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ABSTRACT
            This set of materials incorporates research
information for everyone interested in education: teachers,
administrators, students, lecturers, and actively involved parents.
Included are leaflets and brief reports designed for a quick read,
private study, staff meetings, in-service courses, or small group
discussions. This package contains 14 research studies: "The
Greenhouse Effect" (Ann Henderson Sellers and Russell Blong);
"Children's Attitudes to the Natural Environment" (Theo Gerritsen);
"Teaching Money Making" (Scott Holmes, Penelope Hanley, and Mark
Jackson); "How Young Pupils' Memories Work" (John Morton);
"Solving--Not Solving" (Roger Dominowski and Linda Buyer); "Working
With Children Who Have a Life-Threatening Illness" (Ruth Still);
"Accommodating At-Risk Pupils" (Sandra Miller, Gaea Leinhardt, and
Naomi Zigmond); "What Do Teachers Do All Day?" (Roger Peddie); "From
Disadvantaged to Advantaged" (Peter Munn and June Stephenson); "A
Role for Print Literacy in a Free Communications Market?" (David
Marc); "Dealing with Procrastination" (Bill Rogers); "Exemplary
Teaching" (Colin Boylan, David Battersby, Andrew Wallace, John
Retallick, and John Edwards); "Parents Teaching in Schools"
(Jacqueline McGlip); and "Evaluating Learning in Mathematics" (Ken
Carr and Garth Ritchie). (LL)

set

NUMBER ONE 1991

BROADSIDE HIGH ENTERPRISE DAY

item 1

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Contents

THE GREENHOUSE EFFECT

WHAT DO WE, AND OUR PUPILS, NEED TO CONSIDER?

Ann Henderson Sellers and Russell Blong
Macquarie University

Global Warming

THE GREENHOUSE EFFECT is a popular term for the reasons why the earth is warming up. It is a bit of a misnomer because the earth is a better greenhouse than most greenhouses!

The facts are that energy radiates from the sun. Energy with short wavelengths, mostly in the form of visible 'sunlight', passes through the atmosphere and is absorbed by the surface of the earth. This absorbed energy warms the surface so that the earth itself radiates heat. Energy at heat wavelength is absorbed by the 'greenhouse gasses' in the atmosphere, mainly carbon di-oxide, methane and the industrially derived chloroflurocarbons (CFCs) from spray cans and refrigerators.

These gases themselves then become warm because they are absorbing energy and they begin to radiate heat. Some escapes into space, but some travels back down to the earth's surface, and adds to its warming. It is this 'extra' heat arriving at the surface from the 'greenhouse gasses' that gives us the greenhouse effect.

The ozone hole

The ozone layer is quite a different matter – it protects us from harmful ultra-violet (UV) sunlight by absorbing it. The ozone layer, and the thinning of it called a 'hole' has few, if any, links with global warming. However, some of the same gases are involved – the CFCs (and halogens in fire extinguishers) as well as absorbing heat, also destroy ozone. Possible links between greenhouse warming and ozone depletion are discussed later.

Figure 1.
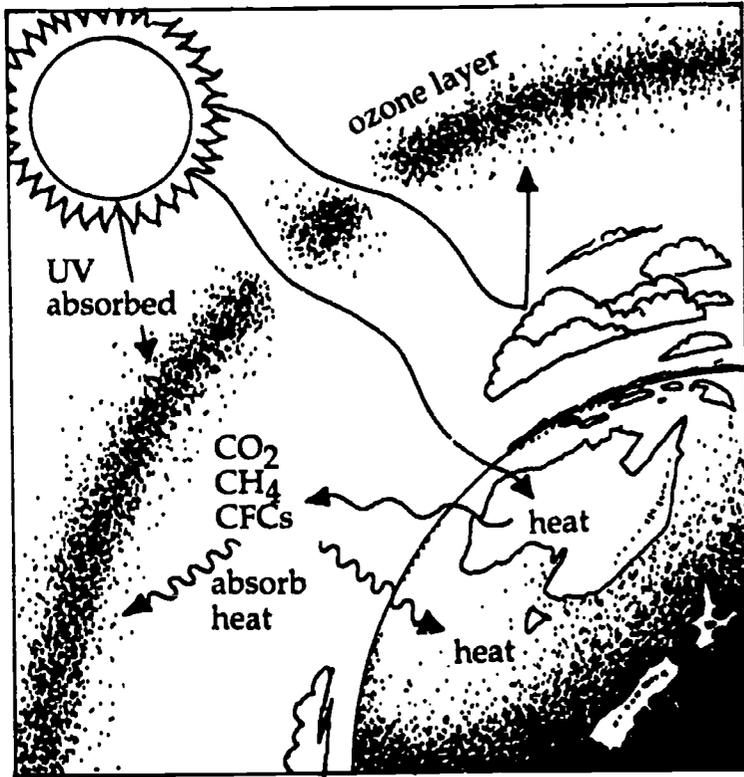
What the public knows

In Australia there was a two-year media and public awareness campaign about the greenhouse effect. The result is that there is probably a greater awareness of greenhouse issues in Australia than in any other country in the world.

In 1987 a group of scientists led by Dr Graeme Pearman of CSIRO and the Commission for the Future organised a meeting at Monash University at which many scientists, planners and social scientists made presentations about the likely changes in Australia associated with the greenhouse effect. This meeting was entitled 'Greenhouse 87' and produced considerable media and public interest. The papers presented at this meeting were edited by Pearman and published by CSIRO under the title *Greenhouse: Planning for Climate Change*. This provides the most comprehensive details of greenhouse effects in Australia and has suggestions for future planning. It is recommended as a basic source of further information.

The Commission for the Future decided that the greenhouse debate should be taken to the public. A year later the Greenhouse 88 meetings were organised in every state in Australia. These meetings extended over three days and included a nationwide television linkup and a question and answer session around the country.

A questionnaire survey and an associated study followed up the meetings held in Sydney and Adelaide. It is this research which is detailed here.

Concerns: the questions we asked

Do people think the evidence for global warming is convincing? What do they think will be its likely impact upon their lives and the lives of others? We asked, for example, 'How convinced are you of the truth of the greenhouse effect?' Figure 2 shows the distribution of the responses to this important question. There were 321 people questioned. None believed the greenhouse to be either 'unlikely' or 'impossible' and only twenty thought it 'no more than likely'. These respondents were a self-selected group of interested, concerned and reasonably well-educated people. Nonetheless no-one considered that the greenhouse theory was wrong.

Figure 2.

Respondents' views on the 'truth' of the greenhouse effect for all respondents and (shaded) the responses of the 120 'more scientifically knowledgeable'.
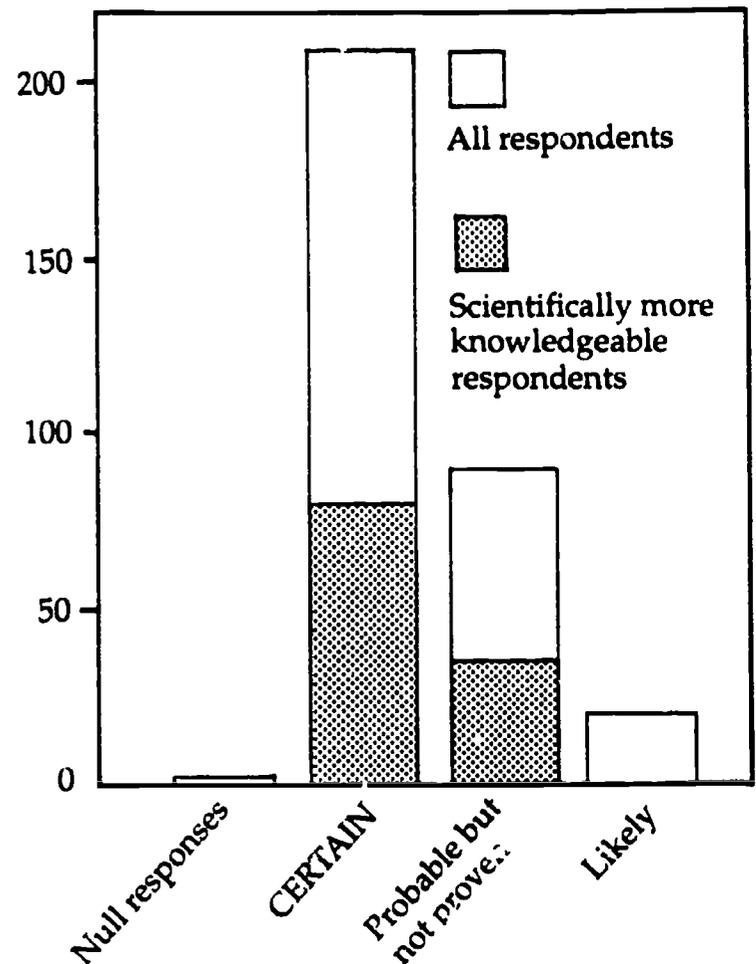
The questionnaire contained some searching questions on how much of the science the general public really understood. One asked them to indicate which chemical compounds they believed to be a cause of the greenhouse effect. They were invited to tick only those which they were sure about. Four were carbon dioxide (CO_2), nitrogen (N_2), methane (CH_4) and CFCs. The second of these, nitrogen, the majority gas in our atmosphere, does not absorb heat so does not contribute to the greenhouse warming. Only 120 of the 321 correctly left nitrogen out of the list. This group, who might be termed scientifically more knowledgeable, were identified and some of their responses are interesting to consider separately. For example all of them believe the greenhouse effect to be either certain or probable.

We were especially interested to try to find out how everyone viewed life 'in the greenhouse', so we asked how they believed climatic changes would affect life for them, or for their children. They were asked to say whether life would be better, the same or worse, at one snapshot point in time, that is, in the year 2030 AD. The majority response in all age groups was that life will be worse in the greenhouse. The most pessimistic age group were those in the

40-55 age range, but the younger respondents (25 and under) came in a close second. Only two percent under 25 believed that life will be better in the future. In the most optimistic age range (those older than 55), 9.3 percent believed that life would improve. The overall sense from this survey is that life will become more difficult and generally worse in the greenhouse era.

Very few people think, initially, of the greenhouse effect leading to deaths. But when asked specifically many of us recognise this as a distinct possibility. Generally people perceive the likelihood of deaths in Australia as smaller than the likelihood of deaths overseas. There is agreement across the age groups with the youngest and the oldest groups marginally less pessimistic than those in the middle age groups. This makes an interesting contrast with the previous results.

Less dramatic than people dying, but still important, are issues such as

temperature increases of about 4"C
higher sea levels
flash flooding
the need to change agriculture
reduction in use of fossil fuels
increased use of nuclear fuels
the impact on Australia's world market share
the increase in tropical diseases in Australia

We asked for a level of concern about these topics on a scale ranging from *very concerned* to *not at all concerned*. Perhaps not surprisingly the single largest vote in the *very concerned* category was made in relation to the predicted increase in nuclear fuel use (Figure 3). Many respondents added footnotes elaborating on this concern. Other major concerns included the reduction in use of fossil fuels, higher temperatures and raised sea levels.

Figure 3.

Level of concern registered on a scale from not at all concerned *to* very concerned.
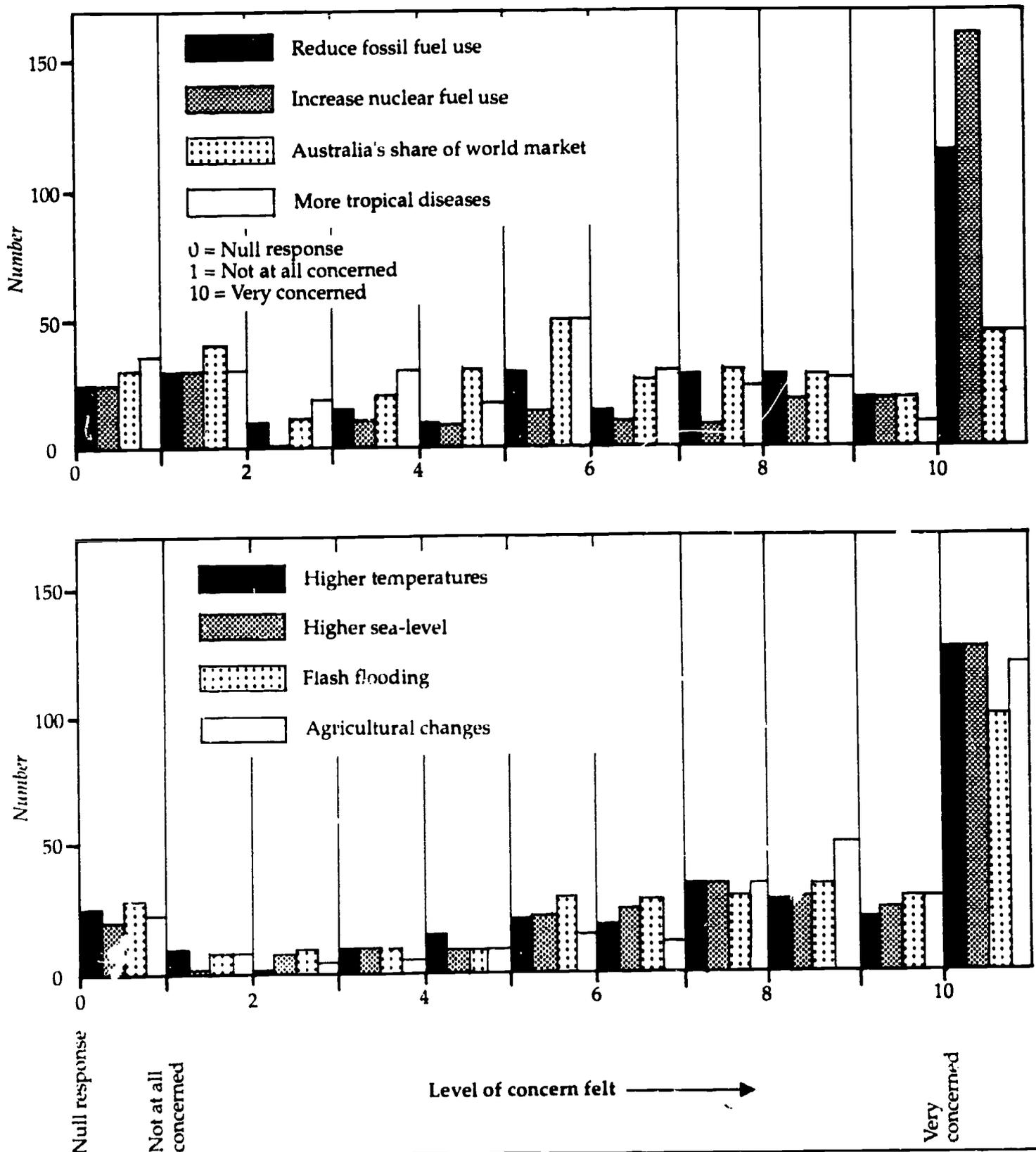
Concerns: the people we asked

It is, of course, very important not to over-interpret the responses to any of the questions because our survey is of a fairly small number of people who were self-selected rather than randomly chosen from the general population. The three hundred and twenty one people who completed the questionnaire had chosen to attend a conference extending from Thursday evening, right through to Saturday evening and to pay a small charge. Moreover, many of the participants had a professional interest in the greenhouse question, because they have jobs associated with political decision making, local or state planning, or because they teach at secondary or tertiary level. There were only 16 people in the manual worker category. Most of those not directly professionally concerned about the greenhouse effect were members of ecological/environmental groups or sympathetic to their aims. There were also senior high school students and tertiary level students.

Direct and Indirect Effects

At the risk of over-interpreting, we feel that Figure 3 throws light on a problem for education about the greenhouse effect: people feel confident about direct effects, much less confident about indirect effects. The gradual slope up to the right in the lower graph suggests that the concern felt about the issues of temperatures, sea level, flooding and farming was more certain than that about the topics in the upper graphs. Responses are more irregular when the question asked is about fuel use, financial markets and diseases. We think that part of the reason for this is that more people feel sure that the direct effects (such as temperatures rising) will happen. And they can foresee the straightforward problems resulting. Many fewer people have considered the indirect effects of the greenhouse changes (such as a greater chance of contacting certain diseases) so the responses are less certain.

Although it is understandable that people think *first* about the *direct* results of the greenhouse warming, great care must be taken that the 'downstream' consequences are considered too. This important issue of second-order effects is essential when discussing the policy and planning implications of the greenhouse effect.

The vast majority (97 percent) of the people at these conferences believed that action should be taken now to alleviate or learn to live with the effects of greenhouse gases. No-one said no action should be taken and only eight were looking for more scientific evidence or a safe solution.

These very strong demands for action, and claims of belief in the greenhouse effect, prompt questions about how well the scientific issues and the scientists themselves are perceived.

Scientific Education and our Views of Scientists

A critically important question, which must be addressed by political leaders as well as by individuals, is what level of confidence (certainty) scientists must have about the greenhouse issue before any action is taken. The number of professional scientists at these conferences was large with 54 classing themselves professional meteorologists, indicating that they had received training or had experience with climatic or weather data.

Very surprisingly, the most common response was that scientists need to have only 50 percent confidence before action should be taken. Next most popular was 70 percent. Very few required 100 or even 95 percent confidence from the scientists.

This is a particularly interesting result. There has been argument amongst meteorologists about how certain their observations of greenhouse warming are. One climate-modeller says his own confidence level is 99 percent but this degree of certainty has been widely attacked by other climatologists who feel that the observational evidence for greenhouse warming is not yet fully conclusive.

There is no dispute at all amongst the scientists about the theoretical basis for the greenhouse predictions but there is still considerable debate about whether the increasing temperature trends observed this century are an *unambiguous* sign of greenhouse warming. On the theoretical side the scientists closely involved with the greenhouse issue are very confident they have 'got it right'. They are well past the '50% confident' the people at the conferences felt was enough to get counter-measures begun.

Interviews with non-scientists at the conferences revealed that they knew little or nothing about the arguments among scientists about the level of confidence climatologists should have about the observations of global warning. Considerable surprise was expressed that scientists should be vehemently debating small differences of confidence or certainty ranging between 95 and 99 percent. Again, it was felt the evidence was quite enough to recommend action immediately.

We asked if people had noticed any intention to confuse the scientific issues. Thirty percent felt there was, and blame politicians and journalists. Without doubt, school teachers are perceived as a benign influence seeking to remove rather than implant confusion. Scientists are viewed as somewhat responsible for confusion, but very few felt that scientists are very responsible.

This question had space for you to add anyone else you felt added to the confusion. The most commonly identified groups were multinational business corporations and extreme environmentalists. These opinions were also reinforced in the interviews. Many people said that multinational corporations had much to gain from profligate exploitation of global resources. On the other hand, they also felt that those who are strongly committed to environmental issues, often (sometimes, it was felt, intentionally) overstate and confuse the scientific background to their case, in order to put their point of view more starkly.

Our survey underlined the fact that many people are confused about various aspects of the greenhouse effect. Many of those interviewed did not understand the difference between carbon dioxide and ozone and therefore did not understand the more difficult issues of where these gases come from and the vertical stratification of ozone. The resulting very different climate impacts were often not fully understood. The underlying difficulty (identified by many to whom we spoke) is the lack of an adequate, basic scientific education.

Background Knowledge

Eighty-seven percent of the people at the conferences believe that the scientific background to the greenhouse issue is generally poorly understood. On the other hand, the respondents themselves were quite knowledgeable about many aspects of the greenhouse issue. Most were very confident that power stations, cars and deforestation contributed to the greenhouse effect. There was also general agreement about polystyrene packaging and fridges and air conditioners, although slightly fewer felt certain about these. The list we showed people intentionally included acid rain and ocean pollution to try to identify those with strong environmental commitments but a less than complete scientific background. As it turned out, relatively few included these as obvious culprits.

We asked to what degree more information was required on a range of issues: scientific background, errors and problems in computer climate modelling, validity of the measured temperature trends, likely consequences (of changes in temperature, rainfall etc.), possible social, industrial and economic impacts. Most people would appreciate much more information on three topics: the likely impacts of temperature and rainfall changes, the possible social, industrial and economic consequences and (perhaps surprisingly) the scientific background. They were generally less interested in gaining information on the topics which would assuredly interest climate-modellers such as the errors and problems in the models themselves and the validity of the measured temperature trends. Here again there is a contrast between the climate modelling community, who are at pains to identify minor differences amongst models and to clarify as precisely as possible the degree of confidence which can be associated with measured temperature trends, and the general public who are interested in the consequences and impacts, but also in the scientific background.

Ozone Hole and Greenhouse – Are They Linked?

We asked 'How many years do you believe you have been aware of the terms greenhouse effect and ozone hole?' Most commonly, people claimed to have been aware of the greenhouse effect for 10 years and aware of the ozone hole for two. Twenty-five percent claimed to have known about the ozone hole for four or more years. They are wrong; the ozone hole was reported for the first time (and then only in science journals rather than the popular press or on TV) in the second quarter of 1985. Thus the maximum length of time that any of them could have known about the Antarctic ozone depletion was a little over three years. Moreover, this first description of ozone depletion related to single point observations made at one of the British Antarctic bases and it was not until about the middle of 1986 that satellite measurements confirmed the existence of the hole and gave the world those dramatic pictures which emphasised the widespread nature of the polar ozone depletion. It was these graphic displays of Antarctic ozone depletion which captured the attention of the media and thus, for most people, the third quarter of 1986, exactly two years before the Greenhouse 88 conference, would be the time at which the ozone hole became a topic of information and discussion.

It is interesting that relatively few (25 percent) of respondents were confused about the length of time they had known about the ozone hole. Some were probably conscious of the much earlier debate about widespread stratospheric ozone depletion which dates back to the 1970s and which was responsible for, amongst other things, the refusal of the United States to sanction large numbers of Concorde flights. Scientists in the 1970s made calculations that related the decrease of stratospheric ozone likely to be associated with water vapour and nitrogen oxides from jet aircraft exhausts. These calculations (and all of those made before 1985) relating to the potential impacts of chlorine freed from CFCs in the lower stratosphere, described global-scale ozone depletion. As we now know, the depletion occurs preferentially and near catastrophically in the polar regions in the spring as the sun rises.

We asked further, 'How much do you think these two phenomena are connected? As expected, the more scientifically knowledgeable saw them as less connected – see Figure 4.

There has been a tendency recently to link these two issues in news headlines and in environmental propaganda. Even reputable and apparently conservative organisations seem to link the greenhouse effect and the ozone hole. Scientifically, however, these phenomena have very little to do with one another. The greenhouse effect is based upon basic physical laws which have been understood for some time but so far the theory still lacks completely unambiguous observational corroboration, at least in the sense of transient increases in temperatures since the Industrial Revolution.

The ozone hole, in contrast, is a recent and observationally-based phenomenon and in this case scientific explanation lags behind. A fully satisfactory theory is still awaited. Thus models of the greenhouse effect could never have predicted the ozone hole and observations of the ozone hole have no importance for greenhouse studies. There is of course an invidious link between these two phenomena: the chlorofluorocarbons. However, the role of chlorofluorocarbons in the ozone hole and the greenhouse is entirely different. CFCs contribute to the greenhouse effect through their absorption of heat, whilst they persist in the lower atmosphere, the troposphere. CFCs contribute to the ozone hole through the ozone destroying chemical chains which the liberation of chlorine from the CFCs sets up, in the stratosphere. Of course, all of these chemical and heat absorption features of the atmospheric system are linked to one another at a gross, global-scale in the sense that all are part of one interlocking planetary system; but other than at this simplistic level, there has been no suggestion, at least until the end of 1988, that the ozone hole and the green-

Figure 4
Degree to which respondents believe the ozone hole and greenhouse effect are connected.

(a) All respondents

Not at all 4.7%

Slightly 20.2%

Somewhat 33.6%

Very 37.7%

Null 3.7%

(b) Scientifically more knowledgeable

Not at all 3.2%

Slightly 25.5%

Somewhat 35.1%

Very 27.7%

Null 3.2%
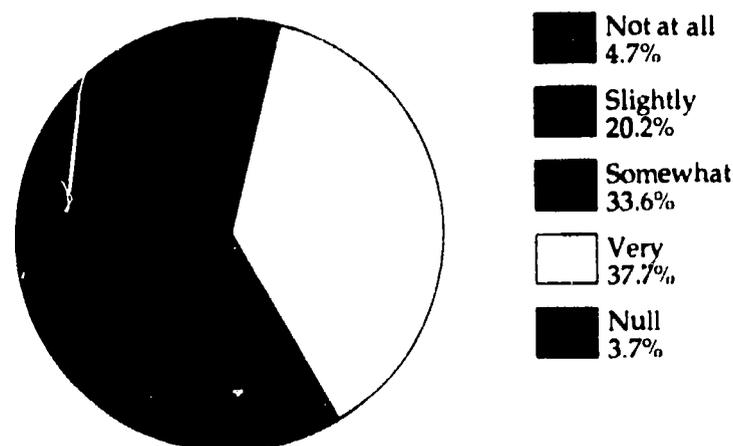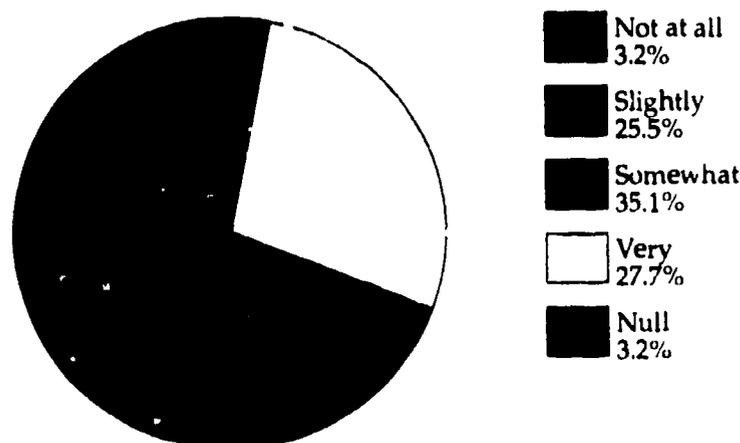
house effect are in any way linked to one another. It is therefore rather disturbing to discover that 70 percent of all respondents believe that these phenomena are very or at least 'somewhat associated'. Only 4.7 percent of the respondents believe that there was no link at all. The best answer at the time the conferences were held was 'Not at all'. Science education, including popular journalism and environmentalists propaganda, needs to be more accurate. Even when the most scientifically knowledgeable and apparently responsible respondents are segregated, this belief in an association persists.

An interesting twist to this tale is that a recent publication (November 1988, after the conferences) has finally linked the rapid onset of the Antarctic ozone hole to the greenhouse phenomenon. The line of reasoning is as follows. Clearly, it is argued, the CFC content of the atmosphere has grown gradually and this gradual trend does not offer the required trigger for the apparently sudden onset of the ozone hole phenomenon. The new proposal is that the trigger for the ozone hole has been a gradual *cooling* of the stratosphere which, curiously, is a result of the greenhouse *warming* of the surface and troposphere. Ozone destruction in the stratosphere requires the presence of ice-crystals which exist in the polar stratospheric clouds that form only in the coldest part of the Earth's stratosphere, the Antarctic stratosphere. There are observations which suggest that stratospheric temperatures have been cooling for the last few decades. This is additional evidence for the greenhouse effect. If the proposed link between this stratospheric cooling (the result of the greenhouse effect) and stratospheric ozone depletion is proved, it is even more urgent to have better greenhouse predictions which are closely tied to local areas.

Overview from our Survey

There is a lack of scientific education even amongst professional people who are educationally well qualified. This lack of scientific background is keenly felt by the vast majority of people attempting to understand scientific predictions and hence to contribute to future planning and policy making. The general public, as represented by those surveyed, certainly *want to know*. Moreover, the respondents to this survey had considerable confidence in scientists in general and demanded what is at first sight a frighteningly low level of confidence (only 50-70 percent) from the scientists themselves before action was taken. This could be part of a feeling that it is better to be safe than sorry – like nuclear war issues, waiting for 90 percent certainty may be waiting too long. Remedies that are bene-ficial in their own right can be started now so that if our fears are groundless we will have gained, not lost.

The vast majority of people responding expressed considerable concern that a likely policy response to the greenhouse issue will be to use nuclear power. Other, secondary, concerns included the reduction in use of fossil fuels, higher temperatures and raised sea levels.

All those surveyed, and especially the high school students who were interviewed, had very clear views and had, to a large extent, correctly interpreted the reality of the greenhouse effect as viewed by the scientists. They also interpreted responses of politicians and planners as ineffectual or even uncaring. These young people find themselves in a position from which they can view the future and find it to be unsatisfactory. They cannot, however, see a way to alter the outlook.

We can conclude that better science education and better education for participation is needed. A warmer world may be more testing but it *can* be made more habitable for us all.

Notes

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The survey reported here was more fully described in Chapter 6 of *The Greenhouse Effect: Living in a Warmer Australia* by Ann Henderson-Sellers and Russell Blong, published by the NSW University Press. This book is an excellent review of what climate science has to say about the effects on Australia. It has many excellent diagrams and chapters on hazards, likely resource changes, and what can be done. Much is applicable to New Zealand also.

Further Reading

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Children's Attitudes to the Natural Environment

Theo Gerritsen

Richmond Park Primary School, Hamilton

NAWTON NEWS *Dec. 1990*

Te Kauri Lodge

It all began when I went to Te Kauri Lodge camp. I was going there on a school trip. The day we got there we went on a hike. When we were walking down Manuka track there I saw a Lancewood. I had never seen a Lancewood before so I touched one of the leaves. The edges were sharp and prickly. I was observing the leaves when I realised the weird way they grew. The first leaf grew at the top then on the other side there was the second leaf. Then the third leaf would be right under the second leaf, except on the opposite side. It would continue like that until the last leaf. The colours of the leaves were a dark green with a thin yellow strip down the middle. The shape of the leaves were long pointed triangles which were thick at the beginning and thin and pointed at the end. The top of the leaves were shiny and smooth. The end was rough and a light green. There was no design on the leaves. The leaves also had a smell. Then I realised that the rest of the group were leaving so then my learning about the Lancewood came to an end for the day.

