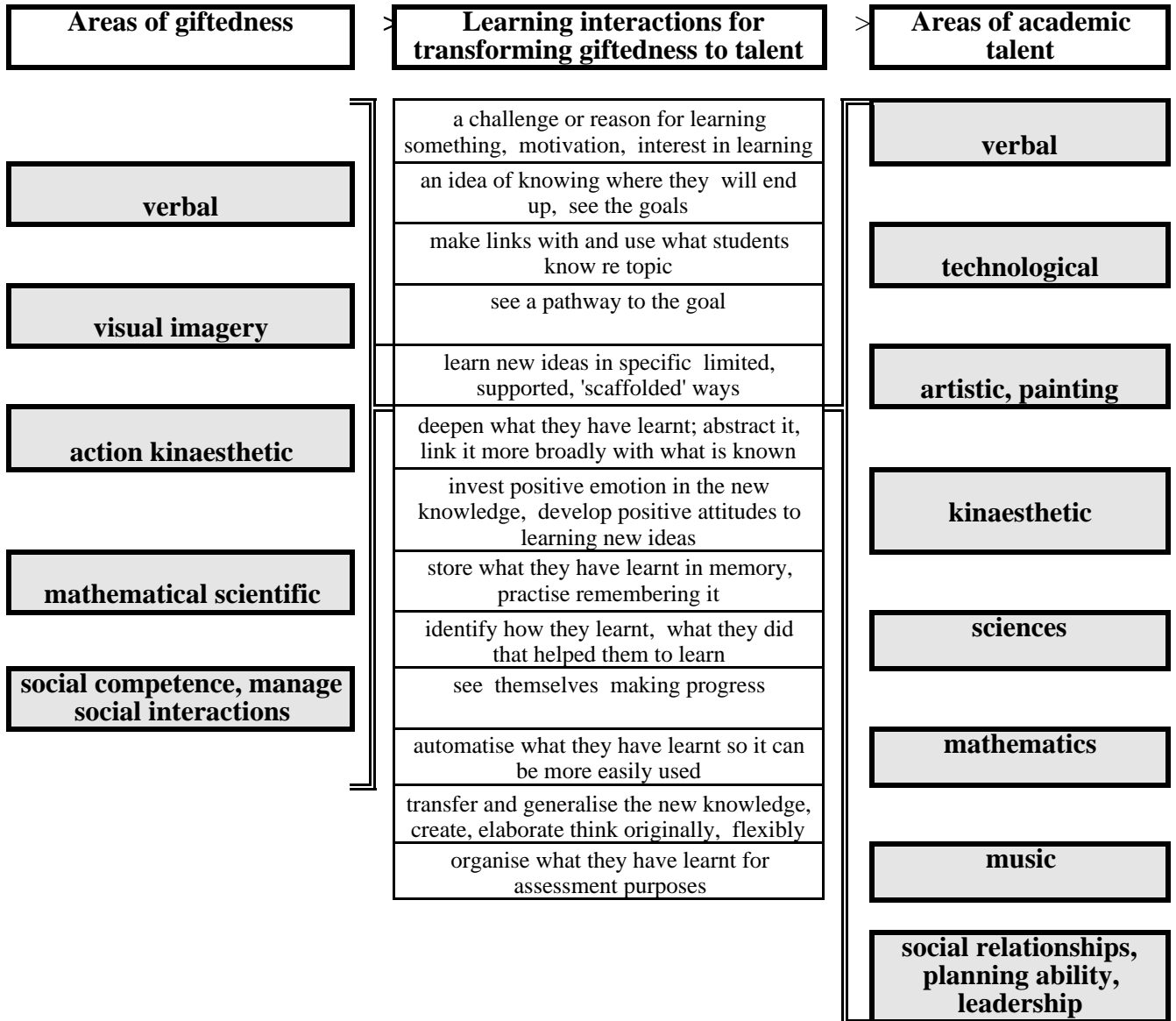


Proposed model of learning : Converting multiple general capacities or aptitudes of high ability into particular talents.

