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Making connections

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Making connections: cognition, emotion and a shifting paradigm

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A paradigm shift in progress: from mystery to mastery

Over the past few decades, there has been a change in prevailing definitions and understandings of intelligence, in the ways that giftedness is identified and in the programming that is recommended for exceptionally capable learners. After a brief description of the historical and conceptual underpinnings of this paradigm shift, we discuss here its practical consequences, including connections to current psychological research on mindsets, and to teaching that promotes both intellectual and emotional learning. Throughout, our focus is on what this means for understanding and supporting high-level development in diverse kinds of learners.

The observed shift is grounded in current findings about human development, neural plasticity, psychometrics and the complex interacting processes that underlie exceptional intellectual ability and achievement (Dai and Renzulli in press; Geake this volume; Horowitz 1987; Lohman 2005; Worrell in press). Increasingly, accepted practice in education and psychology is moving away from a categorisation of some children as gifted (with all others implicitly assigned to the not gifted category), and toward a focus on individual differences in developmental trajectories, recognising that pathways to high-level achievement are diverse, domain-specific, and incremental (Bransford et al. 2000; Dweck 2006; Keating in press).

For purposes of discussion, we have called the traditional categorical perspective a mystery model of giftedness, and the emerging developmental perspective a mastery model (Matthews and Foster 2006). While we acknowledge the mysterious complexity of human development, we use the term mystery model to describe the now-outdated idea that gifted children are special, superior to others in an innate, categorical, and global way. We have observed how confusingly mysterious (or problematically elevating) this is to children who are identified as gifted, and to their parents and teachers. We also recognise the dynamic nature of the development of expertise, and use the term mastery to describe the ongoing process that leads to gifted-level learning, rather than the static end-state that the term sometimes signifies.

Gifted education is frequently criticised for exacerbating social, economic and racial disparities. When it is conceptualised as providing a dynamically responsive curriculum match for
educationally advanced students, however, not only are the results better targeted at students’ actual learning needs, but there are also fewer problems with concerns of equity and social justice (Matthews and Kitchen in press). That is, when educators employ a special education approach, and provide a wide range of learning options to address individual students’ diverse gifted learning needs, the resulting programmes are more consistent with emerging knowledge of child and adolescent development, and they are better able simultaneously to foster both excellence and equity in a diverse society (Lohman 2005; Worrell in press).

The mastery model is aligned in many ways with the talent development literature (Subotnik and Jarvin 2005; Tannenbaum 2003), and is leading to a simple, practical, education-based definition of giftedness: ‘Giftedness is exceptionally advanced subject-specific ability at a particular point in time such that a student’s learning needs cannot be well met without significant adaptations to the curriculum’ (Matthews and Foster 2005, p. 26).

One of the important points of difference between the categorical/mystery model of giftedness and the emergent developmental/mastery model is the relative emphasis on either innate genetic causality or environmental dimensions interacting over time. Most psychology and education professionals today concede the interactive contributions of both nature and nurture, but are increasingly interested in the developmental nature of intelligence, its dependence on a child’s opportunities to learn and the importance of the goodness of fit with the environment. This can be contrasted with the historic emphasis on giftedness as genetic superiority that might be measured at birth if only we had the right psychometric instrument.

Another point of difference concerns duration. From a mystery model perspective, giftedness denotes an intellectual superiority across the lifespan, sometimes expressed, ‘Once gifted, always gifted’. Increasingly, however, educators are recognising the tremendous variability in individual developmental trajectories, and are conceptualising giftedness as a current need for educational modifications, subject to change over time.

Domain-specificity is a key component of a developmental or mastery approach. Intelligence used to be considered a global attribute of a person, so that one might say about a given child, ‘He is gifted’, and mean that he is exceptionally capable in every intellectual endeavour. As we learn more about human development, however, we realise that it makes better sense to identify cognitive exceptionality in particular domains, saying for example, ‘She is mathematically gifted’. Or musically gifted, or linguistically, etc.

With the mystery model, the sooner giftedness is identified the better, and intelligence tests are the gold standard for measuring its presence and extent. From a mastery perspective, however – where giftedness is defined less categorically and more developmentally – looking to provide an appropriate educational fit is an ongoing process, flexibly responsive to changing circumstances and developmental needs, and a natural part of a child’s education. Intelligence tests can certainly be useful, particularly where a child has had problems with access to academic learning, but are used sparingly, as a supplement to a combination of dynamic classroom assessments and high-ceiling tests of academic reasoning.

The models differ also in the educational placement implications once a child has been identified as gifted. With the mystery model, the first choice is usually a full-time, segregated classroom where a gifted child is educated with categorically similar children. Mastery model theorists, on the other hand, advocate a broad range of learning options, including many kinds of acceleration, extracurricular and enrichment opportunities, online learning, and full-time, gifted classes, as appropriate to the child’s learning needs at a given point in time.

