



Further aspects of curriculum differentiation for gifted students

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This presentation will cover

- Developing differentiated outcomes for a unit of work
- Developing extension activities or tasks using the Maker Model



Passow's Criteria

- **Would** all students **want to be involved** in such learning experiences?
- **Could** all students **be involved** in such learning experiences?
- **Should** all students **be expected to succeed** in such learning experiences?

The answer to these three questions should be 'no' if curriculum is to be appropriate only for the gifted students in your class. If the answer is 'yes' then the curriculum is suitable for all students



Differentiating Outcomes

- Modify the core outcomes to develop extended outcomes by adding higher order verbs.
- Use the higher levels of Bloom's Taxonomy to modify the outcome

Core Outcome: Identify and describe the ways living things grow and change



Differentiating Outcomes

- Modify the core outcome to develop extended outcomes by adding complexity to the outcome.

Core outcome: Analyse the role of the audience in the development of text, evaluating its overall influence



Differentiating Outcomes

- Students who have achieved the core outcome from the level in which they are currently placed, work on the corresponding outcome from the next level

Importance of documentation of any accelerative procedure.



Maker aims to:

- Enhance or recognise what is different or special about the students for whom curriculum is designed
- Provide concepts at higher levels of abstraction or greater complexity with an emphasis on HOTS



Maker Model

- Content
- Process
- Product
- Learning Environment



Exercise

- What do you believe are the 5 fundamental characteristics of gifted learners?
- With the person next to you - combine your lists and create a list you both agree on.
- Brainstorm what implications these characteristics have for your teaching.



Content Modifications

- Abstraction
- Complexity
- Variety
- Organisation
- Study of People
- Methods of Enquiry



Process Modifications

- Higher Order Thinking Skills
- Open-ended Thinking (paradox, analogy, intuitive expression, tolerance for ambiguity)
- Discovery Learning
- Proof and Reasoning
- Freedom of Choice
- Group Interaction



Product Modifications

- Real products
- Real audiences
- Evaluation



Learning Environment Modifications

- Student-centred
- Independence
- Openness
- Accepting
- High mobility
- Varied grouping
- Flexibility



Content Modifications

Abstraction	Concrete objects, shapes and noises can be seen or heard. Abstract concepts, generalisations or theories require a learner to go beyond the facts and examine underlying ideas, symbolism, meaning of the content.	Communication: when is it healthy and when is it toxic? Justify your response with examples from at least two different texts. When are drugs a preferred option? When we give a person a chance to prove themselves, how do we know what criteria to use for proof?
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Compare:

What is classical music? Create a timeline of the major periods of classical music.

VS

What makes a piece of music a "classic"? Find modern pieces that have the same characteristics



Abstract Concepts

Working in small groups...

Choose a concept from your faculty area/Year level and develop an abstraction question or activity which you could use in the classroom for a topic/unit which you will be teaching next term.

Evaluate your activity using Passow's three criteria.

Be prepared to share your activity with the rest of the group.



Content Modifications

Complexity	Closely related to abstractness. Complex ideas are made up of many interconnected or interrelated parts. Complexity introduces greater breadth and depth and provides opportunities for students to recognise connections and deeper meanings of content.	Find examples of Japanese characters in which the symbol actually looks like the object it describes. Create two different ways to carry a design through to production. What sports are linked with performance-enhancing drugs and hence have associated athletes with the drug and its desired effect?
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Content Modifications

Variety	More than simple enrichment. Opportunities to explore and manipulate different learning strategies, sample different fields of endeavour, different problem solving scenarios and tools, different areas of strength and interest.	Collect and study examples of music, art and costume or dress from two different cultural groups. How do these examples affect our understanding of these groups? Read other versions of Romeo and Juliet in literature and mythology, such as Hermann and Dorothea by Johann Wolfgang von Goethe and West Side Story by Arthur Laurents.
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Content Modifications

