

# **Raising Standards for all through the Gifted and Talented agenda**

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## **Collaborative Leadership for Creative Learning<sup>1</sup>**

The C21 is recognised as the era of knowledge management and enhancement. The education process, and in particular schools as educational providers, would seem to have a unique role to play in this process. The potential for knowledge enhancement of through gifted learning competence and through creativity, has boundless possibilities.

Gifted learning competence and creativity provide unique opportunities for schools to optimize their development of knowledge. A challenge that faces every school that takes seriously its role in knowledge management and enhancement is how to optimize this development. A assessment of how schools do this provides an indication of how seriously they take their role and responsibility in the knowledge age.

One aspect of raising the standards for all through the Gifted and Talented agenda is to focus on relevant school level pedagogic knowledge. What does the school know about how to facilitate the learning of GATs? What is its pedagogic capital in this area?

A key factor here is the leadership of gifted learning. Increasing a school's capacity to optimize the learning of gifted students requires teacher leaders who can lead and guide the professional learning in the area of gifted education. In this paper I would like to examine the issue of raising standards for all by examining how a school's pedagogic practice in the area of GATE can be led to improve.

A challenge that faces all school leaders genuinely interested in knowledge enhancement is how to put in place school level processes to enable their school community or the educational system to foster the optimal development of gifted learning and creativity. The approach I have taken to this is through the learning community model.

How can a school improve its knowledge of gifted learning and creativity, both its conceptual knowledge and what it does, its attitudes, pedagogy and curriculum practices by learning more about gifted learning and creativity and the conditions that both foster and restrict them.

To examine this further, I have attempted to apply the model I have developed of schools and educational providers as active, explicit learning communities. Key aspects of this model include

- The tiers at which a school needs to learn.
- The outcomes of professional learning
- How the professional learning will occur in a systematic and focused way for each tier. This would include, for example, the means by which the groups of teachers would learn about gifted learning and education and creativity map this into a code of teaching.
- The aspects or areas of knowledge in which the professional learning needs to occur.
- How a school wide understanding of GATE would be collated and mapped into a code of teaching practice that characterizes pedagogic practice in the school.

The schools which do this effectively will

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<sup>1</sup> A version of this paper formed part of an invitational Keynote presentation at **Kent Leadership and Innovation Centre UK** on Monday 20 June 2005.

- develop a broad action plan for professional learning,
- select the content to be learnt is and organize it into 'digestible' units,
- identify the means by which the professional learning would occur ,
- develop an operational plan to guide the community learning and implement this,
- identify the outcomes of the professional learning and share this within the community,
- review and evaluate the outcomes of the learning, use relevant outcomes to enhance teaching knowledge and practice, plans and learns further.

**1. The tiers of learning.**

I mentioned earlier today that it is useful to think of professional learning in a complex organization as a school as occurring at various functional tiers or levels. To improve the extent to which a school fosters gifted learning and creativity , you need a strategy that targets change at several levels of the school simultaneously:

- School leadership level, through the school leadership team (SLT) .
- Professional learning team level (PLT led by leaders of gifted education or MLLAGE).
- Individual teacher learning level (teaching / classroom level).

**2. The outcomes professional learning for each tier in the school.** The focus on improved gifted or creativity education needs to be developed through several aspects at each level:

Goals for fostering the learning of GATs, its place in the overall vision of the school’s purpose	The current level of school knowledge re the education of GATs is identified	Possible options for the school in the area of GAT education are identified
Review progress re GAT student policy and pedagogic provision	<b>Learning to improve the provision of effective pedagogy for GATs</b>	Display the outcomes of the learning of gifted and talented students
Support processes / structure for improving; the infrastructure and physical resources necessary (changes in use of space, time)	An action plan for enhancing and evaluating the school’s work in the area of GATE is developed. The plan is integrated with the overall ‘learning track’ for the school	Professional staff learning: staff learn teaching procedures that are more effective with GATs.  This includes instructional leadership to foster thinking and dialogue about understanding gifted learning and teaching to foster it

**3. The action plan for community learning**

GATE provision is more likely to be improved in a school community when the SLT has an action plan that specifies explicitly how the professional learning will occur. The skeleton of an action plan is shown in the following.

**GATE : 3 year vision** In three years time :

**What will students be doing differently ?** How do we achieve positive learning and reasonable outcomes for all students ? How will teaching ensure optimal access to learning outcomes for GATSSs?

**What will teachers be doing ?** Appropriate pedagogy and effective classroom management for C21st ? Metaphors for effective learning and teaching (personal journey, growth).

**What will the institution foster ?** How will the school organisation 'see' its GATSSs : Total person' concept. What will it validate and resource at the teaching level? What will it be saying re effective GATE ?

**Professional learning / development process**

**The context for teachers learning and fine-tuning their practice** Teaching as a developmental process; teachers as learners. What they need to know about professional learning. Dimensions: (1) preparedness to change (2) ability to adapt, change (3) learning in context; learning in different social and cultural contexts (4) individual differences in learning, multiple ways of learning.

**Institution fostering and directing the development.** The SLT develops an implementation plan for the initiative. Issues include

- clarifying, explicating GATE policy, action plan at the institutional level
- opportunities provided for the school to consolidate, review, plan ahead
- how individual teacher learning is fostered, how feedback is provided to staff

**Teaching the leaders of learning MLLOGE as instructional leaders.** How MLLOGEs are trained as leaders of professional learning to direct, facilitate and manage development in the PLTs.

**Improving teachers' knowledge of GATE.** The systematic professional learning / teaching program in which teachers learn more about GATE and map this into improved teaching procedures, identify options they have in their teaching for describing, analysing and solving problems.

**Professional teaching team approach** to manage the development in each level / faculty:

- processes of the team are negotiated, action plan is developed
- each member has responsibility for particular aspects of GATE, members working in PLTs plan and implement action research projects that examine teaching aspects of the learning interactions.
- procedures for monitoring progress, for collating new knowledge in the PLT are identified.

**Where are we now ?**

**Vision of preferred outcomes**, stated explicitly and shared by staff, PLT teams, SLT and community.

**Identification and audit of**

- existing knowledge of staff re gifted and talented learning and teaching
- resources available (eg, procedures for identifying learning profiles of GATSSs, staff, students' and parents' perceptions of needs, data available
- what staff, PLTs believe they need to improve teaching, what they need to learn. Staff review current GATE practice, perception of students' needs, the processes that need to be in place.

**Institutional plan for prioritising activities** (in terms of time, resources), plan for operationalising, implementing, monitoring and evaluating programme.

**4. How the professional learning will occur in a systematic and focused way for each tier.**

What is actually done to learn at each tier ? How can professional learning at each tier of the organisation or community be integrated with the model of professional learning based on knowledge enhancement ? What will staff at each level actually do to learn more about gifted education ?

Each of these aspects is examined below in terms of its implications for practice at the individual classroom level, the school leadership level and the professional learning team level. The following table identifies the outcomes for some of the key learning interactions<sup>2</sup>.