Natalie Halford, Std 4.

Shone McLean

HAMILTON, where I teach and where my children go to school, is a small city which grew out of a rural town. It is still close to the countryside but real bush, wild rivers and the sea are a bus ride away. Most schools, even the rural ones, if they want to give the children an 'Education Outside The Classroom' programme. organise the whole school off to a School Camp at a lodge or some other well provided campsite in the bush.

I find myself at such camps both as a teacher and as a parent; and once, as a Research Affiliate of the Education Department of the University of Waikato, I was able to dig a little deeper into what children were gaining from their Education Outside The Classroom (EOTC). I first asked 402 children, through a 20 question questionnaire, what they thought about the natural environment. They were a mixture of 10- and 12-year-olds, boys and girls, from country and town schools. Then I went on school trips with them, including school camps at Te Kauri Lodge and Port Waikato Camp. Finally, I asked their teachers, thirty of them, about the programmes their schools were running.

Results

The Questionnaire

I found that in an 'average' class of 30 children, perhaps 3 or 4 will be quite sensitive towards the natural environment and positive towards it, while 4 or 5 will be quite insensitive and be negative about it. The remainder of the class, around 20, will hold the middle ground, open to direction and guidance from their teacher.

Over half the children say they feel secure when out in the natural environment. Thirty percent do not always feel secure and the remainder, about 15 percent, feel insecure or uncomfortable most of the time they are out in the natural or unchanged environment.

Fewer than half of the children were interested in exploring – finding out about and understanding the natural environment. More than 75 percent were keen to see plants and animals protected but only 30 percent were interested in general preservation and conservation of the environment.

There was no significant difference between the attitudes of the 10- and 12-year-olds, nor between country and town children. However, the boys were significantly more positive towards the environment than the girls. The attitudes of children who came from professional homes were significantly more inclined to the environment than those from semi-skilled backgrounds; perhaps children from professional and therefore moneyed backgrounds are more likely to have shared in experiences with their parents that foster an interest in nature.

Observations at school camps

The majority of the children, even those with high scores on the questionnaire, were not notably positive in what they did. Only children in the top 2 or 3 percent could actually be observed showing great interest in the environment. It must be stressed that almost all the children I accompanied out in the field behaved very well, listened to what they were told, carried out instructions and looked at what was pointed out to them. They acted responsibly provided they knew what behaviour was acceptable.

In an assignment the children were asked to make up a set of 'rules' about camping. About 95 percent of the rules put down were about tent sites, fires for cooking and campcraft in general. Only 5 percent were about conservation of the environment. Fewer than a third of the children wrote even one 'rule' about preserving or conserving the environment.

The teachers' questionnaire

The most revealing thing from this questionnaire was that teachers in general, and the schools, consider the school camp as the main component of Education Outside The Classroom. Some think it is the only way to manage EOTC. The programme objectives they gave, almost invariably were about developing outdoor recreation competence, enhancing the work in other curriculum areas or social development. Only two schools mentioned objectives related specifically to the environment, but their programmes did not contain any activities specifically designed to enhance the children's sensitivity towards it. This does not seem good enough.

Conclusion

By 12-years-old over 90 percent of these New Zealand children had attended one or more school camps, which seemed to be the only Education Outside The Classroom activity schools think of. Around 12 percent hold positive attitudes towards the natural environment; 75 percent have less positive, or neutral, attitudes. Observations show that this large middle group will behave in an acceptable manner when out in the natural environment, *if they know what to do*.

Many of the groups I accompanied were out tramping (bush walking), going from point A to point B along a particular route. This is a common and legitimate adult outdoor activity, but many environmental education opportunities were missed. The camps I attended focused on physical activities and adventuring skills for a large part of their programme. Aesthetic awareness heightening activities such as observing the shapes of leaves and trees, feeling the texture of bark, noticing the play of light and shade, listening to bird and animal life were not a major focus on the trips I accompanied, although when things were pointed out the children generally showed an interest.

I consider it is of the utmost importance that children are adequately prepared for work and recreation in the natural environment. They should be engaged in activities that will raise and enhance their environmental sensitivity. To achieve this, teachers and the other adults involved need to be prepared, trained and provided with the resources necessary to develop the programmes that increase the children's awareness, improve their attitudes and enhance their environmental sensitivity.

Notes

Mr Theo Gerritsen is Assistant Principal (Senior Classes) at Richmond Park Primary School, Hamilton. In 1988 he was a Research Affiliate with the Education Department of the University of Waikato, Private Bag, Hamilton, New Zealand.

The original report, of which this is a summary is
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11

___TEACHING___
MONEY MAKING

School Based Enterprise in Australia

Scott Holmes and **Penelope Hanley**
Australian National University

The Value of Mini-enterprises in Britain

A Times Educational Supplement report

IN the last ten years there has been a shift from 'desk-work' to 'hands-on' in school business studies. Budding teenage entrepreneurs certainly provide the popular press with human interest stories and the public is now well aware of this way of teaching the competitive business skills which politicians are urging upon us.

The trend has been fuelled by active interest among business people. Curriculum information and advice is available in new books and journal articles.

However, the time has come to ask if mini-enterprises are really providing the right skills and benefits to this new breed of business-wise pupils.

This *set* item contains an analysis of school based enterprises in Australia, and a review of a report by Her Majesty's Inspectorate of the effects of mini-enterprises in British schools. In New Zealand, Secondary School business ventures are highly organised through a trust; there is information in the *Notes*.

School Based Enterprise
in Australia

Scott Holmes and Penelope Hanley

DESPITE moves away from theoretical course work the majority of school based business ventures are still artificial. The business environments that schools provide, on the whole, do not put children into the full responsibilities and complexities of running real businesses and do not allow children to learn from their mistakes. How this comes about and what would improve the situation can best be learned from a look at what is going on.

Present small business courses in schools can be broadly divided into three categories:
1. Traditional Commerce/Business Studies Course.
2. Business Studies incorporating 'Business Exposure'.
3. Business Studies with an emphasis on business experience, which can be classified as 'Enterprise Activities'.
There is, of course, considerable overlap.

1. Traditional
The traditional or textbook approach is still the most common, and usually also a part of any course involving business exposure or experience. Business studies originated from secretarial and bookkeeping studies which were popular in the 1930's. In the early 1970's 'commerce' became an elective unit in several states, offered at Year 9 and 10 (Forms 4 and 5). The commerce course in Australia was primarily concerned with a 'macro-viewpoint', including topics such as unionism and the money supply. These

courses grew in popularity and subsequently spread to Years 11 and 12 (Forms 6 and 7). Senior courses are on the whole either business studies (the establishment and operation of small businesses) or accounting (with computer applications).

Traditional courses have a textbook/theoretical approach, with occasional case studies. They also consider the role of the small business sector within the Australian economy. Considerable emphasis is placed upon the business 'basics', such as:
- Business Planning and Setup.
- Alternative Business Structures.
- Legal Aspects of Business.
- Market Identification and Marketing.
- Business Sectors – Retail, Manufacturing, Wholesale and Service.
- Business Finance.
- Bookkeeping and Reporting.
- Management Skills, such as staff selection and effective communications.

When we were doing our investigations, Stirling College in the ACT was a typical example of schools which preferred the traditional approach. We found the teachers suspicious of enterprise activities and many questioned the value of work experience. The curriculum was almost entirely based on a textbook with some exposure to computers.

2. Business Exposure

These courses are an adaptation of the traditional business course and traditional teaching methods are employed in conjunction with 'real life' examples of the operation of small businesses. For example, since 1980 the Queensland Department of Education has co-operated with the Institute of Public Affairs in implementing, in various regions, evening seminars at which representatives of the business sector, students, parents and teachers explore employment opportunities and the requirements of employers. The programmes successfully enhance mutual understanding of concerns and needs.

Many business exposure courses involve group discussions of case studies and in some cases lead to the development of case studies by students. Students are encouraged to write-up a business operating within the local community or to survey several businesses of a similar nature.

More recently, business exposure has meant undertaking work experience. Work experience is found nationwide, however, opinions vary about it. Canberra's Hawker and Narrabundah Colleges claim their students have a high rate of success in getting jobs because of work experience. But, Dickson College nearby has found work experience is simply not enough; staff there are discussing the possibility that other activities will promote their students' initiative, skills and creativity more actively.

Various community work programmes are also business exposure. St. Albans Technical School in Victoria has established a community workshop which involves students in socially useful work. Since 1985 Caroline Chisholm High School in the South Tuggeranong Valley has developed a community based education programme providing services and raising funds to meet community needs. The motive underlying these exercises is not profit. Another example is part of the maths programme at Warragul High School in Victoria; students in Years 11 and 12 (Form 6 and 7) Business Mathematics and Statistics run a market research centre that provides a service to the local community. Projects have included: determining the health care facilities needed to establish a community health care centre; an investigation of the shopping habits of people in Warragul; a study of the effectiveness of the Community Youth Service Scheme (CYSS); a demographic study of the people who attended Gippsland Field days.

Getting schools involved in their communities is encouraged by the Student Community Involvement Programmes (SCIP) in NSW and Victoria.

The latest in business exposure courses involve business tours, for example, the Know-Biz Project sponsored by the Victorian Government and private enterprise. There are approximately 194 participating businesses and 109 active branches involved with the project. However, the overwhelming majority of participants are large corporates. The students visit the business, and the tour leader, helped with a manual, emphasises aspects of the operation.

3. Enterprise Activities

Enterprise activities courses usually start with the theory underlying the operation of a small business, with particular emphasis upon the elements of a business plan. The remainder of the course is helping students establish and operate a business venture. The approach concentrates upon putting theory into practice and requires students to work in teams, the teams being given considerable autonomy over the type of business they run and their decisions concerning business operations. There are two main types of activity: ventures and enterprises.

1. Ventures:

These enterprise activities are established and operated with the intention of winding up operations after a specified period of time. The time period ranges from 'one-off' projects (school discos, car washes) to continuous periods of 28 weeks (travel kits, telephone cleaning services).

Some ventures are established by schools alone, some are organised by a school system. In 1986 the Senior Secondary Assessment Board of South Australia offered a Year 12 (seventh form) small business management syllabus, which requires students to establish and operate a small business. During 1987, 230 Year 12 students from eleven high schools in South Australia and the Northern Territory operated their own businesses under the supervision of teachers for 23 weeks. The performance of businesses were compared and prizes awarded to students for originality of activity and return on invested capital. This course has attracted industry sponsorship through the Youth Business Awards. The aim is 'to assist students in the transition from school to work through experiential learning in a simulated environment'. Similar activities are supported within the curricula in Queensland and Victoria. Establishing and operating these ventures attracts sponsorship from the private sector which may be in the form of money, but most frequently is advice and assistance from experienced people.

Ventures gained widespread acceptance with the introduction of the Young Achievers Programme (YA) which means achievement in business.

By 1987 (YA was founded in 1977) over 20,000 students had formed 860 YA companies. YA ventures are normally sponsored by private enterprise. In Australia a business pays a sponsorship fee ($1,000 in 1988) and up to six staff give occasional help as advisers. Sponsors are expected to commit 240 hours and this includes training, preparation, meetings, perhaps a management seminar, and help with a trade fair, also an end of year function. After 28 weeks each venture is wound-up and the residual (if any) distributed to shareholders. Profit is the overriding goal, with over 80 percent of ventures resulting in a profit. Ventures compete for prizes each year, however YA organisers emphasise that the objective of YA is to 'bridge the gap between youth and the business world'.

2. Enterprises:

Business activities which have no specified closure date are called *enterprises*. Enterprises tend to be school based. One such is 'Young Traders' at Cobden Technical School (Victoria) which has operated a manufacturing and marketing enterprise since 1981. The other is the 'Everything Crafty Association' operated by students at Crookwell High School (NSW) from 1980 to 1982. Copland College (ACT) has a theatre restaurant established within the refectory. This type of enterprise is operated each year by a fresh crop of business students and in some cases any other student who wants to be involved. One objective is to avoid being wound-up, rather than spending the life of the project planning for closure. Seasonal factors come into play, with survival, rather than maximising the return on invested capital becoming a primary objective.

Enterprises can also be operated off school grounds and outside school hours. This type of enterprise is extremely rare, particularly as local businesses often see such enterprises as subsidised competition. The only 'off grounds' enterprise recorded is the Treasure Chest Association, a craft shop established in the Crookwell shopping centre in 1982. Initially the shop opened 1½ days per week, but in 1983 expanded to normal shopping hours. In 1986 the enterprise was still in operation but changed direction, with youth entertainment becoming the major product.

A 'Beyond School' Approach to Enterprise Education

Both Ventures and Enterprises have their strengths and weaknesses as teaching tools. An alternative is proposed in this section; it is primarily concerned with students learning from their mistakes and this requires that they be given the opportunity to make mistakes in the first place. Further, business ventures are extended to encompass broader community needs requiring involvement from parties outside schools. The alternative proposed is outlined in Diagram 1, page 6.

Stage 1

Compulsory Unit (Term 1) – this unit provides an overview of the small business environment and equips students with an understanding of business 'basics'; for example marketing and identifying market needs, financial information and bookkeeping, the business planning process and product/service development. Approximately mid-term, students commence preparations for Stage 2, by forming groups and identifying potential members of their business 'think-tank'. Think-tank members could be parents, teachers, government employees and members of the business and general community. They are approached in writing. At the end of the term each student can elect to continue to Stage 2 (Business Plan) or select another unit in the business studies stream.

Stage 2

Idea and Business Plan (Term 2) – the members of the think-tank meet early in Term 2 (or sometime in the holidays) to identify an unfulfilled demand for a product or service within the local community. It may take more than one meeting to identify such a 'need'. The 'need' may not necessarily be profit-oriented, but can be community based.

The objective at this point is to fill a market niche (gap), so initially capital and manpower constraints can be ignored. The purpose of the planning process, to be undertaken throughout this term, is to explore ways of overcoming such problems.

If no business ideas are generated then the group and think-tank should disband and the students have two choices:

a. Redistribute to groups with ideas; or
b. Enrol in an elective unit (a different programme not involving setting up an enterprise).

For those groups with an idea, the idea must now be formalised into a business plan. This will require classroom sessions to assist in solving problems, directing students to appropriate references and sources of assistance and to organise visits by guest speakers with certain relevant specialisations. These sessions will be facilitated by group meetings, where the business plan is developed. Toward the end of the term a weekend workshop may assist students to complete their plan, bringing together different aspects of the plan assigned to individual students. On completion, at a presentation night, their plans are outlined to members of think-thanks and representatives of the local financial community. The feedback from presentation night should be used to seek-out the solutions to unresolved issues and 'loopholes'. Finally, each group will have an 'action meeting', at which they are required to decide whether to:

a. Proceed to Stage 3 (Establishment); or
b. Undertake more detailed planning. This will involve assistance from sources of expertise and additional education in areas where more detailed information is required. At some point in Term 3 the group may decide to establish the proposed business or to review reasons for failure.
c. Stop at this stage and take an elective unit for Term 3.

Stage 3:

Establishment (Term 3) – the students will need to gain access to the required funds (as outlined in the business plan) before the business can be established. At this point, other issues which need to be solved prior to establishment should be addressed, such as management structure, employees, location and extent of operations.

Given that there are certain constraints upon the types of funding available to students, they have a choice from the following three alternatives:

(a) **Student Funded** – this may well include students who are not in the business group. Will it be in the form of unsecured loans or shares? If shares: Will there be different classes of shares? A maximum number of shares? What will be the procedure for the sale of shares after the initial share issue? The company's memorandum and articles will have to be written and a business name registered.

(b) **Student Funded and Sponsor(s)** – this will involve consideration of the issues raised in (a) above, as well as guidelines for accepting and soliciting sponsors. A sponsorship could represent the equivalent of a government grant. Sponsors may impose certain restrictions upon the business's activities. Attracting sponsorships will require marketing of the business to potential sponsors and negotiations with sponsors concerning the terms of a sponsorship agreement.

(c) **Joint Venture** – student and business funding. Shares in the business are purchased both by students and members of the community. Community shareholders may also lend money to the company at an agreed rate of interest. This would also give members of the community a direct involvement in the operations of the business.

If the business fails to attract funding then the students can revise the plan and then seek funding again. or review the plan and the reasons for their failure to attract funding. At this point they may decide to cease to continue, or to sell the business idea. The idea may be viable, but the funding required of such a magnitude that an established business may be in a better position to exploit the business proposal, and so the students will have to market and negotiate the sale of their idea. Any decision regarding funding or continuation of business plans will require a two-thirds majority of group members.

If the group can successfully attract funds then the next phase is to apply these funds to establishing the business and commencing operations. Throughout this stage groups should be continually seeking feedback and direction from teachers and think-tank members. In some cases the groups may need to engage the services of a public accountant or solicitor. Teachers will have to ensure that students are aware of the commitments associated with incurring debts relating to business establishment. Suppliers and landlords will more than likely refuse to deal with students unless an adult or business will act as guarantor. This is a problem that the students will have to address in the business plan. This constraint may force students into joint venture arrangements or cause them to sell the business idea. But, where there is a will, there is a way.

Toward the end of Stage 3, student groups are required to write a report detailing the operations of the business and the business's achievements, relating them to the objectives outlined within the business plan. Businesses that failed to establish, should report the reasons for failure and make suggestions for future groups as to how these problems may be overcome. At the end of Stage 3 businesses are either established and operating, still being established, the business idea sold or recognised as not viable. Students who are still establishing may make a

decision to discontinue and join the students who sold their idea, or couldn't get started, in an elective unit. Businesses in operation may be wound up if the students and other associated parties agree that it is the appropriate course of action, or the business may be sold.

Stage 4:

Continued Operations and Business Review (Term 4) – the business continues to operate with the students pursuing business problems in classroom meetings and working on budgeted information and forecasts. The teacher acts as a reference point to assist with problem solving. At any point throughout the term, if the business is considered no longer viable or that it is appropriate to sell the business, then the necessary steps to wind-up or sell should be undertaken. Toward the end of the semester the groups operating businesses will meet and decide whether to cease operations, to sell the business or to proceed. If the business is to proceed the legal implications and necessary changes to business structure should be considered. The association with the school formally ends at the completion of Term 4 and the students still in business are left to their own devices.

Advantages – Disadvantages

All this may seem more complex, though closer to real life, than students can cope with. However it is designed to fulfil the objectives of Australian education authorities. For example ... students will:

- develop personal qualities such as the ability to make decisions, accept responsibility, show initiative, self-confidence, self control, and resilience and learn to be sufficiently flexible, adaptable and creative to both respond to and effect change.
- experience the competitive world of work both as an employer, manager and entrepreneur.

(Action 2, Education Update, Education Department Tasmania, June, 1987).

So the first aim is to develop competence. The second is to foster an ongoing community involvement in the business education process. This involves students negotiating with the private sector. This is in line with the views of, for example, a Minister for Employment and Education Services, Peter Duncan, who maintained that:

There [is] a strong case for private involvement in both funding and provision of further education and re-training.

(Press Release 56/88, March 17, 1988).

One of the major changes this proposed syllabus introduces is the element of risk. The environment of the overwhelming majority of school-based ventures undertaken to date is artificial. It is an attempt to 'shake-off' what is commonly known as the 'Teacher Paradox':

In attempting to teach entrepreneurship, a paradox arises. Students tend to become dependent on their instructors, a relationship that seems to facilitate learning. Entrepreneurs are highly independent. They seem to be the very antithesis of people in dependency relationships. Thus, educators probably will be most effective if they see their role as facilitators, helping potential entrepreneurs to manage their own learning.

(Scanlan and Flexman, 1980, p. 29).

Another aim is to help more young people see the establishment of enterprises as a viable alternative to unemployment. This is particularly important in an economic environment where approximately 20 percent of the teenage workforce is unemployed.

Overall, the important skills that students can develop from their involvement in a 'real' rather than an artificial business venture are:

(a) Self Reliance and Independence. Students will learn to be self directed and self confident enough to take risks. Students will not be deterred by initial failures.

(b) Development of Creativity and Initiative. These qualities will be stimulated by the necessity of generating new ideas about products and services required by the local community, of solving problems and coping with apparent crises.

(c) Growth in Students' 'Self-Concept'. Students will develop an awareness of their limitations and special skills; basically, knowledge of their own strengths and weaknesses.

(d) Awareness of the economic, legal and business dimensions of the society in which they live. This will be combined with knowledge and experience of the business world.

(e) Ability to be part of a team, to co-operate and work with others, to lead and be led at different times, in various roles. Students will learn the significance of contributing to a project larger than themselves.

(f) Development of basic business skills, such as bookkeeping, communicating with staff and clients, market research and advertising.

(g) Development of communication skills, both oral and written.

Conclusion

The primary objective of this paper was to outline the approaches to school based enterprise education adopted to date and from this analysis develop a structured, less artificial approach. The alternative developed is based on community involvement and requires guidance, encouragement and participation by members of the community. Teachers act as reference points, to assist in problem solving. The overriding concern is that the ventures undertaken have a commercial flavour, addressing the possibility of failure as well as business management techniques. Failure should be dealt with constructively, with students encouraged to learn from their failures, just as entrepreneurs operating in the business community must.

The model presented is not rigid, it should be reworked by those with a more detailed understanding of the mechanics of such a proposal. The concern is that by ensuring students undertake ventures in a restrictive, almost riskless environment, we are not achieving our goal of teaching small business or entrepreneurship.

I grew up in a school system which treated mistakes as sons and the maker of the mistakes as sinners. Caution was our watchword, enterprise a synonym for foolhardiness and initiative a polite name for rule-breaking.

If we accept that mistakes will occur whenever we stick our foot into the unknown; if we correct those mistakes and even use them to improve the original idea; and above all, if we realise that two heads are usually better than one, that good teams are not one person multiplied by six but six very different people with very different abilities, we will achieve a great deal.

(Handy, 1987, p. 3.)

Impoverished by the need to make money

The value of mini-enterprises has been questioned by HM Inspectorate

Mark Jackson

Times Educational Supplement

A REPORT by HM Inspectorate this week proclaims that the Thatcher era's preoccupation with profits is out of place in the primary classroom. And it insists that a balanced education in economic awareness for secondary pupils must examine the limitations of the free market.

The inspectors are highly critical of the way in which mini-enterprises, companies set up by pupils to make and sell goods and services as a practical part of their learning, are being used in both primary and secondary schools. However, while they have found that secondary pupils are not getting a true picture of the realities of the market place, they are worried that primary children are being overloaded with business concepts.

> A number of the activities seen were not wholly appropriate to the age and maturity of the pupils concerned and in some cases too extensive a range of concepts and business practices were being introduced.
> . . .
> There was a danger of teachers . . . cluttering primary classrooms with a multitude of adult concerns. In particular, the use of profit as the sole criterion to judge success or failure of an enterprise is inappropriate

says their report.

The inspectors argue that the balance between the desirable and the undesirable in industrial and economic matters is a fine one. There was evidence that primary children could be pushed into beginning to understand the way the stock exchange and business financing works, and even how to produce a business plan. But the inspectors say that, since the scarcity of time is a real economic problem for schools, it is questionable whether these attempts are worthwhile.

The report cites approvingly examples of mini-enterprises being used as part of a thematic approach to curricular areas such as maths, language, information technology, and art and craft, and says it is evident that children enjoy being involved in the companies. However it points out that other kinds of industry-related activities can be used effectively instead to raise economic awareness.

The inspectors found that few secondary schools were using their mini-companies for cross-curricular learning in this way, and that they were usually part of the personal and social development syllabus or an external exam requirement. Some had adopted a community project as their activity, but a majority were primarily concerned with making as much money as possible for a minimum outlay.

Students benefited from working co-operatively and developing communication skills, but the design skills they used were often low-level and the goods inferior. Because they were sold to customers who felt they had to be less discriminating than they would normally be, many students were getting a false impression of the real market place. And, the inspectors add, students appeared to add little to their knowledge of business structures such as partnerships, co-ops, and public companies or of industry and politics in general.

The inspectors say that those ventures organising an activity for the community were more successful, because they had to be planned thoroughly particularly where outside funding was involved.

They urge that mini-enterprise activity should include projects which meet and identify social need because 'a balanced education in economic understanding should examine why, despite the strengths of a free market, some needs remain unmet and why resources sometimes need to be directed to desirable social ends'.

Notes

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To follow up ideas in New Zealand, contact The Enterprise New Zealand Trust Inc., Box 40-902, Upper Hutt.

In 1990 there were 158 companies running in 110 schools. In New Zeala··d running mini-enterprises is most popular in private girls' schools but many state co-educational schools have had more than one company running a year. Schools get information in October, register for the next year, set up a resource panel, and are in business in March. The students running the enterprise meet on the premises of a local company to conduct their business. Adult volunteers from that company, specialists in production, administration and sales, act as advisors but do not make the decisions. The national office of Young

Enterprise supplies each venture with material to support their business, newsletters, and a company m: nual outlining all business activities from incorporation to liquidation.

During the life of the business the 'Enterprisers' sell shares to raise the necessary capital; elect officers; choose a product or service to offer; maintain detailed records; map out marketing plans and strategies; pay salaries, rent and taxes; produce, promote and sell their company's product or service. At the end of the programme – usually in September – the company publishes an annual report; pays dividends to shareholders; liquidates the venture and receives from Enterprise NZ a Certificate of Accomplishment.

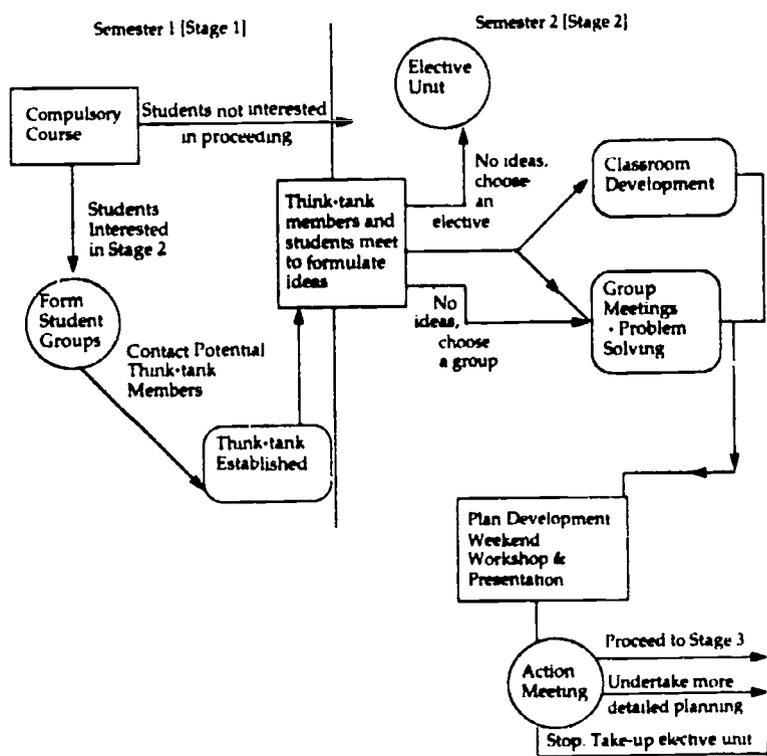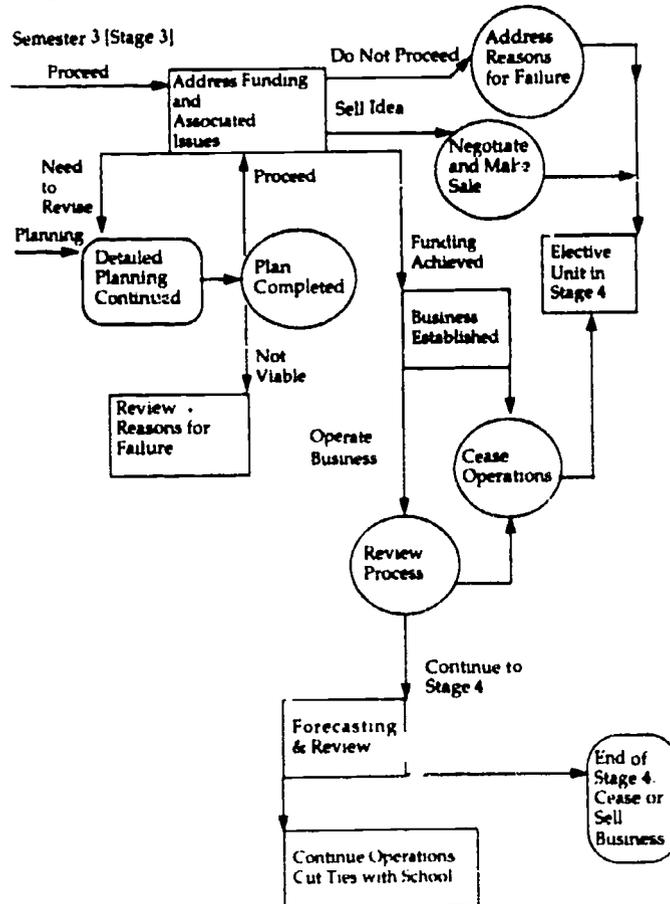Diagram 1 – A Beyond School Approach To Enterprise Education (Part 1).

Diagram 1 – A Beyond School Approach To Enterprise Education (Part 2).

How Young Pupils' Memories Work

John Morton

Medical Research Council Cognitive Development Unit, London

'What happened at school today?'
'Nothing.'

WITH SMALL CHILDREN, this lack of response is not perversity but represents a real difficulty the child has. It usually turns out, if you ask more carefully, that something did happen, that your five- or six-year-old hasn't forgotten, has the language to tell you, but finds it difficult to get it out. Parents don't demand instant recall and fluency. Teachers, finding some children can manage to talk about what happened, may decide those children are 'brighter', have better memories, remember things more easily, than others. Investigation suggest that we must not be hasty in such judgements and that the way we design class work for children should recognise how memory is developing.