Organisation	Integrated or multidisciplinary content. Built on the concept that gifted students gain more from richly connected content in which they can examine similarities and differences, whole to part structures and categorical groupings.	Conduct a traffic survey from your school gate for at least ten minutes. Focus on specific areas such as types of vehicles, number of vehicles, number of passengers, etc and use a table to organise your findings. Having studied the history of drug use in sport, use a timeline to indicate the sequence and evolution of drugs used in sport, with the Olympic Games as reference points.
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Content Modifications

Study of People	Relation of content to people, the human situation, human problems and conflicts through in-depth study of individuals and groups of people.	Study a well-known mathematician from the past and then compare that person's life with that of a well-known contemporary mathematician such as Benoit Mandelbrot. Investigate people who have improved the effectiveness of air travel.
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Content Modifications

Methods of Enquiry	The development of understandings as to how knowledge is constructed and classified from data and information, how research is conducted, analysed and evaluated and the conventions, strategies and methodologies which are unique to specific fields of study.	What is a sociologist? Give examples of two well-known sociologists, discussing their work in comparison to that of an historian. How do scientists and environmentalists decide which animals should be placed on the endangered species list? Study three to five pieces by the same composer. Describe the composer's style. What did he or she do that was the same in each piece?
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English - Fairytales
Theme: Patterns
Focus question: How do fairytales present patterns for our lives?

Strategy	Activity
Abstraction	How did the term 'fairy tale' come to describe stories without fairies in them?
Complexity	Can all fairytales be 'fractured'? Choose one to demonstrate your ideas.
Variety	Are all fairytales stories of good and evil? Read at least three different fairytales to support your answer.
Organisation	Do all fairytales end with the words 'happily ever after'? What is the structure of a fairytale and does it have to include these words?
Study of people	Who has been the most important writer of fairytales, and why? Study his/her life to support your answer.
Methods of inquiry	What do fairytales teach us? Study at least three different fairytales to help answer this question.



Mathematics - Tessellations
Theme: Systems
Focus question: How and why do visual patterns help us in maths?

Strategy	Activity
Abstraction	Mathematically divide a space, with shape or pattern, body or face, Repeat it identically again and again, This is how tessellations begin! http://library.thinkquest.org/CR0213184/Tessellations.htm How does this explain M.C. Escher's work?
Complexity	Create a series of tessellated patterns based on the theme of nature, change, traditions or beliefs.
Variety	How many different mathematical patterns can be found in everyday life?
Organisation	What regular polygons can be tessellated? Create a way to show examples of these shapes in regular and semi-regular tessellations. Include the number patterns that relate to these.
Study of people	Who are most important to the study of tessellations: historians, mathematicians, or artists?
Methods of inquiry	How is symmetry connected to tessellations?



CAPA - Creative and Performing Arts
Theme: Patterns
Focus question: How can the patterns found in nature be used in the creative arts?

Strategy	Activity
Abstraction	'Nature is the original artist, musician and performer, and all else is imitation.' How has nature been copied in the creative and practical arts? Create your own imitation of nature.
Complexity	How important is symmetry to the creative arts? Is this pattern found in nature the most important to the creative arts? Why, or why not?
Variety	Create a list of at least ten different patterns found in nature that can be used in either visual arts or music. Explain or demonstrate how these patterns can be used.
Organisation	Develop a visual catalogue of works of art depicting patterns in nature. Order the catalogue by date, artist, style or medium.
Study of people	Choose a well-known Australian artist, composer or choreographer who has used patterns found in nature as his/her inspiration. Research this person's work.
Methods of inquiry	How are patterns important to an artist, a musician, a dancer, a choreographer, or an actor? Choose one and develop a creative way to show your research findings.



Science / Science and Technology

Theme: Change

Focus question: How and why are simple machines the foundation of our modern lives?