	SL level The SLT can	PLT level The PLT	Individual teacher The individual teachers
Goals the school has for fostering the learning of GATS, the place of GATS learning in the overall vision of the school's purpose	<p>Identify and generate a modified policy, redraft, revise current school policy</p> <p>Unpack vision, goals for GATS at a whole school level and models for the faculty and individual teacher levels.</p> <p>Map the revision into an explicit belief / value, for example, that all students can learn and that all teachers can teach</p> <p>Check that the revision is realistic for the school at that time and that it is aligned with the school community, decide the level of community congruity with the goals and community support available.</p> <p>identify the outcomes for the school when its pedagogy is better catering for GATSS and how its core teaching and learning will look different.</p> <p>Identify procedures school will it use to communicate the focus, goals to groups in the school, the community, including the GATSS, their peers and teachers and to foster a 'learning contract' with them.</p> <p>Identify activities that can be used to negotiate with and allocate parts of the vision to school members ?</p> <p>Identify how the school's 'code of teaching practice' may be modified to include the effective education of GATS .</p>	<p>Develop a faculty / PLT level policy and vision for GATE</p> <p>Unpack vision, goals for GATS at a team / faculty level and operationally the policy as explicit outcomes. What is the vision of the PLT re the change?</p> <p>Identify what it sees as its challenge for GATE, takes time to negotiate this with members, considers input from others</p> <p>Identify what does it see students and staff doing differently from what they are doing now and the role of each staff member in the vision.</p> <p>Describe how it will communicate the changes in focus, goals to students and teachers</p> <p>The MLLOGE develops activities that will be used to communicate the vision to the KLA, lead the PLT and members to that ownership of it is taken?</p>	<p>Identify the core expectations held for her/his teaching, the aspects of school policy re GATE that are not negotiable re school program, for example, that all students will have opportunity for optimal learn.</p> <p>Map the vision, goals for GATS into their code of pedagogic practice as a personal teaching goal.</p> <p>Describe the images they have of their classroom with the novel outcome in place, what they and students will be doing differently, the problems / issues may be targeted by the innovation.</p> <p>Explicate and reflect on their operational beliefs and attitudes to GATS learning</p>

<sup>2</sup> A version of this framework was the keynote presentation at the *Invitational Seminar for School Leaders* entitled *Leading in the provision of gifted education in C21*, part of *Fostering talent in C21 : The Melbourne Experience*, conducted in Melbourne, August 2003 .

<p>Identify the current level of school knowledge re the education of GATS</p>	<p>The leadership team</p> <p>Pool what it knows about fostering GATL at an institutional level. ? How sufficient is it ? What are the school's attitude to /confidence in learning?</p> <p>Assess / estimate the 'pedagogic capital' of the school and the pedagogic strength it needs to achieve its goals to cater for GATSS.</p> <p>Develop unity of purpose re teaching goals, goal congruence among staff with this improvement and for encouraging staff to engage in the change.</p> <p>Identify processes in the school that will support the change.</p> <p>Identify what the school know about how to manage, direct and monitor the change process</p> <p>Identify options for an effective learning +teaching program, evaluates and works through these.</p> <p>Estimate the intellectual / economic resources available to school.</p>	<p>The PLTs can</p> <p>Identify and collate what each PLT /faculty / level knows about GATS learning in its area, both conceptually, in experiences, procedurally and attitudinally. What are the PLT's attitude to and confidence in changing ?</p> <p>Identify what the PLT know about how to manage, direct and monitor the learning ?</p> <p>Identify unanswered questions it has about GATE and identifies possibilities for further development.</p> <p>Identify its professional development needs in GATE in its area.</p> <p>The MLLOGE develops activities to assist the PLT to collate what it knows about GATE</p>	<p>Each teacher can</p> <p>Identify, collate and pool what they know /believe / do about GATS learning in their teaching</p> <p>See their existing knowledge relevant and valued by the PLY</p> <p>Identify their needs in terms of teaching GATSS and confidence re the change.</p> <p>Explicate their attitude to GATE</p>
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<p>Develop an action plan for evaluating and enhancing the school's work in the area of GATE. The plan is integrated with the overall 'learning track' for the school</p>	<p>The SLT can</p> <p>Develop an action plan that shows what the school sees as steps to the goal and indicators or measures of staff learning and that operationalises the vision, is realistic and identifies procedures to</p> <ul style="list-style-type: none"> <li>• negotiate ownership by faculties and teachers and</li> <li>• implement indicators of growth to monitor the progress / success of the school's work in educating GATS.</li> </ul> <p>Identify the risks the school will take and risk management procedures.</p> <p>Estimate the support processes / infrastructure and physical resources needed to support the action plan and identify the current level of resources available (teaching, physical, community, ICT).</p> <p>Decide to target particular areas of knowledge / competence and decide to target these.</p>	<p>The PLT can</p> <p>Identify an explicit action plan for achieve the goal of enhanced provision of education for GATS. The plan shows the steps the PLT will take</p> <p>Identify how it will monitor and review progress and puts in place indicators of its growth, success or improvement and procedures for data collection.</p> <p>Develop the capacity to self evaluate.</p> <p>The MLLOGE plans actions to assist the PLT to develop and implement an action plan, to identify indicators of success. What processes will the leader recommend to monitor progress?</p>	<p>Each teacher can</p> <p>Develop an explicit personal action plan for teaching GATSs as part of their code of teaching practice. This includes identifying aspects of teaching to be modified and how they will</p> <ul style="list-style-type: none"> <li>• enhance teaching practice</li> <li>• use indicators to monitor growth / success.</li> </ul> <p>The plan is implemented and negotiated/ discussed/evaluated regularly.</p> <p>Explicate</p> <ul style="list-style-type: none"> <li>• how modified teaching will be implemented,</li> <li>• how the criteria for access to GAT teaching will be implemented,</li> <li>• the procedures for monitoring student growth,</li> <li>• assistance needed to implement GAT teaching efficiently</li> </ul>
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<p>Staff learn teaching procedures that are more effective with GATs.</p>	<p>The SLT can</p> <p>Resource the professional development program.</p> <p>Monitor the effectiveness of professional learning in each PLT</p> <p>Collate the findings of all PLTs and use them to modify the school's 'code of teaching practice'.</p> <p>Resource the training of 'leaders of GAT learning' in each faculty / level.</p> <p>Identify and use instructional leadership to foster thinking and dialogue about gifted learning and teaching at the whole school learning. The dialogue about teaching is positive and practical, focusing on improving teacher- learner interactions, clarifying explicit expectations re student learning and teaching, engaging in mentoring and coaching.</p> <p>The SLT evaluates the achievement of the goals during whole school learning, fine tune and negotiate new goals.</p>	<p>Each PLT can</p> <p>Discuss the teaching improvement plan for each member, the teaching procedures to be trialed. The PLT discusses how the procedures might be trialed, reasonable indicators to observe and may organize and implement coaching and demonstration support for each teacher.</p> <p>Implement an on-going dialogue about the topics to be taught in the near future by each teacher. Teachers bring their teaching plans to PLT meeting and the PLT suggests ways in which these can be improved.</p> <p>Collate the outcomes of the teaching trials for the PLT, identify improved teaching procedures and update its code of teaching practice.</p> <p>Develop a growing teaching and curriculum resource bank and encourage staff members to develop collegiate networks with peers working in other locations.</p> <p>Review and evaluate teaching provision for GATs at PLT level, negotiate new goals and modifies teaching linked with student indicators.</p> <p>MLLOGE operates as an 'instructional leader' of GAT learning and fosters dialogue about how to identify and to teach Gets in the subject area / year level, encourages discussion about ways of modifying teaching, and provides supportive feedback to colleagues. GAT learning and teaching are discussed regularly in weekly review meetings, staff meetings.</p>	<p>Each teacher can</p> <p>Engage in systematic professional development that</p> <ul style="list-style-type: none"> <li>• increases their understanding of GAT learning and its implications for teaching</li> <li>• increases their knowledge of teaching options available to them</li> <li>• encourages them to reflect on the options in their teaching</li> <li>• allows them to trial particular teaching procedures in their classrooms using action research procedures</li> <li>• involves them reporting the outcomes of their research to colleagues.</li> </ul> <p>Engage in regular dialogue about issues re GAT learning. This dialogue focuses on</p> <ul style="list-style-type: none"> <li>• what are 'do-able' teaching procedures and is presented in small chunks that are digestible and applicable by busy teachers.</li> <li>• how to interpret the learning of individual students in class.</li> </ul> <p>Monitors and reviews the innovative teaching procedures using indicators specified and finetunes or re-directs the teaching where necessary.</p>
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**5. What do classroom teachers need to know ?** Classroom teachers requires a knowledge of gifted learning and education that is contextualized in classroom practice so that they can make the most effective decisions and use the most appropriate teaching practice when it is required.