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Implications for identification

Superior general intellectual ability ?
Gifted characteristics ?

High intrinsic motivation ?
Deep approach to learning ?
High level metacognition ?

Specific academic aptitude in a particular area ?
Creative or productive thinking ?
Superior achievement ?

Implications for teaching gifted and talented students Whether in acceleration or horizontal broadening programs, the learning characteristics of gifted students lead to particular teaching implications.

Gifted students	Instructional implications
<p>need a challenge or reason for learning</p> <ul style="list-style-type: none"> • learn well by having their knowledge challenged, by being able to frame up questions that they pursue. • are more likely to show intrinsic motivation to learn. They resist extrinsic motivational orientations. • are more likely to show deep motives for learning, to want to 'take ideas apart', question and extend them by linking with what they know. They often resist learning for superficial or achieving motives. • may be more difficult to motivate to learn ideas in areas that don't interest them initially. 	<p>Show gifted students an aquarium with goldfish and plants and a container of oil. Ask "What is the link between these ? What do these have in common ? How did this form ? Do you think the little fish and plants like this formed oil ? How long did it take to form ?" Tell the students that fish like the goldfish form oil. How do they think it happens ? Allow the students to say what they think, possibilities. Ask questions that help them take their ideas apart and to analyse them.</p> <p>Encourage them to set goals in areas where they are not interested. Whenever you have students frame up goal for learning idea in a subject such as history, bring together the two key ideas - in this case oil and small animals and plants.</p>
<p>need to know where they will end up</p> <ul style="list-style-type: none"> • learn well by forming an impression of where they will end up, see their goals 	<p>Have students say that they will be able to explain how small marine animals and plants formed oil</p>
<p>make links with and use what they know re topic</p> <ul style="list-style-type: none"> • can have superior existing knowledge of a topic that is better differentiated and elaborated in a range of forms: <ul style="list-style-type: none"> • verbal, abstract, 'semantic' form (verbally gifted) • imagery, experiential form (visual spatial gifted). • procedural form • scientific-mathematical form (math/scientifically gifted) • musical form • process information faster and efficiently, show cognitive efficiency (e.g., memory span) (Saccuzzo, Johnson & Guertin, 1994), show higher efficiency in elementary processes (Geary & Brown, 1991) that determine more complex processes. • need to see that they will be allowed to manage and direct aspects of the learning, that they are valued for what they know and how well they can manage the learning. • are curious, good at questioning a topic or the ideas they will learn about. • need to have the opportunity to recode what they know to match the teaching • often set unrealistically high standards and goals for themselves, self-evaluate and become self-critical.. 	<ul style="list-style-type: none"> • To help them link with and use what they know re topic, present the stimulus materials in different ways, for example, in imagery ways, in actions. • Have them collate what they do know about the topic, what questions they can answer. They can draw a concept map of what they know in the different areas. • Give them more time to think through the ideas by themselves, to allow some ideas to stimulate other linked ideas in their minds. • Encourage them to be curious. • Have them say what they will do to learn about the topic, plan the route their learning might take. Let them see that they have a role in managing and directing their learning. • Have them identify what they don't know about the topic, unanswered questions they have, for example, <ul style="list-style-type: none"> • Why was it only small animals and plants that decayed to make oil ? • Did different kinds of animals make oil of different quality ? • Did the sand and silt that accumulated in the water have to be of a particular type / have a particular density range ? • Did the water need to be in a certain temperature range ? • How long did it take for the animal matter to decay ? • Would there be oil forming in parts of the world now ? • Help them deal with their often unrealistically high standards and goals for themselves. Let them see <ul style="list-style-type: none"> • how making mistakes can help them learn more in the future • that judging themselves harshly doesn't lead to best outcomes • that they can deal with situations in which they believe their creativity is threatened • how they may be putting unnecessary stress on themselves and how they can deal with this • Help them set realistic standards and goals for themselves, see that they can learn better when they allow themselves to make mistakes be 'partly right'.
<p>need to see a pathway to the goal</p> <p>learn well by forming an impression of where they will end up, see their goals</p>	<p>Encourage them to develop their own plans for learning about how oil was formed, the path they might follow, the questions they will answer, the materials they might need. They can decide when they might need to contact experts in the area, questions they might ask.</p>

