person but the less able person may still reach it by directing attention.



e. Acquiring the Skill

Some skill in thinking may be acquired naturally through ordinary everyday living - it is not easy to transfer this skill to new situations. Some skill in thinking may be acquired as a spin-off from other subjects - but this tends to be tied to particular information.

There is no reason why a deliberate attempt to develop thinking skill by directed practice should not be added to these other methods, especially as experimental results suggest it can be effective.

One advantage of developing thinking skill directly (as a specific subject) is that the skill can be applied to any situation since it has not been developed in a specific knowledge area. Another advantage of the deliberate method is that it becomes possible to separate thinking skill from ego. This is a very important and difficult matter for only when the separation is effected can we look objectively at thinking.

One should be able to say: "My thinking in that situation was very poor" without condemning oneself as a dunce. The tennis player who says: "My backhand was not working this afternoon" has separated skill from ego. Thinking is not natural: like swimming or riding a bicycle it becomes natural only after you have learned how. With thinking, however, failure is not as obvious as drowning or falling off a bicycle.

2. THINKING AND PERCEPTION

If a jury could see clearly whether a defendant were innocent or guilty, it could give its verdict at once. It is in getting to this stage of “seeing clearly” that thinking is involved. If we could see every situation absolutely clearly, and our desires and values equally clearly then there would be no need to think. In practice, however, since we are not gods, we cannot do this. We need thinking to sort things out, to bring in information, to explore the situation, to look at things in different ways, to challenge our dogmatism, to decide what we want, to choose, etc.

Most practical thinking occurs in this perception area of trying to “see things clearly.” Unfortunately when we talk about “thinking” we immediately tend to consider logical sequences, syllogistic argument, mathematical logic, “if P then Q...,” and so on.

This type of thinking is very valid, but not widely applicable. It is an idealised abstraction which works well only if things can be put in an abstract form suitable for handling in this way. Unfortunately, most things cannot.

Mathematics is a wonderful thinking tool and would cover all situations if only we could translate all situations into abstract symbols and relationships. But this needs precision and isolation or post-hoc observation. Most situations are vague, interrelated, subjectively defined and evaluated, and shifting - so we cannot make the initial translation. We also have to act ahead of a situation, not in hindsight.

Mathematics and the idealised forms of logic are really second-stage thinking processes that can be applied after the first stage of perception has parcelled things up in a suitable manner. Most ordinary thinking takes place in this first stage.

We can take the example of a couple about to buy a house in a certain area. We can use mathematics to find out what mortgage and insurance they can afford and also to decide the best type. We can use mathematics to work out maintenance costs and extra fares needed for travel. But how do you apply mathematics to such things as the possibility of a job promotion which necessitates having to move; the value of the local schools; the ease of shopping; possible ill health of parents-in-law, etc. Before these things can be considered, they have to be thought of, and that is where the general skill of thinking comes in. You cannot consider some aspect you have not even thought of.

Logic and mathematics are part of thinking and certainly the most reliable part, but thinking is much broader than either of them - and it must be usable in all situations. Thinking has to deal with messy situations in which information is quite incomplete.

Thinking is concerned with exploring our own ideas and experience and that of others. All the time the effort is directed towards seeing things so clearly that we know what to think, feel or do at the time. In a way, logic itself is only a device to enable us to see clearly what is implied in the starting assumptions.

3. TOOLS METHOD

The tools method is simple, but it is very important to understand exactly what is meant by it.

1. The method involves crystallising certain aspects of thinking into definite tools. They are called tools because they can be used in different situations. The tools are independent of the content of what is being thought about.
2. The tools are neutral - they do not give right answers or wrong answers you can look in a direction and see something or look in that direction and see nothing; what matters is that you are looking in that direction. You can use a hammer to knock in nails or break a shop window: knowing that a hammer exists is what matters.
3. Each tool stands on its own. They are not part of an interlinked hierarchical system. Like tools on a workbench, they are independent, but can be used in a co-ordinated manner to achieve a specific purpose.

In practice, each CoRT Thinking lesson is based on a definite tool. In fact, there is always a double tool. The first tool is easy and its function is to make the second tool necessary. For instance, the first tool may simply involve asking the deliberate question: Where do I start?

Once that question has been asked, then the second tool becomes necessary; examining the type of situation and deciding where one wants to end up. Definite tools of this type are far more effective than exhortation, which has little lasting effect and even less transfer effect.

You can acknowledge exhortation with good intentions, but these are not much use until crystallised in a definite form. At first it must seem that the CoRT lesson tools are very deliberate and artificial. It will seem that they simply spell out what tends to be done anyway, and hence are superfluous.

Many teachers, for instance, will have run the CoRT 1 lessons without using such deliberate initials as PMI, CAF, C&S, etc.

This is a mistake. The deliberate crystallisation of a tool has a definite purpose. That purpose is to separate the tool from its result. This is essential in the teaching of thinking if drift is to be avoided. Each CoRT 2 lesson is based on asking a deliberate question.

It is the purpose of the lesson to get that question asked in a deliberate manner. Nothing is said about what the results should be. For instance the question, "What is the conclusion?" is asked in the last lesson of CoRT 2. But the lesson does not tell how to reach conclusions, or how to reach good conclusions. It is enough that the question be asked deliberately.

The process is very much like training in sports. You could put novice players on a tennis court and tell them to hit a cross-court backhand to land within one foot of the other baseline.

You could yell at them whenever their shots went out of court, over the sidelines, dropped short or did not even cross the net. This is teaching by results and is only applicable at a very late stage. The tools method is different. It is not concerned with the results, but simply with exercising the tool.

Using this method, the players would first get onto the court and swing a racket about a bit. Then they would try to hit the ball - anywhere. Then they would try to hit it consistently. Next they would try to get it exactly where they wanted it. Finally they might improve their style.

At each stage, the important thing would be to carry out the tool. In lesson 12 (CoRT 2, Lesson 2), for instance, it is more important that the student deliberately try to carry out an analysis than carry out an excellent analysis.

In the CoRT 1 lessons, a number of headings were deliberately set up to enable students to become more sharply and consciously aware of certain directions (factors, objectives, consequences, points of view) in which to move their attention.

So the first tool is to say to oneself, "I am now looking for consequences" or "I am now doing a C&S." Once that can be said deliberately then the second tool is to discover what one saw by looking in that particular direction. In this way, the first ten lessons attempt to widen a student's thinking by setting up a number of different directions in which they can direct their attention.

In CoRT 2, deliberate questions replace deliberate headings or directions. These questions are concerned with basic thinking tools like recognition, analysis, comparison, conclusion, etc. Such tools produce more thinking about a matter by providing more to look at. These general tools are a form of structure, but it is an “opportunity structure” (like a hammer, cup, and ladder, key) and not a “constraining structure” (like a track, room, and cage).

The general tools are tools without which thinking tends to drift. The lessons themselves provide a light but definite framework within which to teach thinking as a skill.

Part Three

A. CoRT THINKING IN SCHOOLS PART ONE

B. CoRT THINKING IN SCHOOLS PART TWO

- 1 PERSPECTIVE
- 2 TOOLS
- 3 SKILL
- 4 AIM
- 5 TEST MATERIAL

The CoRT Thinking material has been tested over a wide range of Student ages and ability. Since the material provides only a trigger and a framework for thinking practice it can be used over this wide range. The responses will of course be different even though the material remains the same.

1. PERSPECTIVE

These notes are intended to provide a setting or perspective for the CoRT Thinking Lessons. This perspective may be useful for teachers to pass on to the class if they want to know the purpose of the lessons. Both inside and outside the classroom students are apt to feel that thinking is the same as discussion. They are apt to confuse articulateness or having a point of view with thinking as a skill. They are also apt to feel that thinking should not be tackled directly but as a 'gut' feeling about a situation. But neither general discussion nor 'gut' feeling are substitutes for thinking. They do have a great value in their own right but thinking skill is needed to make the most use of this value.

If teachers choose to explain the purpose and perspective of the thinking lessons this can be done as a discussion or dialogue with the class. The first point to be considered is whether thinking is natural or something that must be taught. Obviously, some thinking is natural otherwise people would never be able to cope with everyday situations. But what about the situations with which people are not familiar? For instance choosing a career is not a situation a student will be familiar with through everyday practice.

The purpose of developing thinking as a deliberate skill is to enable a person to apply this skill to new and unfamiliar situations which have to be faced. Walking is natural and so is running. But athletes train and practice quite deliberately so that they can use their full natural potential.

Well-trained athletes will always beat untrained athletes of the same natural ability because their use of energy is more economic and they have more stamina. Similarly the purpose of training in thinking is to make it more focused and more economic and to enable people to tackle problems they would not otherwise be able to tackle. Soccer players spend hours of practising kicking and passing a soccer ball to each other. However kicking and passing a ball is fairly natural. The players practice these things so that they can do them accurately and without hesitation when the need arises.

The deliberate practice of different aspects of thinking has the same purpose: so that when we need to use these aspects we can do so accurately and without hesitation. Once you have learned how to swim or ski it all seems very easy. But in order to learn how to swim or how to ski you have to spend some time doing it deliberately. You have to practice your swimming strokes in an artificial manner. You have to practice your stops and turns on skis. In fact in the beginning you may have to practice things which seem very unnatural like leaning outwards on a corner when skiing or submerging your head during part of a swimming stroke.

All this may seem boring and unnecessary at the time but the ultimate aim is to make these things second nature to you. Similarly, with the thinking lessons the ultimate aim is to make the procedure second nature to you, but first you have to go through the practice stage.

2. TOOLS

The first point has been to show that what seems to be natural can still be improved by direct practice and training. The second point is to show the need for dividing thinking into different operations which are given such artificial labels as PMI, CAF, C&S, etc. These labels have to be looked at as convenience labels.

Instead of having to ask people to look at all the consequences of a situation, you can use the short-hand of asking them to do a C&S. In addition, dividing things up and giving them a name makes it easier to pay attention to different parts of a total situation.

For instance everyone knows what a horse looks like but it is not easy to discuss a horse with someone unless you know how to pay attention to different parts of it. Otherwise you can only talk about a big horse, a strong horse or a good-looking horse.

If, however, you can pick out the withers, the fetlocks, the shoulders, etc., and pay direct attention to them; your knowledge of horses is going to increase. Similarly, thinking is a very general subject that covers many things. It is useful to be able to focus attention on different aspects in order to talk about them and pay attention to them more directly. In tennis, you make strokes to hit the ball, but you have to practice individual strokes, not strokes in general. For instance, you might practice a backhand slice or a top-spin forehand drive. You might practice a lob, a smash, a first serve or a second serve, etc. As soon as you can distinguish the different strokes from the general intention to get the ball back over the net, then you can practice them directly and acquire skill in using them. In a similar way, people who cannot separate out the different aspects of thinking may feel that they are very good at it, but in practice they are only good at one particular aspect.

They may be very good at critical thinking or problem solving but useless at decisions or making plans. So the purpose of the artificial labels is to make it possible to practice the different "strokes" or operations of thinking directly. The labels thus become tools.

3. Skill

Skill consists of being able to deal effectively with a variety of situations. A skilled wood worker can deal with any number of situations involving wood. Skill depends on being able to recognise the situation and knowing how to deal with it. The thinking lessons are designed to enable students to recognise situations that require a certain type of thinking operation and to use that operation effectively. At this point, teachers can refer to the experimental research work, an example of which is given here. (See Test Results).

Teachers can also comment on the experiment in which students who had done the first thinking lesson were three times more able than others to see both sides of a question.

4. AIM

The ultimate aim of the thinking lessons is very similar to that of coaching in sports: to make the basic operations of thinking second nature so that they are carried out automatically, smoothly, and without fuss or effort. This requires defining the operations and practising them deliberately, and that is exactly what the CoRT Thinking Lessons are about.

5. TEST MATERIAL

A section on test material is included. This material is not designed to test the ability of the students or to examine how well they have learned the subject. It is designed to give students an opportunity to display their skill in thinking.

High-achieving students often feel that during the lessons they do not get enough opportunity to show their skill because the group nature of the lessons does not allow individual brilliance and also the time is so brief.

The test material allows the students to get their teeth into a situation. It allows them an opportunity to test their own achievement as they see how easily they can tackle the situations presented.

The test material may also be used with those students who feel that they know all there is to know about thinking. Such students can be given the test material at the beginning of the course and their output can be commented on. It is all too easy to assume that your thinking is excellent until you are asked to demonstrate its excellence. Comments on the students' output will tend to be along the lines of what has been left out rather than what is right or wrong.

In general, the test material is used to tighten up and give purpose to the lessons for those students who require this. If this is not done then the lessons can be seen to be a game in which anything goes and it does not really matter what is said.

The test material can serve to bring home to the students the serious nature of the lessons. Teachers should not feel that, because the subject is open-ended, test material is inappropriate.

The test material is an opportunity for students to flex their intellectual muscles (as is an essay). The test material can also serve to introduce variety into the lessons. For instance, it can allow the exercise of critical assessment. This

is by far the simplest type of thinking since it involves reacting to something put in front of you rather than generating something on your own. It is also the thinking operation that is most trained in other subject areas. There is, therefore, some point in allowing students an opportunity to exercise this skill during the thinking lessons. This is done with the test material. (The change from group output to individual output in the test material also provides some variety.)

From the various points listed above it can be seen that the test material will be most appropriate for the older age groups and especially for those students who are most achievement conscious.

It can also be used with classes where the students are lazy or feel that they know all there to know about the subject. With younger classes or well motivated classes the test material need not be used.

B CoRT THINKING IN SCHOOLS PART TWO

What is CoRT Thinking about? What happens when CoRT Thinking is taught? How is CoRT Thinking supposed to work?

- 1 AIMS OF CoRT
- 2 VALUES
- 3 HOW CoRT WORKS
- 4 THINKING WITHOUT CoRT
- 5 WHAT TO EXPECT: STUDENTS
- 6 WHAT TO EXPECT: TEACHERS
- 7 CoRT IN SCHOOL

1. AIMS

Thinking is as much a skill as tying a shoelace, riding a bicycle or playing tennis. When we neglect to treat thinking as a skill we are relying on raw intelligence and knowledge to carry out the thinking function—this is rather like relying on a player's reach and the tennis racquet to play tennis for the player.

CoRT aims to develop skill in broad practical thinking. Intellectual virtuosity as such is definitely not an aim of CoRT. Brilliant mental gymnastics as such are often of little practical value except to delight and dazzle.

There are people who can think brilliantly about everything except what they really need to think about!

It is a CoRT aim to encourage students to feel that they can think about anything that is put before them - but in a practical and sober way. For instance, in the Experimental Results section is described the effect of some CoRT lessons on the thinking about the suggestion that everyone should spend one year doing social work after leaving school.

Before the lessons there was a great deal of idealism with only positive points being considered. After the lessons the thinking was more balanced and there was far more consideration of administrative difficulties and the like.

CoRT aims to develop a skill in practical thinking rather than in philosophical excursions. CoRT aims to get students to look at thinking objectively instead of regarding it as based on ego and emotion. Students should be able to be cool and critical about their own thinking and dispassionately observant of the thinking of others. Emotions do have a real value - in fact they are the ultimate value. But emotions should be based on good thinking and not become a substitute for it.

So the CoRT aims could be summarised as follows:

- To acknowledge thinking as a skill.
- To develop the skill of practical thinking.
- To encourage students to look objectively at their own thinking and the thinking of others.

2. VALUE

The CoRT Thinking Lessons do have an effect on students' thinking. This can be seen by looking at the Results section in this and preceding teacher's notes. The strength of the effect may vary from teacher to teacher and from school to school. The intention of CoRT is to improve thinking skill.

There is no attempt to change values or impart a political doctrine. If students can see things more clearly and more broadly and think about them in a more balanced way then CoRT Thinking will have achieved its purpose, whatever political or value system is applied thereafter.

Cort on its own

The CoRT Thinking Lessons are designed to be taught as a specific subject. An increase in thinking skill is something every student has a right to expect from school. Thinking skill is part of life. With the possible exception of language and communication there can be no more important a skill. And anyone who has listened to hours of tape-recording of children's thinking can have no doubt that thinking skill is not something that happens naturally in the ordinary course of events.

So irrespective of academic aspirations, there is a real value to the student and to society in treating thinking directly as a skill.

Cort and other subjects

CoRT lessons provide a simple framework for the practice of basic thinking skills. These basic thinking skills are the foundation of any other subject.

Some of the CoRT lessons can be used to increase the range and scope of various subjects.

Those schools which consider it their primary duty not to change society but to fit in effectively with the existing system can use CoRT lessons as a basic ingredient in the examination proficiency for which they aim.

3. HOW CoRT WORKS

Thinking is not a subject that can be learned by the passive receipt of information. An acknowledgment of superior information handed down from on high is not at all the same as the development of a personal skill.

Skill is best developed by action and interaction. Awareness of what is to be practiced and the deliberate practice of it is the idiom of the CoRT lessons.

Framework

The first step is the deliberate intention to teach thinking as such. This provides the basic framework. The students know that they are there to do a thinking lesson. Even if their reaction is: "Oh no, not thinking again!" that is a good thing.

To realise that there are thinking lessons is much more important than to like them or to be good at them. Within this general framework of thinking as a

subject, each lesson provides a more specific framework for looking at and practicing some aspect of thinking. With this framework, teachers can develop their own style and rhythm. They may choose to change all the practice items in a lesson. What is important is that they keep closely to the framework of the lesson and do not run each lesson as a general discussion.

Something to Do

In an interesting experiment, a group of students was asked to give its views on a situation and later was asked to use a deliberate PMI. In the first exercise fifteen out of twenty-two students proceeded to think up 48 points against the idea and only 7 in favour.

The same group later doing a PMI made no initial judgments and found 43 points against and 48 points in favour. The difference is quite striking. The point is that instructing students to “think better” is quite useless because they have to have something definite to do. If they do not have something definite to do then they will make initial judgments at once instead of exploring the situation. Providing them with a PMI to do makes it possible for them to bypass the initial judgment which would determine their thinking thereafter.

The CoRT lessons encapsulate certain aspects of thinking in operations that can be looked at directly and used deliberately. So we have PMI, OPT, CAF, EBS, ADI. These are deliberate and artificial. The purpose is to provide the students with something to do next. Instead of being instructed to think more clearly, or better, or in some more balanced way, the students are specifically asked to do one of the operations.

Practice

The lessons offer a variety of practice items from which teachers choose (or contribute their own). Practice is by far the most important part of the lesson. The students work in groups or as individuals. The important thing is that they should deliberately practice the aspect of thinking that is central to the lesson - and not just have a discussion or think. It is also important that they have a number of practice items. This is essential as it is the only way in which they can be made to look at the thinking process as such.

If only one practice item is used then the students are more concerned about the content of that item than the thinking process used. Using a wide variety of different practice items is basic to the CoRT lessons.