**5.1 Key areas of knowledge include:**

How GATS learn; their learning characteristics and how these are displayed in the classroom.	How to teach GATS, how to link gifted learning with effective teaching, the range of pedagogic options available and when to use each. <ul style="list-style-type: none"> <li>differentiate and elaborate teaching regular topics.</li> <li>allow the gifted learning processes to 'evolve',.</li> <li>'program' where necessary (for GATSS, helping students see the need to be 'programmed')</li> <li>how to assess the knowledge of GATSS</li> </ul>		
How to give feedback to GATS that avoids peer comparisons, targets what they know and that challenges further learning through open-ended questions.	<b>What classroom teachers need to know</b>		Programming and curriculum options such as when to use acceleration versus horizontal broadening.
How to advise and counsel parents of GATSS in terms of on-going classroom issues.	How to counsel these students; how to help them understand and use their exceptionality to advantage.	How to foster the social-emotional development of GATSS, help them <ul style="list-style-type: none"> <li>understand peer interactions and influences</li> <li>deal with concerns and worries about cultural issues</li> <li>learn in groups</li> <li>perceive consequences and implications.</li> </ul>	

This knowledge may differ in its depth and breadth from that of the MLLOGE in the early phases of the professional learning.

**5.2 How can we understand giftedness and talent ?**

**5.2.1 Questions to guide teachers' professional learning** include

- how does the knowledge of gifted students differ from that of other students ?
- how do gifted students differ from 'regular learners' in how they think and learn, their confidence in their ability to learn and think ?
- how do gifted learners differ from each other ? How does being gifted verbally and nonverbally lead to different knowledge outcomes ?

**5.2.2. Examples of models and theories** Classroom teachers benefit from an awareness of what contemporary theories of gifted learning and education may 'look like' in the classrooms. It is important that they are aware that gifted education practice can be underpinned by contemporary models and research. Useful models include

- Renzulli.
- Giftedness versus talented : Differentiated Model of Giftedness and Talent

**5.3 A framework for understanding how gifted and talented students learn.** I have used the learning framework to compile a teaching friendly model of what contemporary research says about how GATs learn<sup>3</sup>.

To learn a new idea most students	Gifted students
<p><b>need a challenge or reason to learn</b> : they</p> <ul style="list-style-type: none"> <li>• differ in their self-motivation to learn (intrinsic) vs motivated by others (extrinsic).</li> <li>• differ in their motives for learning; their purpose can be to               <ul style="list-style-type: none"> <li>• reproduce or memorise</li> <li>• 'take ideas apart' (deep motives).</li> <li>• learn ideas to satisfy external criteria, get good marks</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• learn well by having their knowledge challenged, by being able to frame up questions that they pursue.</li> <li>• are more likely to show intrinsic motivation to learn. They resist extrinsic motivational orientations.</li> <li>• are more likely to show deep motives for learning; to 'take ideas apart', question and extend them by linking with what they know. They often resist learning for superficial or achieving motives.</li> </ul>
<p><b>need to know where they will end up</b>, be assisted to 'see' the goals</p>	<ul style="list-style-type: none"> <li>• learn well by forming an impression of where they will end up, they are more able to set their own goals spontaneously.</li> </ul>
<p><b>make links with and use what they know re topic</b></p> <ul style="list-style-type: none"> <li>• they link the information with what they know about a topic in different ways : they               <ul style="list-style-type: none"> <li>• talk to themselves about it (linguistic);</li> <li>• think scientifically about the ideas.</li> <li>• make images or mental pictures of ideas</li> <li>• think of the key actions.</li> </ul> </li> <li>• differ in how fast and efficiently they learn</li> <li>• what they know about how to learn and to think.</li> <li>• use what they feel about themselves as learners of the ideas (self efficacy)</li> <li>• identify what they don't know about the topic</li> <li>• recode what they know to match the teaching</li> </ul>	<ul style="list-style-type: none"> <li>• wide general knowledge and an extreme knowledge in areas of interest, know things that other pupils don't.</li> <li>• have superior knowledge of a topic that is better differentiated and elaborated in one or more particular forms:               <ul style="list-style-type: none"> <li>• verbal, abstract form,</li> <li>• imagery, experiential form.</li> <li>• procedural form</li> <li>• scientific-mathematical form</li> <li>• musical form</li> </ul> </li> <li>• show early fluency and are expressive particularly in areas of interest and communicate ideas fluently</li> <li>• process information faster and efficiently, can hold more ideas in short term memory.</li> <li>• need to be allowed to manage and direct aspects of the learning.</li> <li>• may set unrealistically high self-standards and goals, are self-critical, judge themselves harshly and believe they will be less successful in learning particular topics.</li> <li>• are 'perfectionists', may worry about expectations that they should be 'perfect' and know they aren't. If they see their giftedness or creativity threatened, they lack the analytic strategies needed to deal with threats constructively and withdraw.</li> <li>• are curious, question topics they will learn enjoy discovering new idea and need the opportunity to explore new ideas.</li> <li>• need the opportunity to recode what they know to match the</li> </ul>

<sup>3</sup> This framework is taken from Munro, J. (2003). Gifted learning : A framework for effective teaching and curriculum differentiation. Melbourne : EdAssist.

	<p>teaching</p> <ul style="list-style-type: none"> <li>• have high sense of moral values</li> <li>• often have low self-esteem that restricts their academic learning.. Their self-talk is frequently more pessimistic than optimistic and they need to learn more optimistic scripts as options.</li> <li>• may be more anxious, often put stress on themselves and feel stress from others due to unrealistic expectations.</li> <li>• show a passion for learning; are 'self-driven' and motivated to 'want to know'. They learn spontaneously without direct teaching, have high levels of intrinsic motivation (feel frustration in learning situations in which they have less control over what, how and why they are learning.</li> </ul>
<p><b>need to see a pathway to the goal</b></p>	<ul style="list-style-type: none"> <li>• prefer to set their own pathway that they can follow to the goal .</li> </ul>
<p><b>learn new ideas in specific contexts</b> They</p> <ul style="list-style-type: none"> <li>• use a range of learning strategies: <ul style="list-style-type: none"> <li>• actions, imagery, familiar language;</li> <li>• recode imagery, action knowledge</li> <li>• answering questions</li> <li>• decide how a new idea is like what they know</li> <li>• change their minds, make and correct mistakes,</li> <li>• talk about the ideas in different ways ?</li> <li>• make a picture of the ideas, imagine them</li> </ul> </li> <li>• hold knowledge in short term memory or the thinking space.</li> <li>• use the information in different ways; <ul style="list-style-type: none"> <li>• some segment it into parts, work on each part; analytic sequential thinking.</li> <li>• some make rapid guess about main idea and check their guess; global wholistic thinking.</li> </ul> </li> <li>• manage and direct their learning ('metacognition') differently: some <ul style="list-style-type: none"> <li>• plan, monitor their progress and review how they have learnt themselves</li> <li>• look for direction from others</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• have a well-developed memory, particularly for the areas of interest, know how to use their knowledge better.</li> <li>• see connections between ideas quickly, learn new information and solve problems rapidly.</li> <li>• keep track of several ideas at once.</li> <li>• link ideas in lateral, creative ways. learn in idiosyncratic ways and often surprise us with the direction their thinking seems to have taken, give unexpected responses to questions ,</li> <li>• often not easily programmed externally, learn better when they can see the meaning base for the ideas rather than when the ideas are taught by rote, may have difficulty learning by rote, learning spelling, handwriting, recall of arithmetic.</li> <li>• ask questions spontaneously, ask complex questions and seek the opportunity to answer them for themselves</li> <li>• explore possible options, trial ideas, interpret ideas as problems,</li> <li>• use analogy, make comparisons well, look at ideas in different ways; for example, intuitively, in imagery or action ways.</li> <li>• maintain comparatively high levels of concentration and persistence on thinking tasks that interest them.</li> <li>• link and categorise ideas at a high level</li> <li>• look for and see cause-effect relationships or consequences rapidly, try to discover the how's and why's of their world. May see' consequences that peers don't, tend to worry, appear to be less self-confident, less sure of self..</li> <li>• often do not need much practise to learn new ideas, require fewer repetitions of an idea to learn it.</li> <li>• often do not get the appropriate corrective feedback</li> <li>• use short term memory better, link ideas at a higher level,</li> </ul>