<p>learn new ideas in specific contexts</p> <ul style="list-style-type: none"> • know how to use their knowledge better. • learn in idiosyncratic ways, are not easily programmed externally and need to align what they know with the teaching. • ask questions spontaneously <i>How can I get from ...to .. ?</i> • explore possible options, trial ideas, interpret ideas as problems to solve • use analogy, make comparisons well, think about ideas in different ways; for example, think intuitively, in imagery or action ways • link and categorise ideas at a high level • look for cause-effect or consequences • often do not need much practise to learn new ideas • often do not get the appropriate corrective feedback • recall better from short term memory and use higher level organizational strategies. • prefer to use global wholistic thinking more than analytic sequential thinking • show superior metacognitive knowledge, more able to monitor comprehension 	<p>Use teaching that encourages them to</p> <ul style="list-style-type: none"> • say the questions they are pursuing at any time • use a range of information sources about how oil was formed, ask , suggest some of the information sources that they could use and how they will locate information. Have them plan how they will collect different sources of information. • think about the story of oil in a range of ways: verbally, images, actions. Allow them to show the rich set of links they have of the history of oil. Encourage them to ask complex questions re the topic, generate their own questions and seek the opportunity to answer them for themselves, for example, about the history of oil, for example, Do you get oil of different quality from different types of vegetation or animals ? • interpret ideas as problems to solve, explore possible options, possibilities, trial ideas, interpret ideas as problems to solve. • allows them to use both global 'big picture' and analytic 'bits picture' thinking. Gifted and talented students are more flexible in their thinking and can often tolerate ambiguity and unanswered questions. <ul style="list-style-type: none"> • Allow students to begin to learn about oil in a 'big picture' way, to think in larger jumps, skip steps in their teaching, to do fewer repetitions of an idea to learn it. • List questions they think the teaching might answer, what questions they might be able to answer having learnt. Supplement bit by bit sequential teaching. • Help them learn how to learn in more conventional ways, to learn how to be structured or programmed by others in some contexts. . • Encourage them to reflect on, keep track of how they learn, what works for them. • think and reason by using analogy, comparing and categorising. Use cue questions if necessary to suggest possible analogies. • think in different ways about how animal and plant matter forms oil, for example, to be intuitive, to visualise the ideas, act them out to see the outcomes, etc. See 2.4 below for a framework for teaching gifted students to elaborate what they know. • make concrete or visual models of the ideas. • work at their own pace • look for cause-effect or consequences, practise, • take a greater role in managing and directing their learning, allow them to monitor their comprehension at any time and to take remedial action if necessary with less external intervention. • give them corrective feedback that recognises the ideas they have in place and possible directions / options they have for working on next. • Give students a range of ways of showing what they know about ideas. Many gifted students find it hard to display their knowledge in some formats because they haven't automatized them. They become frustrated because they can't show what they understand to teachers or peers. They also need to learn gradually how to 'read' and to sum up peer groups, to see what it is that the group values at any time and take this into account. <p>They can use the framework below to convert the information, data to knowledge. See 2.3 below for teaching ideas here.</p>
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<p>deepen what they have learnt; abstract it</p> <ul style="list-style-type: none"> link episodic, abstract and procedural aspects of idea review, consolidate what was learnt decontextualize, summarize, organize, link with what is known, main/subordinate ideas. elaborate and extend ideas through questioning look at ideas from different perspectives 	<p>Use teaching that encourages them to</p> <ul style="list-style-type: none"> link ideas in lateral, creative ways, for example, to operate intuitively, to give unexpected responses to questions, for example, Why might you get oil of different quality from different types of vegetation or animals? Students can link the type of hydrocarbon with the animals that lived in an area. use imagination, fantasy and humour at a high level, show 'intellectual playfulness'. Provide opportunity to explore an idea in depth, debate or argue an issue. have a well-developed memory, particularly for the areas of interest. recode knowledge into different forms, eg., recode imagery knowledge to scientific knowledge. This helps them get positive feedback for what they know. consolidate and review explicitly what they have learnt, explore how far it can be transferred, applied, generalised. They can show new knowledge in language forms, in iconic forms, through action sequences, in symbolic ways, etc. review, consolidate what they have learnt about how oil is formed, to link the episodic, semantic and procedural aspects of idea at once. decontextualize, summarize, organize ideas into main/subordinate ideas, show the new ideas they have learnt in various ways, for example, in poster, comic strip, concrete model. express, communicate what they have learnt about how oil is formed in conventional ways.
<p>invest positive emotion in the new knowledge</p> <p>are assisting by having them invest positive emotion in the new knowledge</p>	<p>Have then discuss</p> <ul style="list-style-type: none"> how the new ideas interested them, have increased their curiosity, the value of the new knowledge, how they could use the new ideas how it was their ability as students that allowed them to learn the ideas at the level of complexity they did.
<p>store what they have learnt in memory,</p> <p>store what they have learnt in memory when they are more interested in the ideas</p>	<p>Have them say</p> <ul style="list-style-type: none"> the new ideas they have learnt as concisely as possible how they have changed what they already knew how they might use the ideas in the future
<p>identify how they learnt,</p> <p>because many gifted students learn rapidly in idiosyncratic ways, rather than being programmed to think, it is useful for them to reflect on how they went about learning.</p>	<ul style="list-style-type: none"> Have them identify new self-talk, self scripts, ways of thinking in historical ways, in the domain of history that they could use in other areas of knowledge. What have they learnt about 'being historians? What are the types of questions historians ask? What are the types of knowledge historians pursue? Have them keep a record of the ways in which they went about pursuing the topic, the ways of thinking that worked for them. They can keep a diary of how they worked through the topic, say whether particular types of thinking strategies such as visualising worked.
<p>see themselves making progress</p>	<p>Have them review the new knowledge they have gained, the questions they can now answer, the directions they can move in the future.</p>
<p>automatise what they have learnt</p> <ul style="list-style-type: none"> many gifted students automatise what they have learnt in meaning ways rather than through being taught rules. they often do not automatise ideas by rote 	<p>Have them review the links between ideas, try to compress the ideas into a few 'chunks' of knowledge.</p>
<p>transfer and generalise the new knowledge</p> <p>show far transfer and generalise the new knowledge far beyond the context in which it was taught</p>	<p>Have them</p> <ul style="list-style-type: none"> suggest the key questions their new knowledge answers, analyse the new knowledge from a range of perspectives, for example, they formulate higher order Bloom-type questions, de Bono 6 hats questions engage in 'far transfer' of the ideas. <p>See 2.5 and 2.6 below for ideas here.</p>
<p>organise what they have learnt for assessment purposes</p>	<p>Have them decide how they will display their knowledge. Give them functional ways in which they can communicate their new knowledge</p>