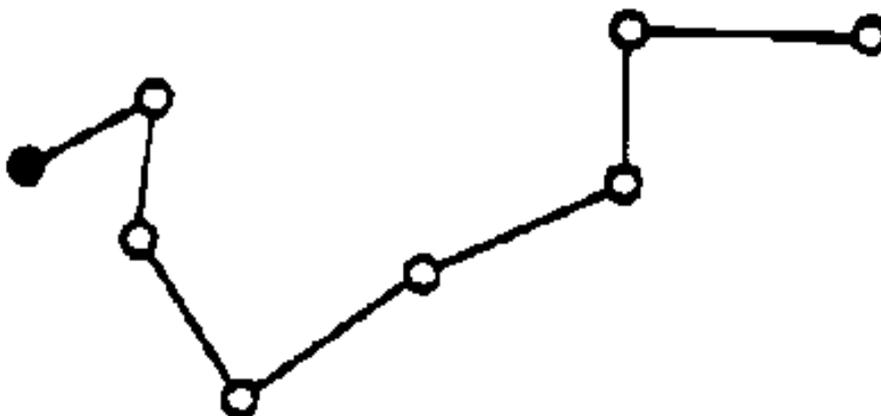
WHY CoRT THINKING WORKS

The theoretical basis for CoRT Thinking is quite simple and ultimately rests on the concept of mind as a pattern-making and pattern-using system (as described in the Penguin book *The Mechanism of Mind*).

We can consider three possible states of thinking. Each of these is illustrated with a diagram.

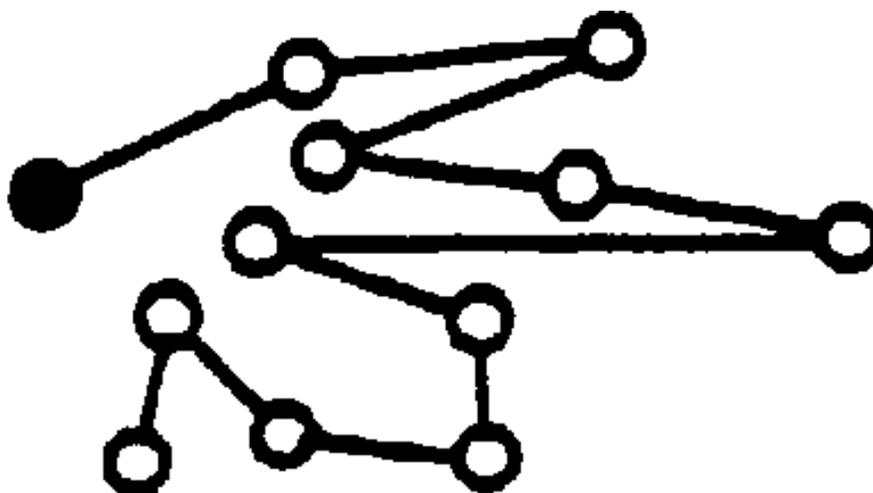
Natural thinking:

The mind moves from idea to idea. Each idea in turn becomes the starting point for a new idea. The overall result is a haphazard ramble that can stray very far from the subject being considered.



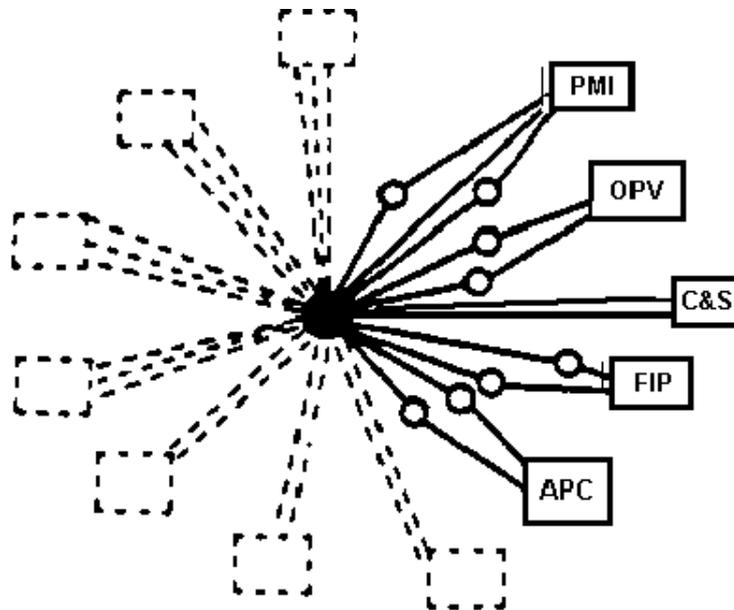
Subject thinking:

Here the central subject matter is kept firmly in mind so that there is no longer a free drift from idea to idea but a tendency to move from an idea back to the central subject. This type of thinking does not get as remote as natural thinking but the exploration of the area is still haphazard and may be limited if there is an emotional content.



Directed thinking:

This is what CoRT is about. Here the central subject matter is surrounded by a ring of specific directions in which to direct thinking. There is much less reliance on drift. Thinking is more purposeful. The whole idea can now be explored.



4. Thinking without cort

Most people may be satisfied with their thinking without ever having had to do CoRT Thinking Lessons. Self-satisfaction is not of course the same thing as skill. Nevertheless there are people who are indeed good at thinking without ever having been taught how to think.

There are also a larger number of people who appear to be fluent thinkers until you take a closer look. This is often the case with bright sixth grade elementary school students, college students and academics. At first there is a fluency and articulateness which often passes for thinking and obscures the poverty of the thinking.

CoRT Thinking will never make anyone more brilliant, but it can make people sounder in their thinking. There are many aspects of ordinary thinking which can be improved by CoRT training. A few of these aspects are listed below. There are many others, but a few will serve to illustrate why some training such as that provided by the CoRT lessons is necessary.

Point-to-Point Drift

The tendency to drift from one idea to another was mentioned before in this section. This tendency can be quite striking, especially with younger students. For instance, some 10-year-olds were asked to consider the suggestion “milk, fish and bread should be free.”

They at once argued that if everything were free everyone would want everything - so the stores would be very crowded - so the buses going to the stores would be very full - so the drivers would want more money - if they did not get more money they would go on strike.

Thinking proceeded in this manner, but there was no mention at all of how the free basic foods would help the families or poor people.

This is an extreme example, but the same sort of thing happens with older students and adults as well. Often the drift from idea to idea is very eloquent and each move is very reasonable, so that at first sight the result seems to be an eloquent, well-argued essay. In fact it is nothing more than an exercise in drifting.

Judge First and Think Later

This is a very common fault indeed and it is to be found even in the most articulate and brilliant of students. The student takes up a position on a point (prejudice, second-hand opinion, instant judgment, whim, etc.) and then uses thinking to defend only that position. Thinking is used only to defend a position or to attack the opposite position.

Almost all essays are of this sort. Again at first sight the essay will seem very reasonable and well argued. On a closer look however it becomes obvious that the student is not exploring the issue at all but exhibiting courtroom virtuosity in defending a position which has not been arrived at by the process of thinking.

After the CoRT Thinking Lessons there is a greater tendency to explore the matter first and then to reach a conclusion (as discussed in the Experimental Results section). In general far too much is based on judgment and too little on exploration. The ratio of judgment points to exploration points decreases markedly after CoRT lessons.

Taking Things to Extremes

A common method of arguing is to take things to extremes and thus to show that an idea is impossible or unworkable. This is sometimes called “reductio ad absurdum.” In its place it is a valid way of proceeding but it can be overdone. For instance, in the milk, bread and fish problem mentioned above many of the children at once argued that if everything were free then the whole system would break down because money and work would have no meaning. Similarly, arguments about immigration are at once taken to the point where the immigrants take over all the houses and the jobs.

This tendency to take things to extremes is a symptom of a lack of confidence in thinking. The thinker flees to a secure, absolute position, which actually relieves him/her of the necessity to think at all. It is more than an inclination to use existing prejudices. It is the creation of instant prejudices.

Considering Only Part of the Situation

This is probably the most common fault in thinking and certainly the most dangerous. Only part of the situation is considered and the conclusion is based faultlessly and logically on that part of the situation. The danger is twofold.

First, you cannot prove the conclusion wrong by showing an error in the logic - because there is no such error. Thus the correctness of the logic seems to validate the conclusion, which may nevertheless be quite wrong when the whole situation is considered.

Second, it is difficult to make someone see more of the situation once that person has come to a conclusion based on consideration of only part of the situation. The only remedy is for someone to see as much of the situation as possible before coming to a conclusion.

In this area the CoRT lessons have been most useful. The experimental evidence certainly shows that CoRT students do have a broader view of things than those who have not done the lessons.

5. WHAT TO EXPECT: STUDENTS

It would be a mistake to expect too much from the CoRT lessons at once. It would be a mistake to expect that a few half-hours of CoRT lessons are going to make a striking difference in all students. In general the effect of the lessons on the older students follows the stages set out below:

1. Students accept the idea that they can be asked to “think” about something. This request ceases to be as incredible as asking someone to breathe.

2. Previously many students if asked to think about something for which they did not have a stock, ready-made answer would tend to label the question “ridiculous,” “stupid,” or “a waste of time.” In the second stage they will no longer flee to the safety of such remarks.

3. By now students will have begun to acquire some confidence in their thinking ability. They have realised that being asked to think about something is quite different from being asked to throw out stock answers or prejudices. They will be ready to try to think about anything, even if it seems remote.

4. In group work or in interaction with others, students will be more ready to listen to other opinions. They will listen and allow the other person to speak. They will be less inclined to say “Stupid” and “Don’t be silly” when a person comes up with an idea different from their own. They will be less inclined to shout people down by a louder repetition of their own. They will be less inclined to rush to a “vote” to prove the correctness of their point of view.

5. By now there should be a general “rub-off” effect of the thinking lessons. This should show both in the tests and elsewhere, for instance in essays. This general effect will include a tendency to come up with more exploration points (as distinct from judgement points).

Thinking will be less egocentric and in considering a problem students will look at aspects other than the purely selfish ones. Students will tend to think more broadly and to consider more aspects of a situation, especially if it is one which is relatively new to them.

6. All the effects up to here may be considered to follow from the general fad of teaching thinking as such, and not to be specific to the CoRT lessons. By now, however, students will be able to use the CoRT processes deliberately and fluently. But they will probably not use the processes unless directly asked to do so.

7. Students will now start using the processes on their own initiative. They will decide which process is appropriate and use it without self-consciousness.

8. There may now be direct transfer of the processes to situations outside the CoRT lessons. General transfer will have occurred by stage 5 but by stage 8 the transfer will be much more specific and better organised.

9. The processes as such will no longer be mentioned, but the operation of the processes and the attitudes involved will have become a routine part of thinking.

10. Students will now be able to be objective about their own thinking and the thinking of others. It is not possible to put a time-scale on these stages. Some students will whiz through the early stages or may indeed begin at a middle stage.

For instance, students who are used to discussing things at home may start at stage 4. Other students may never get beyond a certain stage. It all depends on the students, the teacher and the seriousness with which the lessons are approached. The important thing is to appreciate and note even small degrees of change. For instance, with many students a change from stage 1 to stage 2 is really a huge change.

To expect students to move from stage 1 to stage 10 after five hours of CoRT lessons is to invite disappointment. Younger students react to CoRT as a game which they very much enjoy playing.

6. WHAT TO EXPECT: TEACHERS

Just as the students go through different stages, so do teachers of the CoRT material. Nevertheless the stages set out below are much less real and much less universal than the student stages.

1. A general notion that it would be a good idea to teach thinking directly - both for its own sake and as a foundation for other subjects.

2. Some disappointment on finding that the CoRT material is rather ordinary and middle of the road. There is nothing exotic or startling about it, and no filmstrips or pictorial material.

3. A tryout of the first lessons and some enthusiasm as the first lessons seem to go well and the students enjoy the novelty of it all.

4. After three or four lessons a feeling of awkwardness as the novelty has worn off. The students have not adjusted to the idea of a process subject and find it difficult to get a sense of achievement when there are no right or wrong answers. The students will also complain that the lessons are boring and “all the same.” At this stage several teachers might give up and move on to something else that is new.

5. Those who survive the “hump” stage find that they and the students gradually settle into the idiom of the lessons. The students learn to distinguish the different processes and the teacher learns how to provide a sense of achievement in an open-ended subject.

6. Teachers have now developed confidence and their own style. Within the framework of the lesson they introduce variety and interest and their own practice items.

They are now on top of the lessons and no longer feeling their way about. This stage will probably not happen with the first class to which the teacher brings CoRT Thinking. It is more likely to happen the second time around, when the teacher can start off with confidence.

7. CoRT Thinking has now settled down as a standard part of the curriculum, and while they still enjoy teaching it, teachers no longer consider themselves brave pioneers. They might encourage others to use the lessons.

7. CoRT IN SCHOOLS

As a sort of summary of all the preceding points, we might now consider the general effect of the CoRT lessons in school. The headings below are not in any order of sequence:

Teacher training:

The CoRT lessons offer an opportunity for teachers to acquire experience in teaching an open-ended subject and also a process subject. The teacher has to proceed without relying on textbook content or imparted information. The teacher learns how to offer a sense of achievement to students.

Student training

:

The CoRT lessons offer an opportunity for practice in talking, thinking and social interaction. In the CoRT lessons the students usually work in small groups. In some schools this provides the only opportunity in the whole curriculum for group work (certainly at the younger ages). Students also have to listen to each other and to different points of view.

Thinking as a skill

:

The lessons encourage people to look at thinking as a skill that can be used deliberately and not only as an extension of the ego (“I am right and you are wrong”) or in support of prejudice.

Framework and operations:

The lessons provide a framework for simple practical thinking and also some basic processes. Even if a student takes no more from the whole CoRT course than an understanding and use of the PMI, the course will have been well worthwhile.

Part Four

A. TEACHING POINTS PART ONE

B. TEACHING POINTS PART TWO

C. TEACHING POINTS THREE

A. TEACHING POINTS PART ONE

- 1 CONTROL
- 2 TENTATIVENESS
- 3 FOOLING AROUND
- 4 "DELIBERATE" AND "DEFINITE"
- 5 COACH AND OBSERVER
- 6 OBJECTIVE
- 7 PLEASURE
- 8 SAMENESS
- 9 VARIETY
- 10 CONTENT AND PROCESS
- 11 SHALLOWNESS
- 12 ACHIEVEMENT
- 13 MULTIPLE EXAMPLES
- 14 GROUPS AND INDIVIDUALS
- 15 OUTPUT
- 16 DISCUSSION
- 17 CLASSIFICATION AND ILLUSTRATION
- 18 USE IN OTHER SUBJECTS

1. CONTROL

In the thinking lessons the teacher has to be firmly in control of the class. Control cannot arise from superior knowledge because this is not a knowledge subject. Control cannot even arise from superior thinking ability, since the students may, from time to time, have better ideas than the teacher and it is no use pretending otherwise. Control is achieved by maintaining a brisk pace and keeping things crisp.

It is the control of initiative - sometimes called leadership. The teacher can start or break off a discussion, decide which particular point is to be discussed, question an individual or a group, invite comments, move on to the next point. This is the basis of control. The worst possible type of lesson is one which drifts in an "anything goes" atmosphere. Almost as bad is the lesson full of silence as the teacher patiently waits for the students to produce ideas. When there is a pause the teacher should fill it by example, by asking a particular student for comments or by repeating an earlier point that can be elaborated. The teacher should then move crisply to the next point.

2. TENTATIVENESS

In a particular school the subject may be new to both teacher and students, but CoRT Thinking as a subject has been used successfully by a large number of teachers. The teacher should not be hesitant and tentative or make remarks like "I don't know about this, it looks rather difficult - but let's try it and see what happens". This approach communicates itself to the students very easily, and as a consequence they feel their time is being wasted by some new gimmick if, on the other hand, the students feel that the teacher is tackling the subject in a definite and confident manner, they will respond in a like manner.

Teachers should not talk in terms of an experiment, because this suggests they do not know what to expect and would be surprised by success. It also suggests that they are dependent on the students. Instead, they should let the students know that the material has been used successfully in other schools, and if they cannot manage it, the fault may well be theirs. The attitude of confidence is important. It is true that confidence does build up with time, and we have found that teachers using the material a second time are much more confident. But if there is no confidence at the beginning, the lessons may not get far.

3. FOOLING AROUND

In some schools, students will take the open structure of the lessons and the group work as an opportunity to fool around. Teachers need not fear that by imposing control and direction they are wrecking the lessons. They are not. If a youngster is given a tennis racket and a ball, the youngster will hit the ball around in a haphazard way. The value of an hour of fooling around in this way will be less than the value of ten minutes of directed training. There will also often be a temptation to show off; teachers should be firm in controlling this.

4. "DELIBERATE" AND "DEFINITE"

The key words in running the lessons are "deliberate" and "definite." It is not a matter of thinking ponderously and mechanically, but rather crisply and in a focused manner. It is not a matter of setting up fixed tracks and rolling inexorably along these. But it is a matter of defining directions and tools that can be used whenever the thinker needs to use them.

Unless directions and tools are crystallised in a definite way and used in a deliberate manner they get neglected. Even when the tools seem implicit or superfluous, they should still be made explicit. If this training stage has been done in a deliberate manner, then in the next stage the tools do indeed become automatic. Teachers should not be worried about being artificial or "giving labels" to what is done anyway. This is a very real and useful function.

5. COACH AND OBSERVER

The tennis coach may not be a better player than the person coached. The racing car designer may not be a very good racing driver. It is the function of the coach to be a good observer, to know what to look for, to be able to point out what is going wrong and to be able to praise something that is done right. Similarly, in the CoRT Thinking Lessons, the teacher does not have to pretend to be a super-thinker or even a better thinker than the students. The teacher is in the position of a coach: an observer of what is going on, a director of what is to be done and an advisor on style and performance.

6. OBJECTIVE

The aim of the thinking lessons is to get students to look objectively at thinking as a skill. They should be able to comment freely on their own thinking and that of others - as exhibited in particular situations. A student should be able to say: "I think he/she should have looked for all the alternatives (done an APC) before trying to select one." Achieving this objectivity is the most important task of the teacher because once it has been achieved, all else follows: there is more interest in the lessons, students no longer feel they have to be right because their egos are threatened, and understanding of thinking as a process replaces the idea that thinking is just a parade of knowledge and opinion.

This switch-over to looking at thinking as a separable skill will not happen naturally. It is more natural to look at thinking as an extension of the ego (which is what academics do). Some deliberate emphasis by the teacher will be required: "Jane, what do you have to say about the group's thinking? Why do you feel that way?" The difference between sheer knowledge and thinking as a skill must also be stressed: "They have their facts right, but what's wrong with their thinking?"

7. PLEASURE

The majority of students will not enjoy thinking. Very few people do. It is only after the results of the thinking process have been achieved that students are able to enjoy thinking in the same way as they enjoy any other skill such as skiing or swimming or playing chess. Left to themselves, students would prefer not to think, but to answer from "stock," just as a shop assistant would rather hand you something off the shelf than to have to order it.

As a result, students usually insist that they prefer to think about familiar situations, which means that they prefer to give stock answers and opinions rather than to think. Teachers should not be discouraged if students say they do not like thinking or find the lessons "boring". This is natural and in time it wears off. The best antidote is definite encouragement and the creation of a sense of achievement - both of which require teaching skill.

8. SAMENESS

Students will complain that the lessons all seem the same since they have the same format, the same student notes, and the same general subject of “thinking”. This is true. (In tennis, the rules of the game are the same for each game.) It is what happens within the fixed framework that matters. It is important that the students actually be given the student notes so that they have in their hands something which indicates a different “process” throughout the lesson. This is why the drawing on the notes is different for each lesson. If the teacher merely reads out the process at the beginning of each lesson, the all-important emphasis on the different process that is the subject of each lesson is lost. As a result, each lesson will seem the same, since they all deal with thinking.

Teachers who have been wary about using the processes in a deliberate way and who have tried to teach thinking in a general, broad-minded way (commenting on any thinking point that comes up) have much more trouble in this respect than those teachers who have restricted the lesson to the particular process it describes.