Strategy	Activity
Abstraction	'Behind every form of modern technology is a simple machine.' How can this be true?
Complexity	A simple machine performs more than a simple task. Demonstrate this with at least one simple machine.
Variety	What simple machines can be found in nature? In our bodies?
Organisation	What simple machines could we live without? Develop a flow chart to show the consequences of removing one simple machine from our daily lives.
Study of people	Who was Archimedes? Why was he significant in relation to simple machines?
Methods of inquiry	Develop an exhibition of simple machines that can be used to teach younger students how they work.



Numeracy – *The Very Hungry Caterpillar* by Eric Carle

Theme: Patterns

Focus question: How important are patterns in nature?

Strategy	Activity
Abstraction	The story was about one very hungry caterpillar. What if it had been about two, five, or ten hungry caterpillars? How would the number patterns change?
Complexity	Find a way to show all of the numbers you see or read about in <i>The Very Hungry Caterpillar</i> .
Variety	How many different patterns can you find in the story?
Organisation	Graph the number of foods the very hungry caterpillar eats each day.
Study of people	What do entomologists do? How do numbers help their work? How do they use patterns?
Methods of inquiry	How many different ways can we show what the caterpillar ate?



Literacy – *Sometimes I Like to Curl Up in a Ball* by Vicki Churchill

Theme: Growth

Focus question: How do we learn when we play?

Strategy	Activity
Abstraction	Why do you think the writer of the story used animals to describe things that children like to do?
Complexity	Tell the story of the day in the wombat's life, using actions and sounds.
Variety	How many different places might you be able to find a wombat? Draw pictures to explain.
Organisation	The creatures in the story belong to different groups. Use a table and drawings to show these groups.
Study of people	What if the story was told by another animal in the book? Would they all be able to 'curl up in a ball'? Tell their story instead.
Methods of inquiry	Write or draw your own version of the story, with you as the main character.



English - Text: *Obernewtyn* by Isobelle Carmody

Theme: Prejudice

Focus question: Does prejudice have to be experienced to be truly understood?

Strategy	Activity
Abstraction	Does prejudice stem from ignorance or from fear? Which is more common in <i>Obernewtyn</i> ?
Complexity	'You can't understand how it feels to be a minority group unless you are part of one.' Discuss this in terms of the relationships developed in the novel.
Variety	Prejudice is found or experienced in a number of different forms. What are some of the forms found in the novel? Which characters experience these and why?
Organisation	Most people need to feel they belong to a group. How did the misfits develop ways to experience this sense of belonging?
Study of people	Many famous figures in history have fought to overcome prejudice in their lives and their communities. Choose one of these figures and compare his/her life with that of one of the key characters in <i>Obernewtyn</i> .
Methods of inquiry	If you could belong to one of the Guilds, which would you choose, and why? Are there real life versions of these Guilds? What do they do?



Maths - Algebra
 Theme: Systems
 Focus question: What's the use of algebra in our daily lives?

Strategy	Activity
Abstraction	Is the language or symbolism of algebra universal? Investigate another cultural group's use of algebra through survey, research or interviews.
Complexity	How many different ways can $2a(4a + 3b) = 10$, if $a = 2$ be solved? Prove your methods work.
Variety	Keep a journal for two days to document the number of different activities in which algebra is, or could be, involved.
Organisation	Develop a way to teach the fundamental rules of algebra to younger students using pictures and/or physical activities.
Study of people	Who were the two most important figures in the development of algebra? Investigate their lives and compare their contributions.
Methods of inquiry	Research two different careers that use algebra on a regular basis. Find examples of this use.



Science - Biology
 Theme: Systems
 Focus question: How and why do scientists classify living things?

Strategy	Activity
Abstraction	What constitutes a definition of a living thing? How does science fiction challenge this definition?
Complexity	How accurately do the scientific names for different plant species describe the characteristics of individual plants within each species?
Variety	Carolus Linnaeus is considered the father of taxonomy and the person responsible for 'simplifying' the classification of living things. The classic method of classifying living things was through visual identification. What systems are used now, and why?
Organisation	The variety of classifications used to describe living things has expanded over time. Why has this occurred and how might this be documented?
Study of people	Which scientists have been the most instrumental in the development of classification systems for living things? Choose at least two and compare their contributions.
Methods of inquiry	You have discovered a living creature you think may be a new species. What are the steps you need to take to check this and to have the new species named? Who decides its name and scientific classification?