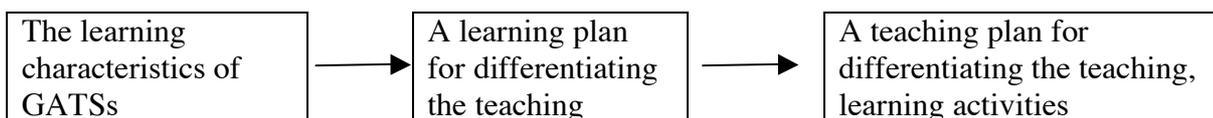
	<p>organize them better during thinking. Short term memory ability matches area of giftedness; math gifted learners have better number memory, artistically gifted have better visual.</p> <ul style="list-style-type: none"> <li>• use global wholistic thinking more than analytic sequential thinking, think in larger jump, skip steps in their thinking, ignore details in some areas.</li> <li>• show superior metacognitive knowledge, more able to monitor comprehension, learn independently, prefer to direct their own learning, may have difficulty in situations in which their learning is directed</li> <li>• use imagination, fantasy and humour at a high level, show 'intellectual playfulness'. may show carelessness in handwriting and similar routine tasks</li> <li>• pursue an idea or argument tenaciously, express opinions uninhibited, argue in a clear, logical and reasonable manner.</li> <li>• can concentrate for prolonged periods and show high levels of perseverance, not easily distracted from tasks of interest.</li> </ul>
<p><b>Deepen, abstract what they have learnt, link more broadly with what is known</b></p> <ul style="list-style-type: none"> <li>• link episodic, abstract and procedural aspects of idea</li> <li>• review, consolidate what was learnt</li> <li>• decontextualize, summarize, organize, main/subordinate ideas.</li> <li>• elaborate and extend ideas through questioning</li> <li>• look at ideas from different perspectives</li> </ul>	<ul style="list-style-type: none"> <li>• use more complex cognitive / thinking strategies than peers and more spontaneously. They often create strategies rather than use taught ways of thinking. They may have difficulty saying what they did to think their way through a task.</li> <li>• show better far transfer of strategies to situations quite different from those in which the strategy was first used or learnt, eg problem solving strategy,</li> <li>• show superior problem-solving strategies, are more flexible in shifting from one strategy to another for complex problems and transfer understanding from one problem to related problems more effectively</li> <li>• spontaneously link episodic, abstract and procedural aspects of idea and move between them more easily.</li> </ul>
<p><b>link positive emotion with new knowledge</b> if conditions are met:</p> <ul style="list-style-type: none"> <li>• interest level,</li> <li>• ideas seen to have value, be useful</li> <li>• they learnt the ideas successfully</li> </ul>	<p>invest positive emotion in the new knowledge if they managed and directed the learning. They are less likely to value knowledge they are forced to learn</p>
<p><b>store what they have learnt in memory,</b> practise remembering it</p>	<ul style="list-style-type: none"> <li>• store easily what they have learnt in meaning or semantic memory, particularly when topic interests them</li> <li>• have more difficulty storing information that has been repeated in rote memory.</li> </ul>
<p><b>identify how they learnt,</b> what they did that helped them to learn</p>	<p>often learn rapidly in idiosyncratic ways, rather than being programmed how to think and have difficulty saying the thinking they used. It is useful for them to reflect on how they learnt.</p> <p>may have difficulty saying how they thought through or solved</p>

	<p>problems, because</p> <ul style="list-style-type: none"> <li>• they are thinking faster than they can vocalize or</li> <li>• they don't believe they need to tell others how they think.</li> </ul>
<b>see themselves making progress</b>	<ul style="list-style-type: none"> <li>• They usually set their own indicators for making progress, particularly for topics that interest them.</li> <li>• They may frequently judge themselves harshly in terms of whether they have made the desired progress.</li> </ul>
<b>automatise what they have learnt</b> so it can be more easily used	Often automatise what they have learnt in meaning ways rather than through being taught rules. They often do not automatise ideas by rote.
<b>transfer and generalise the new knowledge</b>	show far transfer and generalise the new knowledge far beyond the context in which it was taught
<b>organise what they have learnt for assessment purposes</b>	often have difficulty showing what they know in assessment contexts because they prefer to show what they know about a topic rather than fit their knowledge within the assessment task parameters.

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#### 5.4 *How to use the learning framework for GAT learning to differentiate the teaching.*

It is generally acknowledged that the teaching for gifted students needs to be differentiated to take account of how they learn. Whether in acceleration or a lateral horizontal broadening program, teachers can differentiate the teaching using the learning characteristics of gifted students. The learning framework provides a learning plan and a teaching plan for differentiating topics to be taught.



To help teachers see what teaching GATs might look like, take a topic that will be taught and map each of the learning aspects into teaching procedures and student activities. The following example shows how we can differentiate the teaching to help students learn about how oil is formed<sup>4</sup>.

<sup>4</sup> This framework is taken from Munro, J. (2003). Gifted learning : A framework for effective teaching and curriculum differentiation. Melbourne : EdAssist.

<b>Gifted students</b>	<b>Instructional implications</b>
<p><b>need a challenge or reason for learning</b></p> <ul style="list-style-type: none"> <li>• learn well by having their knowledge challenged, by being able to frame up questions that they pursue.</li> <li>• are more likely to show intrinsic motivation to learn. They resist extrinsic motivational orientations.</li> <li>• 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.</li> <li>• may be more difficult to motivate to learn ideas in areas that don't interest them initially.</li> </ul>	<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><b>need to know where they will end up</b></p> <ul style="list-style-type: none"> <li>• learn well by forming an impression of where they will end up, see their goals</li> </ul>	<p>Have students say that they will be able to explain how small marine animals and plants formed oil</p>