9. VARIETY

Teachers are urged to inject as much variety as they can. Some teachers use illustrations or film-strips as material on which to exercise the tools presented in the lessons. This is excellent. The CoRT Thinking Lessons are designed to provide a light but definite framework which can be filled with other material. There is, however, no insistence on slides or film-strips because the material must be usable by a wide variety of schools, some of which do not have these facilities. But schools that do have these facilities should certainly use them to add variety to the lessons.

Teachers are also encouraged to vary the format of the lessons. For instance, some teachers have used role-playing or drama situations. It is important, however, to keep in mind the specific purpose of the lesson. It is easy to get carried away and create a very interesting drama situation which is so tenuously connected with the lesson that very little improvement in thinking skill as such takes place.

For instance, in doing a PMI on whether gypsies should have fixed campsites, a class may act out a situation in which a group of people is trying to run

gypsies out of town. This performance may tell everyone a lot more about gypsies but it will not in itself do very much for the PMI tool. Nevertheless, this sort of lesson may be useful so long as it is understood that its purpose is “interest”. It is suggested that when teachers do not want to use this sort of lesson they should do a specific lesson on PMI and then follow up with the interest lesson (or split the lesson if there is no time for two lessons). The important point is that at some stage the students should be looking at the thinking operation directly and not dissolved in some situation.

When students complain about lack of variety in the practice items they should be invited to write down their own practice items. A definite time should be set aside for this. The teacher can then select from among those items and use them. The aim is always to have a mix of items: some familiar and some remote, some easy and some difficult.

10. CONTENT AND PROCESS

Students often comment that many of the practice items are rather remote and not connected with their own lives. For instance, a student pointed out that the item on “designing a city centre” was not very relevant, since very few students were ever likely to be involved in designing city centres. The teacher gave a very good answer. This particular school happened to be near Nottingham, England and that city council had actually asked the public for its views when re-designing the city centre.

The teacher pointed out that people may be asked for their views or may want to present their views even if they themselves were not going to become city planners. One of the main complaints about education has been that it does not encourage students to look outside their own narrow patch. The fault is really that of the students, who have restricted views of what should concern them.

Quite apart from offering views on city centre design there are two other good reasons for including this sort of practice item. The first reason provides an opportunity for practising a “thinking process”. In thinking about a city centre students have to consider priorities (FIP), alternatives (APC), other people’s views (OPV), etc.

The purpose of the item is to give an opportunity for such practice so that the process can become part of thinking skill and can then be applied to other more immediate situations. The second reason is that it is necessary to

stimulate students to think about some remote items from which the students are sufficiently detached. With very similar items there is little thinking only a parade of emotions and experience. The items which the students prefer are not necessarily the ones that are going to have most effect in training their thinking.

The answer is to have a variety of items: some familiar and immediate, some remote. The teacher must make it quite clear that anyone who considers him/herself a skilled thinker must be able to think about anything. It is the process not the content that matters. The teacher can use mathematics as an example of a process that can be applied to different situations

11. SHALLOWNESS

This is indeed a difficult point. It is difficult because one cannot get people to accept that there might be more to look at than what they can see. One teacher said that one group of students were so capable that they could do all the practice items in the lesson in five minutes. They probably could. But much more able thinkers might have spent five hours on each item - and in some cases a lifetime. We can take the example of the "yellow car" from the very first lesson. The suggestion to be discussed by the students is that "all cars should be painted bright yellow." We can look at this item with three levels of sophistication.

First level:

I don't like yellow.

Yellow is very boring - all streets would look the same.

It would never work - no one would accept it.

Second level:

Yellow may be the safest colour since it can be seen out of the corner of the eye and is also more visible than red at night, so accidents might be reduced. There would be much more difficulty in finding your car in a parking lot or for the police in finding stolen cars. There would be a reduction in delivery time because the colour you "wanted" would always be available.

Third level:

How much government interference should there be with personal choice? This is obviously justified in some areas, like traffic regulations, but is car colour such an area - where does one draw the line?

Perhaps vehicles could be categorised by different colours: private cars could be yellow, buses green, ambulances and fire engines red. Then the traffic lights could respond to the different colours. Also there might be a special tax system so that only yellow cars which had paid the tax could enter the cities. How important an ingredient of life is colour and aesthetic appearance in general?

The basic difficulty is that students (and teachers) are apt to think in terms of "difficult problems" which stretch the mind. This means that the mind has to work hard to find a "solution". Such problems include the brain-teaser and crossword puzzle type. In real life these problems are extremely rare.

Much more common are the apparently simple situations which can be dealt with in a superficial way but which really require far more thinking if they are to be handled properly. Such problems may never appear difficult at all. Students who believe they have no career choice except to follow in their parents footsteps cannot see a "problem" in choosing a career.

Thinking is involved not only in solving problems, but in exploring a situation in depth. This is a very difficult point to get across. Problem-solving thinking is valid but we also need to practice generative thinking about situations; that is what really makes the difference. With such generative thinking we open up new possibilities, consider new factors, and take into account other people's views. No situation is too simple to think about in depth.

Teachers should demand a great deal of thinking and sophistication from able students. They should be prepared to say: "That's alright but we want something better". They should never be satisfied with a glib, superficial answer even if it is "right". In practice this means that teachers themselves must be prepared to give more sophisticated answers to illustrate what they require.

12. ACHIEVEMENT

Of all the points discussed in this section, achievement is undoubtedly the most important. The success and enjoyment of the lessons depends on the students feeling a sense of achievement. This is not easy because the students cannot assess their achievement for themselves and may not be entirely convinced by the judgement of the teacher.

In a knowledge subject, students can tell when they are right and they also trust the teacher as a custodian of facts which can be checked in a book. In mathematics there are right answers which can be worked through by and for the students. In thinking, there are “good” answers, but the reason why one answer is preferred over another may seem subjective: it cannot be worked out easily to the satisfaction of the student, and resentful students come to doubt the impartiality of the teacher.

An even greater difficulty is the fact that an answer may be “right” but not good enough. The burden of creating a sense of achievement falls on the teacher and is certainly the major task in teaching the CoRT Thinking Lessons. Creating this sense of achievement involves two things. The first is providing the students with a very clear picture of what they are trying to achieve. The goal should be as clearly defined as home run is in baseball or the bull’s-eye on a dartboard. When targets are so clearly defined, the players can assess their achievement for themselves. This is not easy with thinking.

The purpose of the thinking lessons is to get students to carry out some thinking tool in a crisp and fluent manner. Achievement is carrying out these tools. For instance, if someone is asked to analyse a situation, then a crisp analysis is an achievement. If someone is asked to do a C&S, then a comprehensive C&S is an achievement. Unfortunately, you can only tell that a tool has really been carried out by looking at results. Do the results show that an analysis has been done? Hence one is back to assessing results.

Nevertheless, the praise should be directed firmly at the tool. “That’s a very comprehensive analysis,” or “You’ve done a good C&S there”. This is important, because a result is particular to one situation and it is not much use praising it. But a tool can be used in any situation and praise directed at the tool trains thinking skill.

If the first point about achievement is to provide students with a clear picture of what they are trying to achieve, the second point is to provide them with some feedback by praise or other means.

If you yourself can see the bull's-eye on the dartboard, you can judge your own achievements. But suppose you are throwing the darts blindfolded? You must now rely on feedback from someone who watches where each dart lands: "That was a near one. A little more to your left". In thinking lessons, the teacher must perform this function. Teachers make an effort to point out the bull's-eye, but since this is difficult they must also provide the feedback to let students know how they are doing. They do this not by being neutral but by responding to ideas.

The teacher must build up a repertoire of responses with which to assess students' ideas. These responses must be varied but they must also be very definite and credible to the students. Some obvious examples are given below, to indicate the sort of thing that is required.

Praise:

Clever, Important, Subtle, Strong Point, Effective, I like that, Interesting, Original, Fascinating, Different, Unusual.

Criticism:

Obvious, Rather silly, Weak, Trivial, Already made point, Irrelevant, Not important, Facetious

As usual, it is better to point the way by definite praise of the good than by criticism of the poor ideas. But when a student is not trying, or is being facetious, then criticism is in order. Teachers should make a point of explaining why they have praised a particular idea, so that students can see more clearly what is wanted. They should also be ready to illustrate the different points in the lesson with their own examples (or those suggested in the teacher's notes for each lesson).

Teachers must not passively accept everything. They need not be neutral. They can disagree with an idea put forward so long as they explain their disagreement and do not pretend it is an Olympian judgement. They must be ready to accept that students may have different ideas than their own, and that there is usually room for different ideas.

In order to create a sense of achievement, artificial devices can be used. For instance, instead of saying "do a CAF," a teacher can ask for a list of five factors. There is nothing magic about five, but it gives a definite endpoint, which an open-ended list does not. Another device is to ask the students to try to guess what the teachers have down on a piece of paper as an analysis of a situation.

Again, there is nothing special about what they have down, but there is achievement in being told “Yes, that is exactly what I do have written down”.

Artificial devices like this can be used freely, students may also be asked to vote which idea they like best from a master list accumulated on the blackboard.

13. MULTIPLE EXAMPLES

Sometimes a teacher will devote whole lessons to doing a single practice item in great detail. It is doubtful whether this is the best way to illustrate a particular thinking process. Instead of concentrating on a single example, it is better to go through multiple examples even if very little time is spent with each. It is difficult, however, to keep a balance between doing examples so quickly that only the most superficial comments are given and taking so much time that the purpose of the lesson is forgotten.

14. GROUPS AND INDIVIDUALS

In the CoRT Thinking Lessons, the students usually work in groups for reasons stated in the CoRT 1 teacher’s notes. Most of the students like this. There are, however, some difficulties. Teachers are often unused to the group format and feel that they are losing control over the class. There is much more noise, since five groups may be talking at once. General communication with groups is difficult since their attention is turned inward to the group rather than outward to the teacher. The students tend to fool around if so inclined.

These are all valid points. Nevertheless, the teacher should persist with the group format rather than hurry back to the more familiar class situation. From time to time, with particular items or lessons, the teacher may work on an individual basis by setting tasks and asking questions of individuals. With individual work the major difficulty is “thinking time”.

A group may be given five minutes to discuss a problem because even if some members of the group run out of ideas, the others can continue to discuss it. When the class is used as a whole with individuals doing their own thinking, it is not possible to allow five minutes because many students would be bored after one minute and there would be nothing for them to do.

The two complaints from the students themselves about the group format are that there is no scope for individual brilliance and that some students do not contribute. Bright students complain that they can think better on their own, that they want credit for their own ideas instead of having them submerged in a group output, that in a group only consensus matters and contrary ideas are ignored. This need for individual achievement varies very much from class to class. It can be met by frequently introducing individual work, especially of the essay type, with problems from the test section. Furthermore, when teachers recognise high-achieving students, they can ask them individual questions, giving them an opportunity to express their ideas as individuals.

The second complaint is that in group work some students do not contribute; they fool around and tend to disrupt the group (often by playing the clown). When this happens, the teacher can shift the offender to another group in which the student's personality may be less dominant. For instance, a clown usually relies on a sidekick to encourage him/her. If clown and sidekick are separated, the clown calms down.

The silent group members may be silent out of laziness, disinterest or sheer lack of ability. The teacher should try and find out which students are acting in this way by moving from group to group. The teacher can then make a point of asking these silent students for the output from their group. If this is seen to be happening, then the group makes a more deliberate effort to include the silent members.

An excellent solution to the group vs. individual difficulty is often used automatically by several teachers. The students work in groups, but when it comes to the output stage they respond as individuals - the teacher asks a named individual to report back for the group. The teacher may also accept individual questions or comments. In other words, groups are for working, but individuals are for communicating with the teacher.

15. OUTPUT

The output is usually verbal, but may from time to time take the form of written essays or note-tape replies to questions. Group output may be given by a designated spokesperson for the group or by an individual who is asked by the teacher to report on the group's thinking. When there is a list of points (as in CAF) or a list of alternatives (as in APC), teachers can make a master list on the blackboard.

They can also ask each student to make a master list and then at the end get one student to read out his/her master list.

This helps to ensure that students pay attention to the ideas offered by others.

A very important function of the teacher is to repeat in a clear and crystallised fashion the ideas put forward by the students. Students do not always listen to each other's ideas, and in any case the idea may have been expressed in a vague manner. So the teacher crystallises it, and repeats it back to the class (instead of just nodding and passing on to the next idea): "So here we have the idea that if all cars were painted yellow and buses red then the traffic lights could be made to respond differently to the two colours."

16. DISCUSSION

Some discussion can be allowed at the end of each practice item. This should not, however, be about the content of the item, but about the way it has been handled. For instance, a group may claim (in the AGO lesson) that one objective of a teacher is to keep in good health. An individual from another group might object that since this applies to all people and is not peculiar to teachers it should not be included when looking at the objectives of teachers.

The discussions associated with the practice items should be kept brief—even when they could carry on in an interesting manner. One of the biggest dangers in the CoRT Thinking Lessons is the possibility of being diverted into tracks that may be interesting in themselves but do not help to train thinking skill.

The Process discussion section at the end of each lesson is a different matter and can be allowed to go on for much longer. The important thing is for the teacher to keep the discussion focused on the process that is central to the lesson. The questions given in both teacher's notes and student notes are put there to help the discussion get started. The teacher does not need to go through these if the students' own comments and questions are sufficient.

In conducting the discussion the teacher asks questions and poses situations. He or she can pick out disagreements between students and get a discussion going in this way. The teacher does not have to pretend to know all the answers. The purpose of the discussion is to give students a chance to look directly at the thinking process and explore it. If a student asks a question which the teacher cannot answer, it can be thrown back to the class for an answer or an individual can be asked for an opinion.

17. CLASSIFICATION AND ILLUSTRATION

One of the least successful CoRT Thinking Lessons in the experimental version was the AGO lesson. In that lesson an attempt was made to distinguish between Aims, Goals and Objectives. As a result teachers spent the entire lesson trying to make this philosophical distinction, and the students became hopelessly confused. Classifications and distinctions are not part of the lessons. It is true that in several lessons different types of tools are put forward, but these are intended as illustrations. The different types are there to show that there is more than one way to use the tool. For instance, the Conclusion lesson points out that some conclusions are definite, others tentative and yet others changeable.

This illustrates the point that conclusions may be tentative and need not all be definite. In the Analysis lesson, the distinction between “original parts analysis” and “perceived parts analysis” is intended to allow students to analyse things in a broader way than just in terms of components. The aim of the lesson is not to get students to put things under their proper classification. Two classes mean that there are two ways of doing something - not two boxes into which things must be fitted.

18. USE IN OTHER SUBJECTS

The purpose of the thinking lessons is to train thinking skill in a direct and deliberate manner. Clearly this skill can be applied to other subjects' areas: History, English, Geography, Science, Social Studies, etc. The thinking skill can be applied deliberately or unconsciously.

An attempt may be made in these other subject areas to use the tools and headings of the CoRT Thinking Lessons in order to get students to think about things (e.g., “What do you think Henry VII's priorities were?”). This requires that the teacher of the subject be involved in the thinking lessons in some way or at least be aware of them. Otherwise the transfer of skill has to be unconscious.

Other subject areas can also be used directly as “practice material” for developing thinking skill. This can be done with, inter-disciplinary studies, social studies, humanities, etc. For instance, students can be asked to do a PMI on “industrialisation,” or they can discuss environmental pollution. The discussion can be stopped at different points by the teacher, who asks what the group is “focusing” on at the moment.

A word of caution, however, is necessary here. If the thinking lesson is simply done as an adjunct to another lesson then the content of the other lesson must be done first in a deliberate manner. Then, in another session, the tools from thinking lessons can be transferred to a content area.

It is very important to avoid diluting the thinking lessons by dissolving them into other subjects. After all, the CoRT Thinking Lessons were designed specifically to pay deliberate and direct attention to thinking.

B. TEACHING POINTS PART TWO

- 1 "All the lessons are the same."
- 2 OPERATIONS
- 3 OBSERVATION
- 4 CRITICISM
- 5 EXAMPLES
- 6 CONTENT
- 7 SUPERFICIALITY
- 8 CONFUSION
- 9 OUTPUT
- 10 NOTES AND ESSAYS
- 11 OTHER SUBJECTS
- 12 ACHIEVEMENT
- 13 REVOLVE AGAIN
- 14 TEACHER'S EXPERIENCE
- 15 TEACHER'S SUPPORT
- 16 IT CAN BE DONE

1. "ALL THE LESSONS ARE THE SAME."

This comment is often heard from students of average ability. There are three possible reasons for it:

- a. The students are not really paying attention to the lessons. Since each lesson does involve "thinking" they assume all the lessons are the same
- b. The teacher has allowed the lessons to become general discussion sessions and has not concentrated on that special aspect of thinking that is central to the lesson. (This is by far the most common cause.)

c. Teachers are unclear in their own minds about the distinction between the lessons.

Imagine you are walking around a building. Every now and then you pause to describe some particular aspect of the building. At one moment you may describe the whole facade. Next you may concentrate on the porch. It is true that the porch is included in the facade, but nevertheless you can pay attention to it more directly if you wish. When you stand at the corner you may again see the facade, but this time you see the side of the building as well. It is much like that with the CoRT lessons.

The lessons are not designed to be separate, watertight boxes but different aspects of thinking. For instance, it is true to say that consequences (C&S) are really part of the factors that have to be considered (CAF). But it is still worth focusing directly on consequences since otherwise they are easily ignored when there are more immediate factors. At other times the lessons may appear to be similar when they are in fact different.

The PMI lesson involves subjective judgement but the CAF lesson is neutral and simply lists the factors. You might do a CAF about where to go on vacation, but a PMI on the proposal to go to Mexico.

There are times when CAF and a PMI may be similar. For example, in considering the factors involved in building a highway through the heart of a city, some of the factors have an automatic plus or minus value:

1. Making people homeless.
2. Increasing traffic congestion.
3. Destroying beautiful buildings, etc.

But if a PMI had been done instead of a CAF then such neutral factors as the following might have been ignored completely:

1. The way the decision should be made.
2. Whose business it is.
3. The alternative uses for the money.
4. Other traffic schemes, etc.

In the CoRT 3 lessons it might be objected that doing an EBS is just like doing an OPV. It is true that if you do an OPV on your opponent in an argument you might be doing an EBS, but this does not mean the two are the same.

An EBS refers to the whole other side of the argument and not just the way your opponent is thinking at the moment. Similarly an OPV may be done on someone who is on the same side of the argument.

Under certain circumstances two lessons or two operations may be used for the same thing, just as both a hammer and a shoe can be used for knocking in a nail. But their full range of function is different even though there may be an area of overlap. The trouble really arises from our classical method of putting things in separate definition boxes. If you have a green box and a blue box then you decide that something belongs in the green and it is quite separate from the blue box.

But the CoRT lessons are based not on definition boxes but on the “flagpole” system. Instead of a green or blue box, there are two flagpoles some distance apart. Something may be placed between the green and blue flagpoles. This means that under certain circumstances (light, etc.) it could be considered green and under others it could be considered blue. In the box system what matters is the hard and sharp definition boundary. In the flagpole system what matters is not the boundary but the central important point.

2. OPERATIONS

In the CoRT 3 lessons there are two deliberate operations: EBS and ADI. It is intended that these operations be used quite deliberately. It should be possible to ask a student to do an EBS in the same way as one might ask him/her to do a PMI. At this point we can consider the whole question of these thinking operations encapsulated by a set of artificial initials. The purpose, of course, is to make the operation deliberate, noticeable and usable.