A clue about memory development, and particularly memory about events, comes from *infantile amnesia*. Past the age of ten years, or thereabouts, most of us find it impossible to recall anything that happened before we turned four or five. Freud noticed this and put it down, as one would expect of him, to guilt induced by infantile sexuality. This implies that children's minds work the same way as adults. I, and recent researchers, find a better explanation in what we have discovered about the way our minds develop.

Kathleen Nelson discovered, for example that three-year-olds can answer general questions about events (What happens when you have dinner?) with general answers (we wash our hands then sit at the table) much better than specific questions (What happened at breakfast this morning?) which are usually answered with silence. She and her colleagues suggested that small children have no memory of individual episodes only for events which are repeated – if events repeat then a fusion of experience takes place and specific memories are no longer available.

My investigations, with Julie Wilkinson, show that this picture of how children remember is not complete. In particular it does not deal with things children remember but *cannot* put into words.

What happened in the Park?

Julie Wilkinson took pairs of four-year-olds for a walk in the park. They played games on the way there and when they got there. On the way back they called in at a shop and bought something to drink. Nothing unusual was happening. The children knew Julie and they often went for walks in the park.

The next day at school the children were asked 'What happened yesterday?' When they had all had a go at answering that, half the children were asked some more probing questions, but the other half started off back to the park and were asked, as they walked along, about yesterday's trip. When Julie and the child passed a place where something had happened the child would often spontaneously, unprompted, tell what had happened there. If that didn't happen Julie would cue them by asking 'What happened here?' If there was still no recall she asked a more direct question, 'Did we find something here?' The classroom questions also gave successively greater clues. In all cases Julie provided the correct answer if the child did not.

The results were quite outstanding.

Table 1
Park Study – effects of context on verbal and non-verbal recall

	Out of context	In context
Free recall		
verbal/11	1.0	3.3
nonverbal/10	0.4	3.0
Total recall		
verbal/11	6.0	8.9
nonverbal/10	3.5	7.0

The probe questions produced an enormous amount of extra material and the effect of context was massive. This means we must never assume (as the legal system does) that if it cannot be spoken it is not remembered. It is just harder to get out, that way.

The sorting out in Table 1 also gives us another teaching aid – if there is a chance for context or acting-out to help recall, then purely verbal knowledge (for example, the name of a song) is also more easily brought to mind. There is a lot of purely verbal knowledge required in school, from colour names to arithmetical tables to the dates of peace treaties. Context and non-verbal answers will help show what has been learnt but is difficult to express.

The search for a theory

From the Park Study we clearly need a theory of memory that will have these characteristics:
1. it allows the nature of the questions to affect recall;
2. it allows situational context to affect recall;
3. it allows non-verbal recall.

The need for these three characteristics is also seen in these three cases –

1. *What was her name?*
We all have the experience of being aware of everything we know about someone, other than their name. We know where she works, where she lives, her husband's first name, the last time we met, the colour of her eyes; we even feel certain we will instantly recognise her name if someone else produces it and, if we had started with her name, all the rest would still come to mind.

2. *Don't you remember?*
We all have gaps in our memories and are, at times, unable to recall events, despite detailed clues being supplied. An example in our research was a man who could not recall an evening when he nearly had a stand up fight with a waiter about a table reservation until his wife reminded him that the restaurant had a long driveway with orange trees. The content of the episode itself did not serve as a cue – something else did.

3. *What made me think of that?*
We all have the experience of memories being triggered by something that was just part of the background of an event. Scents, or pieces of music are often the trigger. The smell of sulphurous coal takes one person back to his days in a single-men's camp on a construction site. 'They're playing our tune' is another example. Or this experience:

A couple of years ago I changed my perfume! The perfume I wore before that I had worn during a very unhappy time in my life. A few months ago, I found this large bottle of perfume and thought, 'I can't let this go to waste,' and sprayed some on. Almost immediately I was back in hospital coming around after having my stomach pumped.

Note that the smell was not the smell of the hospital.

What we learn from these three kinds of event is that we need a model which readily allows the following three properties:

1. not all knowledge is retrievable;
2. the central parts of an episode do not necessarily cue recall of that episode;
3. peripheral cues, which may be non-essential parts of the context, can serve to cue recall and may be the only effective cue.

The Headed Records (HR) model was designed to do this.

The HR model is that our memory is in separate, distinct Records. Either you remember all of the Record or none of it. They are not connected directly to each other. Each Record has a Heading; when we try to remember something it is the Headings we search, and if our brain finds a Heading with the right cue, then the Record is revealed to us – it 'pops into our head'. BUT, what is in the Headings is never revealed to us – we never 'see' what is in the Headings.

Heading 1 — Record 1
Heading 2 — Record 2
Heading 3 — Record 3

Here is how the model works for our three common problems of memory.

Dame Nellie Melba, Soprano, born in Grueyre Vic.

1. *What was her name?*
   This is the case of the person's name being in the Heading but not the Record. 'Soprano' in the Heading opened up the Record to us, but the name is in the inaccessible Heading.

Famous Soprano of the early 1900's, born in Grueyre, Victoria, sang mainly in London and USA, house is now under the National Trust, had a pudding named after her...

restaurant orange trees long drive

2. *Don't you remember?*
   This happens when you try to use part of the Record as a Heading. This incident has been stored by the memory under a heading that doesn't mention the (embarrassing) fight. You can't get to the Record without the correct heading.

California, 1984, dinner, with friends at the Troc., drunken waiter, said our table was reserved for others, shouting match, we won. Embarrassed wife . . .

3. *What made me think of that?*
   The Heading (which we can't look at) contains items we might not expect a Heading to have, in this case perfume worn at the time.

hospital perfume overdose death
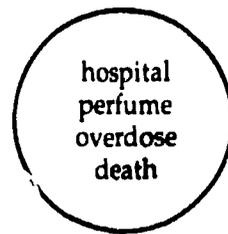
All the events leading up to an attempted suicide and its immediate aftermath

What is Memory For?

I believe that our memory system is designed to help us *interpret* the world and *guide* our actions on the basis of experience. It is not designed, as a computer is, to instantly find, translate into English words and regurgitate, facts. A system of Records with Headings works well for interpreting and guiding, but no extra efficiency would derive from being able to examine Headings.

We are constantly receiving new experiences and making new Records with new Headings. This happens at two levels: one concrete, one abstract.

1. Concrete.
We receive, hear, see, taste, smell, feel; we have emotions and ideas; we decide what to do. These give us our primary Records, some items of which make up the Headings.

2. Abstract.
We recall Records of what happened, how we felt, what we did, and can use these to muse, to cogitate, or even to re-tell. The result of this recall, this thinking, these reminiscences, gives us a secondary Record and its Headings. If we were narrating the story, telling someone or writing it down, the memories will have to be changed from the brain's 'code' into a verbal code. This is an extra step.

This sounds very complex, and it is. In adults it is by no means instantaneous – think of all the 'ers' and 'ums' we use when having to explain something. In children it may be an impossible skill.

Searching, Way Back

How do we set about searching? Suppose you are asked 'Could you tell me the address of your best friend, please?' You will have to search for a name under the Heading <best friend>. Maybe you haven't got such a Heading, so some thinking about <friends> and <best> will be necessary. When a Record has popped into your mind you will then have to check that it has an address in it. If not, perhaps something else in the Record will be a Heading for another Record . . . and so on. Bits of this are at a conscious level, bits are not.

Let us think briefly about the way such a system might develop. As we get more experience we are going to use different things as cues. In particular, when we develop language we will get a whole new set of language-based elements for the Headings. Consider, then, what would be happening to you as a three-year-old. Your conceptual system is just beginning to set up useful cognitive categories, and your language system is still rudimentary. You have found a way of setting up Headings that seems to work. You create new Headed Records of your current experience. Then, suppose that right now, as an adult, you try to access one of the Records you laid down as a three-year-old. You form a Heading but it is a Heading based on your *current* way of conceptualising the world. This will fail if you are trying to search for something set up using the organising system you used at the age of three.

This failure of retrieval is very severe. Possibly the only categories that have survived over the years are our basic emotions. Only under very special circumstances will we be able to retrieve the original Records. The exceptions will include episodes that we have repeated to ourselves over the years or heard other people repeating at a time when our Heading system was close enough to the adult form to be compatible. These would be secondary records. Apart from these episodes we will, to all intents and purposes, be amnesic for our infant and early childhood experiences. We do not need repression as an explanatory concept for infantile amnesia.

Searching, Not Far Back

We seldom have the simple task of remembering one incident or fact – something stored neatly in one Record. For most recall we go through a *Retrieval Cycle*.

One can readily see the operation of this cycle. Ask someone a simple question like 'What did you do yesterday afternoon?' Our experiments showed that it was rarely that someone could answer a question like that directly. Here is an example:

A: What happened yesterday afternoon?

B: [... 5 secs ...] What happened yesterday afternoon?, er, what happened yesterday afternoon? Right, er, thinking about what was yesterday. Oh my God, what's today? Wednesday today so it must have been Tuesday. What's so special about Tuesdays? Tuesdays are general seminar day, made the tea, er, ... (meta comments) ... What did I do after lunch? Ah, I've got it. I didn't come in yesterday morning, so I came in for lunch, yes I came in for a late lunch and then I was running around. Did I run any subjects yesterday afternoon? ...Er, Good God, I can't remember. I can't think what I did between coming back from lunch and four o'clock. OK, yes, right, after lunch, yes, it relates to tea time. I went to Safeways and got the biscuits, than I came back, and then, I think, I sat here, actually, and worked out... no, yes, I did a bit of work, it's all coming back now! And then Tim asked me to do his experiment so I did Tim's experiment and by that time it was teatime.

Simple questions are not easy to answer even by an adult who succeeds only by going round the retrieval cycle a number of times, evaluating the information he had, and formulating a new description (for a new Heading) every time. Think of the problem a child is having, not only operating the cycle, but managing the 'code' change into language as well.

The Witch Study

The basic thesis of this article has been stated already: children are not only registering what they see, hear, touch, taste and smell, what they feel, and what they do, BUT they are also creating a system of Headings for retrieving what they have experienced. Their 'trial' Headings are not the same as ours so it is not surprising if what triggers a memory in us doesn't trigger it in them. Couple that to learning new skills of 're-coding' memories into language, and running an efficient retrieval cycle, and it is surprising we are able to communicate with young children at all.

As an example of problems and development of *memory of events* here is a short description of an experiment Julie Wilkinson carried out in 1988 with a group of children between 3½ and 5 years old.

Normally at (English) tea time, mid afternoon, the children at this Day Nursery sit at the table, each with their own place-mat identified by a picture – a ball, or train, etc. After something to eat and drink they get down, go to the bathroom, go to the toilet and wash their hands and face. Then they sit on other chairs or the floor and read till the tables are cleared and toys put out.

On the day in question the children discovered that onto their place-mats a picture of a black cat had been stuck. Before they could start their tea there was an interruption – a 'witch' in black

cape and pointed hat came in and told the children she had lost her black cats. This caused great excitement. They were found on the place-mats. The children were told to give the place-mats to the witch when they went to the bathroom, after tea, to say a magic word, and the cats would tell the witch if the child had been good.

After all that was over, the children went to the staffroom where Julie had a stuffed owl, said to be the witch's, and the children were encouraged to stroke it and talk to it. The whole event took about 20 minutes, and was super-imposed on normal routines.

Next day the children were first asked, 'What happened yesterday at tea time?' Then, 'Something special happened at tea time, what was it?' Then, 'Tell me about the witch coming at tea time.' This gave a chance for free recall. Then there were directive questions, 'What was the witch looking for?' 'What did you have to do at the bathroom?' and so on.

There were 11 children. Only 4 could answer the first question, mentioning 2 events each. Two remembered some of the incidents after question two. Talk about the witch got at least one of the incidents recalled by the other five children. Helped by the directive questions an overall average of 7.8 items were talked about.

Analysis of the questions answered and the children's ages shows even between 3½ and 5 the ability to access memories and elaborate them increases quickly.

Asking how the children organised their replies was most revealing. To, 'What happened at the bathroom?' one child said nothing and four gave generalisations such as, 'wash our face and go toilet.' Three made a general statement plus information from the *next* episode, 'wash ourselves and then we had to come in here to see the owl.' Three just mentioned the owl. No child mentioned giving the witch the place-mats, the cats, the magic word nor the have-you-been-good? talk.

Of course the numbers are breathtakingly small, but sensible patterns seem to be emerging. They suggest that, using our Headed Records model most children had organised their memories something like this.
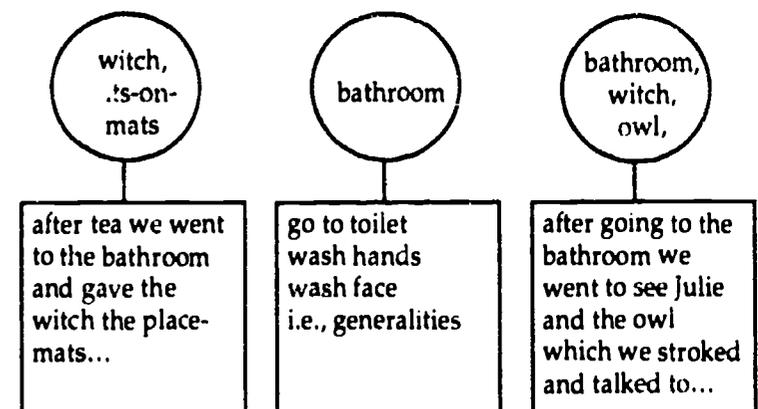
If we look at the actual conversations in which we 'dragged' the story out of the children we can see a little further into the way they have organised their memories. Here is a fairly typical conversation

J. Can you tell me what happened at tea time yesterday?

H. (aged 4y.1m.) Yes.

J Can you tell me all about it?

H. A witch came.

J. Anything else? What else happened?

H. We had cats on our mats.

J. Anything else? What else happened?

H. We saw the owl.

J. What else?

H. And you was hold the owl.

J. Yes I was. Anything else you remember? ... What else?

H. The witch said give me our cats back when you go to the bathroom.

J. Anything else?

H. (shakes head)

The main thing to notice is that the experimenter kept on encouraging the child by asking 'anything else?' or something like that. The child responded to this but never more than two points at a time. They did not require clues to continue; just encouragement.

This, and other more complex evidence suggests that the basic organisation is that the Records are small, each containing part of the story in approximate chronological order, and one item in each Record is part of the Heading of the next Record.
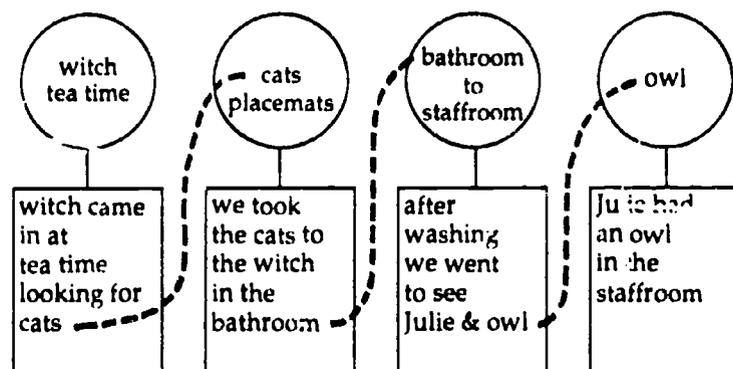
In none of the Headings is <yesterday> one of the items.

One can note in passing that the reason for so little coming out each time is surely partly the child's difficulty in turning memories into language. Also the children do not seem to turn the telling into another Record with a new Heading – making secondary Records is not well developed. Thus the reason for the child recalling the memory at all may be to 'Please Julie' and the system tries to get away with as little as possible! Day-dreaming, for its own sake, is not yet one of their pastimes, nor the enjoyment we get from remembering the good-old-days.

Does teaching help memory?

The narratives the children told lacked structure. In an attempt to increase the structure we tried telling the children our version of what happened, but casting it as a story, with the child's name inserted. The children were captivated by this ploy. 'Once upon a time there was a little girl named Sally who went to Day Nursery. On Tuesday, just when Sally and the others were having tea...' The children were asked questions, just the same as for the actual event, the next day.

If you count just the events they managed to recall then the results are hardly different from those before. But if you look at the quality there is an impressive improvement. This is the child whose episodic conversation was given earlier.

Helen was reading a hungry snake book and someone knocked on the door and then she said, "Hello children' and she said, 'I am Wanda the witch' and she said, 'Go office when you've washed your hands and see the owl'... and the witch said bathroom higgledy piggledy and Wanda the witch took the cats off the mats and then we had a little run, play, run out the garden.

What has happened? Using our Headed Record model to describe the changes we can say that at first the children formed ordinary separate Records of the separate episodes, seeing the witch, handing over the cats, petting the owl, etc. (The difficulty the children had in recall was in chaining the episodes together.) The story-telling, however, would form a new single Record allowing the child to produce a single coherent utterance with narrative structure. There is evidence also that, in their retelling of the story, the children drew on items tucked away in their earlier Records but previously not verbalised, for example the 'run out the garden.'

Conclusion

We can see that the problem the young child has to face when trying to satisfy the questioning adult is quite acute. The child i placed in the position of trying to produce narrative speech from a Record which was set up for a totally different purpose. Primary Records are for USING: they get used for interpreting the world and guiding action and have a construction which is appropriate for these uses. If you try to use them for narrative it will not be efficient. There are many ways of failing to get a four-year-old to recall.

Notes

Julie Wilkinson's work can be found more fully in

Wilkinson, J. (1988a) Context effects in Children's memory. In M.M. Gruneberg, P.E. Morris and R.N. Sykes (Eds.) Practical Aspects of Memory. Current research and issues. Volume 1. Chichester: John Wiley and Sons.

and

Wilkinson, J. (1988b) Preschoolers' event memory: methods for facilitating recall. London: University College, PhD Thesis.

Freud's description and analysis of infantile amnesia is in

Freud, S. (1973) Introductory Lectures on Psychoanalysis, Chapter 13, The Pelican Freud Library, Harmondsworth: Penguin, Vol. 2.

The work of Katherine Nelson on children's inability to give more than generalised replies can be found in

Nelson, K. and Cruendel, J. (1981) General event representations: basic building blocks of cognitive development. Advances in Developmental Psychology, New York: Academic Press, Vol. 1.

and

Nelson, K. and Gruendel, J. (1986) Children's scripts. In K Nelson (Ed.) Event Knowledge: Structure and function in development. Hillsdale, N.J.: LEA.

The theory of Headed Records was first put forward in

Morton, J., Hammersley, R.H. and Bekerian, D.A. (1985) Headed records: a model for memory and its failures, Cognition, Vol. 20, pp. 1–23.

From the section called Searching, Way Back on, a whole theoretical step has been omitted. It is called Description (following Norman and Bobrow) and helps to explain how the mind knows which Heading to search for, retrieval depending on getting a match between the Description and the Heading. For an account of how it fits in see the original John Morton paper

Morton, John (1990) The Development of Event Memory, The Psychologist. Bulletin of the British Psychological Society, Vol. 1, pp. 3–10.

and

Norman, D.A. and Bobrow, D.G. 1979) Descriptions: an intermediate stage in memory retrieval, Cognitive Psychology, Vol. 11, pp. 107–123.

Solving – Not Solving
Learning and Remembering Solutions to Problems

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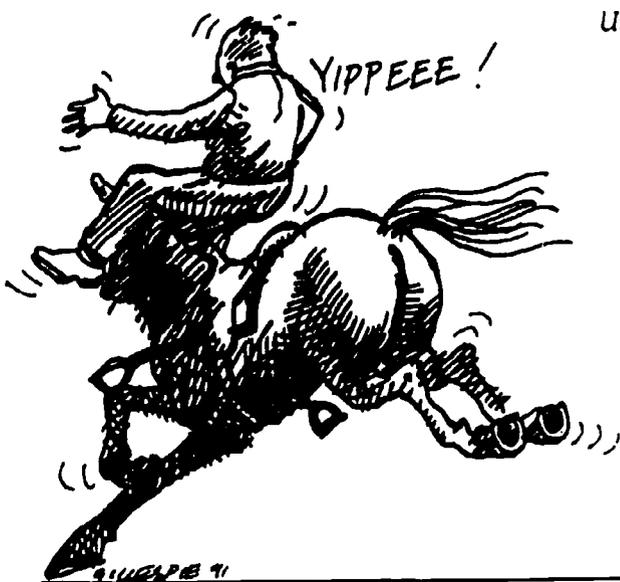
HOW WELL do we remember solutions to problems? Is memory for solutions different from memory for other kinds of material? Is memory for solutions affected by the way in which we acquire the solutions in the first place?

Solvers Versus Nonsolvers

*T*he purpose of our initial experiments was to compare solvers with nonsolvers (who are given the solution) when problems are presented a second time. We decided to use a number of different problems in order to give the results greater generality. All of the problems we used had been employed in prior research on problem solving and were 'puzzle-type' problems. The problems do not require specialized knowledge or training, which is important because the focus is then on problem solving itself. One of the problems we used was the Horse Trade problem:

> A farmer bought a horse for $60. He then sold it for $70. Later, he bought it back again for $80. Finally he sold it for $90. How much money did the farmer make in the horse-trading business?

Quite a few college students get this problem wrong, with the most common wrong answer being 'He made $10'. The reasoning behind this error is usually 'He made $10, then lost $10, s verall he's $10 ahead.' The mistake here is failing to see that there are two and only two buy-sell transactions (the 'lost $10' transaction doesn't exist!); each time he bought and sold the horse he made $10, so his overall gain was $20. As a 'check' on the answer, notice that the farmer spent a total of $60 + $80 = $140 and received a total of $70 + $90 = $160.

Two other problems we used are presented in Figure 1. Both of these problems require drawing lines to meet certain constraints. They were used in most of the experiments we conducted.

Figure 1.

The Prisoner Problem

The diagram below represents a block of 16 prison cells. There is one prisoner in each cell. One day the prisoner in cell X went on a murderous rampage, breaking through walls and killing all the other prisoners, each time leaving the body in the victim's cell. His last victim was the prisoner in cell O. The murderer never broke through an outside wall or corner, and he never re-entered a cell with a body in it. Draw a path he could have taken during his killing spree.

The Nine-Dot Problem

Connect all of the dots shown below by drawing 4 straight lines without lifting your pencil from the page and without retracting any lines.

The solutions are shown in Figure 2.

The 1st Experiment

Fifty college students taking introductory psychology participated in the first experiment. They signed up for two sessions and were told that they would be given a number of problems to solve, some in the first session and additional problems in a second session a week later. No mention was made that the session-one problems would be repeated in session two. Session-one data were collected in small groups. For each of seven problems, work sheets were distributed and the students were given a few minutes to try to solve the problem. When time was up, work sheets were collected and the solution was shown to the group with an overhead projector.

Students were seen individually for their second sessions one week later. They were given the same seven problems for a second time, with the same time limits as in session one. Anyone who failed to solve a problem was (again) give the solution.

Figure 2

Two of the possible solutions to the Prisoner and the Nine Dot problems.

Results

The results were clear: prior solvers did better than prior nonsolvers when problems were presented a second time. Averaged over all the problems, session-solution rates were 98% correct for prior solvers, compared to only 60% for prior nonsolvers. Not only were prior solvers more likely to solve problems in session two, but they also produced solutions more quickly, taking an average of 36 seconds compared to 67 seconds for prior nonsolvers (these averages based only on solutions actually achieved).

Discussion

The findings supported the idea that solving a problem leads to better memory for the solution than being given the solution after an unsuccessful attempt. Some possible criticisms needed to be addressed, however. Because session one data had been collected in groups, it was possible that some nonsolvers had not fully examined the solution feedback. (This would be a reason for poor performance in session two, but a rather uninteresting one.) Also, strictly speaking, we had not shown that session-one solvers had learned anything; to demonstrate learning (and memory) we needed to compare their first and second solution times. Individual sessions allowed us to do that. Finally, we tried a modified version of solution feedback for the prisoner and nine-dot problems.

The 2nd Experiment

In session one of the first experiment, the completed solution was drawn. To see whether this mattered, in the second experiment we compared the two forms of feedback; half the subjects saw only the completed solutions, whereas the other half watched the experimenter draw in the solution (and repeat the drawing if asked to do so).

Results

The results of this experiment were essentially identical to the earlier findings. When problems were repeated in session two, prior solvers were more likely to solve them (99%

correct) than were prior nonsolvers (48%), and their average solution times were faster. 50 seconds versus 76 seconds. Solvers' second solution times were also much faster than their first solution times (average – 126 seconds), indicating that they had indeed learned a lot about the solutions the first time. Somewhat to our surprise, although some nonsolvers saw only the completed solution to the prisoner and nine-dot problems and others watched the experimenter draw-in the solutions, this had no effect whatsoever on second-session performance.

Results of Both Experiments

Both experiments showed a clear pattern of results. Students who solved a problem showed near-perfect memory for the solution, virtually always solving the problem in session two and doing so much faster than the first time. In contrast, presenting the solution to students who had been unsuccessful did not work very well, yielding second-try solutions in only about half the cases, and with slower solution times. It must be emphasized that providing solutions did do some good! Nonsolvers' solution rate went from 0% in session one to 48% or 60% in session two. Nonetheless, providing solutions did not yield later performance even close to that seen after people had produced solutions. We have replicated the basic memory difference between solvers and nonsolvers in other experiments using a variety of problem types. These studies, which focused on other questions, will be described later.

Discussion

A good explanation for these results was proposed by the Gestalt psychologists, especially Max Wertheimer, who argued that providing an answer was not likely to lead to the same level of understanding as actually solving a problem. In solving a problem the first time, it would seem almost inevitable that the solver detects and comprehends the relations between the solution and problem characteristics; having solved, the person sees problem and solution as structurally integrated. When a person has tried but failed to solve a problem, giving the solution might sometimes result in comparable understanding, but it can easily fail. The key to memory for solutions would appear to be the degree of understanding the person achieves.

We followed up these experiments with two series of studies, each addressing a different question, rather like two sides of a coin. One question was whether better ways could be found to give solution feedback to nonsolvers, so that their second-try performance would be improved. The other question was whether it was possible to produce solutions but with reduced understanding, so that second-try performance would be noticeably less than near-perfect. This idea is a bit tricky, but we will explain it later. First, we'll summarize the studies on solution feedback.

Kinds of Solution Feedback

These experiments concerned only students who failed to solve a problem on their first try. The problems were relatively difficult, like the prisoner and nine-dot problems, and students were given only a brief time for their first tries at solving. The idea was to let them start work on a problem but not solve it; after time was up, they received some kind of solution feedback.

Four Experiments on Feedback

In all, four experiments on solution feedback were completed. The basic procedure was essentially the same in all of them: College students signed up for one session and were told that they would be given a number of problems to work on; no mention was made that any problems would be repeated. After general instructions, the students worked on a series of worksheets: a target problem, the

feedback sheet for that problem, another target problem, its feedback sheet,...some filler problems, and then second presentations of the target problems. The time between first and second tries at a target problem was 20-24 minutes, in contrast to one week in our earlier experiments.

The major focus was on the comparison of **Basic Feedback** with **Explanatory Feedback**. Basic feedback was like that shown in Figure 2 for the prisoner and nine-dot problems – the completed solution was presented. Explanatory feedback sheets in addition contained a paragraph emphasizing the key elements of the solution. For the prisoner problem, explanatory feedback focussed on the importance of the murderous prisoner returning to his own cell (which had no body in it) after slaying his first victim and leaving through the other internal wall. For the nine-dot problem, explanatory feedback stressed the need to extend lines outside the space of the dots. Details of the methods and data from this experiment, and the second in this series, are in the notes section at the end.

Feedback results
Although adding an explanation to solution feedback was generally helpful, it did not lead to second-try performance as good as that of prior solvers in the earlier experiments, even with the markedly shorter interval between first and second tries. One concern was that we did not know if subjects had understood the explanations, so in the next experiment we tried to assess their comprehension.

It is worth noting that all feedback sheets had included a question asking if the student understood the solution to the problem. Nearly all answered yes; the high failure rate on second tries shows the inadequacy of asking this question.

The results were also clear when we checked their comprehension. Second-try success was greater following explanatory feedback for both the prisoner problem (56% vs. 41% for basic) and the nine-dot problem (94% vs. 24%). Examination of feedback sheets for the explanatory condition sharpened the picture. For the nine-dot problem, only two students did not correctly complete the feedback sheet, one of whom failed the problem on second try; 100% of those correct on the feedback sheet succeeded on their second tries. For the prisoner problem, one-third of the subjects did not correctly complete the feedback sheet, and all of these failed on their second tries. Of those completing the feedback sheet, 83% succeeded on second tries on the prisoner problem. Explanatory feedback with a correct, paraphrased drawing of the solution led to very high second-try solution rates.

Further questions
Two further questions were suggested: 1. Did it matter that subjects had received an explanation of the solution before being asked to draw it? In other words, would the same results occur with basic feedback? 2. Was it important to have subjects draw the solution with a modification? Would literally copying the solution on the feedback sheet be sufficient? These questions were pursued in the fourth experiment.

The results were somewhat different for the prisoner and nine-dot problems. For the prisoner problem, all subjects asked to copy the provided solution did so, but only 36% of them solved the prisoner problem on second tries. When asked to draw the solution with modification, less than half the subjects were able to do so; 100% of those who completed the feedback drawing had second-try success, compared to only 27% second-try solutions for those who did not. For the nine-dot problem, the copy/modify contrast did not matter; what was important was accuracy on the feedback sheet. None of the nine students who did not meet the feedback drawing request solved the nine-dot problem on second try, but 91% of the forty-six students

who met the feedback request produced second-try solutions.

Upon reflection, the difference in results for the two problems makes sense. The solution to the prisoner problem has fixed starting and ending points, and the solution can be copied the way one might copy any line, with no need to consider why the line is drawn as it is. And copying the prisoner solution led to poor second-try performance. In contrast, the nine-dot solution cannot be copied in the same way; the provided solution does not show where to start or the order in which to draw the lines. Therefore, success in drawing either the presented or a modified solution requires attention to critical solution features and therefore leads to second-try success.