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<p><b>make links with and use what they know re topic</b></p> <ul style="list-style-type: none"> <li>• 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"> <li>• verbal, abstract, 'semantic' form (verbally gifted)</li> <li>• imagery, experiential form (visual spatial gifted).</li> <li>• procedural form</li> <li>• scientific-mathematical form (math/scientifically gifted)</li> <li>• musical form</li> </ul> </li> <li>• process information faster and efficiently, show cognitive efficiency (e.g., memory span) (Saccuzzo, Johnson &amp; Guertin, 1994), show higher efficiency in elementary processes (Geary &amp; Brown, 1991) that determine more complex processes.</li> <li>• 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.</li> <li>• are curious, good at questioning a topic or the ideas they will learn about.</li> <li>• need to have the opportunity to recode what they know to match the teaching</li> <li>• often set unrealistically high standards and goals for themselves, self-evaluate and become self-critical..</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Give them more time to think through the ideas by themselves, to allow some ideas to stimulate other linked ideas in their minds.</li> <li>• Encourage their curiosity about the topic by asking a range of questions that might 'overwhelm' non-gifted peers. Have them identify what they don't know about the topic, unanswered questions they have, for example, <ul style="list-style-type: none"> <li>• Why was it only small animals and plants that decayed to make oil ?</li> <li>• Did different kinds of animals make oil of different quality ?</li> <li>• Did the sand and silt that accumulated in the water have to be of a particular type / have a particular density range ?</li> <li>• Did the water need to be in a certain temperature range ?</li> <li>• How long did it take for the animal matter to decay ?</li> <li>• Would there be oil forming in parts of the world now ?</li> </ul> </li> <li>• 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.</li> <li>• Help them deal with their often unrealistically high standards and goals for themselves. Let them see <ul style="list-style-type: none"> <li>• how making mistakes can help them learn more in the future</li> <li>• that judging themselves harshly doesn't lead to best outcomes</li> <li>• that they can deal with situations in which they believe their creativity is threatened</li> <li>• how they may be putting unnecessary stress on themselves and how they can deal with this.</li> </ul> </li> <li>• 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'.</li> </ul>
<p><b>need to see a pathway to the goal</b> 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><b>learn new ideas in specific contexts</b></p> <ul style="list-style-type: none"> <li>• know how to use their knowledge better.</li> <li>• learn in idiosyncratic ways, are not easily programmed externally and need to align what they know with the teaching.</li> <li>• ask questions spontaneously <i>How can I get from ...to .. ?</i></li> <li>• explore possible options, trial ideas, interpret ideas as problems to solve</li> <li>• use analogy, make comparisons well, think about ideas in different ways; for example, think intuitively, in imagery or action ways</li> <li>• link and categorise ideas at a high level</li> <li>• look for cause-effect or consequences</li> <li>• often do not need much practise to learn new ideas</li> <li>• often do not get the appropriate corrective feedback</li> <li>• recall better from short term memory and use higher level organizational strategies.</li> <li>• prefer to use global wholistic thinking more than analytic sequential thinking</li> <li>• show superior metacognitive knowledge, more able to monitor comprehension</li> </ul>	<p>Use teaching that encourages them to</p> <ul style="list-style-type: none"> <li>• say the questions they are pursuing at any time.</li> <li>• use a range of information sources about how oil was formed, suggest information sources that they could use and how they will locate information. Have them plan how they will collect different sources of information.</li> <li>• think about the story of oil in a range of ways: verbally, images, actions. They show the rich set of links they have of the history of oil. They ask complex questions re the topic and pursue answers for them, for example, <i>Do you get oil of different quality from different types of vegetation or animals ?</i></li> <li>• interpret ideas as problems to solve, explore possible options, possibilities, trial ideas, interpret ideas as problems to solve.</li> <li>• use both global 'big picture' and analytic 'bits' thinking. They use their flexible thinking and tolerate ambiguity and unanswered questions. They can <ul style="list-style-type: none"> <li>• begin to learn about oil in a 'big picture' way, think in larger jumps, skip steps, do fewer repetitions to learn an idea .</li> <li>• List questions they think the teaching might answer. Supplement bit by bit sequential teaching.</li> <li>• learn how to learn in more conventional ways, learn how to be structured or programmed by others in some contexts.</li> <li>• reflect on, keep track of how they learn.</li> </ul> </li> <li>• think and reason by using analogy, compare and categorise. Use cue questions if necessary to suggest possible analogies.</li> <li>• think in different ways about how animal and plant matter forms oil, for example, be intuitive, visualise the ideas, act them out to see the outcomes, make concrete or visual models of the ideas.</li> <li>• work at their own pace</li> <li>• look for cause-effect or consequences, practise,</li> <li>• manage and direct their learning, allow them to monitor their comprehension at any time and to take remedial action if necessary with less external intervention.</li> <li>• get corrective feedback that recognises the ideas they have in place and possible directions / options for working on next.</li> <li>• show what they know about ideas in a range of ways of. Many gifted students find it hard to show 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 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.</li> </ul>
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<p><b>deepen what they have learnt; abstract it</b></p> <ul style="list-style-type: none"> <li>link episodic, abstract procedural, cultural ... and scientific aspects of idea</li> <li>review, consolidate what was learnt</li> <li>decontextualize, summarize, organize, link with what is known, main/subordinate ideas.</li> <li>elaborate and extend ideas through questioning</li> <li>look at ideas from different perspectives</li> </ul>	<p>Use teaching that encourages the students to</p> <ul style="list-style-type: none"> <li>link ideas in lateral, creative ways, for example, to think intuitively, make unexpected responses to questions such as Why might you get oil of different quality from different types of vegetation or animals? They can link the type of hydrocarbon with the animals that lived in an area.</li> <li>use imagination, fantasy and humour at a high level, show 'intellectual playfulness'. Have them explore ideas in depth, debate or argue an issue.</li> <li>recode knowledge into other forms, eg., imagery to scientific knowledge and link, episodic, verbal, action aspects of idea at once, show new knowledge in language, icons, action sequences, symbols, for example, in poster, comic strip, concrete model, and get positive feedback for this.</li> <li>consolidate and review explicitly what they have learnt about how oil is formed, explore how far it can be transferred, applied, generalised.</li> <li>decontextualize, summarize, organize ideas into main/subordinate ideas,</li> <li>express, share what they have learnt in conventional ways.</li> </ul>
<p><b>invest positive emotion in the new knowledge</b></p> <p>are assisting by having them invest positive emotion in the new knowledge</p>	<p>Have the students discuss how</p> <ul style="list-style-type: none"> <li>the new ideas interest them, arouse their curiosity,</li> <li>the value of the new knowledge, how they could use it</li> <li>their ability allowed them to learn it at the level of complexity.</li> </ul>
<p><b>store what they have learnt in memory,</b></p> <p>store what they have learnt in memory when they are more interested in the ideas</p>	<p>Have the students say</p> <ul style="list-style-type: none"> <li>the new ideas they have learnt as concisely as possible</li> <li>how they have changed what they already knew</li> <li>how they might use the ideas in the future</li> </ul>
<p><b>identify how they learnt,</b></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>	<p>Have the students</p> <ul style="list-style-type: none"> <li>identify new self-talk, self scripts, eg., ways of thinking in historical ways, that they could use in other areas of knowledge. What are the types of questions historians ask? What are the types of knowledge historians pursue?</li> <li>keep a record how they learnt the topic, the thinking that worked for them. They can do this in a diary, say whether particular strategies such as visualising worked.</li> </ul>
<p><b>see themselves making progress</b></p>	<p>Have the students review their new knowledge, the questions they can now answer, the directions they can move in the future.</p>
<p><b>automatise what they have learnt</b></p> <ul style="list-style-type: none"> <li>many gifted students automatise what they have learnt in meaning ways rather than through being taught rules.</li> <li>they often do not automatise ideas by rote</li> </ul>	<p>Have the students</p> <ul style="list-style-type: none"> <li>review the links between ideas,</li> <li>compress the ideas into a few 'chunks' of knowledge</li> <li>practise recognizing them in unfamiliar contexts and information sources and recall them automatically.</li> </ul>
<p><b>transfer and generalise the new knowledge</b></p> <p>show far transfer and generalise the new knowledge far beyond the context in which it was taught</p>	<p>Have the students</p> <ul style="list-style-type: none"> <li>suggest the key questions their new knowledge answers,</li> <li>analyse the new knowledge from various perspectives, formulate and answer higher order Bloom-, de Bono type questions,</li> <li>engage in 'far transfer' of the ideas</li> <li>solve open ended problems, CPS activities.</li> </ul>
<p><b>organise what they have learnt for assessment purposes</b></p>	<p>Have the students decide how they will show / communicate their new knowledge in functional ways,</p>

**5.5 To take account of students being gifted in different ways** Students can be gifted in a range of knowledge areas. A framework or template to design activities that develop the idea you are teaching in each way is shown in the following, using the example of teaching the topic of evaporation<sup>5</sup>:

<i>Learn new idea in particular cultural, social or historical contexts</i>	<i>Link new ideas in scientific-mathematical ways</i>	<i>Link emotions/ feeling with new ideas</i>
How has evaporation been used in history ? (to obtain drinking water, for refrigeration) How is evaporation used in different cultures ? What problems does it cause ? How can communities control it?	What feelings would you have if you evaporated (light-headed) How might liquids that are evaporating feel ?  Would 'mass hysteria' be like an emotion evaporating ?	Is there the same amount of water in a room when a dish of water evaporates? How has it changed? - same amount, change of state What causes evaporation ? What matches evaporation for solids ? Why / when do things evaporate ?
Draw attention to the cultural, historical aspects of ideas	learn ideas in symbols, abstract, ideas, to think about them in a general way	the feelings attitudes linked with ideas
<b>EVAPORATION</b>		
<i>Link new ideas in words, in sentences, in more abstract ways</i>	<i>Link new ideas in particular contexts and in images</i>	<i>Learn the actions that go with the new ideas</i>
Brain-storm ideas -- concept map ---->network map Paraphrase, summarise text that explains evaporation. An evaporating liquid is interviewed. What would it say ? Ask 6 hard questions about evaporation. Write a story / play "Adventures of a liquid evaporating" When else would you use the word 'evaporate' Discuss situations involving evaporation, what happens.	Imagine, draw, collect situations in which evaporation occurs * water on a dish * clothes drying on a line * petrol on the body of a car * vapour rising from sea * dry ice foaming.  Visualise various liquids evaporating and describe what you see. Visualise some of the things that might slow a liquid evaporating. Draw a comic strip of petrol evaporating from body of a car Useful icons for evaporation ? Classify instances of evaporating. Make poster or snapshot of the ideas	Thinking about evaporating as an action. What things would affect how quickly a liquid evaporates ? Make an action model of evaporation (for example, corks flying out of a shaken jar). Small groups of students act out a gas evaporating. Is there a reverse action to evaporating ? Acting out a gas evaporating; rising up, stretching, spreading out. Once a gas has started to evaporate, what might allow it to travel further / faster ? Did the nanogenes in Dr Who act like a gas evaporating ? Which liquids would need more energy to evaporate ?
think about the ideas in words, paraphrase or summarise them, work on links between verbal concepts	Remind students to think about ideas in real-life contexts, visualise them	use actions to represent ideas, to imagine the ideas changing

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**5.6 Help students integrate what they know into a synthesised idea.** Gifted students often prefer to think in the areas in which they are gifted, because these areas of knowledge allow them to 'make sense' and learn more easily and rapidly. They need to be encouraged to link the new ideas from the various aspects they have learnt so that they can move easily between them. Part of this involves learning to switch between ways of understanding ideas, for example

<sup>5</sup> This framework is taken from Munro, J. (2003). Gifted learning : A framework for effective teaching and curriculum differentiation. Melbourne : EdAssist.