Teachers vary greatly in their use of these operations. Some ignore them and get on with the lesson anyhow. Others surmount the barrier of awkwardness and find that they can ask a student to do an OPV. During the lessons themselves the students have no difficulty in using operations. In general, students find it easy to remember PMI, CAF and OPV from the first lessons and less easy to remember FIP and AGO.

We know from definite experiments that the operations do make a difference. If a group of people are asked to consider a problem and decide upon it their decision will be far less balanced than that of a parallel group who have deliberately used a PMI.

In their essays, students who have done CoRT lessons are more likely to look at things in a balanced way. It is quite rare for students actually to use the terms PMI, C&S, OPV in their essays, but they write about good and bad points, consequences, and other people's views in a way that is different from those who have not done any lessons. This is as it should be, since the initials are only a carrier for the operation and attitude involved. But the student needs to have a very clear notion of the operation through practice with the initials.

Teachers should try and be definite and deliberate about the operations. They should make them the central point of the lesson. From time to time they can introduce operations practised previously into the current lesson, or ask the students what they involve. The operations also provide a direct way of spreading the thinking lessons into other subject areas. For example, a student can be asked to do a C&S on some proposed social change or to examine the AGO of some figure in history. The terms are meant to be convenient shorthand, and in time they do become so. It is certainly much easier to ask a student to do a PMI or EBS than to "consider the good, bad and interesting points" or to "examine both sides of the question."

3. OBSERVATION

The CoRT 3 lessons are somewhat different from the preceding lessons. The first twenty lessons demanded generative thinking. The students were asked to carry out some operation: to do some thinking about a situation. In seven of the CoRT 3 lessons the students are asked to observe and comment on the thinking of others. This observation is like bird-watching. It is a matter of recognising a phenomenon and putting it into some category. This type of thinking is much easier than the generating type, since there is always something to react to. The emphasis is on crisp, sharp observation.

At first, students may be hesitant and unsure about how to classify something. For example there are times when the distinction between fact and opinion is unclear. If I were to say "You nearly ran over that pedestrian" it may be regarded as a fact because you may really have driven within a few centimetres of the pedestrian and given him an obvious fright. On the other hand it is really an opinion, because for all I know you may be an exceptional driver and have judged the distance so well that there was very little chance of an accident.

Areas of doubt like this will arise in teaching. The best thing is to deal with them by saying "now that could be fact or opinion," and then go on to other examples where there is no doubt at all. Long philosophical discussions, even

if they do finally resolve the matter, leave too great a residue of confusion. "In time the boundaries of what is clear will spread so as to clarify what before was doubtful." Teach from the centre outward - not from the boundary inward.

4. CRITICISM

Observation and criticism are often closely bound together. In fact it is more common to practice critical observation than the neutral observation required in the CoRT 3 lessons. In the lesson where a distinction is made between fact and opinion there is no suggestion that a fact is a valid type of evidence and an opinion is not. What matters is that the student should learn to distinguish between facts and opinions by recognising each type of evidence clearly. Once the students have done this they may come to feel that at certain times opinions are not as valid as facts and that at other times a strong opinion is more important than a fact. If teachers make the mistake of attaching automatic value-labels to fact and opinion they will be severely limiting the students' ability to think about matters in which facts are few and often irrelevant.

The essential purpose of the observation lesson is to get the student to recognise certain phenomena clearly and objectively. This is done in CoRT 3 by having the students look at the thinking of others. Once the lesson has been learned, then the students should be able to recognise the same processes in their own thinking. People who can recognise prejudice in other people are more likely to avoid it themselves.

5. EXAMPLES

Choose simple examples. The teaching method depends heavily on examples. A single good example is worth a great deal of philosophical discussion. But no matter how good the example, the teacher must painstakingly draw the point from it. They should do this even when it seems unnecessary. They should not just leave the students to absorb the message of the example on their own. The reason for this is that often the students see in the example a message that is quite different from the one intended by the teacher. If an example is poor or confused it is better abandoned than explained. It is best for the teacher to say: "That is a poor example, let's try to find a better one."

Examples are given in the student notes and also in the teacher's notes. No doubt teachers will be able to supplement these examples with others of their own - possibly more topical and more direct. Teachers should never be afraid to oversimplify with an example. Once the central point is made clear then subtlety will add itself later.

There is a case for introducing negative examples: the boy who did not do a PMI on leaving school early; the government which did not do a proper C&S before closing local railway lines; the girl who did not do an EBS on her argument with her father on what time she got home at night. This sort of example serves both to illustrate the process and to indicate its usefulness.

6. CONTENT

The content of the problems and thinking situations used for practice in the lessons is so important that it has been discussed in previous CoRT teacher's guides. The matter concerns both the items the teachers choose for their class from the lesson notes and also the problems which they generate themselves and insert into the lessons.

The first way a problem can be interesting is if the students see it as having a direct relevance to their own immediate lives. But this sort of problem is not much use for practising thinking. This is because many of the students will rush to the obvious easy answer (even if it is wrong) and will consider any deliberate thinking as superfluous and a distraction.

Where there are well-worn channels of response, students are unlikely to abandon these to start thinking. Later on, when they have more confidence in their thinking, they will be more able to do this. So it is better to have problems for which there are no easy or obvious answers. Thinking can then be seen as a way of finding an answer. Moreover, the student who does offer a useful comment is appreciated, whereas in the obvious-answer problems anyone with a different point of view is attacked as being "stupid."

The second way a problem can be interesting is if the students have a lot to say on the subject, even if it is not directly relevant to their immediate lives. Usually what they have to say is second-hand experience, opinion and prejudice (e.g. a problem on immigration). Here again the students may actually feel themselves cramped by the procedures of the thinking lessons. They would prefer to fly, drift or float from idea to idea than to try and use some framework.

The best problems are those about which the student might have a moderate amount to say. The emotional content should be low at first. Problems which are real and very difficult are also useful, since there is no obvious answer. The teacher should not be afraid to vary the type of problem: from social significance to science fiction; from the school world to hypothetical situations; from personal life to engineering and physical processes.

7. SUPERFICIALITY

This is an extremely important point. Some students make the following sort of comments on the lessons:

- They are stupid.
- They are childish.
- The examples are too easy.
- Everyone thinks anyway.
- The thinking lessons are just common sense.
- Thinking is natural.

These comments are usually made by the students of lower ability. It is not hard to see why such comments might be made. It is almost impossible for people to suppose that they might be missing something unless they can actually conceive of what they might be missing.

A person with limited thinking cannot suppose that there is thinking which is broader, deeper, more effective or better organised. It is quite true that there is nothing new about thinking - everyone does think. Unlike geography, physics or mathematics, the students are not immediately conscious that they are doing anything except what they have always done. Improvement depends on practice. But at each moment of the practice, students are only slightly better than at the moment before. So they cannot see any immediate difference.

“A father is angry with his daughter so he increases her allowance.” This problem is seen as ridiculous by many students because they cannot conceive how such a contrary thing could ever make sense. More perceptive students comment that the father might be sorry for being angry or for having overdone his anger, and so is trying to make amends.

Very perceptive students suggest that the father may actually have increased the allowance with the objective of being able to punish her more effectively in the future by lowering the allowance from time to time.

There is no easy answer to this problem. Teachers can add their own thinking or point out the thinking of some students in an attempt to show the more superficial students that their own thinking needs improvement. The teacher can also use the tough attitude: "Well, if it is so easy I want much better answers than that." Teachers must, of course, be able to follow this up with their own thinking on the matter. In some cases the use of very difficult problem situations can help.

8. CONFUSION

This is the danger that, at all costs, must be avoided. It is almost better that students do something wrong than that they should be confused. For instance, one teacher tried to do both the PMI and the CAF lessons on the same day. Needless to say, the students got very confused, because, at one moment, they were being asked to judge things and, at the next moment, they were being asked to be neutral.

Confusion often arises from philosophical discussions which may serve to clarify matters for one or two of the students at the risk of confusing everyone else. Another source of confusion arises from the habit of arguing by distinction. For example, in the CoRT 3 lesson on the ways of being right, a teacher might try hard to define the difference between the "show" method of being right and the "refer" method. This is an ordinary teaching procedure, but it can lead to confusion. It may be better to illustrate each process separately without attempting to contrast them one with the other.

Teachers should always remember that they are teaching practical thinking, not philosophy. In some cases there may be no very strong philosophical reason why two things should be treated as different or why there should be two categories instead of four, but there may be very practical reasons.

For instance, the use of facts and the use of feelings are both treated as examples of the "refer" method of being right. Facts may seem exactly opposite to feelings. But the practical point is that people are "referring" to something outside the situation itself: in one case they refer to facts, in the other to their feelings.

9. OUTPUT

In most lessons the students work in groups or interact on an individual basis with the teacher. This means that students have little time to work methodically on their own. For this reason it may be a good idea, especially with the older students, to ask them to put down their thoughts in writing from time to time. They should be asked to use some of the deliberate thinking processes, and not just to “freewheel.” The purpose of writing interludes is not to test what effect the lessons have had, but to provide a means for a more deliberate use of the thinking operations. Many students like the achievement and individuality of writing something down and may even ask their teachers if they can do some writing.

10. NOTES AND ESSAYS

It is usual for any written thinking at school to take the essay form. This can have some effect on the nature of the thinking. For instance, essays tend to argue cases rather than to explore them. There is a position to be defended, a point to be made, an opinion to be expressed. Also in an essay there is a tendency to move from point to point, so that each new point leads on to another one. The point may become very irrelevant and remote. There is less of a tendency to work within a framework so that each point is related to the overall picture. Obviously one wants to improve the essay writing ability of the students, but to do this it may be useful to switch occasionally to the note form.

In the note form the students construct frameworks, and then put down different points within the framework. Since they do not have to construct or to defend a point they can explore the situation much more widely. Since they do not have to link all the points together into an elegant paragraph they can spend more time on actually thinking about the points. This practice in the note form improves essays because it gives students a framework and stops them from rambling. It also helps students to realise that in real life thinking does not always take essay form, but can take the note form.

11. OTHER SUBJECTS

The CoRT Thinking Lessons are so simple and so basic that they can provide the foundation for other subjects.

Some transfer will probably take place anyway but it is much better if a deliberate effort is made. This deliberate effort can take two forms.

The first way is actually to teach the thinking lessons as part of the other subject and apply the processes directly to the content of the subject, for instance this could be done in geography.

The second way is to transfer the thinking operations from the thinking lessons which have been taught separately. A student doing a project may be asked to do an EBS on some controversy or to examine the evidence for some view.

The main point here is to be deliberate. Too much should not be attempted. It is not any use making students apply all the thinking processes they can to a subject. It is far better to tell them to apply one or two in a definite manner.

12. ACHIEVEMENT

This is another one of the difficult problems. How do the students know exactly what they are trying to achieve? How do they get the satisfaction of knowing that they have achieved it? The absence of definite answers places a heavy burden on the teacher, who has not only to clarify the objective but to let the students know when they have reached it or missed it.

Throughout the lessons, teachers must be conscious of the students' need for a sense of achievement, and that the teacher alone can provide this. It is true to say that the teacher who can provide a sense of achievement will be successful at teaching the thinking lessons. One simple way is to build on a student's idea, so that although much of thinking may have come from the teacher, the student can feel that their ideas provided the foundation. Drawing out ideas in discussion with the students is another way. Straightforward praise has been commented on in the previous CoRT teacher's notes (important, original, interesting, new, and strong, etc.). Adding a further point to a list also provides a sense of achievement.

In the CoRT 3 lessons there is a sense of achievement in observation when a student can pick something out. It is for this reason that it is suggested that students be equipped with a "metaphorical buzzer." This means that, as soon as they spot whatever they have been asked to spot, they should signal to the teacher, who might listen to them then and there or indicate that all comments should wait till the end.

13. REVOLVE AGAIN

The CoRT Thinking Lessons are taught at many ages - the age and ability level determine with what sophistication the lessons are tackled. In all there is six terms' work, spread over two years, with ten lessons a term. When students come to the end of the course they can quite easily start again at the beginning. They will now be expected to handle the processes with more skill and to tackle the problems with more sophistication.

Naturally it would be best to avoid those practice items which had been tackled the first time round, but this should not be difficult, since there is always a choice of items and in any case experienced teachers can generate their own or take them from other subject areas.

Most of the thinking aspects covered in the lessons do really require more than the prescribed 35 minutes. Decisions, planning, and analysis are examples of lessons which could be done again and again with benefit.

14. TEACHER'S EXPERIENCE

The more a teacher teaches the CoRT lessons the easier they become. There are teachers who have taken one group of students through the introductory section and have then done the same with a new class. The second time around it is much easier. This is because teachers have acquired their own teaching style and idiom and the confidence that goes with knowing the lesson. They also have a larger store of examples and illustrations. They can anticipate the students' difficulties and the points that will need clarifying.

Most of the difficulty with thinking as a subject arises from its nature as a process subject. Teachers are more used to content subjects.

The idea of a subject that is designed to allow students to practice a particular skill - rather than learn something- is new to many teachers. But the awkwardness of novelty is only there the first time.

15. TEACHER'S SUPPORT

Many teachers using the CoRT material will be doing so on their own. It would be nice if they could be supported by some form of central support or by meetings with other teachers using the material, for it is difficult to work in isolation. When teachers working in isolation come to an awkward spot they tend to give up if there is no one with whom to discuss matters.

No teacher should feel, however, that they are teaching the CoRT material the wrong way. The framework has deliberately been made so basic and simple that any teaching that comes within this framework will be serving the purpose of the material. The rest depends on ordinary teaching skills. If teachers can keep their classes interested and focused on what they are supposed to be doing then the lessons will be a success.

16. IT CAN BE DONE

The CoRT Thinking Lessons do work. A great variety of teachers have used the material at different age and ability levels, in a wide variety of schools. It must be admitted that in some schools it is much more difficult to teach a process subject than in others, because the students' reluctance to be taught excludes their co-operation, but not necessarily their interest.

Some schools have obtained striking experimental results, while others have not. In most cases, however, it is clear that the lessons have had an effect on the students' thinking habits. This is perhaps surprising, since the lessons are so few - about 5 hours a term.

Teachers, however should not expect too much and then be disappointed with their teaching if their expectations are not achieved. For instance, if you gave an articulate sixth grade class a subject on which they had many views you would not expect to find much difference between the CoRT group and a control group in the number of points raised but you might find a difference in the type of point.

The important thing is that teachers treat the CoRT material as a simple, practical framework, within which they can develop their own style and method. A tennis court is not the tennis player.

C. TEACHING POINTS PART THREE

- 1 GOOD LOGIC AND BAD LOGIC
- 2 UNDERSTANDING
- 3 KNOWLEDGE AND AWARENESS
- 4 DISCUSSION, ANALYSIS AND ABSTRACTION
- 5 OPERATIONS AND ATTENTION
- 6 TRAINING, PERFORMANCE AND ABILITY
- 7 CONTROL
- 8 TEACHER MOTIVATION
- 9 CONFIDENCE
- 10 CONCEIT
- 11 THE VOID
- 12 ACHIEVEMENT

The CoRT APPROACH

Teachers are entitled to use whatever teaching methods they find most suitable for their classes. Nevertheless, it is worth setting out the basic CoRT approach to the teaching of thinking and contrasting it with some other approaches

1. GOOD LOGIC AND BAD LOGIC

Bad logic certainly makes for bad thinking. But, unfortunately, good logic does not necessarily make for good thinking. This is because the perceptual side of thinking is so important it is possible to start from a particular perception and to argue very logically to a conclusion that many people would regard as wrong. Religious persecutions are only one example of the dangers of this sort of thinking.

A bad computer will certainly give wrong answers. But a faultless computer will not give the right answers unless the right questions are asked. In the same way, logic is a tool at the service of thinking but it is by no means the entirety of thinking

There are those who feel that it is enough to criticise poor logic whenever it occurs in the thinking of their students and that in time this process will teach them how to think. This is not so.

The process may teach them to avoid mistakes, but they may still remain poor at thinking. Similarly, just to teach the mistakes of logic and to warn students to avoid them is only a small part of thinking.

2. UNDERSTANDING

It is hardly surprising that many teachers consider that the primary purpose of teaching is to impart understanding. In most subjects this is perfectly true. In science the teacher tries to get the student to understand the principles involved. In geography the teacher tries to get the student to understand the basic geologic processes, in a language the teacher tries to get the student to understand the structure, etc. Understanding is developed by explanation, illustration and discussion. The process is one of induction. Students are encouraged to feel their way towards understanding. Sometimes students are left so much on their own that the process is called one of discovery. Unfortunately, this quite fashionable approach is not especially suited to the teaching of thinking as a skill.

In CoRT the understanding element is quite small since most of the operations are very obvious. There is not much to understand about the use of a PMI or about an OPV. The important point is to be able to use them with skill. A person may understand their nature fully and also understand the importance of using them and yet never actually do so. Too much emphasis on understanding very often turns the lesson into a philosophical discussion. This may be interesting in itself (although often too abstract for many students) but develops very little skill as such.

It is not suggested that understanding be dispensed with and the operations used blindly. What is suggested is that enough understanding be provided but that the emphasis be on skill in the use of the operations. Understanding is no substitute for practice. The teacher must realise that this subject is not like most other subjects since it is very directly concerned with the development of an operating skill. This is an important point.

3. KNOWLEDGE AND AWARENESS

An average person leafing through the CoRT lesson notes would remark that there was little new and that any reasonable person would know about all the processes described. The person would even comment that dividing

thinking up into separate aspects was unnatural and only a way of making it seem more complicated. In all respects except the last one such a person would be right. But knowledge and awareness are very different from use. Everyone knows about looking for pros and cons in a situation, but in practice very few people do so when their judgement of a situation seems reasonable enough to them. On one such occasion a random half of a group was asked to judge the proposal that money should bear a date (e.g., 1974) and that an internal exchange rate should govern conversion of dated currency from one year to another.

Of the group 44 per cent thought it was a good idea. The other half of the group was forced to do a deliberate PMI and then judge the idea. This time only 11 per cent thought it was a good idea. And yet probably everyone there would have insisted that he or she had looked at both sides of the question.

Another proposal was that marriage should be a five-year contract. Of the first group 23 per cent thought it was a good idea. When the other half did a deliberate PMI on the idea their acceptance of it was 37 per cent.

Again this is a very fundamental point. Knowledge and awareness are not the same as skill.

There are some very knowledgeable baseball fans that would never score any runs at all. One of the problems of the CoRT lessons is to make obvious processes sufficiently unobvious for them to get the attention and practice they need. That is the reason behind the use of such crystallisations as EBS, ADI, etc.

4. DISCUSSION, ANALYSIS AND ABSTRACTION

This is a well-known teaching process, and is used in the author's book 'The Five Day Course in Thinking' (Penguin). It involves doing something, discussing it, then analysing what has been done and abstracting some principle for future use. The process works best with an individual or with a very small group of highly intelligent students. It also makes heavy demands on a teacher's time and skill. The end result is the insight realisation on the part of the students as they "suddenly see how it is."

In many teaching situations, the procedure is that of a discussion about some topic. The interest of the topic carries the discussion forward. At the end the teacher may try to lead the class back to analyse what they were doing and

from this analysis to abstract certain principles - in the hope that these would remain embedded in their minds. There is no doubt that the method can work. But the transfer effect is small. Moreover, it requires intelligent students, many skilled teachers and much time. In short, it is rather an inefficient method and not suitable for widespread use.