Feedback discussion
The experiments on solution feedback demonstrate a number of important points. It is possible with appropriate techniques to produce high levels of second-try success in people whose first tries have not been successful. The most important determinant of later performance appears to be the kind of processing subjects engage in when solution feedback is given. Second-try performance is a better indicator of what has been learned and remembered about a solution when the second presentation involves even a slight alteration of the first version.

Simply presenting solutions is generally not very helpful. Adding an explanation of the solution produces benefits by directing the person's attention to critical problem elements and promoting comprehension of problem structure. But explanations do not seem to be necessary, as much the same effect can be achieved with basic feedback plus a requirement that the learner reproduce the solution in a productive fashion. Because solutions can be copied with little or no attention to important problem details and relations, good results are more reliably obtained when the requirement is to produce a modified version of the solution provided. Indeed, those who correctly and productively reproduce solutions exhibit very high second-try solution rates.

This result must be viewed with caution, however, because the retention interval in these experiments was quite short, and further research is needed to determine how well the performance levels hold up over time. All the findings support the proposal that understanding of solutions is vital, and they indicate that adequate understanding can be achieved in more than one way.

Solving Problems With Unequal Understanding

In the experiments discussed to this point, success in solving a problem has been consistently associated with excellent, near-perfect performance when the problem is presented again. In these experiments, students were required to solve problems without any help, so when they did succeed, they produced the entire solution. The studies summarized in this section deal with the question of whether helping a person to solve a problem might prevent the person from attaining the level of understanding of the solution which is required for re-solving the problem or solving a variant of the problem. The first experiment demonstrates that giving part of the answer can hurt solution memory, but the later studies show that it is possible to help students solve problems without harming their later performance.

Help that hinders
The first experiment employed 24 problems called *number-phrase puzzles*; these are *not* maths problems but rather concern relatively ordinary facts about certain numbers. For

example, there are 26 letters in the alphabet; the corresponding puzzle would be 26 = L of the A, with the person required to complete the words for which only first letters are given (indicated by single, upper-case letters). Another example is 24 = H in a D, with the answer Hours in a Day.

In the experiment, the problems were initially presented to students in one of three ways. Those in the **Difficult Solution** group were simply asked to solve the 24 puzzles; one minute was allowed for each problem, and students who could not complete a phrase were shown the answer. In the **Easy Solution** group, part of the answer, namely the first word in the phrase, was given, so students saw problems like 24 = Hours in a D. In the **Read-Only** group, the complete solution was given, e.g. 24 = Hours in a Day, with the students given a cover task (to get them to attend to the puzzles) of rating how familiar the phrases were to them.

One week later all of the students were given a surprise recall test. They were given the problems in their minimal form, e.g. 26 = L of the A, and asked to complete the phrases. Those in the **Read-Only** group successfully completed only 65% of the phrases. For puzzles which had been solved in the first session, students in the **Easy-Solution** group recalled 82%, whereas those in the **Difficult Solution** group completed 97% on the recall test. It is clear that initially generating the solutions aided memory, compared to reading and rating them. Of special importance is the finding that giving part of the answer to the **Easy-Solution** group depressed their memory for solutions they had produced. This suggests that providing solution information in the initial session prevented the students from developing an understanding of all of the problems they solved. That lack of understanding led to later failures to produce solutions to problems for which they already knew the solution.

Helping without hurting

Giving partial answers can retard understanding. Is it possible to help students solve problems without hurting their memory of the solutions? Two more experiments addressed this question.

An example of the problems used, and of the different instructions given, is shown in Figure 3. The Card problem requires arranging a set of eight playing cards so that they will be dealt in sequential order (Ace,2,3,4,5,6,7,8) when every other card is dealt to the bottom of the deck. That is, the first card is dealt up, the next card is placed (face down) at the bottom of the deck, the next card is dealt up, the next placed at the bottom, etc. The problem is how to arrange the deck so the right order of cards will eventually appear.

Students in the **Control** group were given the problems in their standard form; those in the **Answer** group received, in addition to standard instructions, part of the correct answer, specifically chosen to hide the solution structure. Students in the **Diagram** group were given the standard instructions plus a blank diagram of the structure of the solution and were encouraged to use the diagram in solving the problem. When problems were repeated a week later, all were presented in standard form.

Results
The **Control** group solved 64% of the problems in the first session, less than either the **Answer** group (83%) or the **Diagram** group (82%). Both kinds of aids, partial answers and diagrams, helped students solve more problems in the initial session than they would have been able to solve on their own. The two aids were not the same, however, regarding solution memory. Analysis of second session data indicates that students in the **Control** and **Diagram** groups

re-solved significantly more problems (respectively, 97% and 86%) than students in the **Answer** group (73%), but that the **Control** and **Diagram** groups did not differ from each other.

Again in this experiment, providing partial solutions (**Answer** group) interfered with re-solving problems a week later. However, showing students the structure of a solution not only helped them solve problems the first time, but also allowed them to understand the solution and reproduce it one week later. In fact, it appears that helping by making the structure of a solution clear to students is just as useful to them as figuring out the problem entirely on their own.

Figure 3

An example of Control, Answer, and Diagram Groups' Instructions
Standard Instructions for the Card Problem

Ace/Eight Card Problem

Directions: Here are eight playing cards, they are sequential from Ace to Eight. Your task is to arrange these cards so that when you turn them over the order of the cards is Ace, 2,3,4,5,6,7,8. When you turn the cards over, you will turn up the first card, put the next card on the bottom of the deck, turn up the next card, etc.

Please show your work.

•••

Additional Information Provided to the
Answer Group
The second card in the stack is the 5, the fourth card the 7, the sixth card is the 6, and the eighth card is the 8.

•••

Additional Information Provided to the
Diagram Group

Top of the Stack

Bottom of Stack

Another experiment which gave almost identical results is described in the notes section at the end. It involved an isomorphic problem new to the solvers – transferring solving techniques, not re-solving, was involved.

Discussion

The pattern of results from these experiments is clear. Students who generate solutions on their own really understand the solutions they produce. They have virtually perfect success reproducing the solutions and do extremely well at solving variations of the original problems. Unfortunately, not all students can figure out all problems on their own. The way in which students are helped to solve problems can have a profound impact on their understanding of problem solutions. Obviously, providing either partial answers or diagrams helped students to solve some problems they would otherwise have been unable to solve. But, providing partial solutions as an aid apparently interfers with attaining an understanding of problem solutions, so re-solving a problem and solving an ismorphic problem were impaired. However, those who received structural diagrams were significantly more successful at re-solving and transferring their solution knowledge. Students who received the diagrams seemed to understand the solutions just as well as those who figured everything out for themselves.

Final Comment

*T*o return to our original questions: Students who solve problems on their own have excellent memory for the solutions. And it does indeed matter how solution information is acquired. Simply giving solutions to students is a relatively ineffective technique. Even giving partial answers to help students generate solutions yields reduced solution memory and transfer. The better techniques focus on problem structure – providing structural diagrams as solution aids, or giving an explanation of a solution to people who have tried but failed to solve a problem. In the latter case, it is important to assess understanding, preferably by requiring students to paraphrase the solution. The collection of findings highlights the distinction between solving a problem and understanding its solution, as well as pointing to understanding as the central factor influencing later performance.

Further Reading

For overviews of learning, understanding, and memory:

Greeno, J.G. (1977). Process of understanding in problem solving. In N.J. Castellan, kD. B. Pisoni, and G.R. Potts (Eds.), *Cognitive theory.* Hillsdale, NJ: Erlbaum.

Katona, G. (1940). *Organizing and memorizing.* New York: Columbia University Press.

Wertheimer, M. (1981). *Productive thinking.* Chicago: University of Chicago Press.

For more technical treatments of problem solving:

Chi, M.T.H., Bassok, M., Lewis, M.W., Reimann, P., and Glaser, R. (1989). Self-explanations: How students study and use examples in learning to solve problems. *Cognitive Science,* 13, 145-182.

Holyoak, K. J., and Koh, K. (1987). Surface and structural similarity in analogical transfer. *Memory and Cognition,* 15, 332-340.

Ward, M., and Sweller, J. (1990). Structuring effective worked examples. *Cognition and Instruction,* 7, 1–39.

Notes

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Historical and detailed technical information about the different experiments follows.

How the research began
Our research started because of a theoretical controversy. Many years ago, Gestalt psychologists had proposed that problem solving (at least sometimes) was different from simple learning and memory. They conceded that, when faced with a problem, one might just recall something previously learned which would solve the problem. But they argued that in some problem situations, solving involved a process of restructuring – one had to change one's view of the situation to find a solution. Such restructuring would lead to understanding of the relations between the problem situation and the solution. A further implication was that the solution to a problem which had been solved even once – with understanding – would be remembered very well.

The controversy was and is that many psychologists do not accept this second kind of problem solving purported to involve restructuring and understanding. The alternative is to consider all problem solving as the retrieval of information from memory, with the impli-

cation that solutions to problems are learned, remembered, and forgotten just like anything else.

Early research
Over time there has been considerable research on problem solving, but the focus has been on how solutions are initially produced. W discovered that there had been very little research on the topic of remembering problem solutions. In Kohler's reports on problem solving by chimpanzees, there are some comments that the chimps tended to find problems easy when they were presented a second time. There was, however, no systematic study of solution memory. More recently, researchers reported that their human subjects showed substantial forgetting of problem solutions, often failing to solve when the problem was presented a second time. (See Weisberg, R.W., and Alba, J.W. (1981). An examination of the alleged role of fixation in the solution of several insight problems. *Journal of Experimental Psychology: General,* 110, 169-192.)

An important point, however, is that these subjects had not solved the problem in the first place; rather, they had failed to solve and been given the solution. (See Dominowski, R.L. (1981). Comment on the paper by Weisberg and Alba. *Journal of Experimental Psychology: General,* 110, 193-198.)

The unanswered question was whether memory for solutions would differ between people who solved a problem, versus people who were given the solution. If the way in which a solution is acquired doesn't matter, then solvers and nonsolvers who are given a solution should remember it equally well. On the other hand, if the Gestalt psychologists were correct, then solvers should remember the solution better. This seemed to be an interesting question, and we decided to investigate it.

Solvers versus non-solvers

The 1st Experiment: Results

To analyze the results, session-one performance was used to divide the students into solver and nonsolver groups separately for each problem (thus an individual student might be in the solver group for one problem, the nonsolver group for another, etc.) The two groups were then compared in terms of session-two performance.

The 2nd experiment

The way the solution was presented had no effect on second-session performance: see Dominowski, R. L., & Buyer, L. S. (1985). *Retention of problem solutions.* Paper given at the Annual Conference of the Cognitive Section, British Psychological Society, Oxford, Sept.

Kinds of solution feedback.

Four Experiments on Feedback

The research findings were reported in Dominowski, R. L. (1987). *Solving previously-failed problems: Effects of the form of solution feedback.* Paper given at the Annual Conference of the Cognitive Section, British Psychological Society, Cambridge, Sept., and in Dominowski, R.L. (1990). *Feedback and understanding in learning problem solutions.* Paper given at the Annual Meeting of the Psychonomic Society, New Orleans, November.

For the first two experiments, data were collected in group sessions, with fixed time limits for working on each sheet (first-try, feedback, filler, second-try); slightly different time limits were used in the two studies. The first experiment involved 48 students, each randomly assigned to one of three feedback conditions: Basic, explanatory, or modified basic. The last condition involved the same solution feedback as the basic condition, but subjects were asked to answer some questions about the problem (e g., what did they think was the key to solving the problem?).

The primary data concerned performance when target problems were presented a second time. Across all problems, second-try performance was better following explanatory feedback (63% correct) than after either basic (46%) or modified-basic feedback (21%). The differences were not the same for all problems, however. Performance after modified basic feedback was always worst; answering questions (within a very short time period) apparently interfered with feedback processing. For the prisoner problem, basic and explanatory feedback yielded equal second-try success (81%), whereas for the nine-dot problem, explanatory feedback (88%) was superior to basic feedback (50%).

The second experiment was quite similar to the first. Three changes are noteworthy: Less time was allowed for second tries at target problems. The second presentation of the prisoner problem was altered, with the 'X' cell in the upper right corner and the 'O' cell in the lower left. This change might be trivial, but it might also harm second-try performance of those whose grasp of the solution was tenuous. Finally, explanatory feedback sheets included a blank problem space as well as the solution (and explanation), with the subject asked to draw the solution in the blank space but with a change from the solution presented. If the solution shown for the prisoner problem was that in Figure 2, then the subject was asked to draw the solution with the first victim being in the cell to the right of the 'X' cell. The solution shown for the nine-dot problem was like that in Figure 2; the subject was asked to draw the solution but 'make it point in a different direction.'

A total of twenty-four students participated, thirteen receiving basic feedback and eleven the modified explanatory feedback. Across all target problems, second-try performance was better after explanatory feedback (52% correct) than following basic feedback (26%). Second-try success rates were lower for the prisoner problem, compared to the previous experiment, and explanatory feedback was better than basic feedback for both the prisoner problem (55% vs. 39%) and the nine-dot problem (72% vs. 39%). There was also the suggestion, for the explanatory group, that those who correctly completed the feedback sheet were more likely to have second-try success than those who didn't complete the feedback sheet (91% vs 39%). Because only a small number of subjects was involved, the results had to be considered tentative, although encouraging. To increase the reliability of the data, the experiment was repeated with 36 additional students (17 basic, 19 explanatory), each seen individually, which allowed greater control over procedures.

Further questions (the fourth experiment on feedback)

Only basic feedback sheets were used, with the requirement to either copy or draw with modification the solution provided. Second presentations of target problems involved a change from the first presentation, the prisoner problem as before (moving the 'X' and 'O' cells to the opposite diagonal), and the nine-dot problem rotated 90 degrees so that the dot pattern appeared as a square on first tries but a diamond on second tries. Fifty-five students participated (28 copy, 27 draw with modification).

Solving problems with unequal understanding

Help that hinders

The first experiment in this section can be found described in full in Buyer, L.S., & Dominowski, R.L. (1989). Retention of solutions: It is better to give than to receive. *American Journal of Psychology*, 102, 353-363. When students had initially failed to produce a phrase and were given the solution, later recall was the same for the Easy- and Difficult-Solution groups and equal to that for the Read-Only group. This finding replicates the earlier result of greater solution memory for solvers vs. nonsolvers.

Helping without hurting

The Gestalt psychologists had argued that understanding of the inherent structure of a problem is the key to retention and transfer of solutions. Is it possible to help students solve problems without hurting their memory of the solutions? The two experiments which address this problem can be found written up as part of a dissertation by L. S. Buyer submitted in partial fulfillment of the requirement for the degree of Doctor of Philosophy in Psychology, University of Illinois at Chicago.

In the Card problem experiment each of the 101 students initially worked on problems under one of three different instructions which were designed to manipulate what Max Wertheimer called structural understanding. Each student worked on three different kinds of problems in an initial session (with answers given after failure to solve) and was given the same problems to solve one week later.

In the card problem analysis of the second session data also showed that for problems that students had failed to solve in the first session (and for which they received solution feedback), second-session averaged 60% and did not differ among instructional conditions. This is another replication of solver vs. nonsolver memory differences.

A third experiment on helping without hurting was identical to the second except that, in session two, students were asked to solve isomorphic versions of the problems they had attempted in session one (rather than repeating session-one problems). Isomorphs are structurally similar problems having different surface descriptions. For example, the isomorphic version of the Card problem required students to figure out how to arrange a deck of eight cards (4 red, 4 black) so that they could deal out Red, Black, Red, Black, Red, Black, Red, Black when alternating between dealing a card to the table and placing a card at the bottom of the deck. Although the Ace-8 and Red-Black problems have comparable structure, the students could not simply reproduce the Ace-8 solution when they were given the Red-Black problem in session two.

For problems that students solved in session one, the percentages of successful transfer to the isomorph in session two were 70% for the Answer group, 84% for the Diagram group, and 88% for the Control group. The Diagram and Control groups performed similarly in transfer, and both exceeded the performance of the Answer group.

As before, second-session performance did not differ among conditions for problems where students had initially failed to solve.

Working With Children Who Have a Life-Threatening Illness

Ruth Still

Evans High School, NSW

Nikki Slade

1. Introduction

A FEW YEARS ago for a postgraduate degree project I studied a group of seven children who were receiving treatment for leukaemia or cancer.

One of the main aims was to encourage the children to express and explore their feelings. Encouragement is important since feelings of anger, sadness, fear, happiness, and relief arise because of their illness and the treatment that they receive. The other aim was to help them cope with the disease itself.

There are other questions to consider also. How do healthy and ill children understand death? How aware are they of dying? How will parents, siblings, school and friends be involved and how can they cope?

2. The Children

I wanted to work with primary school children 6- to 12-years old, because I felt they were less inhibited about drawing and therefore perhaps more willing to share their ideas and feelings.

The hospital suggested I see six children either in the early stages of treatment for leukaemia or in remission. The age and family details of four of the children were as follows:

- Lynne aged 8 had a younger sister, Josi and they lived with their divorced mother.

- Melissa, aged 10 had an older sister, Sharon, and they lived with their parents.

- Ed, aged 8 had a younger sister, Sandy, and they lived with their parents.

- Jamie, aged 9, was the eldest of four children, who all lived with their mother.

I saw these four individually for one hour once a fortnight, six sessions each. The other two children were Brent (aged 10) and Wayne (aged 6) and a third child, Elizabeth, was also referred to me in my role as a school counsellor. I saw Brent and Wayne once and Elizabeth was seen by me over a period of some twenty months.

3. Research methods

D rawing was the principal therapy but other projective techniques such as sentence completion and story telling were also used to aid the therapy when appropriate. A scale of depression provided an objective measure of overall depression and also a close look at various areas of depression, affection, social problems, self-esteem, pre-occupation with sickness and death, and guilt. It also helped me discuss these areas with the children. The Rohde's Sentence Completion (ACER 1953) helped the children express their ideas and feelings on a whole range of areas about themselves.

An injection from the doctor

Note the size of the needle and the boy's arm. When I asked why his back was towards me in the picture he said this was because he didn't want me to see how sad his face was.
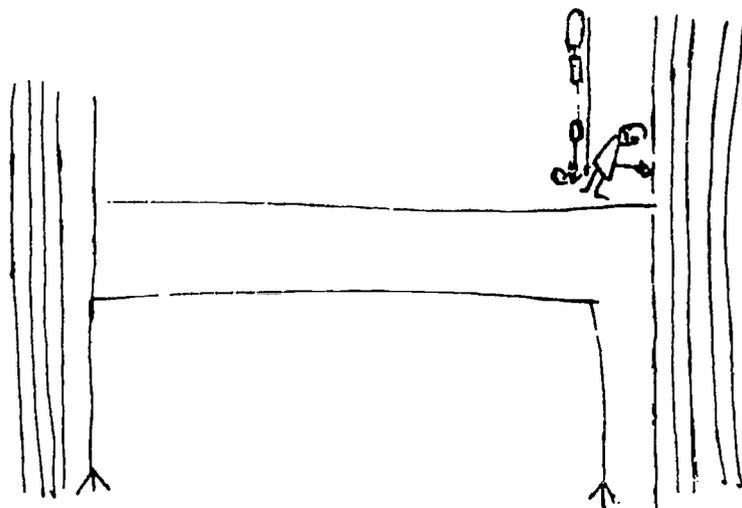
In bed in hospital

The original is in yellow, a colour representing illness. Note the size of the bed, seen side-on, compared to the self portrait; the size of the needle and drip, so much bigger than her; the sad face; one hand gripping the bed-head.

At the first session some drawings were done and the Children's Depression Scale (CDS) was completed with the child and also a parent or sibling, whoever was available. At subsequent sessions there were drawings and sentence completions, or whatever was felt to be therapeutically appropriate.

Ideas for the drawing themes came from *There's a Rainbow Behind Every Dark Cloud* published by Celestial Arts (1978). The series of drawings I tried to use were: draw yourself and your family before you fell sick, a happy picture, a sad picture, seeing the doctor, going to hospital, going home, going to school, things you like to do, dreams, death.

If fantasy work appealed to the child (as it did with Ed) I used, as well as the Rohde, *Awareness: Exploring, Experimenting, Experiencing* by John O. Stevens (1971).

In the final sessions the children were given the opportunity to share the drawings and other works with their families.

4. Discussion

The Concept of Death

T here are a number of researchers who have examined childhood attempts to understand death. Looking at their work shows that a child's changing orientation toward death is a complex phenomenon that spans the whole course of his or her childhood and probably continues on into adulthood. The concept of personal mortality requires self-awareness, logical thought, concepts of probability and causation, concepts of personal and physical time, of finality and separation. The evidence strongly suggests that the young child lacks most of the mental operations required to form the separate concepts which are integrated into the concept of death. Childhood is the time when these concepts grow and become organised.

Whether you are helping a child who has not had personal experience with death, or a bereaved child or a dying child, probably the most worthwhile method of assisting the child to learn about death consists of allowing him or her to talk freely and ask his or her own questions. In an atmosphere of acceptance, the normal child can speculate and question and gradually explore thoughts and fears. This seems to hold true for the bereaved child and the dying child. If assured of acceptance, the child experiencing death firsthand can choose his or her own time and manner of approaching the subject.

Awareness of Dying

I reviewed the literature on stages of dying and was able to focus on which stage my children appeared to be in, or moving backwards or forwards through. I was able to study how much child-

ren with a life-threatening disease know about their illness, treatment and prognosis. I also looked at the effect when parents or medical staff do not tell a child about his or her illness. Children, like adults, express considerable anxiety about death, their illness, their bodies, their families and the world in which they live. It is only by exploring the personal meaning of the disease with those involved can we learn about concerns and strengths which arise as they cope.

5. The Expression and Exploration of Feelings and Ideas through Drawing

Children need a safe, therapeutic environment for them to be able to explore and express their ideas about themselves, their disease, their treatment, school and their families. Using drawing provided an environment where this could be done. The other projective techniques, the CDS, sentence completion, fantasy work and play, also encouraged discussion. During my years as a teacher and school counsellor I have often used drawing this way. Most children find it relaxing and a non-threatening way to share their feelings, but some, as I found for two of these children, do find drawing difficult. So for them I used the other techniques to facilitate discussion.

Drawing therapy, like play therapy, provides a natural medium of expression and a non-threatening approach for the therapist. Drawing, in a controlled and accepting situation, can enable the child to release his or her innermost thoughts, feelings, fears, anxieties and aggressive impulses without fear of censure of punishment. Thus drawing allows children to reduce their anxiety. Although I often suggested the topic for a drawing I tried to use a non-directive approach so that the child was free to express his or her feelings and respond to my interpretations. Thus I tried to observe how the drawings were done, the children's body language as they drew and things that they might be saying through the drawing but couldn't put into words. In this way I tried to understand and empathise with the child's emotional expressions as perceived in the drawing, verbalisation and manner.

6. Parental involvement

When parents learn that their child has a life-threatening disease, feelings of guilt, hostility and denial may complicate their anguish. Parents seem to appreciate honesty and desperately want 'the facts' about their child's illness, treatment and prognosis.

The most important issue in adjusting to leukaemia for the patient and his family is acceptance that from the time of diagnosis this disease will be a major factor in their lives and a major challenge to the family. The demands of the treatment and its effects will be with the child and his family from the day that treatment begins until either long term remission is obtained or the child dies. Treatment, and the effects of treatment, impose on the family's schedules, plans, vacations, interactions and lifestyles.

Parents should be encouraged to put into words their immediate and long range fears and their behaviour should be discussed with them. With the physician and social worker, parents should talk and think about their visibility to the child during treatment procedures, how they will show that they care, the need for flexibility and the disadvantages of overprotectiveness. Parents should be informed about the behaviour to expect from the patient.

The reactions of healthy siblings also need to be considered. Parents need advice about how to share knowledge of the illness with the patient's healthy siblings and how they can participate in their brother or sister's care. Often parents find that the greatest help comes from other families who have lived through the same experience.

Using drawings, as a means for children to express their ideas and feelings, worked well from my point of view as a counsellor. But the drawings also helped the children to communicate ideas and feelings to their parents. I am convinced there is definitely a role for a counsellor to be working with such children and their families, particularly as an intermediary between parents and children.

7. What should one do?

Arising out of my case studies, I recommend the following:

In hospital

Hospitals can help social workers be involved in social skills and counselling for the whole family rather than being tied up in such routines as finding beds for family members, sorting out government allowances, etc. Perhaps, if this is not possible, then a counsellor should be appointed to the medical team. This person could be involved in the playrooms, not only initiating play, but also interpreting drawings and play with patients. I believe it is worthwhile for the counsellor to keep a record of the patients' drawings done at the clinic and when in the hospital. There are similar ideas in *There's a Rainbow Behind Every Dark Cloud*. Obviously such a counsellor needs to be orientated towards the patient and the family; for example, communication skills need to be developed in the families. Also self-esteem work could be done with the whole family, but particularly with the ill child.

Families need support by seeing that their child gets the best care. The patient's family also needs care. The ability to control
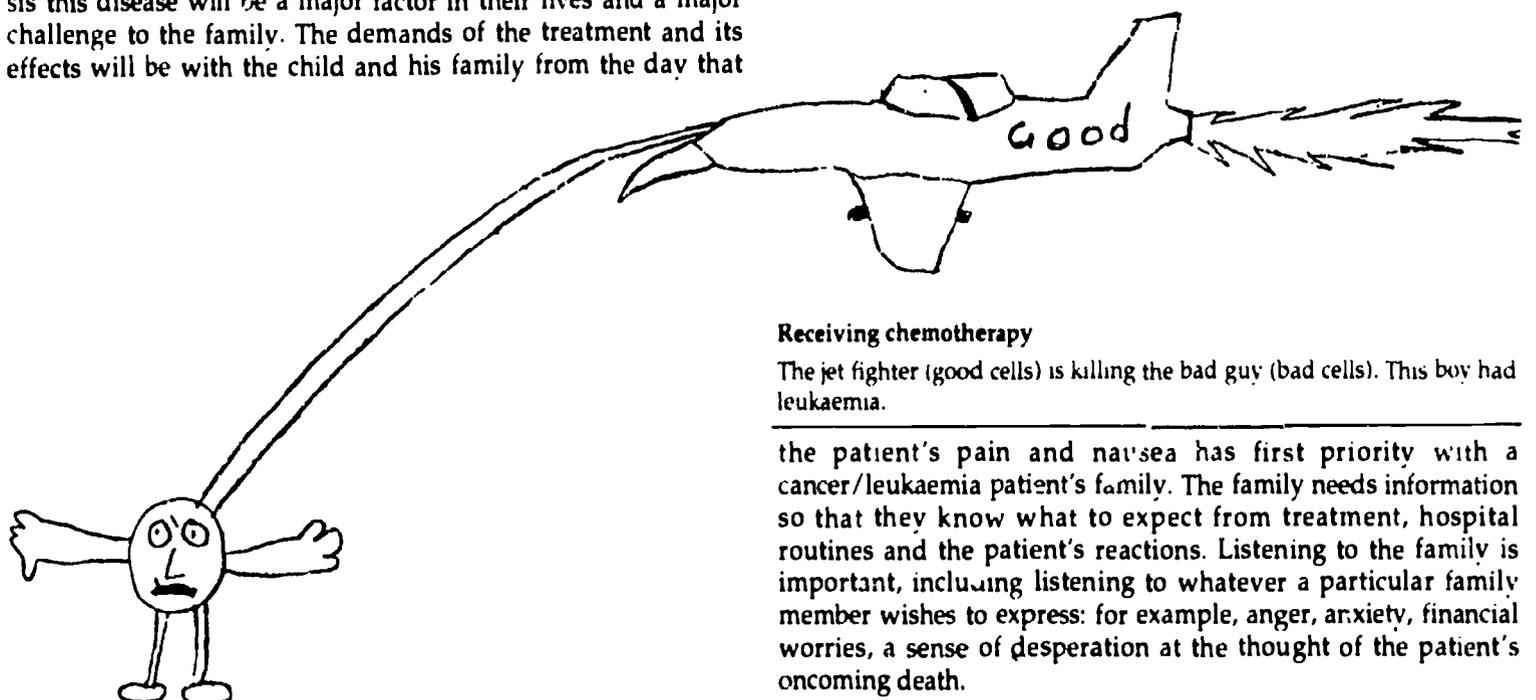
Receiving chemotherapy

The jet fighter (good cells) is killing the bad guy (bad cells). This boy had leukaemia.

the patient's pain and nausea has first priority with a cancer/leukaemia patient's family. The family needs information so that they know what to expect from treatment, hospital routines and the patient's reactions. Listening to the family is important, including listening to whatever a particular family member wishes to express: for example, anger, anxiety, financial worries, a sense of desperation at the thought of the patient's oncoming death.

One needs to listen to the patients too; to check their understanding of what is happening to them, what the treatment is for, etc. Listen even to their denial of the oncoming death or what they are NOT saying; this in itself could be telling you something.

In school

When the child has been newly diagnosed after an initial absence from the class, the teacher should be invited to a conference with the parents and health professionals to help prepare for the child's return to the classroom. The teacher or the school nurse needs to gather the following information.

(a) the specific type of cancer/leukaemia and how it is being treated;

(b) the treatment that the student is having, when it is administered, what the potential side effects are, and the effects on appearance and behaviour;

(c) the approximate timetable for future treatment, procedures or tests that may result in the student's absence from the classroom;

(d) the limitations, if any, on the student's activities;

(e) what the student knows about the illness;

(f) for younger students, what the family would like classmates and school staff members to know;

(g) for adolescents, whether the student wishes to talk directly with teachers about any of these points.

The school counsellor should be involved – children with a life-threatening disease do face a serious emotional crisis and much of their attention and energy may be focused upon their disease and their attempts to develop ways to cope successfully.

In addition to managing the classroom, teachers need to recognise and manage their own feelings of anxiety; they must also act as a model and counsellor to the child's classmates. If a class is prepared for the return of their classmate then teasing or isolation due to embarrassment or fear will be lessened. The teacher needs to consult with the child and parents prior to any class discussion to obtain permission to share information. Children with cancer can engage in activities suitable to their age and abilities. But while on chemotherapy they are unusually susceptible to infection and therefore school work should be sent home during those times when isolation is required.