History
 Theme: Ancient Civilisations
 Focus question: Which ancient civilisations have had the greatest influence on the modern world? Why?

Strategy	Activity
Abstraction	Why are words such as 'seat' and 'cradle' used in descriptions of ancient civilisations? Give examples to explain your ideas.
Complexity	Some people believe finding the lost city of Atlantis will provide a greater understanding of the ancient world and its foundations, while others believe it is simply a myth. Investigate the opposing theories and make your own judgement.
Variety	At the time of the well-known ancient civilisations, other less discussed ancient civilisations rose and fell. Why are they less prominent in general knowledge? Choose two of these to investigate and evaluate.
Organisation	When did ancient civilisations rise and fall? Develop a timeline to document the development of two ancient civilisations from different parts of the world.
Study of people	Compare and contrast the contributions of at least two ancient civilisations. Order these contributions from greatest to least.
Methods of inquiry	How do the disciplines of archaeology and anthropology help us understand ancient civilisations?



Geography
 Theme: Global Environmental Issues
 Focus question: How and why has human activity impacted on the world's wetlands?

Strategy	Activity
Abstraction	Does the beauty of an environment ensure greater protection for it? Why has the protection of the world's wetlands been slower in being initiated than that of other global environments?
Complexity	The Ramsar Convention was established to protect wetland birds and their migration corridors and breeding areas. A number of wetlands throughout the world have been designated 'of international importance'. How is the designation decided, by whom and why?
Variety	How many different types of global wetlands are at risk? What are the main causes of the environmental issues faced by these wetlands?
Organisation	Develop a creative way to inform younger students of the issues of endangered and feral species found in Australian wetlands.
Study of people	What organisations are most prominent in the protection of global wetlands and what is their primary mission? Investigate leading figures within these organisations and evaluate their impact.
Methods of inquiry	Examine the human activities which impact on one of Australia's wetlands. Which activities are unnecessary and which are necessary, and why?



Activity

Now develop further content modification activities to add to your abstraction question/activity.

Complexity
Variety
Organisation
Study of People
Methods of Enquiry



Product Modifications

- “Products are the natural result of the content and the end result of processes used to develop knowledge” (p.135)
 - Ideas, problem solutions, research reports, dances, musical compositions, displays, constructions, books, athletics demonstrations, speeches, mime etc.
- Eg. A research report
- “teacher-selected” topic versus “self/group selected”
 - “teacher-directed” versus “professionally-directed”
 - “student-type” versus “professional-type”

(Maker & Nielson, 1996)



Product Modifications (cont).

- Products for gifted students should use their abilities to create professional-type products.
 - Product addresses real problem
 - Product has a real, rather than contrived purpose
 - Presented to a real audience
 - Product is a transformation/synthesis rather than a summary or recapitulation
 - Product is evaluated by someone other than the teacher using appropriate criteria
 - Format is appropriate to audience and abilities of the creator

(Maker & Nielson, 1996)



Product Modifications (cont).

- Real problems
 - Use brainstorming techniques, mind mapping, student discussion to highlight areas of interest to students.
 - Use problem analysis and definition to refine ideas (what do we already know about the problem/what do we need to find out/who can we ask/what research is needed?)
 - Characteristics of gifted students: Ability to analyse, enjoyment of problem solving, high-level of reasoning, goal-oriented thought.

(Maker & Nielson, 1996)



Examples of real problems

- Issues of 'cultural diversity' often bring with them conflict and resistance to change. Choose a present-day example of such a conflict and examine some of the responses to the problems that have been, or are being, tried. Suggest some further ways to bring about a solution to this situation.
- Study the dilemmas in the movie Mr Holland's Opus. How true are these for a musician or a music teacher? What might be possible solutions to make music a more viable career for those who are musically gifted?