5. OPERATIONS AND ATTENTION

The CoRT approach consists of developing deliberate operations and deliberate areas of attention. Each of these is small enough and definite enough to be easily understood. This is indicated by the remark of one teacher: "The lessons appeal not only to the intellectual but also to the remedial students who immediately get the idea." The operations are then used (directing attention at a special area may be treated as an operation). Practice of the operations develops skill in these operations.

There are two huge advantages with this method.

- First, the operations are so simple that they can be used by students of any age or ability.
- Second, the operations themselves can be transferred to new situations. Thus transfer is direct and immediate.

The actual success of the transfer depends on the success of the lesson and the motivation of the students, but the method is much more direct than in any of the teaching methods outlined above. At the same time there is a real problem in terms of interest. It is not very interesting standing at one corner of a tennis court and hitting ball after ball into the opposite corner in order to practice a backhand stroke. It is much more fun to play in a game of tennis. Similarly the discussion and abstraction approach may (with the right teacher) be more interesting. However, the advantages of the operations methods are so considerable that an effort must be made to hold the students interest rather than give up and revert to a discussion method.

The most important thing in teaching thinking is that the training and transfer element be strong. If it is not then the teaching may be a self-indulgent waste of time.

6. TRAINING, PERFORMANCE AND ABILITY

Students who have had some thinking lessons behave rather differently when given a subject to think about. They work faster, come up with more ideas, are more ready to listen to others and enjoy thinking more. These effects can be quite obvious with tape recordings of the students. It is often suggested that there has been no change in the innate thinking ability, but that the students have been trained to give a certain performance. This is probably true, but is not a criticism. When someone is trained to play tennis, their performance improves. Their innate ability to play tennis (i.e., sense of balance, reaction time, visual acuity, etc.) may not have altered at all. But what is playing tennis if not the performance of tennis? Similarly, what is thinking except the performance of thinking? The whole purpose of the CoRT lessons is to train the operating skill of thinking.

Skilled use of a saw by a carpenter is quite different from a deep understanding of the physics of saws. It is also different from an innate ability to use a saw (strength of arm, steadiness of grip, etc.). Skilled use of a saw is skilled performance in the use of a saw. In the same way skilled thinking is skilled performance of thinking.

7. CONTROL

Experience has shown that the teacher must be in control of the class in a definite manner. This does not mean an authoritarian position, but it does mean a leadership position. This can be achieved by being in control of initiative and pace, by experience and confidence. The tentative approach is no use. The neutral, passive chairperson approach is no use either. The "let's all think of this together" approach will work with well-motivated groups but not with others.

The teacher is in the position of a tennis or track coach. A coach in such a position must know what to do, must be definite and positive. It is no use for a coach to be tentative. It is no use for a coach to say "hit a few backhands when you feel like it" or "run around a bit if you want to." The coach does not have to be better than the person being coached. A coach just has to know what is happening, what to do next and the overall view of the training program.

Teachers must have a very clear view of what they are doing and what to expect from the students. Teachers should impart this view to the students because if the students do not know what they are doing they quickly lose interest.

8. TEACHER MOTIVATION

There is no doubt that the lessons are most successful when the teacher wants to do them. If the teacher has been told to do them, then the lessons are half-hearted and weak. The reason is that the lessons depend very much on the teacher's response to the student's ideas and even more so on the way the teacher sustains interest. When a teacher is not really interested in the subject, this communicates itself very quickly to the students, since there is no corpus of knowledge to carry both teacher and students along. Furthermore, the teacher who is not really interested will drift further and further away from the lessons until the students have no idea what is happening. On the other hand, a teacher who is interested will introduce variety but will stay close to the spirit of the lessons.

9. CONFIDENCE

Teachers notice that when they teach the lessons the second time around things go much better. This is because teachers have acquired confidence and know what they are doing. They also know what comes next and what to expect from the students. The tentativeness that so debilitates a lesson is gone. The "I'm not sure how this is going to go, let's see what happens" attitude does not make for good lessons.

10. CONCEIT

Many able students are very conceited about their thinking ability. This is not surprising because being smart has high value at school. Moreover, if they have demonstrated their intelligence by being good at exams and so on they have a right to assume that they are smart.

Unfortunately, such conceit is rather self-defeating, because it closes the mind to the possibility of improvement. Faced with the CoRT Thinking Lessons, such students declare that they understand all the processes which are obvious anyway and that they cannot see how the lessons will improve their thinking. They rush to the first superficial answer and declare that the problem has been solved. It seems very difficult for them to go beyond the superficial. This is an important point.

Throughout education, able students are challenged: that is to say they are urged to reach towards things which are out of their reach and ahead of them. They are given difficult mathematical problems to solve or difficult analytical tasks to perform. The degree of difficulty is always apparent as they tackle the task.

The idiom of the CoRT Thinking Lessons is very different. The tasks appear easy. There is no apparent difficulty to grapple with. So the students think that the task is easy. They have never been trained to develop their own momentum: to go beyond the superficial and treat something in depth. If they are not drawn forward by the difficulty in front of them then they cease to move at all. This is a very dangerous situation because life requires far more thinking about apparently simple situations than about complicated puzzle-type situations.

The conceit situation is difficult to overcome because it is one of the most difficult things in the world to make someone look beyond the superficial: it is like trying to make a person eat more when the appetite is sated. If the students do consider themselves very able then the teacher must demand a great deal of them. They must not be satisfied with ordinary or superficial answers. At the same time teachers should prepare themselves before the lesson so that they can demonstrate to the students how a particular lesson item can be tackled in depth.

The conceited attitude would not matter if the thinking skill of such students were indeed high. But their essays and other material do not necessarily show a high degree of skill. There may be a degree of articulateness and fluency of expression, with ideas linked together in a reasonable manner. But the thinking may often be intensely narrow in range and frequently of the semantic logic-chopping type. The sensible, practical, broad-ranging approach is not very evident.

11. THE VOID

This situation is the opposite of the conceit situation. It occurs with low-ability groups who cannot get started. Often they seem to resent being asked to think, and this resentment is a horror of the void. As soon as such students acquire some structure with which to think, they open up and begin to operate as thinkers. In fact they often seem to surprise themselves by their ability to think.

As one teacher put it: "The least able students suddenly find they have a direction in which they can think - because they certainly cannot produce ideas just from nowhere. They can now think about the PMI instead of just having a void."

With such groups the process is exactly the opposite of the one used with the conceited groups. Confidence is built up by setting definite tasks which are just within the capability of the students. Confusion must be avoided at all cost. What one wants to end up with is students saying to themselves "Yes, I can do that."

Several teachers have commented that in the CoRT lessons students who had not been considered very bright academically suddenly show an unexpected ability to think and to contribute ideas.

12. ACHIEVEMENT

This is a difficult problem. Students like to see an end point. They like to see that they have achieved something. In right-answer subjects there are right answers. In knowledge subjects there is the right knowledge. But with a skill subject like thinking, the change in skill from day to day may be so imperceptible that students do not feel anything has been achieved. They will not say to themselves "Now I can do an EBS" because they probably feel they could always have done one.

The teacher can help a great deal in giving the students a sense of achievement. The teacher encourages and even over encourages the good ideas. At the same time teachers must make clear what they consider good in the idea, otherwise the students do not know what to aim for.

There is a danger of shaping answers and learning how to please the teacher, but the need for a sense of achievement overrides these. The teacher can for instance put three headings on the blackboard: excellent, good, passable. Any idea that is put forward gets an immediate tick in one of these columns. This is much more real to the students than just being told their idea is excellent, because they now "own" the tick on the board. They can look at it and know that they put it there.

In the lessons the problems that excite most interest are those which have

an easily recognisable answer. That is not to say the answer is an absolute one but it is recognisable by the student as working.

This is an important point. Questions and problems should be phrased by the teacher so that the students can recognise in their own minds that what they are about to say really does answer the question. For instance, the question “What is a good colour for a car?” is open-ended and the student cannot tell whether the answer grey is better or worse than green.

The question “Which colour is easiest to see at night?” allows the students to tell themselves they have found a good answer when they say “red” (although in fact this is wrong). Questions with some tension in them (e.g., explain this impossible situation) also arouse interest. As soon as students feel that “anything goes” and that one answer is as good as another, they lose interest.

In fact with the CoRT 4 lessons on creativity, a sense of achievement is more easily reached since the final product is a new idea (whereas in the previous sections it might only have been a sensible comment).

Part Five

- a. TEACHING METHOD
- b. TEACHERS MOTIVATION
- c. TEACHER VARIATION

Teaching method

The structure of thinking lessons and the way they are conducted are considered under the following four headings:

- 1 GROUPS
- 2 NOTES
- 3 TIME
- 4 THE TEACHER

1. GROUPS

In the CoRT Thinking Lessons the students work in groups. This group format is very basic to the lessons for several reasons. If the students work as individuals then the brighter students tend to give all the answers or become impatient if they are not allowed to do so. The other students do not get involved at all since they are unable to see the thinking that leads to the answer.

In the group situation even the dullest and most silent member of the group can watch in action the thinking of the more able group members as they discuss matters. The timidity and shyness that prevent many students from offering opinions disappear when they are operating within their own small groups instead of with the teacher and the whole class.

Within each group there is much more time for back-and-forth discussion disagreement and alternative points of view than there could ever be with the whole class since the members of each group call talk more often. Finally, the very nature of the thinking lessons involves the practice of a particular thinking operation and this is easiest in small groups. It is not a matter of

receiving knowledge or finding the right answer.

In several schools the thinking lessons have provided the only opportunity for the students to work in groups and this in itself can have a socialising value. The students themselves seem to enjoy working in groups.

Forming the Groups:

There are several ways of doing this:

a. Groups put together by the teacher who knows the class and divides it into the groups that would work best.

b. Arbitrary arrangement according to where students are sitting. This can also be done by having the students pick up slips of paper which assign them to a particular group.

c. The teacher call choose group leaders who then pick their own groups. Natural groups in which a group of friends work together.

d. The grouping of friends is not recommended since they may find their own company so delightful that little attention is paid to the lesson itself. With a well-motivated class, however, the method can work.

Size of Groups

This depends very much on the nature of the class. For instance a remedial group of nine children would operate best as a single group with the children clustered around the teacher. On the other hand very articulate high-achieving students can feel very frustrated in large groups since their individual ideas cannot get through. In this case a group Size of five would be best.

The way the teacher chooses to run the lesson can also affect group size. For instance, if the teacher wants a full output from each group then more than four groups are impractical because of the time involved. If however only one group is designated to give a full output and the other groups simply add extra suggestions then a large number of small grounds becomes possible. In this case each group acts as an individual might in an ordinary class.

In general the more articulate the students the smaller the group size has to be. On the other hand small groups which do not produce much output can

be re-grouped into larger groups. The ideal group size is four. More than six is difficult and over eight is impossible.

Spokesperson

There are times when someone has to give the outlook of the whole group. This spokesperson should be determined beforehand. The spokesperson may want to take down in note form the output produced by the group. There is no need to have a formal chairperson or leader unless the group is so large that a chairperson is needed to see that everyone does not speak at once. From time to time the teacher may call upon a different member of the group to be spokesperson in order to give everyone a chance to express the ideas of the group. But there is little point in forcing a reluctant student to do this.

Change of Groups

The groups may be changed from time to time: for instance after every three lessons. If the students want to change more frequently or less frequently this can be done. Minor switches can be made if there are personality difficulties or if a teacher notices that a particular group is very weak. Sometimes one or two individuals want to opt out of a group to work on their own. This should not be encouraged but may be allowed in exceptional circumstances.

Disadvantages of Groups

Some high-achieving students find that in a group they cannot express their own ideas because of the necessity for compromise and in any case the ideas are credited to the group rather than themselves. In fact in the lessons there are opportunities for individuals to respond on their own either in the discussion period or in the offering of additional ideas after the designated group has given its output. With these high-achieving students it is worth using the individual test material from time to time. With this material they can operate on their own as individuals.

Group Output

The members of a group discuss the situation they have been asked to think about and develop their ideas and conclusions. One of the groups is then designated by the teacher to give its output through its spokesperson. The other groups listen and can then add their own ideas, comments or

disagreements provided that they are new points. These additions may be done either by the group spokesperson or by individuals in a group. If there have something to say the groups try to attract the teacher's attention and the teacher chooses the desired groups.

There are other ways to organise the output. For instance in some cases each group in turn gives one point. In some cases the groups are tackling different situations and here each group has to give its own output. The output is usually verbal but the teacher can also ask for an output in note form if the groups are being lazy. The way in which the teacher handles long-winded or facetious outputs is dealt with in the section describing the teacher's role.

2. NOTES

For each lesson there are teacher's notes and student's notes. A set of student's notes is given to each student at the beginning of each lesson. It is important that the students keep their notes since they contain the essential principles of the lesson in addition to the practice material. In this way students gradually assemble their own textbooks.

Structure

Each lesson has the same basic structure just as each meal has the same basic structure given by the different courses. Within this structure the content varies widely. Each of the thinking lessons consists of the following basic sections:

- Introduction: explains the particular aspect of thinking covered in that lesson and gives an example.
- Practice: provides problems and situations for the practice of thinking.
- Process: opens class discussion of the aspect of thinking that is the subject of that lesson.
- Principles: gives five basic principles concerning the subject of the lesson for the groups to examine and comment on.
- Project: provides further problems and thinking situations which can be tackled at the time or later.

The full nature of these sections and variations in the arrangement of them will be discussed later.

Where the lessons are used with students who might have difficulty in reading the notes the teacher can read out the separate items to the class.

Resources

The only resources used are those already present in the minds of the students. Thinking is the skilled use of already available information. The students are not required to absorb film strips books or other material before they can start thinking. The notes serve only to trigger the student's minds. That is why the same notes can be used with such a wide range of student ages and abilities. In each case the trigger is the same though what is triggered may be very different.

Since the students are not required to absorb material before they can begin to think those students who are not good at absorbing material on account of disability or inattention find that they can function well in thinking lessons.

Content

Each lesson contains a variety of problems and thinking situations. Since it is impossible to predict the interest of every teacher or class there is a wide mix of material. Some of it is directly relevant to a student's own world and experience. Some of it is deliberately remote so that a student can practice thinking objectively. Some of it is designed to encourage students to think about situations they might usually regard as outside their competence.

The variation in content is very important for the purpose of the thinking lessons is to direct attention to the process. This can happen only if there is sufficient variation in the content so that no single item occupies too much time. In this way students are forced to shift their attention from the content to the process. This point is fundamental. If the lesson becomes a discussion on one of the practice items it may be fascinating but it becomes useless as a thinking lesson.

It is not easy to predict what content will interest a particular class. For instance one class of nine-year-olds became very interested in the problem

of whether parents should send a crippled child to a special school or an ordinary one. Another Class was fascinated by the Science fiction suggestion of a breakfast pill that would replace food.

Social realism and problems immediately related to the student's world are not necessarily the ones that most interest the students though an attempt should be made to include a fair proportion of these.

In each lesson teachers may choose from a selection of alternative practice items to find the ones suited to their classes. For instance a class of nine-year-olds may not be interested in environmental problems.

Teachers who do not like the given practice items may invent their own providing they relate to the purpose of the lesson.

It cannot be emphasised often enough that the purpose of the lessons is to develop thinking as a skill that can be applied to any situation. The purpose is not to have general discussions on interesting topics.

3. TIME

The lessons are designed to be used once a week for 10 weeks. A greater frequency is not advisable. Any extra lesson periods may be used for the test material. The lessons are designed to be used with a minimal lesson time of 35 minutes or with longer periods up to twice the minimum.

With 35-minute lessons the practice section may have to be shortened and the project section usually omitted. With longer periods it is possible to extend the practice section both by allowing more time per item and by using more items; the discussion period would be longer and the project section could be tackled.

The introductory set of 10 lessons is part of a two-year syllabus of 60 lessons covering different aspects of thinking.

4. THE TEACHER

The teacher's role will vary with the age and ability of the students, the type of class and the motivation involved. For instance a high-achieving sixth grade group (aged 12-13) used to working in a tightly structured situation with right answers for which they get individual credit will need a different sort of approach than a class of 10-year-olds bubbling with ideas for the sheer joy of it.

The teacher's role may be considered under the following headings:

1. Choice
2. Variation
3. Enrichment
4. Control
5. Emphasis
6. Response
7. Achievement

1 Choice

The teacher may choose the order in which to do the different sections in the lesson. Various alternatives are outlined in the section on alternatives and teachers may also generate their own. Teachers choose which practice items would be suited to their classes or again may generate their own. Teachers choose the type of output wanted from the groups. Teachers also choose how they are going to set up the groups, how much time is going to be given to each item, and when they are going to use test material if they think this is appropriate. Teachers also choose which group will give its output and from which other groups to accept additional suggestions. In fact, the lessons can be adapted to suit any particular teaching situation.

2. Variation

Apart from the specific variations suggested in the alternatives section and elsewhere in these notes, the teacher can choose to inject different variations so long as the essential purpose of the lesson is not destroyed. For instance, the teacher may decide to try one of the practice items with a role-playing or debate format or as a scoring game.

To relieve the sameness of the lessons, teachers are encouraged to introduce as much variation as they wish, relying on their own teaching experience and knowledge of the class. Nevertheless, it must be remembered that the purpose of any lesson is to focus on a particular aspect of thinking. A general discussion on some topic is unlikely to serve this purpose.

3. Enrichment

These notes only provide a bare skeleton to be fleshed out. The interest of

the lessons depends on the teacher's ability to enrich the items suggested in the notes. In setting one of the practice problems, a teacher should build up the situation into an interesting one rather than just asking the students to tackle item number 3 in their notes.

For instance in the C&S lesson, one item concerns a robot that is developed to replace humble labour in factories. The teacher could paint the scene in terms of the empty factories with only a few workers in white coats to look after the robots. In the AGO lesson students are asked to consider objectives of a homemaker, shop-keeper, food manufacturer and farmer with regard to food. The teacher call set the scene in terms of the homemaker on his own, the shop-keeper working for herself or for a supermarket chain (and give it local identity if possible), the manufacturer in terms of a specific name and the farmer growing crops.

Enrichment also refers to the explanation of the thinking process that is the subject of the lesson. More or better examples can be given here. Finally, enrichment refers to the way the teacher deals with the output from the groups. Teachers can comment and elaborate on ideas that are put forward. They can link one idea with another or contrast them. Teachers do not have to accept passively the ideas that are offered. They can work on them and develop the interest in them.

4. Control

This is important. The lessons should run at a fast pace. The overall aim should be one of crispness and effectiveness. Without this the lessons can easily degenerate into aimless drifting. To maintain the crispness the teacher must be in control. If control is lost the lessons can tend to flop into purposelessness. In the thinking lessons the teacher does not have the authority of imparting superior knowledge but still retains the controlling initiative. The teacher can comment on ideas or cut off a discussion and move on to the next item when they want to. The teacher can choose to ask any group or individual for a comment or choose not to.

The degree to which teachers may have to exercise control will vary with the class. With a well-motivated class teachers may simply be caretakers watching the thinking as it flows. With a more difficult class they may have to be quite tough until the class gets into the swing of the lessons. Students used to structure and control may take some time to adjust to thinking lessons. The four most difficult situations are as follows:

Facetiousness:

Teachers may have their own way of dealing with this. Silly remarks can be treated as such and groups which persist in making them can be ignored. The composition of a group can be changed. The teacher must, however, be sure that it is really facetiousness and not a genuine attempt at an unusual point of view.