- Learning to talk about their rich visual imagery of a set of ideas
- Learning to put their rich verbal understanding into actions or to imagine them
- Learning to think about their action understanding in a scientific way.

A second aspect involves having the students link the various aspects into a synthesised understanding of the topic. For this you need to analyse the content you will teach, identify the key ideas, teach each aspect and then integrate them. You can use the types of questions shown to assist with this.

Example : topic on *Elections* students do activities to link the following aspects of each idea

	<i>idea 1</i>	<i>idea 2</i>	<i>idea 3</i>
episodes, experiences of each idea : <i>What experiences do you link with .... ? In which real life contexts does it arise ? What ideas occur with it ? When is it used ? What images / icons can I use to remind me of it ?</i>	<ul style="list-style-type: none"> <li>• read Letters to Editor</li> <li>• collect policy pamphlet</li> </ul>	<ul style="list-style-type: none"> <li>• see candidate on TV</li> </ul>	those who can vote <ul style="list-style-type: none"> <li>• in Council election</li> <li>• for class captain</li> </ul>
Verbal understanding of the ideas : <i>How can you link the ideas in language .... ? In debates, verbal categories, with more general / specific ideas, explanations, verbal logic.</i>	<ul style="list-style-type: none"> <li>• campaign platform = opportunity to present policy</li> </ul>	<ul style="list-style-type: none"> <li>• candidate</li> </ul>	Voters
The actions, procedures linked with the idea <i>What would you do when you are .....? What actions go with the set of ideas ? Convert new ideas to procedures and action sequences.</i>	<ul style="list-style-type: none"> <li>• debate, argue</li> <li>• say opinions, promises</li> <li>• actions intended in policy</li> </ul>	<ul style="list-style-type: none"> <li>• stand for election</li> <li>• agree to represent; do what the electors want</li> </ul>	<ul style="list-style-type: none"> <li>• draw map of electorate</li> <li>• collect names of voters</li> </ul>
emotional aspects of each idea <i>What feelings are linked with the ideas ?</i>	<ul style="list-style-type: none"> <li>• open-minded</li> <li>• truth, excitement, doubt,</li> </ul>	<ul style="list-style-type: none"> <li>• anticipate</li> <li>• inspire</li> </ul>	<ul style="list-style-type: none"> <li>• hope</li> <li>• Acceptance /doubt</li> </ul>
Contextual, cultural aspects of the idea. <i>How does idea develop in different cultures, at different times in history, at different times in the future ?</i>	<ul style="list-style-type: none"> <li>• How the opportunity to present political point of view varies with culture and in history</li> <li>• Political web page</li> </ul>	<ul style="list-style-type: none"> <li>• being a candidate varies between cultures. Who has access to it ?</li> <li>• Future candidates in democracies ?</li> </ul>	
Logical –scientific aspects of the idea <i>What objective / observable characteristics are linked with .... ? What are more general / specific features are linked with... ?</i>	<ul style="list-style-type: none"> <li>• Objective and testable features of campaign platform</li> </ul>		

### 5.7 *Teachers have tools to review the extent to which their teaching caters for GATs.*

Review the extent to which your teaching encourages students to learn in the following ways<sup>6</sup>.

How often would you	Not at all	Some- times	Al ways
introduce ideas as real-life problems that students solve	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ask students to suggest questions the teaching might answer?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have students guess particular outcomes and then check them ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
use novelty ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
use open-ended tasks in which the students frame up questions and an action plan ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
use fantasy and imagination to develop ideas ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have students pursue spontaneously their own interests in maths ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have learners see where they are on their 'journey' through a topic ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
provide them with a programme of topics ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
help them see their learning pathway is predictable from what they know ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have learners describe / draw parts of their 'journey through a topic ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ask students to draw / talk about what they know about the topic ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
remind students to link the new idea with what they know ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ask students to brainstorm topic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ask students to collect everyday information about the topic ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have students ask questions about the topic?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
use co-operative sharing activities in which they share and pool their thoughts about the topic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have students recode imagery/ action knowledge into a verbal form ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
use activities to automatise students' prerequisite knowledge ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
respond emotionally to what they know about the topic ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
say what they will do to learn the ideas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
see that what they already know is useful and relevant ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
act out the ideas they are learning ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
visualise the new ideas by teaching them to use icons and form mental pictures for the ideas ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
learn mental actions to match the physical actions ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
talk about their changing knowledge of a topic ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
learn positive attitudes to the ideas they are learning ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
integrate contextual, abstract, procedural and emotional aspects of ideas they are learning ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
look at the new ideas from various angles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
put their knowledge of a topic into categories ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
manipulate the conventional symbolism describing / talking about the new ideas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
remind students to think about the ideas they are learning, reflect both on what they have learnt and how might the ideas be used in the future ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
teach them to talk about the thinking they use while doing a topic ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have students assemble and add to their list of useful learning strategies ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
teach them how to plan their way through tasks ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
teach them to see possible 'danger areas, dead-ends in tasks ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
at the end of a lesson review and say what they have learnt ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
tick off where they are now on their journey through maths ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
respond emotionally to the ideas they learn, discuss their feelings ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
see the usefulness or value of the ideas ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
value themselves as learners, see that it was what they did ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
comment on how they are feeling while learning a topic ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
see that curiosity and a positive attitudes to enquiry is valued ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
attribute their success functionally ' ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
see themselves as masters of the topic they are learning ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
draw pictures to remind themselves of ideas they have learnt ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
say what do the ideas remind them of ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
think of things that can help them remember the idea ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
speed up recalling the ideas and using them ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<sup>6</sup> This framework is taken from Munro, J. (2003). Gifted learning : A framework for effective teaching and curriculum differentiation. Melbourne : EdAssist.

**5.8 Tools to assist teachers to produce an enquiry that GAT s may pursue for a topic they will teach** One approach to differentiating the teaching for GATS is to allows these students to learn a topic we are teaching at a more complex level than their regular peers in more self directed ways. For this, we need to develop an enquiry that these students can pursue. Guidelines that teachers can use to generate an enquiry are as follows<sup>7</sup>:

Guideline for differentiating the topic for GATS	Application to the space concept	Application to Romeo and Juliet
Analyse the topic that the regular students will be required to learn	The topic aims to help students to learn the properties of right-angled and equilateral triangles.	The topic aims to teach students an example of the genre of a play
Identify more complex versions of the topic, that aim to have students make far transfer, for example <ul style="list-style-type: none"> <li>• Question concepts that underpin topic.</li> <li>• Imagine / apply the ideas in different situations, at future times (will they might be used / modified in the future/ other contexts ?)</li> </ul>	Analyse and talk about the properties of clusters of right-angled and equilateral triangles.	Analyse and talk about the play in terms of its structure and genre
Frame up questions that relate to these ideas. Select questions that link back the understanding of the class.  To generate challenge tasks, bring together the key ideas they need to learn. Develop activities that encourage GATS to <ul style="list-style-type: none"> <li>• be intrinsically motivated to learn.</li> <li>• 'take ideas apart', question and extend what they know by thinking about possibilities.</li> </ul>	The GATs think about the perimeter, angle properties and area of the clusters of triangles. I won't teach these properties directly but guide the students to research them and to synthesise their understanding.	The GATs will analyse Romeo and Juliet to examine whether there is evidence it has been written by more than one author.
Estimate / clarify what students may already know about the topic. To see how much of the content you will teach to the class as a whole is known by the GATs, you may need to use a set of tasks.	Recognise triangles, discriminate them from other shapes.	Students draw network maps of what they know about Romeo and Juliet before beginning to teach.
Develop the idea initially in particular contexts by unpacking the topic. Set up activities so that students can research, analyse and evaluate each idea and link with what they know. Work out activities that allow GATS to think <ul style="list-style-type: none"> <li>• creatively, intuit, think in possibilities, speculate, predict</li> <li>• critically, to evaluate new ideas in terms of what they already know</li> <li>• logically, to use their existing knowledge of the topic</li> </ul>	Analyse and describe isosceles right angled triangles, first clusters of 2 triangles, clusters of 3 triangles and then , clusters of 4 triangles. Link the area of clusters of triangles with areas of squares, rectangles. Look for examples of polyabolos in real world situations such as architecture, artwork, ornaments and jewellery, symbols. Why are they used in each type of situation ?	What are the key features of a play ? What are the factors involved in constructing and interpreting plays ?  How do authors 'come through' in a play ? Examine the proposition that a text represents the attitudes and intentions of an author and uses particular linguistic structures and features.  What you would expect to

<sup>7 7</sup> This framework is taken from Munro, J. (2003). Gifted learning : A framework for effective teaching and curriculum differentiation. Melbourne : EdAssist.

<ul style="list-style-type: none"> <li>by problem solving, to decide how they might trial a set of ideas, reflect on their trialing, gather data</li> <li>in terms of their purpose, unanswered questions</li> <li>by generalising, transferring, synthesizing.</li> </ul>		observe in a play what was the work of more than one author ? On what criteria or indicators might texts written by different authors on a a theme differ, for example, the use of conventions such as imagery, stereotyping, symbolism, how they detail their thoughts, feelings, opinions, ideas.																																	
Synthesise their new understanding. Use activities in which students <ul style="list-style-type: none"> <li>identify and talk about shared patterns,</li> <li>generalise, look for rules and why they work</li> <li>synthesise, draw together aspects of the new ideas into a 'big picture'.</li> <li>draw together the principles into a body of knowledge.</li> </ul>	Predict and compare the size of the squares and rectangles that can be made from pentabolos, tetrabolos and triabolos.  Solve word problems. Compare patterns with other triangle clusters.	Evidence for differences in the play in the expression of complex attitudes, themes and issues and for multiple writers ?																																	
Throughout the sequence use tasks that <ul style="list-style-type: none"> <li>balance convergent and divergent thinking.</li> <li>are unusual and lead to unexpected outcomes</li> <li>Allow intrinsically motivated activity</li> <li>allow high task commitment</li> <li>draw in various aspects of topic knowledge</li> </ul>	<table border="1"> <thead> <tr> <th>To what extent do the tasks allow</th> <th>little</th> <th>Some</th> <th>A lot</th> </tr> </thead> <tbody> <tr> <td>convergent and divergent thinking ?</td> <td></td> <td></td> <td></td> </tr> <tr> <td>unexpected outcomes ?</td> <td></td> <td></td> <td></td> </tr> <tr> <td>intrinsically motivated activity</td> <td></td> <td></td> <td></td> </tr> <tr> <td>high task commitment</td> <td></td> <td></td> <td></td> </tr> <tr> <td>a high level of student initiative</td> <td></td> <td></td> <td></td> </tr> <tr> <td>various areas of maths knowledge</td> <td></td> <td></td> <td></td> </tr> <tr> <td>creative / intuitive/ divergent thinking?</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			To what extent do the tasks allow	little	Some	A lot	convergent and divergent thinking ?				unexpected outcomes ?				intrinsically motivated activity				high task commitment				a high level of student initiative				various areas of maths knowledge				creative / intuitive/ divergent thinking?			
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Describe what you want as a content outcome for the GLIM: for the GLIM to know about the side, area and angle properties of sets of triangles, to transform mentally sets of triangles and to synthesise the sets of triangles into other geometric shapes.

Content	how the students will think about the ideas ?	Research skills and resources ?	How students will show what they have learnt
Patterns, trends in the side, area and angle properties of sets of triangles and how these link with other geometric shapes	Plan, trial, analyse, evaluate, compare, mentally rotate and translate shapes, synthesise	Internet Sets of triangles	GLIM show what they have learnt about polyabolos and polyequilats in a poster, a power point presentation, a set of games they teach their peers.
The key linguistic structures and features of a play and how authors use these to communicate attitudes and intentions.	Analyse and evaluate the play in terms of its structure and genre and synthesise a response that indicates whether there is evidence R & J has been written by more than one author.		GATSs decide how they will display their response, for example, in an investigative report (written, power point presentation), in a play that highlights the changes or in a visual form.

## 5.9 *Fostering a learning climate for teaching gifted and talented learners*

Teachers need to be aware of the characteristics of a learning climate in classrooms most likely to foster the learning of GATs. Some key aspects of this are shown in the following table<sup>8</sup>. Teachers can use these items to evaluate their current climate and identify areas in which they might improve it.

Encourage students to learn spontaneously.	Help them learn to deal with boredom. Where this arises, <ul style="list-style-type: none"> <li>• help them see open-ended aspects of the ideas</li> <li>• encourage them to teach you about the ideas</li> <li>• try to make up games involving the ideas.</li> </ul>
Provide opportunity for the self-driven learning	<ul style="list-style-type: none"> <li>• foster interest in problem solving contexts such as conservation, population change, climate change, waste disposal</li> <li>• encourage student selection of learning materials</li> <li>• encourage students to both produce and consume of new ideas</li> <li>• encourage communication with similar-minded students</li> </ul>
Increase awareness of the range of available resources	<ul style="list-style-type: none"> <li>• Internet, data bases, computer, library</li> <li>• teach them how to access sources in community, for example, business, interest groups (for example, historical societies), specialist scientific institutions (zoo, museum, marine societies), cultural institutions (National Gallery)</li> </ul>
Foster students' interest in others who were / are gifted	These students may not find suitable role-models in the peer group. Help them <ul style="list-style-type: none"> <li>• see they are not alone</li> <li>• see options, how others dealt with the types of problems they face.</li> </ul> Biographies of gifted scientists, writers, artists can provide support.
Encourage learning outside of school, work with similar thinking peers who can be models	Examples <ul style="list-style-type: none"> <li>• debating</li> <li>• drama groups, dance, ballet</li> <li>• sporting groups</li> <li>• pen pals, Internet pal</li> </ul>
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. They may have difficulty resolving inner conflicts, unsure of themselves.
Help students understand their giftedness	They may not value their exceptional abilities, know how to show what they know so that it fits with peer expectations and feel different and alienated because they don't get the necessary positive affirmation but not understand why. They need to know that <ul style="list-style-type: none"> <li>• not all students learn in the same way, although some people might think they should</li> <li>• they may be strong in some areas but not in others</li> <li>• some peers may not understand what they say or know</li> </ul>

<sup>8</sup> This framework is taken from Munro, J. (2003). *Gifted learning : A framework for effective teaching and curriculum differentiation*. Melbourne : EdAssist.

