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Foreword

Would you like your students to be so enthusiastic about the tasks you set that they ask for more? Are you looking for teaching materials containing mind-stretching activities that are interdisciplinary, empower students, encourage independence and do all this with good-humoured grace? Lynne Kelly's book, *Challenging Minds: Enrichment for Able Adolescents* will transform your classroom in these positive ways.

Challenging Minds is a thought-provoking, intriguing and tantalising collection of mind stretching challenges for able adolescents. Each of the fourteen activities, usually completed over a period of weeks, provokes the highest levels of thinking in Bloom's Revised Taxonomy: Analysing, Creating and/or Evaluating. An unusual and excellent feature of these materials is the emphasis on metacognition (awareness of one's own thinking). By reflecting on their processing and the success or failure of their strategies, students are empowered to become better thinkers. Rather than focusing on what to learn, the emphasis is on how to learn, helping students develop the tools needed to function successfully in the information age. These activities teach students how to think, regardless of the subject matter.

Such a collection of enrichment activities for able secondary students is a rare and welcome addition to the field of gifted education. All too often, gifted students in secondary schools are simply accelerated. Although acceleration can be a useful option, unless the accelerated curriculum is differentiated by an explicit focus on open-endedness, abstractness, complexity, critical and creative thinking, and metacognition (all aspects of *Challenging Minds*), students are simply asked to remember facts faster.

One of the features that makes Lynne's book outstanding is that each activity has been field tested for at least five years in secondary classrooms. The reactions of students, and the possible pitfalls the teacher may encounter, are clearly and often humorously elucidated. You have the comfort of knowing that this material has been successfully tried and tested with students in real classroom settings.

Challenging Minds was written to stimulate higher-level thinking and metacognition in gifted students. The introduction provides background information that ensures confidence for the novice and offers justification for the use of these materials to teachers well-versed in teaching thinking strategies. The rationale discusses the learning patterns of able adolescents, including their curiosity, use of humour, sense of relationships, creativity, logical thinking, and heightened moral and emotional

development. Clear instructions outline the teacher's role, time allocation for the challenges, how to get started, the importance of student self-evaluation, and assessment of how challenges have been used in schools. A discussion of Bloom's Taxonomy, upon which the thinking activities are based, follows. Next is a section on metacognition, or 'thinking about thinking'. This metacognitive aspect helps students become aware of the processes they have selected and asks them to consider how successful they were in attaining their goals. This section concludes with an annotated overview of each of the fourteen challenges related to the metacognitive features. The remainder of the book details each of the challenges, which range from a deceptively straightforward finding of answers to a variety of knowledge and comprehension questions in the first challenge, to activities on such diverse topics as cryogenics, advertising, starting a restaurant or paradoxes.

Lynne uses the challenges in three ways, depending on the nature of both the challenge and the student. Firstly, activities are used with special classes of identified gifted students. Secondly, challenges are offered to small, informal groups of self-selected students. And finally, they are used with individuals as spare-time activities to keep them interested after they have finished regular class work. However, even though the challenges are intended as enrichment activities for the gifted, many, if not most, of the activities could also be used with all students in a regular classroom setting.

One difficulty with providing enrichment activities for some secondary gifted students is motivating them to invest time and effort if their work is not recognised for assessment purposes. By incorporating these challenges in the regular classroom and by having students self-assess on criteria provided for each activity, the importance of their efforts is recognised. They are also empowered to judge their own work. If they have already earned an A mark, this could go up to an A+. On the other hand, many able students are so bored with their regular schoolwork, they would be grateful for this type of stimulating task and would need no external rewards. Compacting the regular curriculum by assessing students who want to complete required material early would provide time to do challenges. The opportunity for the students to share their efforts might also be a reward. If the teacher recognises a strong student interest, a challenge could be modified to better relate to that interest, which is usually highly motivating. With able students, compulsory use of challenges should be avoided. Once some students get started and begin to laugh and enjoy the activities, others will surely follow.

If used in a regular classroom setting, certainly not all students will be able to complete all activities to the same level. What will differ is the rate at which they learn (not necessarily the speed they find answers); the terminal level or end point (the more able students will reach higher levels); the number of repetitions needed for permanent memory; ease of information retrieval; the ability to generalise, abstract and see relationships; and the learning trajectory, which will be much steeper for brighter students (Cohen, 1990). You may find, for example, that the whole class could do the first part of Challenge 7, Laughable Logic – perhaps in a personal development class to deal with what kind of humour is appropriate for school – but only the able learners or those who really want to go on would tackle the more complex classifying aspect of this activity. However, all students can and will make progress in becoming better thinkers. All students can benefit from these mind-stretching activities and some seemingly average students may even demonstrate unseen abilities when given Challenges.

In fact, *Challenging Minds* fits with several of the principles central to education of gifted students that should belong to all. These can be summarised as 'Six Simple Rules' (Cohen, 1991/2):

1. **Focus on the unique pattern of strengths: the abilities, competencies and talents of each individual child.** Through some of these activities, students not normally seen as gifted may find that their abilities in visual, practical, social or other domains allow them to perform very successfully on challenges. Both teachers and students may identify strengths not normally apparent in regular class work.