Because of the mastery model’s flexible responsivity to individual differences, and fluid connections with general education, it takes into account racial, economic, gender and cultural diversity, and is more equitable than the mystery model, while being equally conducive to
excellence. When gifted learning options are (and are seen to be) flexibly targeted to special learning needs, giftedness can be found in every school in every district, regardless of socio-economic status, race, language, or culture. For obvious reasons, this goes a long way toward addressing the longstanding political and funding problems of the field.

A final point of contrast between the two models is that of programme evaluation. When we use intelligence or creativity tests to identify giftedness, we do not have any increased understanding of the specific learning needs that distinguish identified-gifted students from others. This makes it difficult to make sound programming decisions, and even more difficult to evaluate success. Are we perhaps looking for gains in IQ or creativity test scores? Mastery model programming, on the other hand, because it is based on identifying students’ current needs for special gifted education, can be evaluated by discerning whether a given child is actually learning, and at what rate. This can be assessed using domain-specific measures of academic achievement, including portfolio assessment, standardised tests, grade-normed tests and other measures, depending on a number of factors, including the student’s developmental stage, interests and domain of learning (Lohman 2005).

By conceptualising gifted education as an educational match for students who otherwise experience a mismatch with the curriculum normally provided, the mastery model represents a changing mindset which not only better addresses the learning needs of students who demonstrate exceptionally advanced ability under traditional approaches, but also encourages high-level learning in those whose exceptionality might not otherwise be identified.

The role of mindsets in understanding giftedness

Carol Dweck (2006, this volume) distinguishes between two different perspectives on one’s own ability that she calls a fixed mindset and a growth mindset. Interestingly for those engaged in gifted development, these overlap closely with the mystery and mastery models of giftedness (see Table 1). From the vantage point of a fixed mindset, as with a mystery model, ability is seen as innate and permanent: some people are intelligent and some are less so. From a growth mindset, as with the mastery model, ability is seen as growing incrementally over time with appropriate opportunities to learn: intelligence develops. The outcome differences between these two mindsets are strikingly large and persistent across age, sex, culture, ability level and socioeconomic status. Results in repeated studies in a number of lines of research show that those who hold the growth mindset in a particular area of their lives are happier, healthier, more fulfilled and more successful in those areas, whether it is school, work, sports, business, love, friendships or family relationships.

Dweck’s concept of growth versus fixed mindsets may come to represent the tipping point in the shift from mystery to mastery. Our conceptualisations of intelligence and giftedness are foundational to gifted education. These shift dramatically when we move from a fixed mindset, where some students are categorised as inherently smart and some are not, to a growth mindset, where intelligence is seen as dynamic, as developing over time with appropriately scaffolded opportunities to learn. Looked at from this perspective, teachers who encourage their students’ continued engagement in the learning process are fostering gifted development, quite independently of where their students may score on ability or intelligence tests: ‘The great teachers believe in the growth of the intellect and talent, and they are fascinated with the process of learning’ (Dweck 2006, p. 188).

From a fixed mindset, as with a mystery model of giftedness, some people are inherently smart, and some are not, and there are ways accurately and reliably to measure this. From a
growth mindset (or mastery model), on the other hand, intelligence develops over time with appropriately scaffolded opportunities to learn. There are many fewer limits on who might or might not be gifted, and many opportunities along a given developmental trajectory to become gifted; intelligence is a moving target that cannot be measured with much expectation of reliability over time. This is consistent with current findings on neural plasticity (Nelson 1999) and gifted development (Gottfried et al. in press). It is also an important perspective for whose who are concerned about minority under-representation and giftedness (Graham, in press; Warwick and Matthews this volume; Worrell in press).

Referring to Ellen Winner’s work with child prodigies (Winner 1996), Dweck addresses the topic of extreme giftedness. She concludes that there is a prevalent misconception that such exceptionality is innate, and that the emphasis ought to shift from what might be genetically endowed to the essential temperamental and motivation dimensions that are connected to mindsets: ‘Most often people believe that the “gift” is the ability itself. Yet what feeds it is that constant, endless curiosity and challenge seeking’ (Dweck 2006, p. 63).

Another recommendation emerging from Mindset for our work in supporting high-level development is that rather than praising children for innate and permanent attributes, we should instead praise them for their growth-oriented processes, for what they accomplish through practice, study, persistence and good strategies. Even better than praise is to ask them about their work in ways that appreciate their effort and choices. Many parents and educators are surprised to learn that, ‘Praising children’s intelligence harms their motivation and it harms their performance’ (Dweck 2006, p. 170).