<p>Help them improve their peer group social interaction skills</p>	<p>They may have difficulty identifying with a peer group, feel they have less in common with peers, (their peers may not comprehend their ideas and they feel that there is something wrong with them) and have difficulty communicating with same-age peers because of interest difficulties, while older children find them emotionally immature.</p> <p>They seem 'the odd one out', experience loneliness and isolation and not feel part of any group. They are often sensitive to rejection by others and over-conform in the peer-group so that they do not appear different. They may</p> <ul style="list-style-type: none"> <li>• want to dominate peer groups and group interactions and to direct group activities</li> <li>• be less carefree and easy-going as class peers but instead are more serious.</li> <li>• have difficulty understanding and valuing the learning of others, be irritated by class peers who do not understand the ideas at the same depth.</li> <li>• lack confidence in peer interactions, have difficulty trusting others</li> <li>• feel for others and events in the world, worry about children who they see being unfairly treated, take on the problems of others and world problems as personally affecting them, they have a heightened awareness of moral values,</li> </ul> <p>You can help them</p> <ul style="list-style-type: none"> <li>• see what they do have in common with peers</li> <li>• learn more effectively in peer group, set up situations in which they engage in group problem-solving and sharing activities</li> <li>• learn the skills necessary for joining in peer group activities</li> <li>• understand that not all children think in the same way</li> <li>• learn how to show peers what they know in acceptable ways.</li> </ul>
<p>Help them extend and integrate their knowledge</p>	<ul style="list-style-type: none"> <li>• teach students different types of questions to ask about set topics</li> <li>• help them learn ways of researching topics of interest, for example,</li> <li>• encourage them to investigate real problems in everyday life</li> <li>• encourage them to see tasks as open-ended challenges</li> <li>• provide suitable role-models for learning; mentors, Night of Notables.</li> </ul>
<p>Gifted students manage their learning effectively.</p>	<p>Help them use their independence as learners in functional ways. Present ideas as challenges or problems. Students generate their directions for pursuing them. The teaching can</p> <ul style="list-style-type: none"> <li>• give learners increased opportunity to make decisions about what and how they will learn and how they will manage the learning</li> <li>• allow to learn independently and to direct their learning, to have time to operate independently</li> <li>• teach students to improve how they learn,</li> </ul> <p>Encourage them to say how they went about thinking and learning.</p>
<p>These students often show uneven rates of development.</p>	<p>They show an 'asynchrony' in development so that they may</p> <ul style="list-style-type: none"> <li>• present as emotionally or physically immature.</li> <li>• show specific learning disabilities in particular areas, for example rote learning, spelling, handwriting, rote recall of arithmetic information.</li> </ul>

## 6. How the professional learning will be implemented

***The content to be learnt was organised into 'digestible' units*** The SLT needs to ensure that the content to be learnt is 'un-packed and 'broken into 'digestible steps' so that staff can learn the outcomes necessary for genuine improvement. The SLT needs to develop a content plan that recognizes the complexity of the knowledge and shows how the knowledge will be learnt gradually.

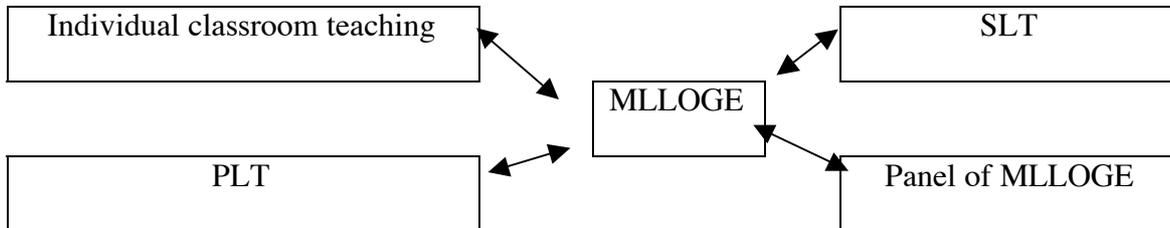
***How the community will learn*** The SLT also needs to recognise the need for a teaching plan by which staff would have time to explore and implement aspects of the learning interactions model in their teaching and for each PLT to consolidate its knowledge about 'best practice pedagogy'.

The procedures that could be used to facilitate staff learning include:

staff identify goals for learning	<ul style="list-style-type: none"> <li>• identify current problems in teaching as a need for change</li> <li>• identify goals for learning</li> </ul>
explicate current knowledge	<ul style="list-style-type: none"> <li>• collate what they know about how GATs learn, explicate and reflect on their beliefs and theories about how these students learn and should be taught,</li> <li>• identify what they don't know but would like to know about learning</li> <li>• reflect on the conditions under which they could be most successful</li> </ul>
become aware of new ideas as options, possibilities	<ul style="list-style-type: none"> <li>• become aware of how GATs learn and how these learning characteristics are displayed in classrooms</li> <li>• see these ways of learning mapped into teaching procedures</li> </ul>
contextualise the new ideas	<ul style="list-style-type: none"> <li>• contextualise aspects of the teaching procedures in their own teaching practice, for example, what would they be do and what their students would be doing if they differentiated a topic to be taught in the next few weeks to accommodate GATs</li> <li>• evaluate their teaching and see options they have for fine-tuning how they teach.</li> </ul>
see teaching procedures modelled in their classes	<ul style="list-style-type: none"> <li>• observe possible novel teaching practice demonstrated in their teaching,</li> <li>• are coached to implement the procedures that will assist GATs.</li> <li>• in PLTs apply the teaching approach to topics they will teach in the next few weeks</li> </ul>
trial new teaching procedures in action research	<ul style="list-style-type: none"> <li>• identify areas in which they could improve / fine-tune their teaching</li> <li>• in PLTs develop an action research learning plan for trialing and evaluating novel teaching procedures in their classrooms and</li> <li>• trial and evaluate novel the teaching procedures in their classrooms.</li> </ul>
evaluate, collate the outcomes	<ul style="list-style-type: none"> <li>• report the outcomes of their trial to their PLT and to the school</li> </ul>
up-date their teaching	<ul style="list-style-type: none"> <li>• fine-tune their teaching to accommodate changes in approach to learning.</li> <li>• how it can become part of regular teaching practice - code of teaching that characterises the school's core approach to pedagogy.</li> </ul>

### *Preparing the middle level leaders of gifted education*

The MLLOGEs need to be provided with systematic professional development that enables them to lead, foster and guide the professional learning of PLTs and individual teachers and to link with the school leadership team and the direction of professional learning in the school. They work at the interface between the SLT and individual classroom activity.



The MLLOGEs guide the PLT to plan how it will learn, to monitor its learning progress, change direction if necessary, use learning actions selectively, review and consolidate the new knowledge.

The areas of knowledge MLLOGEs need to lead the professional learning of colleagues include:

- an in-depth understanding of GAT learning and how this maps into teaching.
- an understanding of adult professional learning, and skills in fostering it, including
  - the conditions necessary for this, procedures to foster PLTs in a community,
  - how to implement effective professional dialogue about GATE, , for example, ways of analysing specific problems, advising and guiding colleagues to select and use particular curriculum programs
  - leading and implementing group learning enhancement action plan,
  - coaching and mentoring for improved teaching for individual staff members and groups, lead action research of teaching procedures.
  - fostering positive attitudes to GATE, goal congruence and goal direction that focuses on GAT learning and a sharing and negotiation of group knowledge about it.
- a knowledge of effective pedagogy for GAT students and how teachers can map their skills, conceptual knowledge and attitudes into pedagogy. Skills in analysing content area teaching in terms of its learning demands for GATs, how to unpack topics and recommend differentiation.
- A knowledge of the school as a learning organisation and the relationship of professional learning to the work of the school and the work of individual teachers, guiding and coaching the SLT re its focus on enhanced provision of GATE.
- an understanding of how to use resources.
- an understanding of the influence of context on learning,

The MLLsL needed specific training to acquire these areas of knowledge. They needed to be trained in various capacities for this role (coaching, leading learning teams,

## **Conclusion**

There are many aspects of raising standards for all students through the gifted and talented agenda. It is obviously an extremely complex topic. My area of knowledge relates to that of professional knowledge and learning. I believe that one aspect of raising the standards for all through the Gifted and Talented agenda is to focus on relevant school level pedagogic knowledge.

What I have attempted to do in this paper is to identify some ways in which the professional knowledge within a school community can be enhanced so that the quality of provision of GATE can be improved by an understanding of how GATs learn. I began with the questions What does the school know about how to facilitate the learning of GATs? What is its pedagogic capital in this area? I have attempted to provide some options for schools as they pursue these questions. It is based on my firm conviction that one of the greatest powers in quality education is teacher and school professional knowledge.

I would like to thank the Kent Leadership and Innovation Centre for involving me in its important work in this area and to wish you all the highest levels of success in your work in catering for the learning needs of gifted and talents students.