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Introduction

Three common approaches are used for students perceived to have high intellectual potential: acceleration, extension and enrichment. All are of great value. This book is designed to be used as an enrichment course, exposing such students to activities that would not be experienced in the usual subject-based curriculum. The tasks are cross-curricular and cannot be classified as extension in any accepted subject area. They are also context based, in that most allow students to follow realistic interests in realistic situations. The emphasis can be adjusted to match the particular talents of the students involved in the course.

Challenging Minds consists of fourteen challenges of varying complexity. Each challenge poses a problem and asks students to formulate a response. All tasks are open in nature and permit a variety of approaches as well as a variety of final reports. For each challenge, there is a guideline to tackling the challenge, and a set of teacher notes. From Challenge 2 onwards, there is a component asking students to consider their own thought processes. This section is headed 'Thinking About Thinking'.

Each task takes the form of a challenge designed to develop the students' skills in a number of areas simultaneously. The tasks have been designed to take the students into the higher levels of Bloom's Revised Taxonomy of cognitive behaviour which emphasise the skills of Evaluating, Creating and Analysing. The lower levels of Remembering, Understanding and Applying are obviously also appropriate; however, the emphasis is on the higher level and more abstract skills. Particular applications of Bloom's levels are given in the teacher notes for each challenge.

Intellectually gifted children are differentiated in a number of ways. These vary depending on which reference you read, but there are a number of characteristics which are common to all references – and it is these I have concentrated on when designing the challenges.

Gifted students are known to have a higher sense of self-awareness and sensitivity to feelings. They tend to possess high expectations of themselves and may resist attempting a task in a way that will cause lower results. The challenges are designed to avoid such tick/cross assessment, encouraging students to take risks. In preference to only marking the final product, I have used the students' own analysis of their methods to evaluate their work; therefore, 'making mistakes' and taking risks will not cause lower assessments. Evaluation of the method by which students completed the challenge, and a realistic but constructive self-criticism of their final product, is to be highly recommended if they are to gain maximum benefit from attempting the tasks.

Gifted children are often identified early due to their incessant questioning of the world. They exhibit a great curiosity. This trait has been addressed particularly in Challenges 1, 3, 4, 5, 6, 9 and 12. Gifted children are also noted for their keen sense of humour. Often they are perceived as laughing at different things to other students. I have tried to allow this to play a large part in the challenges, particularly Challenges 4, 7, 8 and 12.

The ability to see relationships and patterns in situations is often noted with gifted students. This ability has been targeted in a number of the challenges, particularly Challenges 3, 7, 10, 11 and 12. These children are known to identify such relationships earlier and more clearly than their peers. Many references quote a heightened moral, emotional and philosophical development with gifted students. A number of the challenges have been designed to incorporate such aspects, particularly Challenges 2, 3, 6, 10, 11 and 12.

Imagination, initiative, creativity and an individualistic approach to tackling tasks are traits which have been associated with giftedness. Most of the challenges have been designed to incorporate these within the scope of the response required, especially Challenges 3, 5, 6, 7, 8 and 12. I have found the need to vary the actual challenge definitions, when applicable, to enhance the opportunity for a student to follow a different approach. The invaluable skill of clear, logical thinking is targeted in Challenges 2, 4, 9, 13 and 14.

Many of the tasks are much better attempted over a number of weeks to allow students to mull over the approaches they are to use. It is an aim of all challenges to encourage the students to broaden their definitions of 'resource' and 'method' and to optimise their skills in using both. They are also characterised by the ability to work for greater lengths of time and at greater depths than their peers. All the challenges are to be done over a reasonable span of time. During the course, I have interspersed the challenges with shorter tasks of the more common puzzle or single activity format.

I have often started courses with the first challenge presented in this book. This is a far more structured challenge than the rest, and one that has a more defined solution. The questions are carefully selected to help students broaden their definitions of the terms 'resource' and 'method'.

To assist teachers who wish to assess the responses to the challenges, a set of criteria has been proposed. Responses to the challenges can vary greatly and students may negotiate a change in the way they respond to the challenge. Consequently the work produced may deviate from the expected form and teachers may need to adjust the assessment criteria as they see fit. Gifted students should be permitted to use their creativity, but this may require teachers to use the suggested criteria equally creatively!

In using the criteria, teachers may wish to give a mark for each component and then average the mark for an overall rating. If the teacher feels one criterion is more important than the others, she or he may wish to weight the marking for each giving more value to certain criteria, and hence construct a final mark. I have usually marked the response to the challenge and the 'Thinking About Thinking' section separately. This has been important when a student has performed very poorly on the challenge but then analysed the reason why very well. This has been the case for a number of underachieving gifted students whose motivation or self-concept has been cause for concern. This separation allowed these two aspects to be clearly differentiated, and valuable discussion and counselling has arisen from the 'Thinking About Thinking' responses. For school assessment requirements, these two marks were then combined.

Enjoy the challenge!

– Lynne Kelly

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CHALLENGE

Get the Answers

This challenge requires you to find the answers to the following 100 questions within the time limit set by your teacher. You must use a minimum of eight different resources, including other people (but not other students!). Make sure that each source you select is reliable.