Helping gifted history learners elaborate the ideas in a range of ways:

<p>Cultural-historical thinking Think about the ideas in historical –cultural ways. When did these processes begin to occur ? How long did they take ? When did man begin to mine oil? How did cultural factors make the mining of oil relevant or useful ?</p>	<p>Affective thinking Think about the ideas in emotional ways.</p>	<p>Logico mathematical thinking Think about the ideas in scientific ways. What are some of the key scientific concepts that are mentioned ? What scientific processes are involved ?</p>
The history of how oil was formed		
<p>Verbal linguistic thinking Read the data re oil forming. Paraphrase and summarise it. Tell yourself the questions it answers. Interview an ‘expert’ about how oil was formed. What questions would you ask. You be the expert being interviewed. Prepare a 5 minute speech about how oil was formed. Make up six easy and difficult questions for another group about how oil was formed. Debate the topic “There is likely to be many still undiscovered oil reserves around the world.</p>	<p>Imagery episodic thinking Collect pictures, diagrams of how oil was formed. Visualise specific instances. Reflect on these, analyse specific instances. Note what they have in common. Draw diagrams that show how it formed. Develop an icon to represent the process.</p>	<p>Action thinking Think about the actions involved in forming oil. Build models of how oil was formed. Have students act out what could have happened to make oil. Have them act out the various changes. What are the key actions in forming oil ? If you wanted to make oil in a factory, how would you apply these actions ?</p>

Task 6 Apply the instructional framework above to a topic that a classroom teacher may teach at the primary or secondary level.