8. In conclusion

Coping with a life-threatening disease raises many issues, feelings and anxieties for the patient and his or her family. Dealing with all of these issues, feelings and anxieties is the challenge to the patient, the family, the hospital personnel, the school and to the community.

Notes

Mrs Ruth Still is an Educational Psychologist and District School Counsellor based at Evans High School, Blacktown, N.S.W., Australia. She welcomes contacts for further discussion.

Her research is detailed in

Case Studies of Counselling Children with a Life-Threatening Disease (1986) held by Macquarie University.

Getting Help

Teachers, and certainly schools, are advised to seek out and keep a list of local organisations who can help and give information. The list will be longer than you might expect; for example New South Wales has in 1991, as well as government agencies,

1. The Bereavement Care Centre
   41 The Boulevarde
   Lewisham 2049
   Phone: 569 9311

2. Compassionate Friends
   P.O. Box 199
   Pymble 2073
   Phone: 267 6962

3. The Association for the Welfare of Children in Hospital
   158-160 Hawkesbury Road
   Westmead (On the ground of Nepean C.A.E.)
   Phone: 633 1180

4. Sudden Infant Death Association
   Phone: 639 6969

5. National Ass. Loss & Grief
   P.O. Box 79
   Turramurra

For Further Reading

Adults

Anthony, S. *The Discovery of Death in Childhood and After* Baltimore: Penguin Education Books.

Grollman, E.A. *Explaining Death to Children* Boston: Beacon Press. 1967.

Jampolsky, G. et al. *There's a Rainbow Behind Every Dark Cloud* Millbrae, California: Celestial Arts. The Centre for Attitudinal Healing. 1978.

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Kubler-Ross, E. *On Children and Death* New York: MacMillan Publishing. 1983.

Langner, M.B. *The Private Worlds of Dying Children* Princeton, New Jersey: Princeton University Press. 1978.

Nelson, W.D. *Helping Children Understand Death* Australian Early Childhood Resource Booklet No 3.

McKissock M. *Coping with Grief* A.B.C. Crows Nest. 1985.

For Children

Grandpa by John Burningham

Why Did Grandpa Die? by Barbara Hagen

The Dead Bird by Margaret Wise Brown

The Accident by Byron Mellonie and Robert Ingren

Lifetimes by Byron Mellonie and Robert Ingren

Badger's Parting Gifts by Susan Varley

The Tenth Good Thing About Barney by J. Viorst

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ACCOMMODATING AT-RISK PUPILS

Sandra E. Miller, Gaea Leinhardt, Naomi Zigmond
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What is it about high school that makes some pupils want to leave as soon as possible? Some students (up to 8% of those at school) may have so much trouble with the academic work that is the main fare at school, that we can call them Learning Disabled. Is the difficulty of the work the main reason they leave? Is it something the school should change? Or do these children, who often come from deprived environments require something different which many schools do not provide?

All pupils, from time to time, feel 'alienated' from the school system, but for some this is more acute and dangerous than for others. The symptoms of alienation are poor work, truancy, bad behaviour, and a general disengagement from what the school is all about. We could, and sometimes do, call in special services to look into a child's problem, but more often the school does what it can to cope by itself. Teachers make special efforts to get such children fully engaged in school life; schools organise special classes and programmes.

Our research set out to look at pupils in school, to find out how the pupils experienced the socialisation aspects of being at school (relationships with peers, teachers, counsellors, administrators) as well as the academic aspects of school (curriculum demands and learning tasks). This paper is about the way at-risk pupils, and the school, deal with academic learning. Our research was in a suburb in the USA, but Australian and New Zealand teachers will recognise their own pupils, their own schools and their own attempts to cope.

The School
Wilson High School has almost 1000 pupils; its teachers are 80% white but its pupils 80% black. For the 7% of the pupils it categorizes as Learning Disabled, Wilson has three self-contained classrooms in the Junior High and three 'resource' rooms in the Senior High – one for math, science and health; one for English; one for Social Studies.

We selected three learning disabled (LD) and three 'ordinary' children to follow in this study. Though most at-risk students miss a great deal of school, we selected only students who attended school regularly. (Otherwise we would never have had a chance to see them in school!)

The Pupils
They were 15- and 16-years-old, some in regular classes, some in a vocational track. We selected only boys.

The Method
After a brief pilot study, we conducted 5 months of observations – each child was observed three days at a time each month in English, Math and Social Studies. There were also semi-structured interviews, one each month. To check on the cognitive demands made (in both the special and mainstream settings) and general school climate, teacher plans, pupil assignments, and school policy documents were collected and carefully analysed.

Safeguards against researcher bias were employed and are described in detail in the original study.

Findings
Accommodation
Our initial impression of the school was that the skill levels of all its students were quite low and the demands made of mainstream, as well as special education classes was at a low level. It was also clear, early on, that common signs of 'institu-

tional alienation', such as pupils seeing the teachers as unfair or uncaring, were not present. In fact, the overall dropout rate for learning disabled students was about 25%, approximately 10% lower than that of the city schools nearby.

During data collection and analysis, our initial impressions of a low standard of expectation at Wilson High changed. We began to see a larger, more complex process of support and institutionalized responsiveness to students which we call *accommodation*. Accommodation is what happens when the school responds to the needs and/or desires of students, as perceived by teachers, administrators, etc. It is an effort to adjust the demands of school life to bring them more into correspondence with the realities of adolescent life; a willingness to compromise on the part of the school in order to reconcile student needs and school demands.

Accommodation functions in a variety of ways: to modify the demands made of students, to provide support for students in meeting those demands, or to provide alternate means by which students may meet the demands of schooling. It also operates at various levels: *institutional* accommodation is reflected in schoolwide rules and policies and their waiver, *classroom* accommodation is reflected in the adjustments that teachers make to tasks and setting demands, and *personal* accommodation is reflected in the responsiveness of teachers to the personal needs of individual students.

These types of accommodation appear to facilitate the academic engagement of students who are at risk and may serve to retard a gradual process of academic *disengagement* that might normally affect this group of students. We wonder, in fact, if there might be some relationship between the high levels of accommodation to students that we observed and the comparatively lower dropout rate found in this school.

Accommodation
We noted that school policies at Wilson tried to give pupils the chance to meet the demands of schooling, and had a degree of flexibility so administrators, counsellors, and teachers could adjust conditions to individual circumstances.

One of the best examples of this type of accommodation (institutional accommodation) was the school response to a fairly strict attendance and promotion policy. The attendance policy said:

> any student who is absent from school and/or class for a period of eleven (11) days or more during the total school year for reasons other than verified medical (doctor's note), or administratively approved absences will not receive credit for the year, or the class.

This policy had serious implications for at-risk students because it would make it virtually impossible for students with poor attendance records to pass any of their classes. The institutional accommodation came in a second policy that gave students a second (or third or fourth) chance to pass the year. By attending an afterschool programme, students were allowed to 'buy back' their unexcused absences and clear their records. Attendance at three afterschool sessions (of 1½ hours each) bought back one unexcused absence. Thus, it was theoretically possible for a student to miss up to 45 days of school and still make up the time in the afterschool programme.

Approximately 20 students per day attended the afterschool programme where the only requirement was that they had to be working on school work, although there were no stipulations about what work that should be. One of our students, Marvin, took advantage of the afterschool programme in the year before this study, and despite a month's worth of absences was able to pass 10th-grade.

Accommodation at the Classroom Level

Classroom level accommodation reflects the ways in which teachers modify the demands of their classrooms in response to students who have trouble meeting higher levels of demand. Teachers at Wilson did this in a number of ways:

Selection of curricular materials

Most teachers at Wilson High believed it necessary to modify curricula and simplify tasks that they required of *all* their students, not just the mainstreamed special education students.

Four of the mainstream teachers involved in this study commented independently that they had simplified the content of their courses because their students would otherwise have difficulty. Mr E., for example, confided that each math class in Wilson High was actually taught at an academic level below that suggested by its title. Thus, a class that was listed as 'academic' was actually taught as a 'general level class' and a 'general' class was actually taught as a 'remedial' one.

Reflecting a similar view, Mr C. expressed concern with finding suitable curriculum materials for a mainstream literature class:

> A student in the class asks Mr C. whether or not he is going to use the 'academic book' (on Mr C.'s desk, called *Adventures in Appreciation*.) Mr C. explains that he wants to start using the book with this class, probably in January. After class, Mr C. explained to me that he wants to use the literature book, but thinks it might be too difficult for these students. In any case, he'll give it a try.

In February Mr C. explained that he preferred *Adventures in Appreciation* because it contained works by Poe, Chekhov, and other good writers, but it had indeed proved too difficult. Instead, he was assigning stories from a 10th-grade book for this 11th-grade class. His 10th-grade class would continue using an eighth-grade book.

Instructional delivery

Classroom accommodation was also evident in the way teachers taught; teachers chose a means of instructional delivery that minimized the skills required of students.

For example , social studies students are usually required to extract important information from reading text materials. Students in Mr G.'s mainstream American History class, however, were almost never required to exercise such skill because Mr G. read the text aloud. As students followed along in their books, Mr G. stopped intermittently to define terms or give examples. He also paraphrased the main ideas from each passage after he read it.

In special education there was no need for students to read any text material. Mrs J. outlined each textbook chapter on the blackboard, then asked questions that could be answered by referring to the blackboard outline. Questions on the material were assigned as seatwork, but students relied on their outlines to answer these questions, without ever having to refer to the text material itself. In fact, they frequently had no books.

Two more teaching techniques helped students who had poor notetaking skills record important information. One was a notetaking guide. It consisted of a photocopied outline of information given in a lecture by the teacher. In various places important information was left blank and students were required to fill it in. The second was simply a blackboard or overhead projector outline of the important points of the lecture that students copied into their notebooks. These notetaking guides presented the material to the students in such a way that independent thought was unnecessary. They also played an important role in two additional forms of accommodation, the nature of student assessment and the simplification of cognitive tasks that students were asked to perform.

Assessment

Evaluation of student performance reflected accommodation of students in several ways. First, student grades were determined not only by their test scores but also by the number of homework assignments students completed (even if the assignments were not accurately completed). Second, even during times of academic accountability, such as during testing, teachers often gave students 'a break' to enhance their performance. Finally, there was an extremely high degree of overlap between tests and instruction. Each of these examples of accommodation is described below.

Students' final marks were derived from quizzes, tests, and homework assignments. Invariably, teachers did not mark homework assignments for accuracy, but just gave students points for having completed their homework. Students who had trouble with the course material could improve their final mark by completing homework, even though they did not complete it accurately, because in many cases doing homework was weighted equally with test scores.

Neil, one of the target students, explained how homework grading worked in several of his classes:

Neil: [In geometry] we give him our paper, and we get a check if it's done or at least tried, and if you don't, you get a zero. I get all the checks for every homework so I get 100%.

Interviewer: So, if you have 10 problems and you have 5 of them correct?

Neil: See I don't know about that, but if you have like 8, he'll still give you a check for the problems that you tried. How well I do on the test [is most important] cause that is where I do low at. My homework is good. I get 100% on my homework, but I study for the test and I don't get them right.
[In English] . . . He don't really touch it, he just looks at the notebook . . . and he marks in the book, '10 homework assignments' . . . That's one thing, he'll never know if we got them wrong . . . I like that a lot cause I don't care.

A second form of accommodation that affected the process of evaluation of student performance was teacher flexibility. George described this flexibility when we asked him what happens in his LD class if he fell behind in his work:

> If you [don't] do your homework, he'll say, 'Okay, you do, do it now and turn it in,' and if you get an 'F' on a paper, he'll give the paper back to you [and] say, 'Do it over' and he'll grade it over again.

Another way of 'letting students off the hook' was by modifying testing procedures so the students could perform well. It was Mr G.'s policy to allow students to use their notes and textbooks during the last 5 minutes of the test. Mrs J. postponed a test for two students when she discovered that the students hadn't learned the material. In some instances tests did not work as indicators of mastery. This was particularly true in LD classrooms where students received considerable assistance from the teacher during 'tests'. Teachers sometimes said that students were expected to do the work on their own, but often helped them considerably.

> At 12.59 George asks a question about State College, referring to a question on the test which requires him to locate the town. He seems puzzled by this. Ms J. says to him, 'Well, it wouldn't be here,' pointing to the list of recreation areas where George had been looking. 'It's a city.' Once she tells him this, he seems to understand. At 1.07 George turns in his test paper and asks Ms J. if she's going to check it now. She sits down at her desk and pulls out the map . . . [when she] finishes, [she] tells George that he got them all right.

A third form of accommodation in assessment was evident in the nature of tests themselves, specifically their overlap with what had been taught. A high degree of overlap helps pupils because it does not require them to bring knowledge gained outside of the class to the test in order to pass. It is also a further form of accommodation if students are told explicitly where and how the overlap will occur. Then they not only know what material they should study for the test, they also do not have to engage in the metacognitive task of 'knowing what to know.'

At Wilson High review sheets or notetaking guides played a critical accommodating role in assessment: they defined the overlap of course content and test. Mr G. reminded his class often that the smart person would pay close attention to the reviews because some of those questions 'might show up again.'

The more that teachers accommodated to students' low metacognitive functioning, the more comfortable students felt about their classes. Tod described how difficult he found a class at his former high school.

> He'd show us movies on the solar system and all that and we would take notes on it, and from our notes we would have to study for a test. He wouldn't give us any notes. We would have to take notes for ourselves. We wouldn't know what was on the test or if our notes was correct or not, so you could be writing down certain things and they wouldn't even be on the test.

Then of his teacher at Wilson High, explained:

> If you read the whole chapter and there are certain sentences that he wants you to know, like the facts, they are already written down on the ditto [photo-copied] sheet, and then you just fill in the answers from the book. That's like your notes. You know for sure that the notes are going to be on the test. You study from that, you'll pass the test with ease ... You could say it's all in the dittos though. The whole test is on the dittos.

The pupils knew there would be a lot of overlap between class-work and tests. To them the content of the test defined the content of the course. This considerably narrowed the scope of the information students attended to. Elliott, for example, found much of social studies class irrelevant because he knew that the elaborations and embellishments to the text being presented by the teacher were not going to be on the test. As a result he often fell asleep in class:

> [On the tests] all you got to do is write down what he said and he gives you credit for it. He is kind of, I wouldn't say boring, yeah, he is kind of boring ... cause um, in my other classes, they give a lesson, I'm wide awake ... I'm awake and listen to the teacher ... [but he] puts me to sleep cause he confuses me, sometimes cause he'll relate something that went on like in American History like in the Revolution with today's problems ... It don't really mean nothing cause he ain't really talking about the book ... That's what's confus-ing. They ain't on the test.

A final example of accommodation in assessment was the rela-tively low level of cognitive demand in the tests themselves, a natural outcome of the high degree of overlap between study guide or review sheets and the test. For example, in one social studies test, 18 out of 22 test items were items that had been included on the review sheet that the teacher read aloud just before the students took the test. Of those 18 items, 13 required an answer that used the same words as the review sheet, or the same examples that were provided in the review sheet. The cognitive task of studying for such 'verbatim' items is quite different from that required for a test composed of paraphrase items or items in which students must draw inferences. Verbatim items require a kind of memorisation that may even interfere with comprehen-sion of the material being learned. The predominance of memori-sation tasks over comprehension items on tests was a cognitive accommodation: it reduced the demand for complex thinking on the part of students.

Personal Accommodation

Personal accommodation is the general level of teacher involve-ment with students, their expressions of interest, acceptance, and support. At Wilson High it was much more evident in special education than in regular education classes. It was clear that the LD teachers at Wilson High had a great deal of knowledge about, and concern for, the students in their charge. This was noticeable in staffroom conversation: 'Was Marvin absent again?; George is really having difficulty in his mainstream health class, maybe we should move him back into the resource room; Rahvid forgot the job application you gave him.'

It was also noticeable in the nurturing atmosphere of the LD classroom:

> Billy, a student not in this class, and another boy come in and walk over to Mrs A., who is sitting at her desk. Billy says, 'We're coming up to your house tonight to get back that tape.' Mrs A. laughs and exclaims that it's not her fault that they weren't here yesterday to pick up the tape, and pulls a videotape from her drawer and hands it to Billy. Another boy comes into the classroom frowning. Mrs A. says to

> him, 'It's such a beautiful day, what's the matter with you?' He says he has a headache. At this moment, Mike enters the room carrying a wine rack that he has made in wood shop. The teacher's aide, Mrs D., and Mrs A. both complement him profusely on the rack and he beams. The bell rings and Rahvid enters the classroom with Lionel. Mrs D. asks Rahvid about a speech that he is planning to read during announcements for black history week. She is inquiring how long it is, and Rahvid comments that he's afraid that it will take about five minutes. Mrs A. reassures him that if Mrs Q. helped him to write it, it will be alright. The aide asks about another student who is not present. She saw him driving his grandfather's car on Sunday and wonders because she thought he wasn't allowed to drive anymore ... [Later], Mrs A. comments sympathetically to Kevin, who's been sitting with his head down on his desk, 'Your head's really hurting pretty bad, huh?' He tells her yes, that he had been to the nurse's office and they didn't do anything, but that it hurts behind his eyes and his eye is blurry. Mrs A. sounds concerned, 'You mean you can't see out of your eye?' ... She then asks the aide to please walk with Kevin down to the office and tell them that his head hurts badly, and he can't see out of one eye.

It was also apparent that students found their LD teachers to be a major resource when they needed some form of assistance. LD teachers coached them in preparation for tests in other classes, helped them write speeches, helped them fill out job applications, offered advice, listened sympathetically to complaints, and very often, simply chatted with their pupils.

The Effects of Accommodation

Our observations and interviews at Wilson High School confirmed that what schools do can boost students' academic engagement and overall integration into school life. We found numerous examples of school policy and staff facilitating this academic engagement through institutional, classroom, and personal accommodation. We found that administrators and teachers consciously tried to limit the demands made on students or to provide alternate means by which students could meet those demands. And we found that students were aware of the accom-modating aspects of their environment and even came to antici-pate accommodation.

We believe that these kinds of accommodation play a key role in keeping students academically engaged enough to complete their high school careers. But, though accommodation reduces the most extreme levels of disengagement and alienation, it does not necessarily promote active engagement in school. In fact, accommodation may have some unintended side effects that actually limit what students get out of school.

One side effect has to do with student expectations that accom-modations will always be made. These expectations are at the institutional level as well as at the personal level. For example, Marvin was unconcerned that he was not meeting school atten-dance requirements because he expected that some 'arrangement' would be made to help him pass the year, as had been done before.

A second side effect is that school 'learning' did not require even moderate levels of active engagement with the *content*. Our six students spent a great deal of class time 'shuffling' information without ever truly learning it: they copied information from the blackboard into their notebooks, read information from their notebooks aloud to the class and copied information from their notebooks onto their homework papers. But they could do these information-shuffling tasks without paying very much attention to the information itself. They did not need to understand the ideas in the notes they were copying nor in the answers they were reading. Tod explained:

> I never pay attention to what he says in World Cultures, I just write down the notes ... I can't even remember what he said today.

Our students, like George, participated in class discussions and did well in homework assignments as long as study guides or outlines were in front of them, but ran into difficulty every time they were required to use the information without the guide. We saw students commit information that they did not understand to memory and be relatively unconcerned about making sense out of the information. In an interview after a social studies class

Rahvid explained how he was going to go about working on his first term paper:

> Well, first you read the book, and then you see if there's any bibliographies, that's lost, lost articles …

Rahvid's misunderstanding came from a typographical error on the note-taking guide ('Bibliography: a lost of articles'). Rahvid seemed to realise that 'lost articles' did not make sense, but he assured us that was the meaning of 'bibliography' and proceeded with the assignment anyway.

A third side effect of accommodation was student boredom and apathy:

> It's just boring. Class is boring. Seem like the class is never goin end. We just take notes and read all the time. That ain't no fun all the time.

Some students felt they had been exposed to the same material too often (and they probably had been). Elliott, who did not pass an end-of-year test for Introductory Algebra I, was placed in basic math class instead of Algebra II. He felt that it was too easy for him and that he shouldn't be in that class because it was:

> Old stuff. Stuff I did. Some of it, I think second grade could do the work.

Students like Elliott hungered for a challenge in their educational experience:

> I like [this new unit on the metric system]. I like it cause it's hard, it's a challenge. The other chapters wasn't a challenge.

Paradoxically, the same students who complained of the lack of challenge did not necessarily perform well in their 'easy' classes. They often assumed that they knew the material and didn't need to study for tests, although this perception was often inaccurate:

> I got a B in it. I'm gonna get an A but I messed up one test on multiplying decimals or just plain multiplying with like three-digit numbers. I thought I knew it. But I'll get an A. Most definitely.

Conclusions

It appears that accommodation, as described in this paper, may serve to keep at-risk students from total alienation and increase the holding power of a high school. Yet our research also suggests that accommodation may unintentionally limit students' levels of academic engagement and, because of its unintended negative side effects, ultimately limit the usefulness of students' school experiences

Such a conclusion demands further investigation. Is teaching accommodation more positive than assessment accommodation? Do personal accommodations differ in importance from accommodations about academic demands? Does the impact of each accommodation differ from one student to another? And, perhaps most crucially, does accommodation necessitate the lowering of academic standards, as appears to have happened at Wilson High? Are lower academic standards necessary in order to keep students in school?

A promising possibility is that personal accommodation may be quite potent in and of itself. A separate analysis of our data suggests that the sense of belonging and attachment that results from personal accommodation may be the strongest positive influence that holds at-risk students in school.

For schools themselves, our impression is that there has been an unnecessary trade-off between academic excellence and a responsive school environment. The goals of higher achievement have often been promoted at the expense of positive teacher-student relations, and vice versa. Creative solutions are needed to meet both goals: academic excellence and positive, responsive student-teacher relations.

We sense that accommodation (although it may keep students in school) may well be a poor model for preparing adolescents for the world beyond school. Believing that there will always be a second chance, learning that you can get through school without challenge and hard work, and being bored, may teach students to look for second chances, to not seek challenges or hard work, and to not persist. The challenge at Wilson High School and other secondary schools is not simply to keep students in school until graduation, but to provide them with educationally worthwhile experiences while they are there.

Notes

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A full account can be found it

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The concept of 'overlap' between what is taught and what is tested is developed in

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That personal accommodation may be the strongest positive influence that holds at-risk children in school is suggested by research by

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The challenge at Wilson High School …' paraphrases

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What Do Teachers Do All Day?

or, Innovation Has Its Price

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YOU get all those long holidays'. 'You finish at three' 'You have all those free periods'. Or so they say. Teachers know that life is not like that, but we have trouble convincing these cynics that teaching is not a bed of roses. We often have to say 'You try it' – to those who have never experienced the tribulations of the typical classroom and what happens when the school bell signals the 'end of the day'.

Good research is available about teacher stress and there are some useful case studies of principals. The daily life of the classroom teacher, however, is less well-known outside the profession. More particularly, the effects of change on the daily life of teachers is something which has seldom been considered. Change can result from new teaching conditions, such as alterations to a subject syllabus or examination prescription, or from new organisational conditions, such as the appointment of a new principal, or shifts in school policy following election of a new school council or board of trustees.

An American researcher, Michael Apple has suggested that teachers can be faced with 'intensification' and/or 'de-skilling'. Job intensification occurs as teachers are asked to do more and more complex tasks in the same amount of time. De-skilling occurs when teachers are asked to use curriculum packages which require nothing much more than good management and following instructions (e.g., 'Hand out worksheet 14B at this point.'). De-skilling can sometimes be accepted by teachers as one means of reducing the stress of intensification.

Here is what happened to a group of sixth form (year eleven) French teachers who were faced with a new syllabus *and* a new form of assessment. When changes like this occur, what do teachers do (apart from teach!)? How do they feel about their role, their classes, their lives?

The Research

In 1989, I was contracted by the New Zealand Ministry of Education to evaluate a trial programme in inter-school moderation for sixth form French. The seventeen teachers in the trial were asked to use a new set of grade-related criteria. They also received a number of marked exemplars of student work to show the appropriate standards. The purpose of this particular trial was to see whether the teachers could assess consistently, across schools and without the assistance of visiting moderators, panel meetings, national examinations, or other external measures.

There were four in-service days through the year of the trial. As well, most of the teachers were visited twice during the second half of the year, by the district inspector of languages and by a member of the group which had developed the package. The clear understanding, however, was that the teachers were 'assessing alone'.

At the same time the teachers were asked to use a new (draft) French syllabus. The syllabus was to become compulsory for 1991. It shifted emphasis from a more formal to a more communicative approach, and introduced a set of themes as the basis for teaching. It was immediately clear that no single textbook was suitable for the new syllabus, and that a good deal of very up-to-date material would be required to teach the new syllabus well.

As part of the evaluation of the trial, the teachers were asked to fill in a weekly diary form, starting from the first week of the 1989 school year. The form asked the teachers to describe what they had done especially for the trial, what contacts they had made with other language teachers, and what problems and difficulties they had experienced.

As well as the diaries, data came from an extended interview with each teacher and discussions, at the four in-service days and in a November meeting with me.

General Results

As might be expected, some teachers filled in occasional diary forms in a summary style; others provided weekly forms for a good part of the year, but left out some weeks; a few gave details week by week for the whole year. The reasons given for these differences are themselves a reflection of differing needs and demands. One teacher remarked early in the year that she was not really doing anything extra or different:

> I have been using topic-centred books for a couple of years, so I know my way around them now.

Others said they put the diaries low on their priority list, not because they were reluctant to supply information but simply because they were so busy with other tasks related to the trial and their teaching. This question of time comes up consistently through the diaries, and was raised at every in-service day. There were four main points made by most teachers, and on several occasions.

Other Duties

First, a number of the teachers had administrative and other school responsibilities. One was a fifth form dean who – among other things – also coached sport, ran a school choir and was centrally involved in a major school production. Two or three were heads of department with responsibility for other teachers, textbooks, equipment and other aspects of departmental administration. Another was involved in and responsible for the school's computer centre. A number of the teachers noted, but played down the impact of these duties, in discussion. For some of them, the trial and new syllabus were just one more thing in an already busy schedule.

New material

Secondly, the new syllabus required a lot of new material and hence a lot of time in preparation. Teachers frequently reported spending hours searching for material, getting it photocopied or adapted for classroom use. They often felt frustrated when this search was fruitless. This led to resentment about the time – and money – which such searches cost them:

> The lack of material is driving me bananas ... I'm constantly shuffling through books for material and I have a nil photocopying budget. It's costing *me* a fortune!

Even when the teachers located what they believed was good material, they sometimes discovered quite unexpected demands in the classroom:

> I should know by now to assume they know nothing but was stunned to discover only one person had been on the inter-island ferry and knew about car decks.

The same teacher found she needed to explain about duty-free shopping to her class in a subsequent lesson. When the district inspector announced at the third in-service day that another group of teachers had produced a package of listening material for the trial, the sighs of relief were clearly audible!

Time

Thirdly, the new assessment programme led to a substantial rise in the time taken to prepare tests and to mark stud ; work. Many teachers found the shift from a norm-based ranking system to one based on achievement extremely positive, but the time to prepare went up sharply:

> Spent six hours in the weekend (after suddenly deciding the test I was going to give was not suitable), searching for something better, but could not find anything.

One teacher decided that 'assessing alone' was not the best answer:

> Prayed to God for assistance on when to give these tests. He and I decided that first thing in term 2 would be ideal.

The time needed to grade the students' work was perhaps an even more substantial demand, as teachers used the new criteria

and the exemplars as instructed. One teacher with only five students wrote:

> Not very confident in giving grades for the reading. Yes I did spend 4-5 hours on it. Don't laugh!

The same teacher spent a further four to five hours in successive weekends marking the listening and writing tests. It should be remembered that this was only one, and the smallest by far, of her classes.

Another teacher reported an apparently common phenomenon. She spent several hours marking a speaking test early in the year. On the day the test was due back, she told the class she wanted more time and proceeded to re-mark everything, taking several further hours to recheck the grades. Much of this assessing was reported as taking place in the weekend:

> These [diary] forms should have Mon. – Sun. NOT Mon. – Fri. All my work on exemplars and assessing is done in weekends and holidays.

In-service Days

The fourth and final issue of time came from the in-service and meeting days themselves. The teachers were enthusiastic about these days, not the least because they had the opportunity to see that others were having the same kinds of difficulty as themselves:

> One of the best things was seeing that I'm not the only one having all these problems and fears.

But the in-service days brought their own pressure of time, as the teachers had to prepare lessons for relievers to take, relievers who in several instances were not language teachers. This meant a loss of both preparation and class time.

Other Results

Pressure

These problems of time were linked to problems of pressure. Teachers felt very responsible for getting their students through the new syllabus, but along with all the usual interruptions of the school year, the need for new material and the demands of the trial assessment programme made this difficult. The comments of a number of the teachers reflect this pressure:

> I think I'm in a state of quiet panic!

> I feel uneasy about being fair to the kids as I experiment with this method of assessment.

> Having a bit of a panic session over the amount of grammar involved in the course . . . The units are also taking much longer than I first expected.

The case study, gives further evidence on this point.

Responsibility

What was most significant in teacher comments was the strong sense of professional responsibility that consistently comes through. Teachers felt frustrated, not delighted, when they lost classes to swimming sports, biology field trips, form six camps, school productions, or timetable changes. They used words like 'pressure' and 'panic' to describe their concerns over the amount of time lost and the need to ensure their students covered the required work. The following comment is typical:

> Lost two periods because of Easter. Concerned not about the [trial] but at the amount of class time I am losing through public holidays, strikes and Form 6 Retreats . . .

Abandoned study

The combination of pressure and time had other effects. Teachers trying to improve their own qualifications through part-time university study found the extra demands particularly serious. For one, these demands were too great:

> Spent 1st week of August holiday making a valiant effort to finally get up to date with Massey [University] work, but found that this was not possible and that I would probably not cope with third term pressures of marking etc., so withdrew.