Aims

1. To broaden the concept of 'resources' to include a greater variety of references and recognise the value of other people's abilities and knowledge.
2. To gain experience seeking out information in a variety of ways, and assessing the reliability of various sources.
3. To improve efficiency in tackling a sizeable task.
4. To develop skills in evaluating personal methodology.

Method

1. Write a brief report on the following and submit it for review at the end of the assignment:

   a. What is your definition of a 'resource'?

b. Describe briefly how you will tackle the task of finding the answers.

c. How will you approach the task in order to gain as many answers as possible within the time limit?

2. Within the given time limit, find as many answers as possible. For each answer, record the source of the response. If the internet is used, the address of the website used must be provided.

3. Having corrected the answers and re-read your initial comments, write a report on what you have learnt, including responses to the following:

   a. Has your definition of a 'resource' changed in any way? Do all resources have the same reliability? If not, does this affect their usefulness? Can you think of any examples of when a less reliable source is still of great value?

   b. If you had to do the task again, would you approach it differently? If so, how and why?

   c. Did the way you recorded your answers affect your efficiency? If so, how?

   d. Were there any aspects of your method that were particularly good and could be recommended to others?

The Questions

1. What is the German word for 'horse'?
2. What is Queen Elizabeth I's surname?
3. How is e-knee-bree-ated (meaning drunk out of your mind) spelt?
4. Who was the king of the gods in Greek mythology?
5. Who wrote **Pride and Prejudice**?
6. When did Albert Einstein win the Nobel Prize?
7. Would you serve Amanita phalloides for dinner if you liked the guest?
8. What is the most recent figure you can get for the population of Botswana?
9. What is the telephone number for IP Australia?
10. How do you calculate the gear ratio on a bicycle?
11. What is Gympie's postcode?
12. What were the names of the two families in the War of the Roses?
13. Why is Lake Mungo, NSW, famous?
14. Who played Velvet in the original version of **National Velvet**?
15. How far is it from Moscow to Paris?
16. What is the capital of Botswana?
17. What is the Apgar test?
18. In which sport is the pommel horse used?
19. What does the S R (followed by a number) mean on the side of tyres?
20. What are the ingredients for a white sauce?
21. What other instrument is usually played by the musician who plays a Cor Anglais in an orchestra?

Teacher's Notes

Cognitive Level

Bloom's Taxonomy

This challenge concentrates on Analysing of arguments and Creating relevant cases. Analysing both sides of an argument is often difficult, especially if the student has strong feelings about the issue; however, it is a valuable skill.

Creating a logical argument for two opposing sides is a challenge worth pursuing. The actual argument is exciting and challenging, and provides the case studies necessary for constructing the tactics and techniques section of the report. This could be seen as operating at the Evaluating and Creating levels.

The 'Thinking About Thinking' aspect, or metacognosis, allows for the Evaluating and Analysing of individual thought processes with the aim of optimisation.

Personal Characteristics

Gifted students almost invariably enjoy arguing. They like the challenge of being required to think quickly and logically. New ideas excite them. This situation is designed to allow them to try out new ideas, then change sides and explore the opposite point of view. Hopefully the situation will be safe enough for them to feel free to do so.

As the topic is taken to further depths, students are able to use the talent they often possess for twisting themes and viewing them from many positions. The traits of initiative, inquisitiveness, versatility and originality are all drawn on as the quality of debate improves. The topics often appeal to highly gifted students who are able to work at a level of abstraction that is not usually presented to their age group.

Gifted students are capable of metacognitive analysis. They also seem to delight in such an analysis.

General Notes

The topics vary from those which are quite straightforward to those which require much more imagination. The latter often provides a greater challenge. Some topics appear to be straightforward, such as 'Everyone has the right to their own opinion, but they have no right to force their opinion on anyone else', but are in fact quite difficult. All students should be aware, in advance, of the topics to be argued so that they can fully prepare for these debates.

This challenge requires a group of at least six students. Some must be willing to take on the challenge of arguing for something with which they don't agree. Make it clear that there must be no quoting of opinions resulting from this situation, as no opinions expressed can be said to be those of the speaker. This assurance makes students more likely to try an argument out for the fun of seeing how others react to it.

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CHALLENGE

A. A. Milne — Poet or Psychic?

Background

I have always known that A. A. Milne's book of children's poetry **When We Were Very Young** was of special import, and now I can reveal why. It is really a subtly-disguised set of psychic predictions. Naturally, I have not yet managed to interpret all of his quatrains, septrains, octrains and fifteentrains, but I have deciphered sufficient material to give proof of my claims. Move over, Nostradamus.

Firstly, A. A. Milne not only predicted the computer age long before its advent, he even exhibited the blind bias to a particular brand that is so common nowadays in his poem, 'Happiness':

John had a Great Big Waterproof Mackintosh –

And that (said John) Is That.

His future preference for the Apple Mac is clear and unbending. He even details the peripherals we attach to the computer in his poem, 'The Christening':

What shall I call

My dear little dormouse?

His eyes are small

But his tail is e-nor-mouse.