Implications for teaching gifted and talented learners learning

This model suggests that learning can vary in a range of ways. We can use it to develop a framework for integrating the characteristics of gifted and talented learners :

- how they learn : the specific learning processes they implement.
- what they learn: their learning outcomes.
- why they learn : characteristics of their motivation to learn and learning style.
- their interpersonal interactions during learning, cultural influences on learning
- their self-perceptions and self efficacy as learners
- the comparative rate of development of their knowledge overall.

Encourage students' spontaneous pursuit of knowledge. Help them learn to deal with boredom. This may lead to disengagement from learning, poor study habits and a lack of interest in education. Where this arises,

- help them see open-ended aspects of the ideas
- encourage them to teach you about the ideas
- try to make up games involving the ideas

Provide opportunities for the self-driven aspects of pursuing knowledge.

- foster interest in problem solving contexts such as conservation, population change, climate change, waste disposal
- encourage self-selection of learning materials
- encourage students to be both producers and consumers of new ideas; they
 - consume or use other people's ideas
 - produce their own, add new ideas

Help them to understand the distinction between them and how they need both.

- encourage communication with similar-minded students using the Internet.

Help students become aware of the range of resources available for doing this;

- Internet, data bases, computer, library
- teach them how to access sources in community, for example, business, interest groups (for example, historical societies), specialist scientific institutions (zoo, museum, CSIRO, marine societies), cultural institutions (National Gallery)

Assist with 'information organising' as well as 'information providing'.

- Foster students' interest in others who were / are gifted in various ways. This can help them
 - see they are not alone
 - see options, ways that others used to deal with the types of problems that they might face
- Reading or seeing the biographies of gifted scientists, writers, dancers, artists, etc can provide important support.

Involve them in situations outside of regular school in which they can extend their knowledge and work with peers who think in similar ways and who can provide models, for example

- debating
- drama groups
- dance, ballet
- sporting groups
- pen pals, Internet pal

Help them keep their sensitivities in perspective. They often show an advanced 'moral conscious'. Although their logic is adequate here, their lack of experiences limits the options that they can see for themselves or others.

Help students understand their giftedness

- not all children need to learn in the same way, although some people might think you should
- they may be strong in some areas but not in others
- some children, peers, may not understand what they say or know.

Help them improve their peer group social interaction skills.; help them

- see what they do have in common with peers
- learn more effectively in peer group, set up situations in which they engage in group problem-solving and sharing activities
- learn the skills necessary for joining in peer group activities
- understand that not all children think in the same way
- learn various ways of showing their peers what they know in acceptable ways

Help them extend and integrate their knowledge

- teach students different types of questions to ask about set topics
- help them learn ways of researching topics of interest, for example,
- encourage them to investigate real problems in everyday life
- encourage them to see tasks as open-ended challenges
- provide suitable role-models for learning, for example, mentors, Night of the Notables.

Help them deal with their 'mental energy'. These children are mentally energetic; they can become totally absorbed or focused in an idea or activity, leading to the "Just A Minute" syndrome.

Gifted students manage their learning effectively. Help them use their independence as learners in functional ways. Present ideas as challenges or problems. Allow small groups to generate their directions for pursuing the challenge or problem.

The teaching can

- give learners increased opportunity to make decisions about what and how they will learn and how they will manage the learning
- allow to learn independently and to direct their learning, to have time to operate independently

- teach students to improve how they learn,
Encourage them to say how they went about thinking and learning.

Task 7 Develop a checklist for assessing the extent to which a teaching unit meets the needs of gifted students in regular classrooms.