Combined classes

A feature which is certainly not unique to language teachers but is possibly more commonly experienced than in other subjects is the combined senior class. Language classes at the senior level often become too small for a single level class to be viable. Despite excellent programmes being available through the New Zealand Correspondence School, many schools and teachers prefer to combine two classes so that communicative skills can be maintained. Sometimes this is virtually forced on the teachers as a way of sustaining a language programme in the senior school. The incidence of such arrangements is surprisingly high.

In the present study, seven of the seventeen teachers worked with combined classes. While five of these were the relatively familiar mix of sixth and seventh form (Years 11 and 12), one was faced with a combined French/German class and another taught a French/Japanese class. One teacher saw his class only twice a week, the remaining periods being spent by the students in the library; while a teacher who later withdrew from the evaluation saw her class only once a week, the remaining periods being taken by a (native speaker) part-timer. As might be expected, all of these combined class situations brought additional pressures to bear. Teachers made it clear that, while some work could be done in common, the combined classes meant a loss of teaching time available to each class group.

The Year's Work: A Case Study

The general picture does not do justice to the individual experiences of the teachers. Selections from one diary represent the highs and lows with which many teachers will identify.

Ann (a pseudonym) was a teacher in one of the smaller schools in the trial. It is in a rural town at some distance from other secondary schools. Ann was the only specialist French teacher, although Maori was also taught at the school. She is experienced and approached her tasks in the trial conscientiously.

After hearing that her school had been selected for the trial, Ann spent four full days in January reading and preparing material, even before the initial information meeting had taken place. Once the school year began, even jobs that might seem trivial to outsiders took additional time, at the very point in the year when teachers are involved in a lot of administrative tasks with new classes. Preparing a suitable letter for the parents of the sixth formers who would participate in the trial took an hour and a half. Once that was done, there was the time needed for this to be checked by the principal, and time to organise typing and distribution.

Along with the trial itself, Ann was teaching to the new French syllabus. Because it uses a communicative approach, there is a stress on up-to-date language appropriate to adolescents. This meant a regular (nightly) check of the required vocabulary, along with continued work in preparing other new material. To be right up-to-date with vocabulary not found in most dictionaries was very time-consuming. In February Ann remarks:

> Every night I'm checking for 20 minutes or so, so that I'm up with new vocab.

In Term II she notes:

> Get frustrated because I don't know the French for stonewashed jeans, aerobics, McDonald's filet of fishburger, etc.

Even towards the end of the year, the same comments appear:

> Never a weekend goes by without me learning new expressions, vocabulary.

A single suitable textbook was not available for the new syllabus. Ann spent many hours photocopying pieces from magazines, a variety of books, and from other sources. Given the regularity with which syllabus changes occur in our secondary schools, this is not an unusual task for teachers and it does not always go as planned:

> The sheet I sent in for typing and photocopying wasn't ready for period 1, so I had to write it on the board. Frustration before I started! Office had crisis.

As the year progressed, the usual interruptions to school life became apparent: a timetable switch to compensate for lost Tuesdays meant the loss of a French period; a field trip in another subject reduced the French class to one student; the whole class was taken out to distribute a newsletter to the rest of the school; a visiting poet was timetabled in the slot for French. All of these particular examples occurred in one term.

In term 1, Ann's experience of grading her eight students reflects closely that reported by others:

> Left the reading [test] till Saturday. Spent all day Saturday, 9-11.45 and 1-3 reading and re-reading; then Sunday afternoon for two hours before I came to any definite conclusions.

This had the obvious effect on the work required for her other classes. Towards the end of the first school term Ann notes:

> Getting disorganised with other work, as it's getting closer to end of term. Form 2 and 3 books to be marked again, tests for end of themes [for forms] 3-5; it all seems to be happening at once.

There were some positive effects. Ann reports good feedback from the class about the new syllabus, and what the students thought of as 'not too much grammar'. In the questionnaires I gave to the students most from this school rated the new approach quite highly, although one somewhat ambiguously remarked:

> The new assessment system worked quite well, but I didn't like it.

A further and ongoing source of frustration for Ann was a lack of storage in the school as a result of a fire, meaning that materials in French were stored in three different places:

> Because I have some material at home, some in my small room at school and some in the teacher of Maori's room, I often have to drive up to school [in the weekend] and find things.

> The old tape I selected from my box ... didn't record, so I had to rush home at interval and get another one so I could hear one pupil at lunchtime.

A different source of difficulty was that, like others in the trial, Ann was required to teach a combined sixth and seventh form French class. This added consistently to classroom demands, and the diaries often comment about Ann's worries that either the sixth form or the seventh form were not getting a fair deal:

> Too difficult with the 7th and 6th timetabled together ... The 7th form spoke French well, but they preferred to work separately next door and some reorganisation of their work and my time is needed.

> Had to leave (Wed.) class unexpectedly and help the 7th form who were having trouble with some of their work, so really bad – only 35 mins [instead of 55] with the 6th.

Ann's diaries highlight other factors more specifically relating to procedures used in the trial (and, more generally, in assessment in languages). The absence of students is much more critical where a communicative approach is being taught, and where there is no suitable textbook. Special arrangements have to be made for listening or speaking tests, for example, rather than just telling a student to sit in a corner to do a written test which has been missed. Technology also becomes more important. The cassette tape which did not record has already been mentioned. On another occasion the fact that the power went off meant that the planned recording of an oral assessment had to be postponed from the last day of term II until after the August holidays.

The overwhelming impression left by Ann's diaries, and echoed frequently in those of others, is simply the pressure of time faced by the teachers in the trial. Ann twice noted simply; 'Total exhaustion'. Her diary regularly comments on the pressure she felt to cover work, to make up for lost periods, to do the best for the students when outside factors intervened (student illness, timetable changes), and to keep up-to-date with the preparation of class material. As with the other teachers, Ann's diaries provide some stark evidence about the amounts of time teachers spend on preparation and marking in evenings and weekends, along with quite substantial blocks of time in the vacation periods.

Conclusion

While none of what emerges from the teacher diaries or from the case study will surprise practising teachers, it highlights the need for Ministry officers to examine very carefully the inevitable demands made on teachers when a new syllabus is introduced. Similarly, the demands of a school-based assessment system. The teachers in this trial came from a variety of schools, state and private, urban and rural. They had a variety of professional backgrounds, qualifications and additional responsibilities. Although a few teachers did seem to cope with change quite comfortably, all of them expressed at least some concern and frustration during the year. Their major worry was the time needed.

Intensification and de-skilling? The research reveals some interesting results. There is clear evidence of intensification, as none of the teachers were able to quit any other task just because of the trial. On the other hand, at least one was forced to drop a valuable outside commitment (to her part-time university course), and others clearly spent more time in evenings and weekends on school tasks, obviously at the expense of personal, family or leisure activities.

It is less clear whether any de-skilling took place. There was no requirement to use standard tests or worksheets; the common theme taught in Term II still allowed quite a degree of teacher freedom; some teachers felt they had gained new skills. On the other hand, two or three noted that what they were doing did not coincide completely with their own professional judgement. In one sense, then, the programme 'de-skilled' these teachers, as they no longer felt free to use that judgement. It seems likely, therefore, that Apple's concept of de-skilling needs further examination :o see how applicable it is in secondary classrooms.

At the practical level, what emerges clearly is a need for more in-service time out of school and more preparation time in school, when change occurs. Also needed are further opportunities for teachers in any new programme to meet and discuss difficulties. This is not just to cater for teachers in isolated schools. The comment of one teacher from a large city school is typical:

> I'm feeling a bit isolated and would value a pool of material . . . and maybe a monthly quick meeting rather than a one-day marathon here and there!

Given the recent changes in the New Zealand system, it is unclear where such cross-school support will come from. The Ministry have signalled that in-service and other requirements for new curriculum initiatives will be funded centrally. The evidence from this study is that this central assistance must be both well-planned and significant.

Finally, the study shows that, for these teachers at least, jokes about long holidays and short hours are definitely not funny.

Notes

Full details on the trial are found in

Peddie, R.A. 1990 *Assessing Alone: An Evaluation of the Sixth Form Certificate French Moderation Trial, 1989*, Auckland: University of Auckland Education Department. The author acknowledges the financial support of the Ministry of Education in carrying out this research.

Good research on teacher stress can be found in

New Zealand Educational Institute 1982 *Teacher stress: research findings and report*, Wellington: NZEI.

and in

set, No. 1, 1981, Galloway, D. 'Disruptive pupils';

set No. 2, 1988, Bernard, M. 'Classroom discipline and the effective self-management of teacher stress' (Also in *Best of set: Discipline*)

Useful case studies of principals include

Willis, R. 1980 The work activity of school principals: an observational study, *Journal of Educational Administration*, Vol. 17 (July).

and

Wolcott, H.F. 1973 *The Man in the Principal's Chair*, New York: Holt, Rinehart and Winston.

Michael Apple's work on intensification and de-skilling can be found in

Apple, M.W. 1982 *Education and Power*, New York: RKP.

and

Apple, M.W. 1986 *Teachers and Texts*, New York: RKP.

Some information on the incidence, and effects, of combined classes can be found in

Peddie, R.A. 1984 In a class of their own? Language teaching conditions in New Zealand recondary schools, *N.Z. Language Teacher*, Vol. 10, Nr. 3, pp. 4-8.

FROM
DISADVANTAGED
TO
ADVANTAGED

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THERE are many options and choices for people to continue their learning after they have formal schooling. A wide variety of courses, some with formal awards, some without, are available through universities, institutes, colleges, industrial and business enterprises, professional and labour associations and unions. However, in many instances, getting onto a course requires some previous educational and/or experimental qualification. This reduces choice, particularly for older people who do not have formal prerequisites for entry, especially to higher education institutions. *Bridging* education may help. Some institutions are developing special courses to help potential students seeking a 'second chance'. Are such *bridging* courses a success? Do their students get into higher education? This is a look at one such course and its success.

Background

The Whyalla Campus of the South Australia Institute of Technology has trialled bridging courses. The emphases have been (in educational jargon):
- to acclimatise participants to higher education environments;
- to present a full-time programme to be undertaken in a full-time capacity;
- to provide tuition in those skills determined by faculty members to be prerequisites to first year undergraduate study;
- to introduce participants to the concepts and practicalities of time and personal management.

There are particular debilitating issues in the Whyalla region: rural isolation, restricted social and economic circumstances, gender, inadequately resourced education systems and poorly serviced information bases.

One particular Bridging course, the Whyalla Foundation Course in Social Studies (WFCSS) was developed specifically to give the academic and other standards required for entry to the first year of the Bachelor of Social Work. The specific objectives were, in summary, to get the bridging course students

(1) **communicating well**	listening, negotiating, reading, studying, co-operating in groups, writing essays, word processing;
(2) **calculating well**	doing simple statistics and data analyses;
(3) **comprehending well**	applying themselves, analysing text and data, synthesing, evaluating, all at a reasonably high level;
(4) **studying well**	adapting to the way things are done in higher education, particularly study.

And then to evaluate whether they would be able to manage the Bachelor of Social Work course.

The Study

The first eighteen WFCSS students commenced in March 1988. From this group, twelve returned at the beginning of the 1988 second term, and successfully completed the course at the end of the year. In 1989, they all enrolled as first year students in the BSW degree. After a few weeks, one male and one female withdrew, leaving ten continuing the course. These ten (one male, nine females) are the focus of this investigation into factors which they perceived were related to their success.

Data about their backgrounds, their success and advantage came from a questionnaire and from a group interview. For the interview all the students who had been through the bridging course were given a copy of the questions several days before. By way of contrast, two students who had entered the first year of the BSW by normal methods without first doing the bridging course joined the WFCSS group for the interview.

Findings

Background Characteristics

The ten who had done the WFCSS bridging course (in 1988) had an average age of 27, nearly all were Australian born, most lived in housing trust accommodation and most had left their formal schooling after completing Year 11 (6th Form). From that time until 1988, few had engaged in other study, indicating that nearly all of the group had a schooling gap of at least five years and, in some cases, considerably more. While most of the students had been previously employed, only half had left employment to enter the bridging course. All of the students were residents of Whyalla and six had been in the city for ten years or longer. Most of the students shared life with a partner and over half had children at school. Of the few who had children under school age, child care was provided by friends and relatives. Finally, they had learnt about the WFCSS bridging course from T.V. advertisements, from the South Australia Institute of Technology (Whyalla Campus), from friends and relatives.

Student Success

The questions about success in the first year BSW degree after the WFCSS bridging course focussed on acclimatisation to higher education, how well the foundation course had prepared them, comparative difference in educational experiences, major difficulties at re-entry, and what supported them, helping them to remain in the course.

First in importance were bits of knowledge they had acquired: knowing where facilities were located, knowing each other and the lecturers, understanding the academic expectations and required standards, understanding and experiencing effective and appropriate time management. Accompanying the knowledge, were the skills the bridging course had given them, such as effective library and research skills, essay writing and thinking skills, basic statistical calculations and interpretation. Altogether, the students believed that the course had provided an effective basis for a 'second chance' re-entry to higher education, and they were able to commence their first year studies without impediment.

In contrast, the two students who had entered the first year BSW by normal procedures commented that they didn't know people on campus, that other people were better adjusted, more experienced and 'took things in their stride'. In addition these two students di... know the library system.

The bridging course students made many contrasts between what they remembered of school and what they found in higher education. The Institute lecturers seemed as if they wanted to be there, the lecturers were more approachable and less authoritarian, and the students wanted to be on-campus. Overall, they judged their bridging course as superior to going back to school. Further, they believed that their individual motivation, determination and stubbornness (accompanied by their group cohesion and the understanding of the lecturers) were important factors which would help them remain in the degree course.

Finally, the major difficulties encountered by the bridging course students were family related. Such matters as child care, demands of other family members, finding time for study within the family context, and feeling guilty if time were not given to children, were dominant. To what extent these difficulties were gender-related (seven of the eight students interviewed were women) is not known, nevertheless one may speculate that they could be female factors. Another interesting feature of the difficulties was that, at an earlier stage in their higher education preparation, these students had identified finance (or the lack of it) as a major problem. On this occasion it was not mentioned.

Conclusion

Factors influencing the success of a special group of mature-aged educationally disadvantaged students have been presented. Familiarity with the educational setting and the system, effective relationships with lecturers, specific knowledge and the skills needed in higher education, group cohesion and support, and individual motivation and commitment, these were perceived to be key elements. Family responsibilities, in a variety of ways, were regarded as matters of perplexity. Bridging education, the way it was done in the Whyalla Foundation Course in Social Studies, was judged a more effective way of getting into higher education than going back to school for Year 12 (Form 7) in the secondary education system.

A ROLE FOR
PRINT LITERACY
IN A
FREE COMMUNICATIONS MARKET?

By David Marc
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Nicola Belsham

ABOUT a hundred and sixty years ago, Ralph Waldo Emerson was moved to complain that his fellow intellectuals had become inordinately obsessed with books and book-learning. He warned against the dangers of becoming 'bookworms' and 'bibliomaniacs'. The one thing in the world of value, he reminded his audience, 'is the active soul.' This sounds to the contemporary ear rather like an admonition to pay at least as much serious attention to the Beatles and Spielberg as to Plato and Jane Austin.

During Emerson's time – the early 19th century – the recent extension of literacy (albeit a kind of bargain basement literacy) to previously unschooled classes had greatly stimulated the commercial expansion of the printing industry in the Western world. The private libraries of the aristocracy were joined by the first commercial public lending libraries at the end of the 18th century. By the mid-19th century the corner newsstand was an established icon of urban life. To put the situation in contemporary terms, as the user group expanded, both hardware and software suppliers rushed to fill the marketplace.

British writers had been pondering the consequences of this communications breakthrough since its first inklings in eighteenth century Grub Street. Observing the appearance of sensationalistic periodicals and 'penny dreadful' novels, Alexander Pope predicted a 'rule of Dunces' in a coming age of cheap, mass-produced knowledge culled from cheap, mass-produced books.

In *The Rape of the Lock*, he satirized the fate of epic poetry in the

new market environment of literature. In the same spirit, Jonathan Swift sarcastically parodied the decline of literary quality in the emerging genres of mass literature. *Gulliver's Travels*, for example, was a mocking critique of the newly popular 'travel-adventure novel' (Defoe's *Robinson Crusoe* comes most readily to mind) and in *A Modest Proposal* Swift made deadly sport of mass market political rhetoric.

Reading as grubby

The quantity of printed matter was bound to outstrip the quality of what was being written. The prophecies of Pope and Swift were quickly fulfilled by a profusion of lurid tabloids, penny dreadfuls, and American dime-store westerns, all voraciously consumed by a growing population nurtured by liberal public education laws.

In such a vast sea of grimey ink, quality could no longer be assumed in books. The search for cultural standards made the very act of reading an end unto itself. But was reading a self-rewarding activity? Or did it have some wider social purpose? 'Have you studied so long at reading,' Walt Whitman chided his readers in 1855, 'just to get at the meaning of poems?' Emerson, Whitman, and other romantic thinkers of this era feared the consequences of Culture (the print world of abstractions) displacing Nature (the green world of vital relations) as the model for intellectual imagination. Poems ought to be patterned after 'leaves of grass' as Whitman put it – and not the other way around.

Reading as pastoral

In our own age, the idea that the printed word constitutes a dangerous distraction from the 'natural' world seems antiquarian. It has become almost impossible to think of industrially produced books as the high-tech juggernaut feared by the thinkers and writers of previous centuries. Quite to the contrary, reading has come to seem like a pastoral activity whose slowness and cumbersome demands for peace and quiet give it an almost rustic aura. While the true intellectual curls up under a tree to read, mindless communication technology relentlessly marches on: photograph → cinema → video; mimeograph → off-set → photocopy → desk-top publishing; stageplay → TV → cassette → computer game.

But what is more important? A medium of expression or the meaning of what is being said? To fetishize books as the only (or even the prime) form of 'legitimate' expression is to become the bibliomaniac that Emerson warned against. But this has become precisely the strategy of those critics such as Allen Bloom and Edward Bennet who are attempting to freeze the dynamics of intellect and aesthetics, of thought and feeling, of mind and heart into a 'great books' list. A medium is not a message. Love is a message. Empathy is a message. Passion is a message. Understanding is a message. Self-preservation is a message. Comedy is a message. Tragedy is a message. A medium is not a message.

Reading as religion

In Japan, a consumer pays approximately eight times the world price for a kilo of rice, despite the fact that rice is a primary staple of the national diet. How does this occur in a modern nation whose thrift is otherwise legendary? It is because the government has deemed the production of rice from Japanese soil a metaphysical necessity. This rice has a significance which outweighs the pragmatic considerations of a market economy. The nutritional needs of the Japanese people might be met just as well by less expensive rice imported from California. Some Japanese even say Californian rice *tastes* better. But for spiritual reasons, for reasons based in national religious and philosophic

traditions, the otherwise inefficient cultivation of rice on Japan's 'postage-stamp size' farms continues, protected by strong, active state intervention.

Most Japanese people support this policy; they shoulder, without protest, the economic burden it creates. If the state removed its protectionist tariffs, some Japanese would take advantage of cheap imported rice and, gradually – considering Japanese reverence for tradition, it might even take several generations – home grown rice would all but disappear. One can imagine an eventual situation in which domestic rice gains a kind of ritualistic function in Japanese culture, used on holidays and special religious occasions (like French Champagne at weddings.)

In America, literacy, like the 'sacred' rice of Japan, depends, more and more, on a spiritually-based interventionist policy. Americans grow up in a culture where they learn most of what they know about social relations, current events, the national heritage and what society expects of them, from non-print media, such as television, radio and film. They are taught to read in the school system, but the role of literacy in their lives outside of the classroom is becoming increasingly remote. For day-to-day survival, life at its most practical, road signs have become the most crucial part of American print literature.

A college graduate in 1920 would have written how many letters that have become telephone calls for a college graduate in 1990? How many novels would that person once have read as an organic part of leisure that have become films or television programmes today? How many hours of newspaper and magazine reading have been given over to broadcasts? Even 'how to' pamphlets are rapidly being replaced by videotapes on subjects ranging from gardening and home improvement to computer repair and emergency life-saving techniques. In areas where the free market of communication is allowed to operate, the printed world is losing market share.

Among the managerial classes of American society the university intervenes on behalf of literacy, inflating its value by tying it to every diploma or degree (items which, despite their cost, are basically symbolic.) As a result, the true functional value of literacy in the modern communications market cannot be determined.

Reading as unnecessary

Are there types of knowledge that could be more effectively disseminated by non-print means? Some critics, notably Neil Postman (see his book *Amusing Ourselves to Death*) say no, that true understanding and thinking about information transmitted by a video screen is not even possible.

Given the fact that television is an infant means of communications, barely fifty years out of the laboratory, such judgments may be premature. Though I took several college courses, and have read a fair number of books about the causes and circumstances of World War II, I have little doubt that my major source of knowledge, at least on the mechanics of the war (battles, military strategy and so on), comes from having spent hundreds of hours watching commercial TV series such as *The World at War*, *Victory at Sea*, and *The Twentieth Century*. By the same token, a good deal of what I know of the habits of kangaroos, gorillas, and penguins, or of the ecological functions of rain forests and river basins, can be directly attributed to TV nature programs. Much of my familiarity with courtroom procedures, and even with the controversies surrounding several legal principles, comes from viewing *L.A. Law*. I don't maintain I've got it all right in my head, but I would not have done so from books only, either.

Reading as peculiar

Television, like any transmission medium (including books) can dispense information to those who wish to receive it. To despise the quality of what we learn from television is itself a tacit admission that we are, in fact, learning. Every medium has peculiar traits and one great advantage of reading over many other,

more modern, information consumption techniques is the compelling illusion of extremely intimate rapport between data giver and data getter (i.e., book and reader). A novel is a portable memory bank that contains the replayable software of a peculiar consciousness abroad in culture: oh to go whaling with Melville; to walk with Jane Austin's sensitive and sensible heroines; to sing the body electric with enchanting Whitman!

The satisfaction of reconverting the silent ink words on a piece of paper into images and stories, songs and sense, and, finally, experience, is a sweet, personal, individual achievement that is among the perks of human being.

Reading as unnatural

Where the book loses its competitive edge these days is in its monolithic demand for long periods of undivided attention. While it is of course possible to read sloppily, to fall in and out of synch with the text, to move along turning pages regardless of one's degree of comprehension, if the activity is to be called reading at all, it requires at least some absolute degree of attention that keeps the eyes penetrating paragraphs, moving across lines, pausing at commas, halting at full stops and so on. This demand for isolation from all other sensory stimuli stigmatizes reading as a peculiar activity. In our everyday environment, brash offers of quick-action gratification are made to every human impulse all day long: 'Start the car.' 'Give me a call.' 'Be all that you can be.' 'Can I have another glass of Coke, please?' By contrast, books are slow and take unpredictable amounts of work to understand.

Driving as aesthetics

Driving, to name but one contemporary activity, competes with reading for aesthetic shelf space every bit as much as television does. We exercise our imperial triumph over space often and prominently. The excitement of 'reading' the world through the windshield can be highly stimulating, a seamless web of cubist experience. It is a world full of all kinds of possibilities, including physical beauty, pathos, mechanical breakdown, spontaneous consummation of consumer urge, and even sexual encounter. The car allows the driver to simultaneously penetrate the world and keep it at bay. Unlike reading, driving allows for a high degree of syn-aesthesia: a half a dozen types of radio programme are available at the fingertips; conversations that include little or no eye contact can be carried on for hours; in their traffic jams car commuters 'read' cassettes of Books for the Blind. Sensory phenomena continually compete for the driver's attention and fracture it: architecture, topography, weather and proximity to the insane drivers of other cars, all can make dents in drive-time consciousness.

TV as default

Watching television is an activity midway between the social isolation of reading and the social hyperboles of driving. TV demands only a share of attention. The text, with or without viewer attention continues. A viewer may receive telephone calls, cook dinner, sit in rapt attention in a dark room, or engage in any number of activities while still receiving enough textual information so that it can honestly be said that he or she has 'watched' the programme. As a consequence, (in computer terminology) TV viewing offers itself as the *default* activity of domestic life. To *read* you must actively arrange things – the book, some time, some quiet. With TV, you pick and choose when convenient. Is it so strange that people turn on their sets like lamps when entering their homes? After all, television promises and (with erratic quality but astounding quantity) delivers, a bottomless supply of emotional, commercial, erotic, and instructional texts for private and social appraisal. Why shouldn't the set be playing? Something good might be on.

TV as socialist

Readers are a besieged, hardworking minority that is constantly forced to appreciate the scarcity of time and space. It is not surprising then that many *readers* regard television in much the same way as free marketeers regard welfare: each programme is a giveaway to people who neither pay for it nor earn it. Nothing comes of the handout but a continuing need for more of the same. Laziness and passivity are encouraged at the expense of creativity and individuality. Readers may tolerate TV as a kind of cultural safety net, a subsidised aesthetic cuisine in which ketchup truly is a vegetable. Satellite TV feeds the audience even more calories every day, but satisfaction remains difficult to achieve. The spirit starves in the midst of plenty.

Short of unplugging and thus denying citizenship in the twentieth century – every viewer has to experiment with mundane ingredients, searching for nourishment, trying to find something more than cultural subsistence. The creating mind, though ghettorised and patronised by the 'mass' quality of video transmission, remains proud. Using its heritage of pre-TV book-based culture it tries to free itself from dependence upon the surpluses of the entertainment-industrial complex. Out in the cold the human imagination forages the barks and lichens of a vast and mostly thankless culturescape to gain sustenance from whatever hardy trace elements it can absorb.

If we were to shut down the television system because of the poor quality of most TV programmes (as Postman suggests) could we keep libraries open, based on the quality of most books? Why then does the book maintain its position as the only medium that most scholars, especially humanities scholars, are willing to consider as a vessel of knowledge and culture? Is it because the book is always the most thoroughly effective medium of communication? Or is it because of a spiritual reason that has little to do with empirical performance, as in the case of Japanese rice-farming?

Life as spoken word

The culture of the West has for thousands of years been logo-centric, word-centred. As the bible tells it, the creation of the universe itself came not by God taking up hammer and nails, but by means of the utterance of a word ('Let there be light'). The legacy of this view surrounds us everywhere. A man and a woman risk mortal sin in sexual union, unless they are 'pronounced' husband and wife. The state will take the life of a citizen who is 'sentenced' to death. Every time a magician says 'abbra-caddabra' before pulling a rabbit out of a hat, ritual homage is made to the mystical authority of the word to change reality.

The power of the oral word was further magnified and mystified by its extension into print. The Ten Commandments, to use a common phase, were chiselled in stone. China could be ruled by the Emperor because ink could be brushed onto paper. Printing using moveable type in the sixteenth century greatly increased the already powerful position of the word.

Life as written word

In the last several hundred years, scientists have made discoveries that have led to new communication technologies that bypass the written word. Social scientists have created entire new academic disciplines to study the function and effects of these media. But scholars of English, history, education, politics, etc., though they say they are guardians of language, have by-and-large opted to ignore the new vessels of language and imagination that have come to dominate communication and culture. Instead, with fewer students opting to study their subjects, they have become increasingly dependent on the intervention of the university to force students to study language and literature. Are these universities getting involved in the academic equivalent of a land war in Asia?

The spoken word, after all, was a visceral medium, a medium of human dimensions. It was replaced by the written word, an abstract, symbolic medium, which demanded that its users acquire the secret magical decoding talisman of literacy in order to participate.

Religion, art and politics were all transformed by the mechanically reproduced word. The spoken chant of the Catholic mass was challenged by the book-wielding Protestant ministry. Western literature, which had been dominated since antiquity by oral forms – notably drama and poetry – shifted its focus to the novel, a variety of narrative not designed, but soon used, and then written, specifically for reading in solitude by a silent individual. In politics, the Ciceronian tradition of public oratory was superseded by the mass-produced pamphlet, a new print genre designed to be read by the new reading classes. It included such revolutionary works as Thomas Jefferson's 'Declaration of Independence' in America, the 'Declaration of Independence' by the United Tribes of New Zealand in 1835, and the 'List of Grievances' of the miners at the Eurika Stockade in Australia.

As the aristocratic order was overturned in the West, middle-class society claimed legitimacy in printed charters and declarations, a materialist culture that dismissed such traditions as the 'divine right of kings' as mystical and irrational. Book writers such as Charles Darwin, Karl Marx and Sigmund Freud expressed and shaped the world view of bourgeois society. These three and others wrote gospels for the age of specialisation: biology, economics, psychology. Universities shed their religious affiliations to become centres of secular humanism. The chapel yielded to the library – that warehouse of books – as the centre of scholastic mission. The modern priests were professors and technocrat, and a 'search of the literature' replaced personal revelation as the currency of wisdom. The book became the icon of reason-based, middle-class humanistic idealism, the ideology that had supplanted the theosophic basis of aristocratic hegemony.

Perhaps the confusion of symbol and substance among the proud, reading middle classes was inevitable; in any case, by the late twentieth century, it was there among the keepers of the humanistic flame.

Life as communications systems

However, as books become an increasingly quaint form of communication in the so-called 'real world,' new generations of students identify their personal interests and career requirements elsewhere. A university graduate's only contact with an English department may well be a 'service course' whose sole purpose is to teach academic protocol for the writing of papers for other courses, in which, presumably, the 'real stuff' is taught. At some American colleges, the traditional 'language requirement,' which was once fulfilled by the study of French, Spanish, Italian or even Latin, may now be fully satisfied with the study of a computer language.

The alarm of humanities professors at all this is understandable; their most visible response, however, has only exacerbated the problem. Like Luddites, they attack the visible symbol of the machine and ignore the circumstances that brought it all about and contribute to its power. Like panicking workers who have been automated out of their jobs, many call for protectionist political intervention. Postman calls for a ban on television transmission three nights a week. Bloom suggests a revision of the curriculum which keeps out all works created with modern technology. William Bennett wants every graduate to have read at least all the Great Books on his list.