Source: DEST Modules



Product Modifications (cont).

- Real Audiences
 - Eg. An academic, a council, a government agency, a publisher, an art gallery
 - Why?
 - To learn the importance of audience analysis in the planning of products
 - To avoid students becoming too dependent on teacher evaluation (learned helplessness).

(Maker & Nielson, 1996)



Examples

- Make a presentation of a finished product and its marketing plan to a business leader in a related field.
- Produce your group created sonata for a composer.
- After creating your own version of a photo-realist portrait, ask a gallery owner to evaluate whether your version is marketable.

Source: DEST Modules



Product Modifications (cont).

- Evaluation
 - Teacher evaluation
 - Self-evaluation
 - Evaluation by a real audience
- Characteristics of gifted students: May be highly self-critical and critical of others, tendency towards perfectionism. Need to be taught appropriate methods to make informed judgments. Tendency for students to focus on grades rather than feedback. Focus on weaknesses.

(Maker & Nielson, 1996)



Examples

After learning a variety of graphing techniques using a computer, decide which is the most appropriate to display a set of statistics on the prevalence of illnesses at various ages, for different audiences: a group of medical doctors, medical staff at a hospital, a group of business people, a parent group and a group of Year 7 students.

Source: DEST Modules



Product Modifications (cont).

- Transformation
 - aka synthesis as opposed to paraphrasing other sources
 - Contains the following elements:
 - Viewing from a different perspective
 - Reinterpreting
 - Elaborating
 - Extending (going beyond)
 - Combining

(Maker & Nielson, 1996)



Transformations

- Viewing from a different perspective
 - History: from the past and the future
 - Social sciences: from different theoretical perspectives
 - Art: from differing angles
- Reinterpreting
 - Music: recreating a theme in several variations
 - Redefining a problem
- Elaborating
 - Adding new details or explanations

(Maker & Nielson, 1996)



Transformations (cont).

- Extending (going beyond)
 - Interpreting, extrapolating, generalising, increasing the scope
- Combining
 - Development of conclusions and formation of generalisations
- Characteristics of the gifted: Ability to acquire, integrate and retain large amounts of information; acquire sophisticated understandings with ease; advanced reasoning.

(Maker & Nielson, 1996)



Examples

- Write or paint scenes of your created myth.
- Design a method to teach Year 4 students how to solve 'x' in an algebraic equation.
- Be the judge in a mock trial. Justify your ruling and summarise your closing remarks.

Source: DEST Modules



Product Modifications (cont.)

- Variety and Self-Selected Format
 - Choice and open-endedness
 - Note your own level of enthusiasm when assessing students' work - if you are bored, they are probably bored too!

(Maker & Nielson, 1996)



Products

- History Unit on Ancient Greece
 - Products
 - Group 1: Government - conducted a mock trial
 - Group 2: Quiz show about Greek Gods with figurines
 - Group 3: Architecture - Explained form and structure of temples and made model of Parthenon
 - Group 4: Learning centre with English words with Greek origins
 - Group 5: Conducted mini-Olympic games for the class
 - Group 6: Theatre - presented reenactment of battle between Achilles and Hector

(Maker & Nielson, 1996)



Learning Environment

Learner centred	←→	Teacher centred
Independence	←→	Dependence
Open	←→	Closed
Acceptance	←→	Judgment
Complexity	←→	Simplicity
Varied grouping	←→	Similar grouping
Flexibility	←→	Rigidity
High mobility	←→	Low mobility

(Maker & Nielson, 1996)



Things to take into account...

- Start small... one subject area... one class... one modification
- Students who haven't experienced curriculum differentiation before may challenge the process.
- All classes you teach are mixed ability - whether they are a "top" class or a mixed ability class.
- Remember to document what you do.