Wordiness:

This can be a difficulty with some groups and some items. The teacher can ask a person or group to summarise the three main points of what is to be said. The teacher can also cut off a discussion and move on. If students feel they are not getting enough time, then the written output of the test material can be used.

Silence

:

It may be difficult to generate ideas. If no ideas are forthcoming, teachers should make suggestions of their own for the students to react to. The teacher's notes for each lesson usually contain suggestions for this purpose.

Laziness:

A particular group may decide to let all the other groups do the work. Such a group can be designated by the teacher as the one required giving its output to the rest of the class. Output in note form can also be requested and these can be compared by the teacher.

5. Emphasis

It is entirely up to teachers to keep the central purpose of the lesson in front of the class. It is very easy for the lesson to drift into a general discussion of some topic. When this happens teachers must repeatedly focus attention on the actual thinking process that is the subject of the lesson. They should not be shy about using the labels and should be able to ask someone to do a PMI on an idea or a CAF on some situation. Though these will sound artificial at first, this soon passes.

It is also up to teachers to emphasise the difference between the difficult thinking operations if all the lessons deal directly with content, then they are all going to seem alike since the content is not particular to any lesson. Teachers must point out the difference between APC and AGO and between C&S and CAF, etc. This can be done in the initial introduction period or during the open discussion.

6. Response

Many teachers make the mistake of assuming that since there is no one right answer in the thinking lessons, they cannot judge the ideas offered but must accept them all. There is no one right answer but there are many possible right answers.

There are many wrong answers, silly answers or trivial answers, and the teacher is perfectly justified in treating them as such. The only thing that teachers must not do is to dismiss an idea simply because it differs from their own. Quite apart from the right/wrong basis of judgements there are many other ways in which a teacher can comment on a suggestion. In fact, since the right/wrong basis is inappropriate, there is an increased opportunity to use other modes.

Some possible responses are listed below:

- How is that idea different from the one we just had?
- Could you compare your idea with the other one?
- Is that an important idea or just an idea?
- Which of the two do you think is more important?
- I cannot understand what you mean - could you explain further?
- What would happen then - what is the point of that?
- Why do you think this is a new idea which we have not had yet?
- Could you condense all those variations into a single idea?
- That is a silly idea
- That is not very important is it?
- What else can you think of in that connection?
- Do you have anything to add to that idea?
- Do you agree with the idea we have just heard?

7. Achievement

This can be a difficult point especially for those students who have been used to dealing with situations for which there are definite right answers. They miss the sense of achievement and personal credit. They are also unsure of the rules of the thinking lessons and what they are aiming for. It is up to the teacher to create a sense of achievement. This is not based on the right answer system but on having something to say; on having some thoughts on the matter for instance the teacher can acclaim an idea in the following matter:

- That is a very important point
- We have not had that point before
- That is a very interesting idea (a new angle)
- That is a very original idea indeed
- That is a very interesting variation of the idea we have already had
- That is a neat (or elegant) idea

Similarly a group output can be praised in the above way or as follows:

- That is a very well organised output
- Those ideas are very comprehensive
- That is very imaginative
- I do not think there will be much to add
- You have covered most points
- That is very competent

Expressing displeasure is rather more difficult because it depends not so much on the idea itself but on the teacher's assessment of the motivation involved. The teacher is not really judging ideas but judging whether the students are practising thinking.

There is no point in condemning the output of someone who is genuinely trying; on the other hand someone who is being facetious or lazy can be treated with the following remarks instead of bland acceptance:

- That is rather silly
- That is a weak idea
- I am sure that you can do better than that
- We have already had that idea
- That idea is exactly the same as the other one

Similarly a group output can be treated as follows:

- You have left out a great deal.
- I do not think you have coped with that problem.
- That is all very superficial and obvious.
- You must try harder than that.

In general, the thinking lessons are not different from lessons in other subjects which do not have absolute answers - for instance, English.

The main points to remember are:

1. If students are really trying their hardest, you cannot get them to think better by condemning their performances.
2. If students are lazy or facetious then their output can be judged on its face value.
3. There are many ways of praising an idea apart from saying it is the only right idea.
4. A distinction has to be made between trivial and important ideas if there seems to be deliberate generation of trivial ideas.

SUMMARY

The main points are that the teacher should:

- Make the lessons interesting.
- Maintain control and a brisk pace.
- Keep the focus on the process rather than the content.
- Give the students a definite sense of achievement.

B. TEACHERS MOTIVATION

- 1 INVOLVEMENT
- 2 SOMETHING TO DO
- 3 STRUCTURE AND FREEDOM
- 4 NEW SUBJECTS
- 5 DISCIPLINE
- 6 NON-ACADEMIC STUDENTS
- 7 FOREIGN LANGUAGE

Introduction

CoRT Thinking Lessons can only be as good as the teacher who teaches them. CoRT Thinking Lessons are easy to teach. CoRT Thinking Lessons are difficult to teach. It depends on the teacher's expectations and teaching style. A bicycle is difficult to ride until you learn how. After that it is so easy that you wonder how it could have been thought difficult. It is somewhat similar with the CoRT Thinking Lessons. Some teachers get the knack at once often they are not even conscious that there is any "knack" to get. Teachers who get along well with their students and can interest and motivate them have no difficulty - nor would they have difficulty with any other subject. Teachers who rely on the authority of superior knowledge do have some difficulty since there is no superior knowledge in the thinking lessons: a student's thinking on some matter may be as good as the teachers

1. INVOLVEMENT

Some teachers find the CoRT lessons useful for getting students to talk and think about a subject. This is different from asking them to absorb knowledge and then regurgitate it later. The way individual students react in the thinking lessons, the way the groups settle down to discuss a subject. The ideas that come forward are all of interest to a teacher who enjoys teaching.

2. SOMETHING TO DO

Asking students to think about something is not much use. They do not know where to start. You can tell students to go away and write something about buses and they will do so. Then what? Do you now move to cars and then trains?

The CoRT Thinking Lessons provide something to do. For example a student can be asked to do something specific in the general field of “buses”:

- If you were reorganising the bus System in your town what information would you like to have? (CoRT 5)
- There is a fight between two passengers on a bus and you are investigating the incident. What questions would you like to ask the other passengers and the driver? Write down the questions and imaginary answers. (CoRT 5)
- You want to run a bus service that satisfies everyone. How much guessing do you do? What sort of guessing is it? (CoRT 5)
- The buses do not run evenly. There is a long wait and then three buses appear one after another. What do you think is happening? Is this a clue? (CoRT 5)

3. STRUCTURE AND FREEDOM

Many teachers like to invent their own practice items and to discuss their own topics. They find that the CoRT Thinking Lessons provide a structure or framework which allows the students to focus on one aspect of thinking at a time instead of trying to follow the general instruction “to think properly.”

The CoRT Thinking Lessons and the operations described in them allow both teachers and students to focus on the thinking process itself as well as the subject. Unless this happens no transferable thinking skill is likely to be derived from a discussion no matter how fascinating. Indeed, the more fascinating the discussion, the less likely a transferable skill will be learned.

The CoRT structure is very simple and light. It is not a matter of hierarchical boxes and allotted positions. It is not a matter of intricate sequences that have to be remembered. The CoRT method is to create: things to do and things to look at (in the field of thinking).

4. NEW SUBJECTS

It is not easy to introduce subjects for discussion into the classroom. Under what heading would you discuss school rules? How would you discuss

choice of careers with twelve-year-olds? Are tests important? What do children think of the police? What is wrong with parents? Should people be paid according to how hard they work or according to their needs? In some schools there are special social study classes or career classes but these are specialised. Any subject whatsoever can be introduced into a CoRT lesson.

5. DISCIPLINE

It may seem paradoxical that some schools see in the CoRT lessons an aid to discipline. It might seem that a subject who encourages children to think for themselves would work against discipline. On the contrary the CoRT lessons provide a common basis for thinking about and discussing situations that would otherwise have to be dealt with on an emotional basis.

The CoRT processes allow both sides to take a detached position and to look at the situation rather than at each other. As one principal put it, the CoRT processes provide a common, and neutral, language for dealing with situations and for trying to get each side to look at them more clearly and less selfishly.

6. NON-ACADEMIC STUDENTS

Many of the subjects taught in the curriculum are there because of the examination requirements at the end of schooling. These are the examinations at which the academic students who are going on to college or vocational schools have to excel. In fact a relatively small proportion of students ever take such examinations. This varies from about 14% to 30% in different countries.

Many teachers feel that it is a waste of time, and a turning off of interest, to treat the non-academic students in the same way as the academic students. Such teachers feel that there might be other subjects which could be of more interest or use to these students. CoRT Thinking Lessons provide one such subject. Non-academic students often prove good at thinking. Their deficiency has not been in their thinking but in their ability to absorb knowledge and resort it for examination use.

With the simple requirements of the CoRT Thinking Lessons the students acquire confidence in their ability. They have ideas and the ideas are listened to by the teacher and by the students. Instead of trailing behind in an academic subject which no longer holds any interest for them (since they know they are not taking the college boards) they are discussing things and thinking

about them. It is necessary for the teacher to explain that the lessons are an end in themselves and not leading to a final examination. The lessons are explained as an opportunity to discuss things and to think about them; the CoRT structure is a framework designed to make this possible.

7. FOREIGN LANGUAGE

Several teachers of English as a foreign language have chosen to use the CoRT lessons. They find the lessons provide a subject or content framework within which the students can think and discuss things. The thinking and discussion are carried on in the foreign language. Instead of using politics, history or travel as the context for language training, the teacher uses the CoRT processes and the CoRT practice items. Many teachers of English in English Departments in schools use the lessons in the same way. Language is a medium for describing, thinking and communicating. Too often only the describing aspect is practised. With the CoRT lessons there is more opportunity to practice the thinking and communicating aspects. With such a use of the lessons the teacher pays as much attention to the language aspects of the lessons as the thinking aspects.

C. TEACHER VARIATION

Introduction

- 1 TIME
- 2 EXAMPLES
- 3 PRACTICE ITEMS
- 4 LESSON STRUCTURE
- 5 FORMAT
- 6 OUTPUT
- 7 OTHER MATERIAL

The CoRT Thinking Lessons are designed to provide the basic outline of a thinking course which treats thinking as a direct skill. These “bare bones” can be altered or fleshed out by the teacher as he or she wishes. Some teachers complain about the rigorousness of the course and how everything is prescribed and laid out for use. Others say that they like the structure of the lessons which actually provide things to do instead of just instructing the teacher to go away and “be inspired.” The two opposing views are not irreconcilable.

Those teachers who want to generate their own examples and practice items should certainly do so. It would not make sense to distribute blank sheets of paper to give an opportunity to those who wanted to introduce their own variations - they can do that anyway.

Teacher variation of the lessons can take any or all of the following forms.

1. TIME

Teachers will decide for themselves how long they are able to spend on each lesson. Usually a suggested time is prescribed in the lesson. At other times teachers may feel that with their own particular class and teaching style they want to spend longer than suggested. Some teachers use the suggested 35 minutes but others use 90 minutes or two separate lessons.

In a similar manner the teacher can decide how long to spend on each practice item. They may use the suggested timing or they can decide on their own. In varying the timing the teacher should bear in mind the following points.

- a. The pace of the lesson should be brisk. The lesson should not be made longer by extensive arguments or discussions about individual points. The lesson should certainly not be made longer by abstract philosophising about thinking.
- b. There is a greater chance of getting bogged down in some practice item that seems to arouse the interest of the class. Much as one would like to follow this interest it is sometimes necessary to cut it short in order to move on to another practice item. Otherwise the emphasis is shifted from the thinking process as such to the content of the item. A general discussion may be fascinating but at the end little will have been learned about thinking.

2. EXAMPLES

At the beginning of each lesson it is almost mandatory for teachers to introduce their own examples as a lead-in to the lesson. Such example topics cannot be provided in the student notes or teacher's notes since to be effective the item should refer to a particular class in a particular school at a particular point in time.

For example a teacher may refer to a window that had been broken that morning. Teachers may refer to the holiday weekend that is just coming up. They may refer to an item that was on TV the night before. They may refer to the behaviour of someone in the class. They may refer to the new school extension that is being built. They may refer to the neighbourhood. They may wish to call a neighbourhood store by name. They may refer by name to the local football team. The teacher should think of the example before the lesson, as it may be difficult to try to generate an example there and then.

3. PRACTICE ITEMS

The practice items are designed to be used across a wide range of ages and abilities. This restricts them somewhat. For instance boy/girl problems that might be relevant to a sixteen-year-old might not be as relevant to a nine-year-old. Teachers may choose which practice items they wish to use and which to drop. They can also transfer items from the project section to the practice section. Teachers may vary the items by putting in more information or making it topical.

If teachers do not consider an item to be interesting enough they should try to alter it to increase the interest. Alternatively teachers can create their own practice items. In doing so they should observe the following guidelines.

- a. A practice item should not be so vast and all encompassing that it occupies the whole of the period as a discussion session.
- b. It is best to have a mix of problems so that some of them are immediately relevant to the home or school situation of the students and others are more remote or abstract.
- c. Though it may seem to teachers and students that items with immediate relevance must be more interesting, this is not necessarily so. With very familiar items the students may do no thinking at all but just tick off familiar clichés and stereotypes which indicate their prejudices on the matter but not their thinking. With more remote items the students can practice their thinking without feeling so committed. The thinking lessons are intended more for the teaching of thinking than for social enlightenment. Students who are given one “social” question after another will soon get bored.

d. As far as possible the items should contain some obvious lines of thought so that thinking can start at once. For instance the item “should children wear a uniform at this school” provides more thinking action than the item “should children be allowed to decide whether uniforms are to be worn at this school?” The second formulation might seem more socially relevant but it involves less thinking and it can be included as an extension of the first formulation.

e. Try to provide basic information to set the thinking in motion. Try to avoid the students saying “It depends ... on what you mean by ...; on where they are ... on how much is involved,” etc.

4. LESSON STRUCTURE

The sequence in which the different sections of the lessons are used can be altered. For instance in CoRT 1 many teachers have used a practice item as an introductory example (using an inductive teaching method). Similarly certain sections can be dropped if they do not seem to fit the age group.

With younger children many teachers would drop the principles section in CoRT 1. In schools which do not give homework or project work, the project section would be dropped. In all these alterations it is important that the teacher be clear about the nature of the lesson. It is no use altering the lesson so that it becomes a lesson in drama or a discussion group with no relevance to the teaching of thinking. This can happen and does happen. The basic principles of the CoRT lessons can be summarised as follows:

a. Each CoRT lesson is concerned with one thinking operation or process. This is central to the lesson and the whole lesson pivots around this. The attention of the students should be brought back to this process again and again.

b. The lesson provides definite practice for the central operation. The practice should consist of a number of items on which the operation is practised. A general discussion about one item is not much use.

c. With older children a time can be set aside for discussing the operation or process itself so that the students can become more directly conscious of it.

5. FORMAT

The lessons are usually conducted with the students in groups. The groups discuss the practice item and at the end of the allotted time the group spokesperson gives the output from the group. All this is done verbally, though the spokesperson may make notes on the ideas of the group so that they can be remembered more easily. Teachers may vary the format so that they are dealing with an open-class situation. They may then take suggestions and ask questions.

With an open-class format, there is no point in allowing thinking time since the students can do their thinking while another student is making a suggestion or answering a question. The discussion on each practice item can start as soon as the item has been explained. It is also possible to use a mixture of group and open-class. The students work in groups and then discuss things with the teacher on an open-class basis (i.e., the teacher can ask individuals within the groups for their thinking).

6. OUTPUT

The output is usually verbal both from groups and from individuals. In some cases the teacher may wish to construct on the blackboard a master list of all the ideas suggested. With older groups written outputs can be used. These can be produced by individuals in the course of a lesson (students are asked to write down their thinking on an item) or as homework or project work done outside the classroom. The written output can take the form of essays or notes. The notes may consist of numbered lists with a number for each fresh idea. The teacher may also give definite headings and ask the students to put something under each heading. For example the teacher may ask the students to put something under both the "information-in" (FI) heading and the "information-out (FO) heading.

7. OTHER MATERIAL

The teacher is encouraged to introduce other material into the lessons as source material. This applies particularly to CoRT 5. The new material may include pictures, film strips, tape cassettes, newspapers, TV stories, drama, etc. The teacher may also introduce material from other subject areas such as history, geography, literature, etc. Problems that affect one or another student can also be introduced.

Part Six

CORT USE FOR DIFFERENT AGES AND ABILITIES

There are some differences in the way the lessons are run with different classes.

We can consider the following basic types of use:

- 1 AGE GROUP 4 TO 12 YEARS - ELEMENTARY SCHOOL
- 2 AGE GROUP 12 TO 16 YEARS - JUNIOR HIGH SCHOOL
- 3 AGE GROUP 16 YEARS AND UPWARDS - HIGH SCHOOL
- 4 REMEDIAL GROUPS

1. ELEMENTARY SCHOOL

The material has been used with students over the age of 8. At this level, the effectiveness of the lessons depends very much on the motivation and skill of the teacher. There is no doubt, however, that the lessons can be used successfully with these young students.

The lessons are less self-running than at more senior levels. The teacher has to maintain the momentum and keep this going by encouragement and suggestion. On the other hand, the motivation and interest of students in thinking is very high in this age group. They really do get involved in the business of having ideas. They are much less inhibited than older students and much less bound by competition and other structures. The lessons should not be called games but should be treated with all seriousness.

One very successful teacher calls the lessons "Thinking Groups". The group size should be about 4-6 per group. The teacher reads out loud, elaborates and explains the lesson material because there may be reading difficulties in some of the groups. Nevertheless, the students are each given their notes to keep as usual.

A very important point is to use those practice items which are going to be of interest to the students. This is not always easy to predict with this age group, and the usual mistake is to underestimate their interest and give them only child-type problems.

They can get very interested in adult problems as well as those related to their own immediate worlds. In addition, there may be considerable interest in the science fiction type of problem.

Students of this age are often more interested in ideas as such than are older students who prefer the problems that relate more directly to their own world.

It is important to choose "rich" items where the student can easily picture the situation no matter how fantastic. The items should never be minimal ones which require the student to work hard before picturing the situation. With these age groups, the lessons can be taken quite slowly.

For instance, a lesson may consist of only two practice items and a general discussion. The discussion on the thinking process involved need not be separated but may be interwoven with the practice items.

At first, the principles section may be left out, but this can be added quite soon. If there is time, the project section is used as a group discussion item rather than as an essay. Initially, the students may spend all their time pursuing matters which are not very relevant and also mixing up the practice items.

The teacher need not worry too much about this as one of the most striking effects of the lessons is to train students to direct their thinking in a more focused manner.

Experiments in which students that have done some thinking lessons are compared to others that have not show very clearly that the lessons provide a framework which enables students to stick more closely to a problem instead of rambling from one subject to another.

Students do not mind the use of labels (PMI, C&S, etc.) and the teacher should not feel embarrassed about using them. Confusion is the main difficulty in learning, and the labels are there to prevent this. Since natural interest tends to be high at the elementary level, there is not much point in condemning ideas which seem way-out or trivial.

At this age, ideas as ideas have a value for students and to condemn ideas simply introduces inhibitions without helping in any way. The teacher should try and maintain a strong flow of ideas and pick out and emphasise those which seem especially good.

The three most important points for the elementary teacher to remember are:

1. Keep a high level of interest through choice of item and also interaction with the students.
2. Keep in mind the purpose of the lesson and the thinking operation that is the subject of it.
3. Do not reject ideas.