Like an obsolete factory with protected production, protected curricula will eventually collapse into oblivion. It is suicide for the critics and scholars to ignore the most powerful medium of rhetoric, narrative, language and culture and that, of course, is television.

Vital places and functions

Marshall McLuhan was encouraged to study the mass media not by wild-eyed radicals, but by some of the most conservative traditionalists at Cambridge University during the 1930s. F.R. Leavis, for example, specifically urged McLuhan to study billboard, magazine, and radio advertising, stressing the idea that it is the English critic's duty to study the use of the language, rather than to study only books, or any other medium.

McLuhan, whose personal literary tastes ran toward James Joyce and T.S. Eliot, had written his doctoral thesis at Cambridge on the Elizabethan writer Thomas Nashe. Years later, asked why he had shifted the focus of his work toward the mass media, he replied, 'I find most pop culture monstrous and sickening. I study it for my own survival.' The would-be saviours of Western civilisation should take up the urgent work that McLuhan began, revealing the vital places and functions of print literacy among the multiplicity of communications systems now available to us for the cultivation and movement of information. At the risk of sounding like a starry-eyed idealist, I actually think that reading can pay its own way.

Notes

Marc, David A Role for Print Literacy in a Free Communications Market? (in Press)

Emerson's complaint about bibliomaniacs was made in a speech to the Phi Beta Kappa Society, at Harvard in 1837, which was later printed as an essay called 'The American Scholar'. It can be found in several anthologies of Emerson's work, for example, The Complete Prose Works of Ralph Waldo Emerson.

Walt Whitman's chiding of his readers in 1855 can be found in his Preface to the 1855 (original) edition of Leaves of Grass. See Cowley, Malcolm (ed.) Walt Whitman's Leaves of Grass, NY: Penguin, 1959.

Allen Bloom and Edward Bennet, who are modern critics of all media other than books; can be found expounding their ideas in

Bloom, Allen The Closing of the American Mind, Penguin, 1988.

and

Edward Bennet was President Ronald Reagan's Secretary of Education and he made such pronouncements repeatedly in the mass media.

Neil Postman is a savage critic of poor television. His major book on this subject is

Postman, Neil Amusing Ourselves to Death, Methven, 1987.

Marshall McLuhan and Harold Innis are the gurus of Media Studies. See McLuhan, Marshall The Gutenburg Galaxy, University of Toronto Press, 1962.

and

McLuhan, Marshall, Understanding Media, McGraw, 1964.

A recent biography of McLuhan is

Marchand, Philip Marshall McLuhan: The Medium and the Messenger.

Further Reading

Robert Alter, The Pleasures of Reading (NY: Touchstone, 1990)

Suzanne de Castell et al. (ed.), Literacy, Society and Schooling (Cambridge U. Press, 1986)

Leslie Fiedler, What Was Literature? (NY: Simon and Schuster, 1982)

Katherine Henderson et al. (ed.) Meanings of the Medium (NY: Praeger, 1990)

Ian Watt. The Rise of the Novel.

DEALING WITH
PROCRASTINATION

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OF ALL THE little *contretemps* that daily beset the teacher in the classroom, among the most annoying is the argumentative student. You know, the one who always has ten good reasons why he calls out (it's usually a boy!) is out of his seat for the tenth time, is not 'on-task' . . .

Take Dean, a student 'a little on the tabasco side' of life. Dean is leaning back on his chair, he has his feet up, his short fat legs are crossed. His scraggy denims are shredded at the knees (this is the right place to cut them this year!) Year 9 (Fourth Form) Dean manages to stir up a lot of teachers. It's not just the fact that he doesn't do the work

(or little of it); it's not just his dress and demeanour; it's not even his not having any class equipment – it's largely his mouth and what he says with it.

Feet up, most of us would agree, is not on. It might be relaxing, it might not intrinsically hinder the work output – but it's a no no. Safety, decorum, general respect of mutual rights, are all part of a basic rule about such behaviour.

How does the teacher try to communicate this, enforce the rule and enable Dean to come back on task? It's not easy with Dean because of the way he uses *secondary behaviour*. His *primary behaviour* is 'disruptive', in the sense that it infringes the teacher's right by ignoring an 'agreed'

rule or convention: no feet up on the desks.

Dean's teacher adopts a reasonable stance, he believes in due rights, he wants to be fair, he doesn't want to confront. But if you watch his body language he appears quite tense, anxious, brows furrowed. He is not sure what to say, except he does want to be reasonable.

(T) *Dean, come on, please take your feet off the desk. You know we have a rule about this.*

His voice has a hint of pleading; certainly Dean can smell indecision. Dean does not say, *Of course, Sir, I'll put my feet down A.S.A.P. Sorry.* Dean is in that small, annoying, range of students who believe they have to challenge teacher requests, directions, reminders . . . even if they are delivered fairly, calmly, in line with obvious rules.

(S) (Dean still with his feet up) *Why?! I can still do my work.* He actually has his book propped on his knee. His voice has a whine suggestive of, 'why are you picking on me!' This is *secondary behaviour* designed to draw attention away from his 'primary behaviour' (of having his feet where they shouldn't be.) Although the teacher is concerned this transaction will degenerate (it's happened before!) into a procrastination exercise he addresses the secondary behaviour instead of the primary behaviour. In effect he gives credence to the avoidance 'game' of the student.

(T) *Dean, look you know you're not supposed to have your feet up.* Here the teacher's voice has a whineish pleading tone – his hands open out and up as if he is appealing to reason. *How can you possibly do the work neatly with the book on your knees?* Here he sighs as if to communicate his need for sympathy.

(S) *Fair dinkum!, you always pick on me. What about Melissa, she had her feet up the other day – you never said anything to her did you?!* Here he throws it out as an accusation. He has easily put the teacher on the defence; he has dragged the primary issue (his feet-up-on-the-desk) away to yesterday, with Melissa, and the injustice of unfair targeting.

(T) *Dean!* Now the teacher is on a guilt trip! Fancy saying he picks on students – him!! *Now, that's unfair. I do not pick on you, and all I asked you to do . . .*

Even if Dean puts his feet down the waste of time and attention on this secondary dialogue has again seen Dean appear as the aggrieved party (!) when, in effect, he has refused to own his own feet-up misbehaviour.

Perception

The teacher may be well-intended but is *perceiving* the issue as a personal attack. He wants to be seen as a fair teacher, he wants to give the student due rights but has failed to assert his leadership within fair, clear, non-negotiable rules. Instead the teacher has been waylaid into discussing irrelevancies (secondary behaviour).

Where a teacher has a rigorous demanding belief, processed as: *I must make him do what I say; I can't stand insolence; children must, and will, respect their teachers;* that kind of perception interprets much 'secondary behaviour' as threatening to teacher status and prestige. Discipline transactions involving secondary behaviour often degenerate into win/lose confrontations.

Here is an example:

Wayne is out of his seat, he has taken a sleaze comic (sneakily) from his bag and sneaked (behind the teacher's back) across the room to sit next to Ashleigh down the back and giggle over the comic. His 'primary' behaviour (in classroom rules terms) is being off-task, or, affecting others learning, or being out-of-seat . . .

The teacher is aware of the back row, has been watching these two so he marches over.

(T) *What do you think you're doing?!* The teacher is close, glaring and pointing at the comic.

(S) *Just getting a pencil!* Wayne says this as he picks up a pencil to wave in front of the teacher's visual field) *You got a problem with that?* (he says with controlled sarcasm.)

(T) *Yes I have! you are a liar, you were not getting a pencil . . .*

(S) *I was – why pick on me, you don't pick on the girls, the sucks.* Here he adds to the effect of contempt by folding his arms. Wayne is quite prepared to exercise his right of reply!

(T) *Who the hell do you think you're talking too! I do not pick on you! – Now get back to your seat this instant or you can get out of my room!*

(S) *Why should I?!* More folded arms and 'dumb insolence'.

Because the teacher has defined the transaction in 'win/lose' terms the 'secondary behaviour' is noticed, the teacher 'over-dwells' on it and battle lines are drawn. The primary issue is, in effect, left unattended.

It could have been dealt with differently:

(T) *Wayne, what are you doing?* Here the teacher speaks calmly, firmly, non-confrontationally, using a direct question (not a 'why' question).

(S) *Just getting a pencil. You got a problem with that?!*

(T) She doesn't even address this. She can see the magazine; he knows that she knows that he knows it's there. *You're out of your seat* (feedback) *reading a comic. What are you supposed to be doing?* (Here she re-asserts.)

(S) *Told you, I'm getting a pencil – what are you picking on me for?* (Hurt tone.)

(T) *What are you supposed to be doing?* (Here she re-asserts.)

(S) *Gee! I'm supposed to be doing me work!*

(T) *O.K., back to your seat and do it thanks Wayne.* (Here she re-directs.)

Here she moves away and tactically ignores his last sibilant pout. She expects him to move. She turns her attention away to on-task students, though she can pick him up in her visual field. He goes back to his seat at almost funeral pace! He has to have the 'last-word' (more 'secondary behaviour'). When he gets back to his seat he'll sit, arms folded in sulk-mode to gain even more attention. Sulk-mode is yet another facet of 'secondary behaviour'. The teacher tactically ignores this and does not go back to Wayne until he finally picks up a pen five minutes before the bell.

'How's it going then Wayne?' She attends to his work, when he's back on task to re-establish a 'working relationship'. If she feels it necessary she may direct him to stay back to discuss his behaviour in class but *when in class* she will give minimal attention (sometimes none) to the secondary behaviour.

By the way: make options clear

If Wayne had not gone back to his seat (or Michelle had not stopped 'yakking' to her friend, or Adrian had not taken off his 'walkman' . . .) then the teacher is best served by leaving the student with a clear option or choice.

(T) *If you refuse to go back to your seat I'll have to ask you to stay back and explain your behaviour . . .*

(S) *But but . . .*

(T) *Your choice Wayne . . .* Here the teacher walks away leaving Wayne to 'own' his own behaviour as it were. She will not discuss, or argue. She has not got time. If necessary she can give Wayne a right of reply later.

Simple choices (options) can be given with any age of student as long as the 'choice' is delivered calmly, assertively, not as a threat. It may be possible sometimes to beckon the student aside from their seat to direct, or redirect.

Choices can be linked to isolation within the room (to work elsewhere), time-out in the room (lower primary) or deferred options (work now, observe the rule now, or stay back and explain your behaviour, or face consequences later . . .)

Some typical examples of Secondary Behaviour

Behaviour where the student 'responds' or 'reacts' to a teacher's direction:–

'It's not fair – why don't you pick on the others'.
'Why?' (this is often delivered with a tone suggesting your request or direction is against all social justice).
'You always pick on me . . .'
'She was talking as well!'
'It's a dumb rule anyway.'
'You never listen to me!'
'Miss Davies let us do it . . .'
'I was only . . . ! gee!!' (the guilt-inducing whinge).
'Why don't you pick on the girls!?' (or visa versa).

Some students are experts at verbal secondary behaviour; they are tagged by some teachers as 'classroom lawyers'. Because they so often get their way by procrastinating, arguing, blaming, avoiding, pouting, sulking or sibilant sighing they often win their goal of attention-seeking and avoid taking responsibility for their primary behaviour.

When a student pouts or sulks, or sighs, or raises eyes to the ceiling with a humph!, or mutters, or kicks a foot against a chair, recognise it as secondary behaviour. A game:- 'C'mon say something about my pouting, my sulking – don't hold me to the central issue of classroom rights, rules and responsibility, keep me talking, over-service me . . .'

Re-assertion

Adrian has a 'walkman' headphone set on (his cassette player is in his bag on the floor). His head is jigging around, a faint, but audible musical beat hangs like an aura around his head. 'The year 9 Maths class is a bit boring anyway so what's the big deal about having a slim headset on while I'm doing Ch. 4 of, *Maths for Year 9?!*'

The teacher notices this little scene and addresses Adrian with a simple direction. Her voice and stance (she stands about a metre and a half away) is calm and controlled. She establishes eye-contact:-

(T) *Adrian, Adrian.* He looks up and pulls one side of the walkman off. *Walkman off thanks. You know the rule; in your bag or on my desk.* (Rule reminder with implied choice.)

(S) *Gees! I can still work with them on!*

(T) *I'm sure you can, but you know the rule – in the bag or on the desk.* (Re-assertion.)

(S) *But Miss Davies in the art room lets me wear them!* Here Adrian turns to a mate nearby, who nods and says, 'She does Miss, she does.'

(T) *Maybe she does, but you know the rule: in the bag or on my desk.* (Re-assertion.)

(S) *It's a dumb rule; I can still work with them on. I can . . . !*

(T) Here the teacher breaks in. *Maybe you think it's a dumb rule – in your bag or on my desk.* (Re-assertion.)

She sees him reaching for the head set and turns away to demonstrate that she expects his compliance. He mutters, 'shit' under his breath (she ignores this). She continues to work with other students leaving Adrian to get back 'on-task'. She casually eye-sweeps the class as she moves around the room and goes back to Adrian when he is on-task to re-establish working relationships.

If the secondary behaviour is aggressive or hostile the teacher will quickly address this as a 'primary behaviour'

and re-direct the student to the appropriate behaviour or rule *without arguing*. Remember when such students have an audience (their peers) they will feed off our over-attention and will not be 'made' to do what we direct them to do. One way to 'save face' for student (and teacher alike) is to leave the student with a clear choice. *Adrian if you choose not to work by our rule* (walkmans off in class) *you'll have to stay back* (later) *and explain your behaviour* (with a senior teacher if necessary). The teacher will then move off and let the student 'choose' – most will respond (if sulkily).

This little transaction could have got out of control, though, if the teacher had addressed the secondary behaviour.

(T) *I don't care if Miss Davies lets you have it on! This is my class – you'll do as I say!* (Confrontation) or,

(T) *I'm sure Miss Davies doesn't let you wear it Adrian.* Delivered with a sigh and a please-understand-I'm-trying-to-be-reasonable-approach.

(S) *She does Miss, doesn't she Dimi?* Here Dimi joins, 'Yes Miss, she does Miss!' The teacher turns to Dimi – *Dimi please keep out of this!* But Dimi has hooked her in; she now has a three way 'discussion' on her hands . . .

Recognise the secondary behaviour game? It's one of the oldest games in teacher-student transactions.

Have a Plan

Re-assertion is one way of keeping the teacher-student dialogue on track with the primary behaviour. It needs to be employed with integrity and appropriate assertion. It is, *in effect*, saying, 'at this time I am directing, or reminding you, to own your own behaviour. I will not argue, fight, or play your win/lose game.'

In dealing with these typical contretemps it is important to:

1 Have clear, positive, rules and consequences established with the class that outline expectations concerning classroom communication, movement, learning, safety, treatment (or manners) and the settling of disputes.

2 Know beforehand how you will speak and act in a discipline transaction. When we're caught up in the emotional pressure of the secondary behaviour of the student it's difficult to frame appropriate dialogue – it's easy to over-react and 'feed' the secondary behaviour.

3 Keep discipline within a hierarchy of teacher behaviour going from least intrusive to most intrusive, at each point seeking to bring the student back to the central issue (the rule, or rights-infringing behaviour).

   (a) We might begin with a rule-reminder, or a direct question (avoid 'why' questions).

   (b) If the student argues or procrastinates, re-assert or re-direct. Two or three re-assertions (or re-directions) are normally sufficient to gain grudging compliance. Cut through the but's, the it's-not-fair's, the you're-picking-on-me's.

   (c) If they still refuse to go back to their seats, or refuse to do the work ('I'm not going to do it – it's boring!') don't waste any more time. Leave them with a clear choice or option.

   (d) Only send a student out if the behaviour is persistently disruptive to group or individual rights. Even then, a final 'exit' choice should be given.

4 Stay 'calm' (get angry on issues that really count), and put the responsibility back on to the student. Show 'expectation of compliance' by moving away from the transaction as soon as you have made your point or if the student shows 'compliance'.

5 If necessary, keep the student back later to follow up with conference, consequences, or to give a 'right of reply.'

Remember it takes two people to argue.

Notes

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His address is 81 Powell Street, Yarraville, Victoria, Australia 3013. He is the author of several books and videos, including:

Rodgers, W.A. (1990) *Making a Discipline Plan*, Melbourne: Thomas Nelson.

Rodgers, W.A. (1989) *Decisive Discipline: every move you make, every step you take*. Geelong: Institute of Educational Administration. (A learning package of two videos and book).

Rogers, W.A. (in press) *Discipline: Making a Hard Job Easier*, Melbourne: ACER

'A little on the tabasco side' is a quotation from P.G. Wodehouse. In dealing with typical contretemps, point (1) is expanded in the books above.

Further Reading

The Best of set: Discipline (1988), Melbourne: ACER and NZCER. (Many good items from past issues of *set* in one packet.)

4 9

UNDERSTANDING EXEMPLARY TEACHING

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Introduction

DURING 1983, a study of 'exemplary teaching practice' was undertaken by a research team from Charles Sturt University, Riverina. We wanted to identify exemplary teaching practices, to develop theories about teaching and to assist teachers to develop collaborative skills so they could work with fellow teachers on the improvement of teaching practice.

We began with a long examination of the research projects already done and of the theories of what 'exemplary' teaching is. Then we set out to observe some teachers everyone agreed were exemplary – teachers doing a great job. What we found did not exactly fit the theories by any means. But the hunt was very worthwhile.

The Research

Our observations were in a co-educational high school, one of two, in a rural township in New South Wales. The high school – which we called 'Broad Valley High' had 45 teachers and 580 pupils, 12 of whom were Aboriginal.

For the past several years, the school has had a relatively stable teaching staff and, in comparison with other schools in the region, Broad Valley High had been identified by the Regional Inspectorate as a school which had a number of 'good' or 'exemplary' teachers.

The principal played a key role during the initial stages of this project. He negotiated with the school executive about the project and won their approval, with the caveat that the executive teachers would not be selected since it might be divisive and the benefits should be primarily for the classroom teachers.

During preliminary visits to the school the research team spoke to the whole staff about the study and decided on procedures for selecting the teachers. It was agreed that the School's executive should nominate teachers and, after some 'self-selection', two became involved.

A survey of senior students quite independently chose the same two teachers.

Two 'Exemplary' Teachers

Jean Bailey undertook her secondary education in a small country town in New South Wales. Jean then began her training as a primary school teacher at a country teachers' college, although it was not her intention to become a teacher originally. She had been interested in law but her parents believed that teaching was a better profession for a girl, and that a university education should not be 'wasted on girls'.

After training, Jean accepted a position in a Catholic secondary school in Sydney. After three years she left Australia and took up a teaching post in a third world country. During that time she worked initially in primary schools. She then transferred to secondary school teach-

ing, and was promoted several times to senior positions. Before returning to Australia she worked in tertiary education, teaching English as a second language. During this time Jean continued her academic work, completing a Bachelor of Education degree and then a Masters degree in Educational Administration.

Upon her return to Australia Jean worked as a casual teacher, but now has a permanent position on the staff of Broad Valley High School. She has a small farm 20 kilometres away from the town, and lives there together with her teenage children.

Jeff Egan is much younger. He has been teaching at Broad Valley High School for six years. This is his first teaching position having graduated from the Conservatorium with a Bachelor of Education degree in Secondary Music Education. Jeff is the school's only full-time Music teacher and an accomplished musician in his own right. Many of the responsibilities of a head of department, curriculum development, organisation of classes within each year, ordering, maintenance and replacement of the school's musical equipment, and the development and implementation of policy statements, are part of Jeff's responsibilities.

There is a lot of theoretical argument about how to study 'exemplary' or 'effective' teaching. We followed an *interpretive* approach which as its major purpose looks for the meanings the teachers have for their actions. To show how this was done here is an extract from our notes.

... during our study of Jean Bailey, 9 visits, 16 observations and 12 interviews were carried out during the second school term, 1988. The interviews ranged in duration from 20 minutes to one hour usually before observation in her classroom. Interviews were generally wide-ranging, focusing on issues such as teaching style, classroom management, her philosophy of teaching and attitudes towards colleagues and curriculum. On several occasions interviews focused on what had occurred during our previous visit and thoughts and reflections the researchers had had during the intervening time.

The data were then interrogated. This was usually done in two ways. First, on the return journey from visiting the school the researchers discussed what themes and issues had emerged during each visit... [second] Taped interviews were transcribed and discussed prior to returning to the school for the next visit.

In order to check our ideas two members of the research team who had not been observing Jean Bailey did observe and interview her. The idea was to confirm or refute speculations and observations and to ensure that the pre-dispositions of the two main researchers were not overly influencing their interpretations of what was going on in her classroom.

Outcomes

Jean Bailey

Philosophy of Education: Guiding Jean Bailey's philosophy was a view that a teacher, should 'lead students away from ignorance'. This involved empowering the students

to be aware of their own social, political and educational shortcomings. She was committed to a notion that 'knowledge is important for students, but equally important is their ability to use that knowledge'. Thus, for instance, she was a strong advocate for involving students in debate, both within the classroom and also at the school level. Her view about the process of debating was that it enabled students to use what they knew. She believed that students should be politically aware of what was going on in society. She encouraged her students to be aware of their own rights and responsibilities and this permeated her classroom teaching. She often, whilst teaching, made reference to her own upbringing and her life as a child. In talking to Jean about this, she emphasized the importance, for the students, to understand that she was once their age, and probably had had similar experiences. We noticed for instance, in her classroom teaching, that she constantly used anecdotal material drawn from her own experiences. She sometimes used accounts of her experience in another country as a way of transmitting subject knowledge.

Jean commented that she was brought up in a small country town and knew the discrimination and prejudice that many girls are subjected to in these towns. She was committed to sensitising the girls she taught to some of the problems and inequities faced both within school and the society.

Implicit in her overall philosophy was the need to convey to students that there did exist a real world outside of school, and that part of her task and responsibility as a teacher was to convey something of the essence of this real world to her students.

Attitude to subject matter: Jean took the view that what was important in teaching a subject was not necessarily the matter, but using the subject matter as a vehicle for critical thinking skills and as a source of empowerment. Indeed, during the period of observations and interviews with Jean it did appear that she held a 'healthy' disrespect for her subject matter. On the surface Jean did not confirm usual expectations of a teacher of English. For instance, it was not always clear that Jean was totally conversant with all aspects of the subject matter. She readily agreed with this observation. Her blackboard work did not give the impression that she considered herself an exemplary practitioner. For example she often joked with the students about her shaky spelling and got them to help her spell certain words.

Style of classroom management: On the one hand Jean was of the view that control and management in the classroom were important. Indeed, she recounted the experiences of a class of 12-year-olds she had had during a previous year saying, 'they were impossible to teach'. She admitted considerable control difficulties with this class, and ended up teaching them via the blackboard and rote learning. This approach she abhorred, but concluded that with that class there was no alternative.

We observed that Jean's approach to classroom management was that, as far as possible, students should be responsible for their own actions. On a number of occasions Jean tolerated disruptive behaviour and sometimes took little or no action to quell it. On other occasions she took advantage of it to make a point about issues of responsibility.

She was conscious that boys dominated some classroom discussion and she took deliberate steps to ensure that girls participated fully.

Preparation: Jean indicated that under most circumstances preparation for her school work was done at school. She elaborated in some depth about her years of experience particularly in teaching adults. She said that if she was

investing considerable time planning and preparing for classroom teaching outside of teaching then that would indicate to her a certain degree of incompetence. She considered that the economic use of school time was a priority.

Relationship with students: Jean looked upon herself as a maternal person and this was acknowledged by the principal and the executive staff who had given her a special responsibility for relationships with students. In her classroom teaching as in her philosophy, Jean placed emphasis on what she referred to as equality in the relationship with students. This was more easily recognised in her teaching and interaction with senior pupils than it was with the junior students. It was seen in her use of language. Jean was concerned about using language that students understood and could 'relate to', so she often used a colloquial form of language. On occasions she even resorted to using words commonly used by the teenage culture. Jean herself was a mother and had a teenage family, so was well aware of the common idiom.

Colleagues: Jean had been at Broad Valley High School for about 18 months. She admitted that while she got on well with other teachers she had reservations about some of the methods of teaching used by her colleagues. She also disagreed with the structure of the curriculum and the stress on examinations. In the staff room Jean often did not sit with other English and History teachers.

Jean Bailey, then, was a teacher who did not fit the mould of the exemplary teacher the textbooks describe or other research has examined. This was particularly evident in her attitude to subject matter, her style of classroom management and to some extent in her philosophy of teaching.

Jeff Egan

Conceptualisation of the Curriculum: Jeff understood the Music syllabus and its requirements well. He acknowledged his teacher education course plus his own broad musical background to be of assistance in selecting and preparing resources. He developed his teaching programmes upon his knowledge of the needs and interests of the pupils, his knowledge of the syllabus, and his evaluations of the programme's impact on the pupils' understanding from previous years. You could see in his teaching he was confident with the content, which allowed him to respond quickly to how pupils were reacting to it and, where necessary, to revise, slow down or increase the pace of the lesson.

Jeff Egan saw the curriculum development phase of his teaching as being equally important with (1) his preparation, and (2) the way in which he implemented these lessons.

Jeff said he found it was necessary to use a variety of approaches. Usually, his lessons had distinctive activity components. The duration of each could be (and often was) modified according to the response it got. He judged this variety of activity as the most effective way of achieving his lesson objectives.

There were two distinct parts in his preparation: physical and intellectual. The physical preparation was the organisation of equipment, the selection of musical items, the learning of the music, and getting the resources of the music room. This physical preparation could take anything from 5 minutes to 2 hours. The intellectual preparation involved a continual reflective process on the programme and the content. He is always looking for new musical material that will help develop a particular concept in a better and/or different way.

Jeff set high levels of expectation. He expected all students, irrespective of their ability level, to perform well and to achieve their best. He expected pupils to show enthusiasm for the content of the lesson and to be attentive

to him. Jeff used a variety of strategies to check these high-level expectations. In interview, he commented on the need to avoid the 'never ending lesson' syndrome in teaching. Jeff regarded using the same teaching strategies habitually for a unit, semester or year as totally inappropriate. He believed pupils needed frequent and varied motivation to sustain their interest. His strategies included (i) having pupils demonstrate the musical concepts of the lesson, (ii) questioning pupils, (iii) carefully observing what pupils give as answers, (iv) marking books, (v) individual consultations, and (vi) formal academic and listening examinations.

Being an Educator of Children: Jeff regarded himself as an educator (not just a teacher), valuing the individual's worth, and developing musical abilities. He believed that school should be primarily concerned with the development of the whole person and one of the means to achieve this is through the particular content areas offered in the curriculum.

As part of this view, Jeff's approach centred on getting the pupils to produce music. He believes pupils should learn music, not learn *about* music. Jeff believes that *all* pupils have some musical potential and that they become involved in musical performance in the classroom according to their potential.

Jeff strongly believes that the curriculum should be representative of the musical heritage of society and not concentrate solely on 'music since 1984', a view often expressed to him by his students. He commented that music educators are the 'custodians of society's musical heritage'. He included a variety of musical traditions in his programmes. He said that the long term interests of pupils are important considerations in his planning, expressed in a 'Castor Oil Philosophy' which when translated into programming means: 'You may not like it but it's good for you'.

In his preparation for a lesson, he analysed the content and broke it down into what he described as 'manageable chunks' which fit the ability level of the pupils. He was ever willing to try a variety of strategies to get pupils to understand. Jeff commented that he considered it important to include a sense of surprise and discovery for his pupils in each of his lessons. However, he strongly disagreed with the notion that he was there to entertain the pupils. Rather, he saw the performance by pupils as important. He saw similarities between teaching and a musical performance in that both have a preparation phase and both involve a communication process. He did not object to pupils enjoying what they learnt but the emphasis was on learning music.

Optimistic about Children: At the heart of Jeff Egan's optimism is the view that there is good in each pupil and that all pupils are valuable and worthwhile people. Jeff's positive outlook on pupils took time to develop. He commented that in his first two years as a beginning teacher he encountered situations where he had confrontations with pupils. He reflected on these early years as a time when he 'was doing battle with kids'. Through discussions with other teachers, including his wife, he had been able to reflect upon his approach and to develop a new optimistic, personal approach to pupils. He believed that teachers tend to categorise pupils as 'bad kids' because they do things that interfere with what the teacher wants to teach in class. He does not believe that children are 'inherently bad or evil'.

This optimistic view was evident in the ways in which he developed a positive rapport with the pupils in all his classes. Further, he showed a personal warmth to pupils, expressed a genuine concern for pupils, and was interested in pupils both within his classes and in the wider school community. Jeff said he attempted to adopt a fair and just approach to dealing with all pupils. He deliberately gave praise and encouragement to all pupils when they were achieving and saw this as one way of enhancing their self-esteem. The researchers were able to observe that this same optimistic belief about people also pervaded Jeff's relationship with fellow staff members.

The Teacher as Practitioner in a Chosen Discipline: Jeff's view about the teacher as someone practicing a discipline underpinned his philosophy of education and teaching and enabled him to conceptualize his role in broad terms. He saw himself as a musician as well as a teacher and the practice of his discipline involved him in a variety of community and school performances. He had a reputation as an accomplished musician in the community. He believed strongly in the idea that teachers, in whatever their discipline field, should be actively engaged in that field e.g., the history teacher as historian, the science teacher as scientist, and so on.

Jeff Egan placed emphasis on a set of issues different from those important to Jean. For Jeff, the certainty of the curriculum, his optimistic views about children and his role as a practitioner were very important to his teaching practice.

Some Tentative Conclusions

1. *The 'exemplary' teacher is an extremely problematic concept:* The concept is often used to describe a set of generalised personal attributes alone, without the 'something besides', which teachers bring – their personality, their temperament, the outcomes of their experience, etc. This 'something besides' was evident in this study, through the biographies of Jean and Jeff. Jean had had more than twenty years teaching experience in a variety of cultural settings while Jeff had had six years teaching experience in the one social and cultural setting. Jean had a philosophy of teaching that focused on leading pupils away from ignorance through a critical analysis of social, political, cultural and educational values while Jeff had a philosophy with a positive, optimistic view on pupils that involved being supportive, recognising individual effort and praising commitment.

    From our research we now expect exemplary teachers to bring differing perspectives to their positions and to have personal attributes that are distinctive and different.

2. *Teaching is an episodic process:* When you focus on what happens in classrooms, and the 'mix' involving the teacher, students, classroom life, and subject matter, it is clear that teaching is made up of many episodes.

    Jeff Egan referred to the 'chunking of information' in a lesson. Typically, Jeff's lessons contained two or three chunks of knowledge. Jean Bailey, on the other hand, attempted to divorce herself from her subject in such a way that her 'disrespect' for the subject could be used as a process to create teaching episodes and teaching moments. Her use of personal anecdotes often facilitated this.

    Within lessons there are many different 'moments', where pupil (and teacher) learning is intense. These moments may be planned and involve 'chunked knowledge', or they may be spontaneous, as often happened in Jean Bailey's classroom; they sometimes occur in rapid succession and other times are less frequent; they are sometimes predictable and other times not so; and, may be related to events that happened inside and outside the classroom.

    This view of teaching as episodic adds to Cypher and Willower's (1984) observations of secondary teachers in the U.S. These researchers observed secondary teachers intensely for a week in order to deter-

mine what kinds of activities absorbed the teachers' time in the classroom. During classroom teaching times, Cypher and Willower found that, on average, teachers were involved in 159 'sustained' verbal episodes each day during instruction time.

3. *Teaching processes and practices are subject bound:* This was continually reinforced by our observations during the project: being an English/History teacher is not the same as being a Music teacher.

Jean Bailey believed that part of her role was to lead pupils out of ignorance and to make them aware of societal and political realities. Jeff Egan held the view that he had a custodial responsibility to pass on the musical heritage of society to his pupils – the 'Castor Oil Philosophy'. These boundaries created a context for their teaching.

There may be a set of generic teaching techniques that once learnt will produce competent teachers. But teachers and learners have predispositions towards the content. Pupils have widely different background experiences and will react to (and learn) different forms of knowledge in different ways. This view is at the heart of the Holmes Report in 1986, on the necessity for revitalising the teaching profession in the U.S., which identified the need to develop understanding of (a) the content knowledge of the discipline; (b) the pedagogical knowledge about how students develop and learn; (c) the appropriate ways of teaching that particular subject matter to the students.

4. *Teaching processes and practices are often not scrutinised by teachers:* As early as 1904, John Dewey was emphasising that it was essential for teachers to understand the underlying principles of their practice and not just the technical procedures of teaching. For many teachers, the opportunities for them to engage in a reflective analysis of their teaching is limited. A 'mentor' or 'confidant' can help.

It is also a truism that most teachers are blinkered by their own predispositions about teaching. Rare are those occasions when teachers consciously stand aside from their teaching process and reflect critically about why they do what they do. As a result, the political, ethnical and moral dimensions of the teaching process remain hidden and do not receive the exposure they warrant.

On more than one occasion, the teachers in this project commented that our interviews and observations had caused them to engage in further personal reflective analysis of what they were teaching, what they were trying to achieve with the students, and how their personal beliefs about education influenced what they did in the classroom.

Implications

At least four professional development implications arise.
1. Observation of teaching process and practice, and the subsequent opportunity for reflection and discussion, may enrich both teaching and what pupils learn. Our research strongly suggest (i) this process needs to be undertaken within subject areas; (ii) that it should go beyond the 'inspectorial' approach to observation; and (iii) that those involved should not confine themselves to 'hints, tips and recipes'.

2. Little pay-off is likely to be gained from across-the-school inservice and professional development exercises that focus on teaching process and practice. In secondary schools, teaching process and practice are closely tied to the subject being taught.

3. The induction of beginning teachers may be enhanced if they ̄ provided with regular opportunities for

observation by and discussion with a mentor who is willing and able to move beyond the 'hints, tips and recipes' approach. The mentor is a person who facilitates personal growth by providing empowerment and collegial help.

4. The most effective form of professional development is that which empowers teachers to act and to make changes to their classroom rituals and routines. These changes are most likely to come about when teachers voluntarily decide to examine the processes of teaching that operate in their classrooms. School administrators can initiate such examinations or support self-help. Collaborative approaches work best.

Reflections

We came to this research with a fairly clearly defined set of ideas about exemplary teaching. We tried to suspend these pre-dispositions but, in the end, we found that our own biographies made this difficult. Our predispositions were about knowledge of subject matter; appropriate skills and techniques for delivering it; control and discipline strategies; human relationship abilities; and so on. We realised early on in the project that we were blinkered by our own predispositions and biases, and we were led to examine them. We also were made aware of how teaching involves intimate, intricate and idiosyncratic processes and practices which are exceedingly difficult to describe with any accuracy.

Notes

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The interpretive approach which we followed in our research can be found discussed in
    Fay, B. (1975) *Social Theory and Political Practice,*
    George Allen and Unwin: London.
This approach was chosen rather than that of a 'positivist' paradigm following upon the debate which can be found in
    Bredo, E. and Feinberg, W. (1982) *Knowledge and Values in Social and Educational Research,* Temple University Press: Philadelphia.
and
    Popkewitz, T.S. (1984) *Paradigm and Ideology in Educational Research,* Falmer Press: Lewes.
and
    Lanier, J.E. and Little, J.W (1986) "Research on Teacher Education". In M.C. Wittrock (ed.) *Handbook of Research on Teaching,* 3rd ed., McMillan: New York

Our work was also guided by the 'grounded theory' approach in
    Glaser, B.G. and Strauss, A.L. (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research,* Aldine: Chicago.

The Holmes Report on revitalising teacher education in the USA is
    Holmes Report (1986) Text of Education – School Deans Report on Reforms in Teacher Education, *Chronical of Higher Education,* April 9.

Primary source is:
    Holmes Group (1986) *Tomorrow's Teachers: A Report of the Holmes Group,* Holmes Group: East Lansing.

The early insistence by Dewey on teachers understanding what they are doing is found in
    Dewey, J. (1933) *How we think: A Restatement of the Relation of Reflective Thinking to the Educative Process,* Henry Regnery: Chicago.

For further reading, the following work of Professor Kenneth Tobin provides insights into exemplary teaching in science and mathematics:
    Tobin, K. (1988) Good Science Teaching: In the Eye of the Beholder, *Australian Science Teachers Journal,* Vol. 33, No. 4.
    Tobin, K., and Fraser, B.J. (Eds.) (1987) *Exemplary Practice in Science and Mathematics Education,* Curtin University of Technology: Perth.

Parents Teaching in Schools

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IF PARENTS are to help with the teaching in a school, what do we need to consider? In an Australian primary school in 1986 parents helped teach painting, poetry, music and dance to nine-year-olds. From this experience we can learn the advantages, pleasures, pitfalls and problems.

In this school the arts are regarded as part of the core curriculum. Professional artists had been hired and have performed and taught successfully in the school. However, it was argued that compe₁ ent parents could be used if they were approached to volunteer, and were available at a particular time. No cost would be involved. Also, it was envisaged that parents with interests and skills (but not at professional level) also could assist with children's artistic experiences if given the opportunity. It was also hoped that if parents contributed to the arts, the levels of parental involvement would change.

Levels of Parental Involvement

Previously most parents in the school had been fundraising or just an audience. The challenge was to introduce parental

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involvement according to their initiative, competence, power and responsibility. Training some parents was regarded as necessary; the format was unspecified.

There were traces of the 'closed door' attitude by teachers, the feeling that children's social education should be left to the home and that education at school should be left to teachers. We will see how these feelings fared.

The following figure shows how levels of parental involvement might be modelled.

Levels of Parental Involvement	
Level 1	Audience
Level 2	Fundraiser
Level 3	Spectator
	Aide
	Performs tasks or instruction under the teacher's control
	Organiser
Level 4	Instructor
	Professional
	Non-Professional
	Skilled
Level 5	Adult Learner
Level 6	Policy Maker
Level 7	Advocate

Levels 3, 4 and 5 are the ones the study investigated.

Generally the *Professionals* were the first parents to try teaching. These parents had qualifications in the arts and one parent in the group had teacher training. The second group were *Non-Professionals*, parents who had formal qualifications in teaching but had not practiced as full time teachers for some time, or, were parents with competence in some aspects of the arts but without teacher training. The third group was the *Skilled* group, consisting of parents who had acquired a skill in a training session. In some instances they were assisted by *Organisers*, who were parents who assumed responsibility for materials and equipment but did not instruct the children. A teacher was present at all sessions conducted by parents.

Questionnaires, videoing, field notes, observations, interviews and case studies were used.

A look at each level

Level 3, Organiser

It is natural for people who are keen to help a school to be asked to do jobs well away from the classroom, such as assisting in the tuckshop or a clothing pool. At this school natural organisers became much more closely involved after some minimal training. For example, one Organiser spent time at a school art workshop learning how to organise materials, then, in partnership with another parent, organised art materials during school art excursions. The second parent Organiser became involved because the first had invited her. Organisers, I found, could assist usefully in the classroom and some could involve other parents in projects, usually with benefit.

Level 4, Professional

The Professional parent has qualifications in the arts and works full time in an art. In this school those who helped had many skills in different art forms, used fluent artistic discourse, were not dependent on the class teacher, and set high expectations for student competence. These characteristics are illustrated in the following case study.

Case Study – Elms

Elms was a Professional parent, who operated beyond a passive role and became a 'partner in educational creativity'. He had been up to this time an untapped source for improving children's learning. Elms operated at Level 4 because of his qualifications which included fine arts expertise. After working with the children Elms made suggestions for the curriculum.

Elms was the owner of an art gallery; he dealt in paintings. Elms volunteered to work with the children in the painting cycle even though he was not teacher-trained. Elms decided to invite the children to an arts exhibition involving the works of Absalom, Pro Hart and Sawrey and to instruct the children in the characteristics peculiar to each artist's work. For example, Elms said, 'All artists have peculiarities and one thing Absalom does well is paint skies'. Also, 'Pro Hart (paints) colourful pictures with figures and a brand of humour'. Elms communicated the important aspects of the artists' paintings by showing the children the painting, pointing out the features and asking the children if they had any questions. A child asked for example, 'How did he get the bumps!' Elms answered simply by explaining that the bumps were petrified trees not anthills.

Elms chose to instruct the children in the use of an arts catalogue and the organisation of his gallery. He set the task of recognising the different artists' work on display and helped the children identify paintings by use of the catalogue. He monitored their responses by talking to the children. Elms taught the children for approximately one hour. He did not require teacher assistance.

Elms himself decided on the content of the session, but the teacher affirmed this procedure and organisation beforehand. While no difficulty occurred in this particular session, difficulties were encountered in sessions when the Professionals concentrated on the acquisition of knowledge which they considered important and took little regard of the children's mastery of skills. This approach usually resulted in them losing touch with the children.

I found that the competence of parents can be used to advance children's artistic learning. Not all Professional parents are suited to instructing a whole class, but they could all provide individual assistance to children, supporting the teacher's role.

Level 4, Non-Professional

Some of these parents had formal qualifications as teachers but had not practiced full time for some time. Others had no formal qualifications but were competent in some aspect of the arts.

I found that those without pedagogical training could operate as successfully as those who had been trained; they were just as able to instruct the children in the artistic task. With both groups the children completed the tasks competently.

There was a significant difference between them however; those who had not previously taught, gained confidence, but were still the less confident group at the end. All these Non-Professionals used artistic discourse at a somewhat less sophisticated level than that of the Professional but kept a harmony between verbal instruction and demonstration. They were also rather more dependent on the class teacher for advice, specifically about handling children and organisational procedures, for example, one was hesitant in giving permission for children to work in pairs, while another needed advice about storing equipment.

Case Study – Hobson

Hobson, a Non-Professional was a parent without artistic qualifications. He was interested in sketching and cartooning and was self taught. He had not previously worked in the school, yet, this project showed that he could instruct the children in drawing, therefore he could play an active role. Hobson commenced his session by showing the children samples of the task, which was to draw a blue shark and Donald Duck. In directing the exercise Hobson required the children to identify the basic shapes, for example, the basic shape of the shark was an oval. Hobson showed the children one of the methods that he used to shade sketches. This required the use of tissue to gain effect in perspective. Hobson directed the children's efforts by encouraging them to make their shading darker, to shade within the area and to

apply pressure. He showed the children how to overcome difficulties, for example, when a child could not fit her drawing on a page he helped her to make a composite picture.

Hobson taught the children in the manner which the class teacher could not; the class teacher could not give step by step instruction to enable the children to sketch Donald Duck. Hobson was, however, dependent on the class teacher for direction. He needed advice about the best position from which to instruct the children and for information regarding storage of materials. In an interview at the end of the session Hobson indicated that his confidence had increased in handling the children. He had had experience of teaching out of school and said he found it easier to work with children in the school than in his home.

I found that the Non-Professional parents possessed skills and could specify a learning goal, give an explanation and/or demonstration and actively supervise the children's progress. The skills possessed by parents added variety to the interpretation of the curriculum. And these parents did not need training.

Only a little time is needed to prepare to involve parents if they possess skills and are supported by the staff. At this level, however, parent involvement depends on the school taking steps: these parents did not volunteer without the school's encouragement.

Level 4, Skilled
These parents were not experts. At this school they were parents who had indicated their interest in the arts, showed knowledge and skills at an initial meeting and acquired knowledge and skills during training sessions. These parents had the ability to learn and teach skills in a particular art. On the whole they had insufficient command of language to describe the activity but, by demonstrating, they conveyed their intentions. Most of them depended on written lesson plans to guide the instruction they gave.

Case Study – Stack and White
Stack and White were parents who worked as a team. They had both attended a training session to learn the technique of marbling.

White read an autumn poem as an introduction to the lesson and then told the children that the activity was to learn the technique of marbling using autumn colours. However, the children were required first to draw an autumn picture using pastels. In fact the parent directed the children to draw in crayon which was a misleading instruction.

White then gave a verbal explanation of the technique of marbling and then Stack and White demonstrated the technique. White's explanation was not clear. However, the demonstration helped the children understand. During the session the teacher intervened when the children obviously had misunderstood the instructions and organisational procedures. Throughout the session, Stack referred to the lesson outlines supplied during the training sessions.

Stack and White had previously played passive roles, for example, assisting in the tuckshop. This study showed that parents like Stack and White are willing, often keen, to learn a new skill; the lack of skill need not prevent parent involvement. Parents who acquire skills can provide enriched experience for children; however, parents who acquire skills need the support and presence of teachers during instruction; and, written instructions help some parents.

Training – 'Parents Instructing Parents'

This project differentiated different levels of instruction and it involved 'parents instructing parents'. The parents like Stack and White spent approximately one hour being trained in an art skill by a poet, a painter, a musician, or staff members. A school need not assume total responsibility for training parents.

After the parents had worked with the children, we realised that (i) a training session of one hour's duration is insufficient preparation for some, (ii) the training sessions were held too close to the class session; this prevented parents raising queries or recognising difficulties which might occur for them.

The Professional/Lay Distinction

The study indicated that the professional/lay distinction which categorises the teacher as 'professional' and the parent as 'lay' is too simple. While teachers are professionally trained to teach, parents with different competencies can assist. The study suggests that the 'open door' model for schools needs modifying if we want to utilise parents beyond passive roles and also beyond the active role of being a simple aide within the classroom. Our experience was that parents can become instructors, but teachers do remain in control.

Other Findings

1. Increased Involvement of Parents
At the commencement of the project, 52 percent of the families with children in Year 4 (Standard 3) chose to become involved. By the end of the project 84 percent were involved.

2. Increased Communication
Seventeen of the 25 parents interviewed after the project said they now had increased communication (in some form) with the school; 8 spoke of their increased confidence in communicating with children; 6 spoke of increased confidence within themselves; 4 considered that the way they related to children had changed.

Some parents expressed difficulty with the written questionnaire, some found they tended to think that the children understood instructions when in fact, they didn't, and the learning environment of the home proved more difficult than the school environment for some. The parents had some queries about classroom activities too.

3. Increased Social Contact
Seventeen of the parents saw greater social contact as one of the positive outcomes. Increased socialising began between parents and parents, parents and children, and, parents and teachers.

4. Parent Influence on School Arts Curriculum
While, the project provided some parents with insight into the school's art curriculum, the school gained from the parents who worked professionally within the arts. They were invited to submit suggestions for the school arts curriculum after they had worked in the classroom. Some of these provided a different artistic interpretation of the curriculum and were used in the remainder of the project.

5. Cost Saving
The cost saving came from the voluntary services provided by parents. This was in contrast to the fee charged by professionals (non-parents) who visited the school.

6. Potential for Future Parent Involvement
Twenty-four of the 25 parents interviewed advocated future parent involvement. Some parents requested the same level of involvement in future programmes. This challenged the school to encourage parents to further develop their skills in order to change their instructional roles. The majority of parents wanted the 9-year-old children's art experiences extended further. Interestingly, most parents preferred working with their own children.

7. Improved Learning
During the class sessions the children were generally receptive to the artistic activities provided by parents; some of the activities required skills which the class teacher would not have taught. The children at first found it difficult to articulate what they had learnt, but showed enjoyment and satisfaction from the new experiences. With time and experience the children began to talk about their art experience.

Notes

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This research can be found fully reported in

McGilp, E.J. *Parental Involvement in Children's Artistic Learning*, a PhD. thesis held by La Trobe University, Bundoora, Victoria, Australia.

Teachers and school boards may like to pursue the ideas further through a series of cards for discussion on parent involvement available from the author, and in:

1. Bastiani J. *Parents and Teachers 1*. Perspectives on home-school relations. Windsor: NFER – Nelson, 1987.
2. Braggett E.J. *Parent Involvement in Children's Education*. Newcastle: University of Newcastle, 1980.
3. Davies D. 'Parental Involvement In Public Schools. Opportunities for Administrators'. R.F. Purnell, E.E. Gotts in *Education and Urban Society*, 1985.

4. Schickedanz J.A. 'Parents, Teachers and Early Education' in *Early Childhood*. New Jersey: Avery Publishing.
5. Seeley D.S. *Education Through Partnership*. Cambridge: American Enterprise Institute, 1981.

The levels of parent involvement are adapted from

Gordon I.J. *Reaching the Child Through Parent Education: The Florida Approach*. Gainsville, Fla: Institute for the Development of Human Resources, 1969.

Gordon, I.J. Florida Parent Education Early Intervention Projects: A Longitudinal Study. ERIC, Illinois, 1970. ERIC Clearinghouse on Early Childhood Education Urbana, Florida University, Gainsville.

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EVALUATING LEARNING
IN
MATHEMATICS

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'**H**OW are my students coping with the mathematical ideas they confront?' is a central question. As teachers we choose from a variety of different assessment techniques, formal and informal, to answer it. Does the choice of how to assess matter?

We are sure that it does. Our own observations and recent research suggests that no method of assessment is totally adequate. In this article we consider current practices in assessing mathematics learning in primary schools, we detail research that suggests some limitations in existing assessment practices, and we outline a constructivist approach to assessment.

There have been a variety of different approaches to the assessment of mathematics. Most are either
1) norm-based written tests,
2) mastery-based written tests, or
3) interview schedules.
A look around schools will find all these methods being used.

In several parts of New Zealand pre-testing and post-testing of students is carried out regularly. The tests may be made up by the teacher or be part of a commercial teaching package. The written tests are often multiple-choice or single-answer-required and come in several levels of difficulty. According to the pre-test results (or 'readiness' tests as they are sometimes called) the teacher may then group the class for instruction. At the conclusion of the unit a post-test (or 'mastery' test) is administered. In some areas this way of evaluating is very common.

Some schools have their own internal schemes for monitoring learning. Written tests may be administered by a syndicate, or group of classes. Schools may still use some *PAT* norm-based tests (now outdated and under revision) to show trends and illustrate levels. The percentile rankings of individual children may be recorded on cumulative record cards, and quoted at parent interviews.

Interview guides are published in the New Zealand *School Mathematics* series and are included in the *Beginning School Mathematics* scheme under the name 'Checkpoints'. Typically these interviews provide the exact questions for teachers to ask, and also the model-answers that teachers should expect from children if they have successfully learned the idea being investigated.

The guidelines for assessing learning put out by the former New Zealand Department of Education (1989) suggest a descriptive approach with emphasis on what processes children use as they work. For example, the guide suggests that assessment should take many forms using a variety of methods best suited to the needs of the learner, and that assessment should be thought of as gathering information about the progress of learners. In Australian schools the equivalents of these techniques are also much to the fore.

Evidence of limitations

Are these ways of assessing mathematics adequate? We have found evidence that some frequently used ways are not.

Recently, after a group of student teachers had tried out several forms of assessment, they commented
> Administering the written tests raised many questions . . . By themselves, I found the tests didn't show a realistic indication of what the children knew.
> Children were very cautious of the (written) test and it took some encouraging to convince them that there was no pressure to pass or to do well.

The student teachers found more value in other assessment strategies.

By themselves I found that the tests didn't show a realistic indication of what the children knew. Only by backing up the written tests with oral questioning to each child, could I gain a true indication of what the children knew and how they thought.

In research interviews we have found that children use a large number of different strategies when solving mathematics problems (see Table 1).

Table 1
Proportions of a sample of 42 children (aged 8 and 9) giving ways of correctly solving two problems

Problem	Number of valid ways given				
	1	2	3	4	5 or more
5 + 7 = [ ]	29%	38%	13%	16%	4%
14 + [ ] = 26	42%	36%	16%	6%	

Note: The interviewer's question was 'How did you get your answer' followed by 'Can you tell me of any other ways of doing the problem'. The number of valid ways given by children is an *under-estimate* of the number of ways that they actually know.

For some problems almost every child knows of a number of different strategies. Children often switch strategies (sometimes in the course of solving a single problem). Many other researchers have noted the same. Also children approach school mathematics in different ways to the ways that they approach mathematics in the world and are often able to solve in real life mathematics problems that they can't do in the classroom. Researchers Denvir and Brown found that pencil and paper assessment procedures are not sufficient to indicate children's mathematical achievement and others that teachers who rely a great deal on pencil and paper tests for mathematics assessment have lower learning gains in their class.

Problems of norm-based and mastery-based assessment

1. Mastery-based assessment methods often lack reliability or validity

The reliability and validity of mastery tests is commonly ignored. The assumption is that if items appear to measure the objectives of instruction that the test will be reliable and valid. It is equally important that reliability be established for mastery tests as for norm-based tests. Few mastery tests have their items scrutinised to ensure that the items
> . . . measure their respective objectives, are unbiased in relation to women and minority groups, and differentiate between groups of masters and nonmasters of the objectives (item discrimination). In addition they must be free of structural flaws that could cue or confuse students. (Berk, 1988, p. 367).

Both standardised tests and mastery tests do not take account of the strategy shifts that children may show. Thus, the reliability of these tests should be seen as reliability in a statistical sense only. For even though a child may get the same answers on a retest, the strategies used can be quite different.

2. Item scores in norm-based and mastery-based tests do not indicate the knowledge used in passing the item

In norm-based and in mastery tests there is a fundamental assumption that 'to pass is to know'. But we may ask 'to

pass is to know what?' Children can answer the same questions using quite different strategies. Behind different solution strategies can lie marked differences in children's knowledge.

A further challenge to test validity is found in research that shows that children can solve real-world problems which (on the basis of pencil and paper tests) we would predict that they cannot do. This suggests that the validity provided by mastery and norm-based tests is not the kind of validity needed by teachers who want a pupil's learning to be relevant beyond school. Norm-based and mastery tests may show children's ability to solve 'school maths', but they are not able to indicate children's performance in a wider mathematics context.

3. Assessment can hijack the curriculum
If teachers take the results of test-based assessments too seriously, thinking that they do indicate real knowledge, then the curriculum can become orientated to the test and teachers will teach to increase pupils' scores on the tests.

Testing for standardisation can lead to teaching for tests so that the pupils can be seen to be successful.

Also almost all traditional mathematics assessment involves pencil and paper tasks and teachers and learners may come to see mathematics as pencil and paper exercises. If instead, assessment in mathematics takes children's ability to use mathematics in the world into account, then worksheets and textbooks will be seen to be insufficient.

A teacher may not be diverted by formal assessment procedures, but pupils will be. Erlwanger interviewed children engaged in self-paced maths programmes and found low levels of cognitive learning. The children viewed mathematics as a game in which they had to do no more than guess the answer in the answer key.

4. Assessment outcomes may limit children's learning experiences
it is often assumed that if a test shows that a child cannot do a topic then the child should not be introduced to other 'harder' topics. That is challenged by current research on two counts.

Firctly, so-called 'harder' topics are often easy for children. Curriculum developers can get 'easier' and 'harder' wrong. Young-Loveridge and Irwin have found that children often show facility with subtraction before addition.

Secondly, children's experiences affect the ease or difficulty they have in dealing with mathematical materials. Blades and Spencer found that young children can coordinate references in a grid if the grid is labelled with familiar symbols rather than numerals. We have observed that children from mathematically disadvantaged backgrounds find working number problems with money easiest because they have had experience with money. So children may be able to learn more advanced topics provided the topics link into familiar contexts.

5. Pupils are misclassified by tests
This is perhaps one of the most serious consequences of an over-reliance on standardised written test results. In well researched trials such as those of Denvir and Brown, it has been found that a significant number of students get misclassified (25% of students were misclassified, almost always to a lower level than they should have been). With unvalidated tests the level of misclassification is even higher. Thus relying on test results alone to control where pupils are in a mathematics programme limits children's progress.

6. It is difficult to get conditions for carrying out a valid assessment
Standardised tests require testing to be carried out in a silent non-distracting environment. Other pencil and paper

tests, such as mastery tests, should also be carried out in such conditiors. Invigilating is also required – we have observed that children will often exchange answers in order to hide their weakness. In the typical classroom it is difficult to get ideal test conditions.

Also, for any item to validly indicate mathematical understanding, the child has to understand the question or task. For that reason, the interview may be preferred. Unfortunately the interview requires an uninterrupted period of one-to-one interaction between teacher and child and if there is only one teacher per classroom such conditions rarely occur.

A constructivist alternative

The evidence is clear: teachers should not rely on written tests alone to assess learning in mathematics. There is need for a broader approach. A constructivist approach is one which emphasises the pupils' involvement in the assessment of their own learning; the teacher assists the learners in their own efforts to assess what they have learnt.

Examples are: having children describe the ways in which they have gone about solving problems, allowing children to discuss problems amongst themselves, getting the child's own description of mathematical concepts. Many teachers already engage in some assessment practices which we would call constructivist.

Constructivist assessments result in teachers gaining an idea of the mathematical ideas and strategies of the learner. The learner gains an appreciation of the knowledge that they have and where it is not sufficient to understand situations. Thus the goal is development of the processes and experiences by which learning occurs.

Practically, this approach may involve teachers and learners in exercises that seem more like learning and teaching than assessment. For example, the teacher may get children to describe to each other the way that they solve problems whilst the teacher listens or records. Or, children might write out a list of the problems that they get the wrong answers to, and then they reflect on whether there is anything about the problems that creates the difficulty.

Interviews are good when used constructively, but the realities of the classroom do not allow them to be used as the main method. However, if a teacher is in doubt about a child's readiness to start on more advanced topics then interview' g the child *as they do mathematics* will give a detailed picture of the child's knowledge. In the interview the teacher should pose similar problems in different contexts to find out if there is a solid foundation of out-of-school mathematical experiences that the child can draw upon. The interview can provide the teacher with information on how the child goes about solving problems, about sources of puzzlement, and about the questions they ask themselves – all information which is not available from written tests.

Conclusion

We need to reconsider the strengths and limitations of the assessment devices that we use in our classrooms. Norm-based tests are useful for ranking students. Mastery tests provide some indication of children's ability to do items from a particular domain of knowledge. But neither of these can give us precise guidance on how to improve the learning of those who have failed and those who have passed the tests. Only by observing and listening to learners as they solve mathematical problems and pursue investigations can we get the type of information that will help us plan for better learning.

Notes

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One of the key papers in evaluating primary school assessment of Mathematics is

Denvir, B. and Brown, M. (1987) The feasibility of class administered diagnostic assessment in primary mathematics, *Educational Research*, Vol. 29, No. 2, pp. 95-107.

The variety of approaches (norm, mastery and interview) is discussed by Denvir and Brown.

That children approach school and 'real-world' maths differently is detailed in

Saxe, G.B. (1988) Candy selling and math learning, *Educational Researcher*, Vol. 17, No. 4, pp. 14-21.

and

Carraher, T.N., Carraher, D.W. and Schiemann, A.D. (1987) Written and oral mathematics, *Journal for Research in Mathematics Education*, Vol. 18, No. 2, pp. 83-97.

That teachers do not do so well when they rely too heavily on pencil and paper tests is detailed in

Peterson, P.L., Fennema, E., Carpenter, T.P. and Loef, M. (1989) Teachers' pedagogical content beliefs in mathematics, *Cognition and Instruction*, Vol. 6, No. 1, pp. 1-40.

The quotation from Berk is in

Berk, R.A. (1988) Criterion-referenced tests. In J.P. Keeves (Ed.) *Educational research methodology and measurement: An international handbook*, Oxford, Sydney: Pergamon Press.

That children can answer questions using different strategies, and can change strategies can be found in

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and

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Erlwanger's interviews are written up in

Erlwanger, S.H. (1975) The observation interview method and some case studies. *Proceedings of the Conference on the Future of Mathematical Education*, pp. 125-142. Tallahasse, Fl.: Florida State University.

Young-Loveridge's and Irwin's work showing some children master subtraction before addition is in

Young-Loveridge, J.M. (1987) The development of children's number concepts, *Research Report No. 87-1*, Christchurch: Education Department, University of Canterbury.

and

Irwin, K.C. (1989) Children's understanding of compensation, addition and subtraction. *Paper presented at the N.Z.A.R.E. Conference*, Wellington.

The alternative constructivist approach to assessment is best followed up in

Biddulph, F., Bell, B. and Carr, M. (1989) Constructivist assessment. *Submission to the assessment for better learning project*, Hamilton: Centre for Science and Mathematics Education Research, University of Waikato.

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