2. JUNIOR HIGH SCHOOL

At this age, the pressure of examinations is not so great as it is later, and there is therefore an opportunity to provide some basic groundwork in thinking. The important point is for the teacher to be deliberate and definite and to treat the subject in a serious manner. If the students begin treating the subject seriously, they are more likely to benefit from the lessons. At this level, the teacher may not be able to rely on naturally high interest levels but must provide a definite structure which the students can see and can work within. The pace of the lessons must be brisk and crisp rather than discursive and sloppy.

Teachers should be free with their encouragement and praise and seek to guide the lessons in this way. They must also be quick to tighten up the lesson if it shows signs of losing focus. At this level (unlike the elementary level), the teacher does not have to accept all ideas. Indeed, if teachers did so the students may not know what they are supposed to be doing.

Teachers can judge some ideas to be important, interesting, original, etc., and others feeble, trivial and irrelevant. It is not a matter of trying to force good thinking through criticism but of giving very clear guidelines. With this age group the lessons can be run in the intended manner.

Since the pace is to be brisk, it should be possible to cover all the practice items. The process discussion section and the principles should also be covered. Unless it is more than a single period, the project section should be left out but it could be used as an essay subject or in a similar way.

Each student is given his or her own set of student's notes to keep. Nevertheless, teachers should read out the practice items and try to enrich these. Choice of items will depend upon the teacher's assessment of their own classes.

The items may have to be more relevant to the students' own lives since the students, unlike elementary students, are not as interested in ideas for the sake of ideas. Indeed, it is in this age group that immediate relevance may be most important. Students do, however, live in worlds quite apart from their own lives.

For instance, through the medium of TV students are conscious of war, cops and robbers, and various other situations they may never actually meet. So the teachers' assessment of relevance must take into account not only the students' direct world but also the "second-hand world" derived from the media.

Fantasy is not as wide ranging as with younger students but is focused on fairly well defined alternative worlds. Political and social realism problems are possibly less applicable at this stage than at either the younger or older age levels. The teacher must also try to provide variety by altering the format of the lessons and allowing interaction between groups.

The important points for the teacher to remember at this age level are:

1. Keep the lessons serious, deliberate and definite rather than playing around.
2. Keep the lesson brisk and crisp.
3. Provide by example definite guidelines and objectives so that the students do not flounder.
4. Be quick to control facetiousness and laziness. If teachers feel that the class needs tightening up because the students have too high an opinion of their thinking skills, they may wish to use some of the test material provided.

3. HIGH SCHOOL

At this level, the material may be used in a number of ways. It may be used as part of Liberal Arts or General Studies programs. Some schools are using it as a core subject for Social Studies. The use of the material in high school classes introduces problems that are not apparent in the other groups.

At this stage, the students have already been exposed to several years of secondary education. They are used to definite subjects with a deliberate content and syllabus structures. They are used to individual achievement often on a competitive basis and are accustomed to being graded.

The most important point here is that the students should know exactly why they are studying thinking. They must not get the feeling that the subject is only time filler. Nor should they feel that the subject is only an adjunct to liberal arts and is not regarded seriously by the school. The above section on “perspective” is especially applicable at this age.

Suggestions for teachers

The teacher must set the scene for the lessons and must conduct them in a very business-like manner. At this stage, students tend to be very achievement conscious. The teacher must therefore make it possible for the students to know what they are trying to achieve and to feel that they have achieved it when they have. Ideas can therefore be judged much more critically than at other levels. Indeed, if ideas are never judged, the students soon believe that they know all there is to know about thinking. For the same reason, test material can be used very frequently. Because students are geared to individual effort and achievement, they should be given some tasks (for instance, the test material) to do on their own and not in groups.

When groups are used in the actual lessons, students should also be allowed to respond as individuals and not only through the group output. This always applies to the process discussion section and can also apply to the practice section during which individuals can add to the output of the designated group.

Students may, from time to time, be encouraged to suggest their own problems and thinking situations. For instance, teachers could collect such items from each member of the class and feed back the ones that seemed most interesting. At this stage, the choice of practice items call include items relevant to the student’s own immediate world, to the world they see around them, and also to more general social and political questions like environment, housing, politics, etc. Teachers can also require the class to tackle items which may not interest them directly. This is important because it should be possible to apply the skill of thinking to any problem, not just the ones that interest you.

Maintaining focus on the thinking process

With this group more than with any other group, there is a danger that the emphasis on the thinking process is lost as the students diverge into an interesting discussion on the content of one of the practice items. This is a very real danger and teachers must be able to prevent it. The lessons are not meant as topic discussions but as opportunities to develop thinking skill through directing attention to some aspect of the process.

Teachers must re-emphasise the process under consideration and keep bringing the students back to this. They must not be afraid of using the labels (PMI, C&S, AGO, etc.). When the CoRT material is used as a core subject for Social Studies it is even more important to use these labels since the tools involved can then be applied more directly to the other subjects in the programs.

The transfer effect is even more important in this case. Because this age group is more articulate, wordiness can be a problem. Teachers can reduce this in several ways. They can ask students to summarise their points, they can suggest a written output in note form, or subdivide the larger problems into smaller ones.

Instead of having each group tackling the same large problem, each may tackle some aspect of it. Test material and essay use of the project section can provide opportunities for students to write out their thoughts in full. The lessons can be run as intended.

The groups should be kept small, and if possible there should be no more than four students per group. Output from the groups is verbal but an output in written note form can be used more often.

More time should be allowed for the process discussion and principles section than at other age levels, even if this means reducing the practice items to two. In the principles section students may be asked to put in a principle of their own in addition to commenting on those given.

The project section should be used more freely in this group either during the lesson itself, if this is long enough, or else as an essay subject. During the lesson itself, critical comment from one group about the thinking of another group may be allowed. In general, the teacher can demand much more from students in this age group.

The practice items may seem simple but they are expected to be approached with sophistication and in depth. An answer that may have been very good at a younger age level may no longer be good enough at the high school level. The most important points for teachers to keep in mind are as follows:

1. The Students must know exactly what they are doing and why they are doing it.
2. Teachers must provide opportunities for the students to have a sense of achievement. (This includes use of the test material.)
3. Teachers must keep the emphasis on the thinking process being examined and must not allow the lesson to become a general topic discussion.
4. Teachers can expect a sophisticated treatment of the practice items.

In short, the students can be stretched, but they must know what they are trying to achieve.

4. REMEDIAL GROUPS

The structure of the lesson with these groups is rather different. The class must be small in size - about twelve is the limit. Instead of dividing into groups, the students sit in one group with the teacher in the centre. The lesson can become a discussion session on a practice item. The thinking process involved is woven into this discussion rather than treated separately. This also applies to the principles section, which is not treated separately and may even be left out.

Teachers may have to do a considerable amount of scene setting, prompting and questioning. Above all, they should be able to take a suggestion from a student and rephrase it so that it makes sense to the rest of the group.

Otherwise, good ideas that are badly expressed could get lost. The rephrasing also provides a model for the students to clarify their own thinking. Teachers should also take the trouble to link different suggestions together: "That idea is connected with Jim's idea to . . ."; "which of these two opposite ideas do you like best?"; "We now have two ways of doing this, one from Sally and one from Hector - can anyone think of a third?"

The main problem is distraction. Two students start a private conversation of their own. One student takes something that is mentioned casually and makes it a whole new line of thought. Personal anecdotes relating to the situation are very frequent. The main task of the teacher is to provide a framework for the ideas which is what is most lacking. The lesson material is not used in the usual way. Teachers pick out one or two practice items and these form the backbone of the lesson. The lesson is run as a discussion.

As suggested earlier the thinking process is woven into the discussion and there are not separate discussion and principles sections. The project section is not normally used but a project item can be given to the group to think about before the next session.

The important points for teachers are:

1. The teacher is the focus of the lesson and keeps things going by prompting, suggestions, questions, etc.
2. The teacher operates by encouragement rather than condemnation. In particular, the teacher rephrases suggestions made in order to give them the full value they deserve.
3. Distraction is controlled by firm re-statement of the problem and bringing back into the discussion those who have strayed out of it.
4. The main aim of the teacher is to build up a framework for the thinking of the whole group.

Part Seven

CREATIVITY AND LATERAL THINKING

Introduction

- 1 FIRST AND SECOND STAGES OF THINKING
- 2 PATTERNS
- 3 THE TOWEL MODEL
- 4 THE JELLY MODEL
- 5 THE PATTERNING DIAGRAM
- 6 THE PURPOSE OF CREATIVITY

Introduction

Creativity is a word that covers a great deal. Artists are said to be creative because they do not imitate but produce something new. Yet many artists may simply be using their old style of perception to look at new things. With other artists both the style and the subject matter change. Inventors are said to be creative if they come up with a new invention which works.

Scientists are said to be creative if they make a new discovery. The common element seems to be the production of something new. In many instances such as those above there may be little flexibility and no change of ideas. An artist may be quite unable to see things in a new way.

An inventor may be quite unable to approach inventions in a new manner. A scientist may be quite inflexible in changing his or her ideas. Lateral thinking is specifically concerned with the generation of new perceptions and new ideas.

Lateral thinking involves changing perceptions and flexibility. There is an overlap with creativity since both are concerned with producing something new, but lateral thinking is a more precise definition of the process of changing perceptions: changing the way we look at things.

If a person produces something new that is not good, he/she is not considered to be creative. Use of the term "creativity" is usually a value judgment of a result. Lateral thinking, on the other hand, is a process. A result can only be admired but a process can be practiced and used. Sometimes a person may use lateral thinking and not come up with anything useful.

Lateral thinking is also different from divergent thinking, though again there is some overlap. Divergent thinking is only part of the process of lateral thinking. Lateral thinking is not just concerned with generating alternatives but with changing patterns, with switching to new and better patterns. The end product of lateral thinking is insight, not multiplicity of alternatives. In spite of the above remarks the general term “creativity” is used throughout this guide and in the CoRT 4 lessons. This is because it is the more common term and there is no point in insisting on “lateral thinking” as a more precise term.

1. FIRST AND SECOND STAGES OF THINKING

The second stage of thinking is the “processing” stage. Over the years we have developed many excellent techniques for dealing with the second stage of thinking mathematical processes, algorithms, logical selection and progression, etc.

But the second stage can start only when we have decided how we are going to look at the situation: when we have chosen our concepts and accepted our perceptions. But accepting our perceptions and choosing our concepts occurs in the first stage of thinking. Often this stage is called “perception” and it covers the way we look at things, the way we approach things.

Traditionally, this stage has been left to chance, habit and experience because there has not seemed to be an alternative. This perception stage of thinking is the patterning stage and it is a change in patterns at this stage which gives rise to creativity. When people are given the task of designing a dog exercising machine, the results tend to fall into predictable groups.

There are those who suggest a sort of motor-driven conveyor belt with the dog running against the direction of movement. Others suggest a treadmill with the dog inside. Some suggest a harness from which a bone dangles a few feet in front of the dog’s nose. Many suggest some sort of temptation device which might consist of a cat in a tree (dog jumping machine) or a ball thrown by its master.

Most of these are ways of making a dog exercise. On one occasion a youngster of about seven turned up a completely different concept. His dog was towing, by means of straining in a harness, a rather heavy cart. The cart was heavy because it carried a car battery. From the battery two wires led to an electrified prong positioned a few inches from the dog’s rump.

The child indicated that if the dog stopped, the cart (being heavy) would run into it and make the dog go again. In other words this young designer was not concerned with making the dog exercise but with preventing the dog from stopping. This is an excellent example of a change in the first stage of thinking.

2. PATTERNS

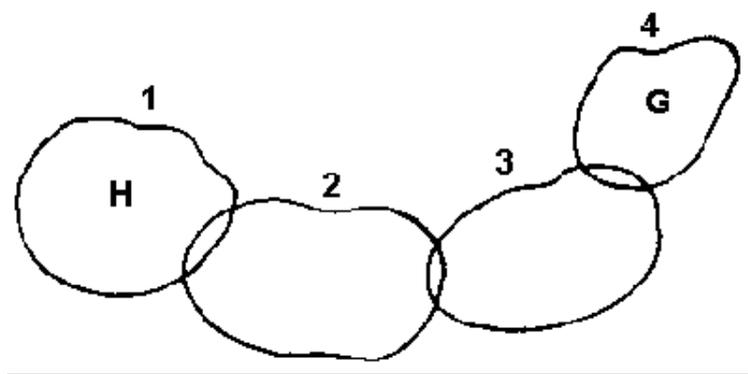
The mind operates to make sense of the world around it by creating patterns. A pattern is simply a putting together of things so that one thing leads to another:

A picture of a cup leads to the word “cup” and also the notion of drinking; the shape of a square leads to recognition of the word “square”; the letters “c-a-t” lead to the sound cat and perhaps a mental image of a cat. There is nothing mysterious about patterns. A pattern simply means that one thing is more likely to follow another than would be indicated by chance. Those who want to read about patterns in detail, and in particular their formation, should read the author’s book *The Mechanism of Mind* (Jonathan Cape, London 1969, and Penguin 1985, London).

A much simplified description of the formation of patterns is given below.

3. THE TOWEL MODEL

A small towel is laid out on a table. A bowl of ink is placed nearby and from time to time a spoonful of ink is taken from the bowl and poured on to the towel. The ink leaves a stain on the towel. When a number of spoonfuls of ink have been placed on the towel there are a number of stains as shown in the diagram.



In this simple model the towel represents the memory system or recording system and the ink input represents incoming information.

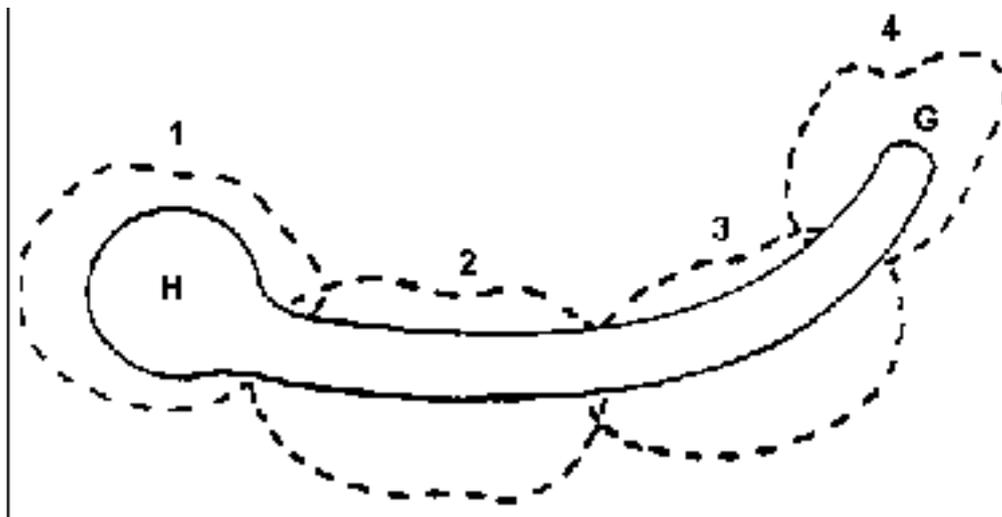
At the end of the process the towel carried a good record of all that has been done to it. You can look at the towel and tell at once where the spoonfuls of ink had been placed. To use the information found on the towel, an outside processor is necessary. This is the classical view of the mind and of computers: a memory storage system and a separate processor that uses the memory.

4. THE JELLY MODEL

The jelly model is very different from the towel model. Instead of the towel the recording surface consists of a shallow dish of jelly or gelatine. This time the bowl of ink is heated up. When a spoonful of hot ink is poured onto the gelatine surface the exposed surface dissolves.

The hot ink, however, soon cools down and no more gelatine is dissolved. When the fluid is poured off a shallow depression is left in the surface of the gelatine. This corresponds to the ink stain in the towel model and is the memory or record of ink input. So far the models appear to be similar.

But if exactly the same sequence of spoonfuls of ink are placed at exactly the same places the effect is very different. In the gelatine model a channel forms. This is because hot ink flows into the existing depression and makes that even deeper, leaving a shallow impression at the point of application. The next spoonful flows into the preceding depression and on to the first depression ... and so on. At the end there is a channel eroded across the surface of the gelatine.



The two systems are actually very different. In the towel model information stays where it has been placed: a "G" input stays at G and, "H" input stays at H. But in the gelatine model a "G" input flows along the channel and ends up in the same place as an "H" input. In other words a pattern has been formed in the gelatine model and one input leads directly to another.

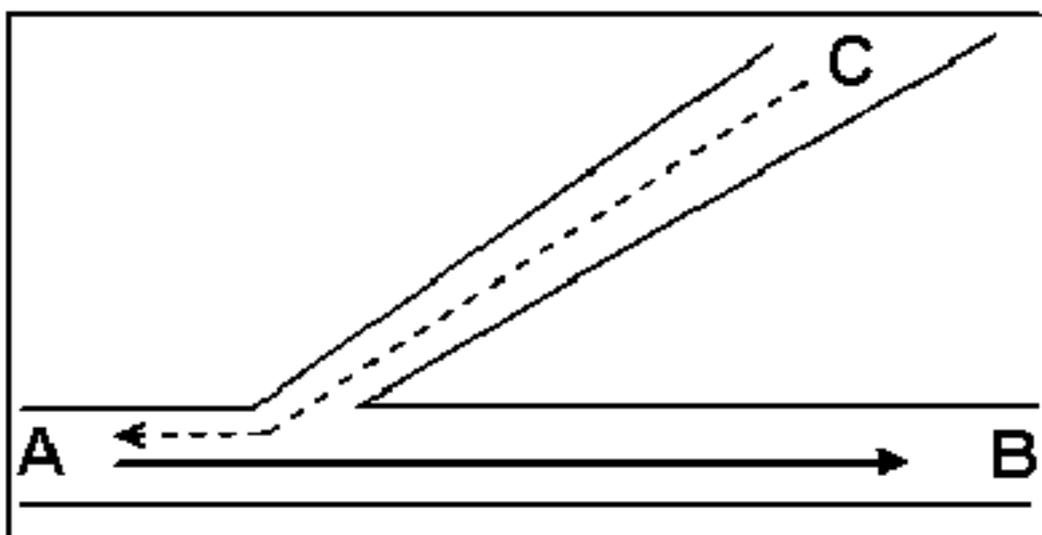
In fact the jelly model is a pattern making model because it creates a pattern from an input of information. It does this by means of making use of the sequence of the input. If the sequence is changed then a different pattern forms or no pattern at all. In terms of perception all the evidence indicates that the brain works as a patterning system.

Indeed humour and insight would be impossible if it did not. Of course in the brain there are nerve networks and synaptic connections instead of gelatine but the patterning process is similar (as far as we know).

5. THE PATTERNING DIAGRAM

The basic patterning diagram is shown below. A pattern is represented as a road. The degree of establishment of the pattern is represented by the width of the road. The rules are very simple. At every moment you tend to follow the wider road (the most established pattern).

Creativity involves getting to point "C".



If you start at "A" you tend to go along to "B." But if somehow you manage to get to "C" then in hindsight you can see at once how you could have reached "C" from "A." It is precisely because of this process that humour and insight occur. In humour you follow along a path until suddenly you find that you are on the wrong path and at once you see, in hindsight, the turn you missed.

With insight you suddenly find a new way of looking at the problem, and in hindsight it seems very obvious. At Wimbledon there are 111 entrants for the singles tournament which is, of course, played on an elimination basis. What is the minimum number of matches that would have to be played?

When people are given this problem they usually put pencil to paper and try and work out how many matches will be in the first round and how many byes, etc. Yet with a change in approach the problem can be solved in a few seconds without pencil and paper.

If we shift attention from producing the winner to producing the losers we find that we must produce 110 losers. Since every match must produce just one loser the minimum number of matches must be 110.

Some groups of children were told that each person in each group should touch the ceiling for five seconds. A prize would be given to the group that took the least time. There were six children in each group. The first three groups proceeded by appointing two lifters and the rest of the children were lifted up in turn and finally the lifters themselves were lifted up.

The last group hit on a simple insight solution. They divided into two groups of three and in each group two children lifted the third in rotation. They accomplished the task in half the time taken by the other group. In hindsight their approach is very obvious. But it was not obvious in foresight.

6. THE PURPOSE OF CREATIVITY

In these lessons the purpose of creativity is to come up with new approaches and new ideas which work. The need for creativity or lateral thinking arises from the patterning nature of perception. In our perception and thinking we follow along the tracks established by experience. If we can somehow manage to escape from these tracks we may find other tracks which in hindsight are very obvious and which have been there the whole time.

Part Eight

MAIN VIDEO CONTENT ON WEB SITE

Clicking on the Training Videos brings up the following video selections:

Training video 1 An introduction to CoRT (Duration 7 min)

Training video 2 CoRT 1 (Duration 5 min)

Training video 3 Bringing CoRT to your school (Duration 10 min)

Training video 4 How to teach CoRT (Duration 29 min).

Training video 5 Decisions lesson Using CAF and FIP. (Duration 24 min)

Training video 6 Ashbrook Firsts. A PMI lesson. (Duration 21 min)

Training video 7 Holy Spirit School. An OPV lesson. (Duration 13 min)

Training video 8 Dealing with non cooperation. (Duration 3 min)

Training video 9 A scenario based OPV lesson. (Duration 5 min)

Training video 10 Teacher Training Day Introduction (Duration 28 min).

Training video 11. Teacher Training Day Some Tools Part One (Duration 20 min)

Training video 12. Teacher Training Day Some Tools Part Two (Duration 28 min)

Training video 13. Teacher Training Day Some Demonstrations (Duration 42 min)

Part Nine

A) THE TEST MATERIAL

- 1 PURPOSE OF THIS MATERIAL
- 2 WHEN TO USE THE TEST MATERIAL
- 3 HOW TO USE THE TEST MATERIAL
- 4 ESSAY TYPE
- 5 CRITICISM TYPE
- 6 ASSESSMENT
- 7 EXPERIMENT
- 8 RESEARCH

1. THE TEST MATERIAL SERVES THREE MAIN PURPOSES

a. Individual:

During the thinking lessons, the students work in groups and do not get much chance to work as individuals. The test material gives them this chance. It also gives them enough time to work over a problem more fully than is possible during the lessons.

b. Achievement:

Some students are apt to believe that thinking is natural and that their own thinking is perfect. The test material provides an opportunity to see whether this is indeed the case. The material is a means of tightening up the lessons. Conversely, the test material provides an opportunity for students to demonstrate achievement and to practice the thinking skills they have learned during the lessons.

c. Effectiveness:

The test material provides a means for teachers to assess the effectiveness of their own teaching.

2. WHEN TO USE TEST MATERIAL

There are two main uses of the test material:

a. Interspersed.

:

With high-achieving students, older students, and students used to tightly structured subjects, the test material can be interspersed with the lessons. This is especially necessary when the lessons appear to lack purpose in the view of the students. Use of the test material after every third or fourth lesson would be appropriate.

b. Experimental:

This is to test the effect of the lessons on the students. In this case, material usually would be used at the beginning of the course and again at the end. It

Could also be used at the beginning and then after a particular lesson.

3. HOW TO USE THE TEST MATERIAL

Time and place

:

In schools where it is customary to give students material to work on in their own time, the test material can be used in this way. Otherwise, one of the thinking lesson periods may be given over to the test material. It is not advisable to try to tackle a full thinking lesson and also test material in the same period (unless it is a double period).

The test material can also be used as essay material and therefore can serve a dual purpose. In this case, it would be administered in the usual way essays are administered. Time allowed for the test material would vary from 15 minutes to 35 minutes depending on the nature of the item chosen.

Output:

The student's test output is always written otherwise it would be no different from the thinking lessons themselves. For this reason the material is not suitable for younger children or remedial groups.

The written output can take two forms:

1. Essay:

Students write down their thinking in essay form. Obviously students work as individuals.

2. Notes:

Individuals or groups can put down their output in written note form.

The test material: Test material can come from various sources.

1. The project items in the lessons can be used for the essay type of test.
2. Teachers may wish to make up their own problems.
3. A further selection of problems is given below.

4. ESSAY TYPE

Below is a selection of items which can be used for the essay type test material. These are in addition to the unused project items from each lesson which can also be used.

Should students inquire whether they are supposed to use a PMI CAF etc, they can be told to do as they think fit.

1. What do you think of the idea of having weekend prisons for minor offenders?
2. Should students be part of the rule-making process in schools?
3. What do you think of the idea that students should be paid a small wage for going to school?
4. There is a suggestion that when graduating from high schools, students should spend one year doing social work (e.g. helping old people, hospital work, cleaning up the environment). Do you think this is a good idea?
5. A boy is trying to decide between a career as a teacher or a law officer. How should he make his decision?
6. A grocery is losing so much money that the store owner may soon have to close the store. Why do you think the store is losing so much money?
7. It has been decided to teach students by internet at home, instead of having them attend schools. Do you think this is a good idea?
8. There is a new type of vacation in which you earn money in the morning and enjoy yourself the rest of the day. What is the purpose behind this idea and what do you think would happen?

9. What would happen if young people, adults and old people had to abide by different laws?
10. Should people be subject to a dress code?
11. If about half the people dislike some law can it still be a good law?
12. How often should rules be changed and who should ask for them to be changed?
13. Gasoline rationing is introduced. Why do you think this might happen and what would happen as a consequence?
14. What do you think of the idea that students should be able to leave school as soon as they can read and write?
15. Because of increasing mechanisation, there comes a time when everyone retires at 40 so that there are enough jobs to go round. What effects will this have?
16. A new type of marriage that only lasts for three years is suggested. Is this a good idea?
17. Should a Company making shoes change the style as often as it can?
18. What do you think are the objectives and priorities of people running TV Companies?
19. A man is found to have stolen a large number of left shoes. What do you think he is up to?
20. An architect declares that he prefers to build ugly houses - why?
21. The government decides to raise the minimum age for leaving school to 20. Discuss this idea.
22. The police are given different coloured hats to wear (red, blue, green, etc.). What is the point of this?
23. Someone tells you that someone else is saying nasty things about you. What should you do?
24. If you were in the government and had to raise money by taxation, which things would you choose to tax?
25. Would it be a good idea for political parties to choose all women candidates rather than men?
26. A city council decides to remove all traffic lights in its city. Discuss this idea.
27. If you had to choose, which would you prefer: to be smart, to be hard-working, or to be well-liked?
28. If you wanted to make lots of money, how would you set about doing it?
29. If you were a parent, would you allow your children to smoke, and if not why not? What are the arguments on each side?

5. CRITICISM TYPE

In the essay type of material, the students are asked to generate ideas about a situation. In the criticism type, they react to ideas which someone else has generated.

Some possible examples are given below.

If teachers wish to generate further examples of their own, they should not try deliberately to include mistakes but should set down a piece of thinking and allow the students to point out the mistakes.

Topical items can be used here.

1)

“A medical school decides that since the world needs more doctors it would be better to make the medical course shorter and easier. This would mean that some of those who become doctors would not know as much as before, but this risk would have to be taken.”

Criticise the thinking involved here.

2)

“The school board agreed that there were some things which young people understood better than their elders. So they set up a body of young people to advise them. But these young people were invited from other schools because the school board did not want the students to make rules for themselves.”

Criticise the thinking involved here.

3)

“A town council decided that traffic congestion was getting very bad and that it would cost too much to try to reverse it. So they remove all restrictions on parking and actually encouraged more cars to drive into the city. Their idea was that things would get so impossible that people would soon stop trying to drive into the city.”

Criticise the thinking involved here.

4)

“In order to reduce the cost of living the government increased the tax on cigarettes and alcohol but introduced a subsidy for meat and bread.”

Criticise the thinking involved here.

5)

"A Company decided that research was too expensive. So instead of doing their own research they waited for other people to make new discoveries and then either borrowed the ideas or bought the company involved. This way other people took the risk."

Criticise the thinking involved here.

6)

"A principal decides that his students are not working hard enough, so he insists that each week the students must take a test. If the students in a class do badly in the test, then the whole week's work has to be repeated."

Criticise the thinking involved here.

7)

"A boy is confused over which girlfriend he really likes best, so he pretends to be bored with both of them. He reasons that if he does not see either of them he will soon be able tell which one he misses most."

Criticise the thinking involved here.

8)

"A girl leaving school has to choose a career, so she writes down on a piece of paper all the things she likes. She then asks her parents to write down what they think she will be good at. She then sees how the two lists compare. Those items which occur on both lists she puts in a hat and draws one out."

Criticise the thinking involved here.

9)

"A doctor finds that he has too many patients to handle. He thinks this is because his patients are always bothering him with matters that are not very serious. So he invents a very bad-tasting medicine which he gives to everyone of his patients no matter what illness they have."

Criticise the thinking involved here.

10)

"A company makes a point of employing only people who are smart but not the smartest. The company says that the smartest people are not used to working hard and will not take orders from someone less intelligent than them."

Criticise the thinking involved here.

11)

“Leaders of a certain union are about to make a wage increase demand. They know these will get all they ask for. They also know members of their union do not like strikes. So they ask for a very large wage increase - that way, if it comes to a strike there will be something big to strike about.”

Criticise the thinking involved here.

12)

“Because newspapers find that bad news is more interesting than good, it is suggested that there should be a tax on bad news so that only the bad news that was really important would be published. Then people would get less depressed.”

Criticise the thinking involved here.

6. ASSESSMENT

What happens to the test material output? The teacher will want to make some sort of assessment which can be used as a basis for a class discussion. The main basis for such an assessment would be as follows:

A. Comprehensive:

By looking through all the outputs, teachers can get a good idea of the important points. They may also have some of their own which no one had mentioned. The emphasis here is on whether the main points have been touched upon or left out.

B. Organisation

:Although a rigidly structured organisation of ideas is not desired, the ideas should be presented in some sort of order and with clarity

C. Interest:

Sometimes, one student may bring up a point which though not a major point is novel and interesting. This is given credit so long as it is relevant.

D. Opinion

Teachers may disagree with various points raised. They should voice this disagreement (not to the extent of saying that the other point of view must be wrong, but by saying that they do not agree).

E. Thinking process:

The deliberate or implied use of a particular thinking process can be commented on. Similarly, failure to use a process can also be commented upon. For instance, if someone fails to pay any attention to consequences, this can be noted. This sort of thing can be done by comparison between individual outputs or on a group basis.

7. EXPERIMENT

There are two main ways in which the test material can be used for experimental purposes in order to see what difference the lessons have made to the thinking of the students: control groups and crossover.

Control Groups

In schools where one class is doing the thinking lessons and a parallel class is not, then it is sometimes possible to give the same test items to the two groups and then compare the output. This can be done in the form of an essay. Naturally, the group which has done the thinking lessons should not be given any special instructions to remember them.

Crossover

Here the class serves as its own control group. One half of the class tackles test item A and the other half test item B. Later the two are reversed and the group that tackled item A now tackles item B. In this way the effect of the lessons on tackling both A and B can be seen since there are before and after results for each item. For instance, the first stage of the crossover can be done before any lessons are given and the second stage at the end of the term.

8. RESEARCH

The most important thing about the lessons is that they should be effective in developing thinking skill. There are three main ways in which the teacher can help:

Observation:

In the course of running the lessons, the teacher cannot fail to notice certain things: how the students react, which lessons work best and which worst, the types of responses, difficulties, points which arouse most interest, the type of problem liked best or least.

Observations may be of a general nature and apply to the atmosphere of the class or the general performance of the students. But observations can also be much more specific and be about individuals.

For instance, one teacher noticed how a boy who was on the verge of being sent to a remedial group suddenly brightened up in the thinking lessons and became the leader and spokesperson of a group that contained the brightest students in the class.

Variation

:

The teacher may decide to alter the way the lessons are run. These alterations may apply to the basic format or individual practice items. If these variations work, it would certainly be most useful to hear about them. There are, however, two dangers.

The first is that the teacher tries alteration after alteration just for the sake of this. The whole thing can become very gimmicky and the students thoroughly confused.

The second danger is when the variation results in a lesson which might be very interesting in itself but is only remotely connected with teaching thinking as a skill. This can easily happen with general discussion lessons, role-playing, debates, etc.

The most useful sort of variation is when the teacher notices something that works particularly well during a lesson and then tries to introduce this deliberately as a variation.

Output:

Students' individual comments can be reported back, as they are often very revealing. One school had its students do a PMI on the thinking lessons themselves and this was a very good idea. Written output either in note form or essay form from tests or from ordinary lessons can also be sent. So can video-recorded discussions.

Whether teachers use the test material and format suggestions in this site or devise their own, the results would be of great research interest.

Results may not seem to be important to the person sending them, but when put together with results from other Schools they may help complete the picture. No one should be timid about sending material, no matter how inadequate it may

Part Ten

CORT TOOLS: THEIR USE AND UNDERSTANDING

THE CORT TOOLS

- 1 USE OF THE TOOLS
- 2 PHILOSOPHY
- 3 CONFUSION
- 4 SUBJECTIVITY

1. USE OF THE TOOLS

The understanding of a tool is not the same as the use of a tool. You may understand how a chisel works and yet be poor at sculpture. You may understand how a frying pan works and yet be poor at cooking. You may be a good driver and yet not understand how an internal combustion engine works. The whole of our educational training is directed toward the idea that understanding has to come first and then use will follow. Unfortunately this is not necessarily so. Everyone understands how to list the pros and cons of a situation. Everyone understands the purpose of doing this and the usefulness. But this understanding is not at all the same as actually carrying out the process. That is why the very first CoRT Thinking Lesson sets up the PMI (Plus, Minus, Interesting points) as a definite operation or tool. Once this tool has been created and defined it can then be practised.

One girl age ten went home to find her parents discussing whether or not to buy a freezer. She sat them down around the kitchen table and made them do a PMI. They decided they did not need the freezer. Another young girl had wanted to have her long hair cut off. When it was cut off she became very upset and tearful and locked herself in her room. In the morning her parents expected her to emerge in a sulk but instead she was happy and cheerful. She explained that she had done a PMI on the shorter hair and liked it as a result.

In each story the girl could use the PMI as a thinking tool. This was because she had practised the PMI as a deliberate tool - not because she understood the philosophy behind a PMI.

2. PHILOSOPHY

Many teachers complicate the CoRT Thinking Lessons for themselves and for their students by putting far too much emphasis on the philosophy behind each CoRT process. Invariably philosophy ends up as tight definitions. Much time, trouble and mental effort is then spent trying to decide whether something fits into one definition or another. This is not the way the CoRT operations have been set up. They are designed to be usable tools not philosophical definitions.

For example, in CoRT 1 several teachers create problems with PMI and CAF (Consider All Factors) by saying the PMI is really part of CAF since CAF includes all factors and PMI puts a judgement on some of the factors.

Similarly they maintain that C&S (Consequences) is also part of CAF since the consequences of an action are among the factors that ought to be considered. All this is philosophically and logically valid or at least arguable. But it misses the point of the CoRT tools and serves only to confuse the students.

The real purpose of PMI is to get students to consider the points opposite to their initial emotional reaction of judgement. The real purpose of CAF is to get students to determine whether they have left out of consideration some important factors that ought to be looked at.

The real purpose of C&S is to get students to look at future consequences of actions and decisions. Each tool is an attempt to direct attention to an area that might not otherwise be considered. Logically you could put C&S under CAF but that would not help if consequences were still left out of consideration. That is why it has a heading of its own. With the CoRT lessons, it is the perceptual structure that matters, not the logical structure.

3. CONFUSION

Some teachers create confusion by showing how one thing can really fit into two boxes. For instance one boy said that a yellow car would be a plus point for his father because it would be safer but a minus point for the boy himself because he would have to clean it more often. Since a PMI is done from one person's subjective point of view, the confusion need not arise.

Similarly with the guessing lesson the division into small guess (SG) and big guess (BG) is arbitrary. At the extremes a small guess is quite obvious (that the lesson will end at the appointed time) and so is a big guess i.e. (guessing the winner of a horse race without a strong favourite). But in the middle there must be a large degree of overlap (guessing the winner of a horse race with a strong favourite). One person might put something down as a small guess and another might put the same thing down as a big guess. This really does not matter.

The boxes are not judgement boxes but attention directors which have the purpose of getting students to look at the probabilities involved in the guess. It does not matter so much what they decide so long as they have looked in this direction.

4. SUBJECTIVITY

The CoRT operations are subjective, not objective. If one person thinks a yellow car is attractive, then yellowness is a plus point. If another person thinks a yellow car is ugly, then yellowness is a minus. Both are correct.

It would be wrong for the teacher to try to show that the general consensus would be to consider yellow attractive. Students might say that they do not like yellow and therefore it is a minus point but if most people like yellow and buy yellow cars it could also be a plus point (from the manufacturers' point of view). The point of view would, however, need to be stated.

If one student sees something as a small guess (passing some exam) but the student's parents see the same thing as a big guess then both are entitled to their view. Both can of course produce evidence in favour of their own view and challenge the other view.

The important point is that the CoRT operations are tools to direct attention and this is subjective. They are not judgement categories with a value. There is no such place as "right" or "left" - there is only a person who can look to the right and left and describe what is seen.

Summary

CoRTthinking.com is an online system that can effectively give teachers and parents the resources, Information and Skills to bring thinking lessons to their students and children. Thinking is the foundation on which our society is built. Innovation and creativity are the cornerstones of our future. The deliberate teaching of thinking is imperative to a modern education syllabus.

CoRT thinking Online (cortthinking.com)

1. The Teachers Guide to teaching CoRT.
2. Hours of Inspirational Videos Explaining the background to teaching thinking and CoRT.
3. 3 Hours of teacher training videos with de Bono Master Trainer Nigel Newman.
4. 2 Hours of CoRT lessons in action
5. Online and Printable Teachers Notes for each CoRT Programme
6. Online and Printable Students Notes for each of the 60 Lesson.

CoRTthinking.com has everything a teacher needs to bring CoRT lessons to their students. The instructional videos remove the need for training days which reduces cost and speeds up deployment of the CoRT programme.

Easy to implement

Now it's Easy to implement the CoRT programme without needing to train every teacher in CoRT. Our remote training system. Encourages, Supports and Enables the teacher to begin teaching thinking quickly and effectively.

A Greener Solution

Teachers and Students do not need to print all their materials if there is access to computers. Because you can print as you go there is no wastage .

Completely Scalable

A school can begin with one class. Then as the school begins to see the value of the thinking lessons they can expand organically. The online video based learning allows schools to train teachers at different times. As the teacher has it. This is easier than organising teacher training days. These teachers can decide on their strategy in bringing CoRT to their class. They can either read the teaching material online or through a digital e-book reader, or print off their notes. The choice is theirs.