When asked if there any recognisable signs of giftedness, many people identify speed of thinking or learning: ‘Gifted kids are fast thinkers’ or ‘They learn really quickly’. According to Dweck’s research, this is fixed mindset thinking: from a fixed mindset, if you learn very quickly, you are gifted, but if you have to work hard at something, or learn it slowly, you are not. By contrast, from a growth mindset, as with a mastery model of giftedness, skills and achievement

### Table 1 A comparison: giftedness models and mindsets

<table>
<thead>
<tr>
<th>Belief or Attitude</th>
<th>Mystery Model/Fixed Mindset</th>
<th>Mastery Model/Growth Mindset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theories of giftedness, creativity, and talent</td>
<td>Innate and categorical; some people are born gifted, creative or talented, and some are not</td>
<td>Dynamic; giftedness, creativity and talent develop over time with appropriate opportunities to learn</td>
</tr>
<tr>
<td>Measurement reliability and predictive validity</td>
<td>Static; IQ or creativity tests accurately measure ability and predict future achievement</td>
<td>Fluid; intelligence and creativity ebb and flow; a current score does not predict the future very well</td>
</tr>
<tr>
<td>Speed of learning</td>
<td>Gifted people learn quickly</td>
<td>All learning and achievement require time; are often slow</td>
</tr>
<tr>
<td>Effort</td>
<td>Gifted people don’t need to work hard; things come easily without much effort</td>
<td>All worthwhile achievements require persistence, an investment of hard work over time</td>
</tr>
<tr>
<td>Failure</td>
<td>A failure or challenging obstacle signifies lack of ability in an area, leads to avoidance</td>
<td>A failure is welcomed as a learning opportunity, and signifies the need to work harder</td>
</tr>
<tr>
<td>Praising intelligence</td>
<td>Beneficial; supports positive self-concept</td>
<td>Detrimental; reduces learning motivation by fostering fixed mindset</td>
</tr>
<tr>
<td>Labelling giftedness and creativity</td>
<td>Beneficial; supports positive self-concept</td>
<td>Better to label programmes than children</td>
</tr>
</tbody>
</table>
come through persistence and intense effort, expended over time. Instead of being markers of giftedness, speed and perfection are enemies of high-level learning. Real achievement comes from a lot of hard work; thoughtfulness (which can be slow) is a good thing.

People operating from a fixed mindset have much to lose by failing. When given a choice, they take easier academic courses they know they can do well on, and avoid competitions they are not sure they can win. The best way to address and prevent underachievement may be to help students learn how to approach things from a growth perspective, where failures are perceived as learning opportunities, chances to see what we don’t know yet or need to work on. Indeed, the growth mindset is associated with higher academic and career achievement levels over time: ‘People in a growth mindset don’t just seek challenge, they thrive on it’ (Dweck 2006, p. 21).

From a fixed mindset, we measure a person’s potential every time we give them a test. From the growth perspective, as with the mastery model of giftedness, the concept of potential is avoided because there is too much open to development over time and to variables like motivation and effort: ‘An assessment at one point in time has little value for understanding someone’s ability, let alone their potential to succeed in future’ (Dweck 2006, p. 29). Every child has tremendous potential, and it is dangerous to think we can accurately determine which one has more than others, and which one has less. Mindsets are learned, and can be unlearned. Parents, educators and others can have a long-lasting beneficial impact on children and adolescents when they model and foster the growth mindset. Dweck (2006, this volume) provides strong evidence for mindsets’ susceptibility to change, as well as practical suggestions for changing mindsets.

A final recommendation that emerges from the work on mindsets concerns labelling: ‘Telling children they’re smart in the end, made them feel dumber and act dumber, but claim they were smarter. I don’t think this is what we’re aiming for when we put positive labels – “gifted”, “talented”, “brilliant” – on people’ (Dweck 2006, p. 75). These labels communicate innate and permanent exceptional qualities, over time corroding confidence, self-esteem, and achievement. When we label a child ‘gifted’, then we foster the fixed mindset in that child, as well as in the adults in her life. Rather than labelling children as gifted (or not gifted), we might consider labelling educational programming descriptively by level of challenge.

Making connections: the role of teaching for intellectual and emotional learning

As Dweck’s work illustrates, understanding giftedness and gifted education involves issues of motivation and self-theory, as well as advanced cognitive abilities. And as we move beyond the traditional categorical model of giftedness, and toward a more fluid domain-specific understanding of gifted development, it is becoming increasingly apparent that all teachers – not just those working with identified-gifted students – need the training and support required for a skillful integration of high-level cognitive and emotional processes with advanced content. In order to implement a mastery model of giftedness and encourage the growth mindset, thus fostering giftedness more broadly, we must find ways to connect gifted with regular education, and to help all educators connect thinking and feeling processes for themselves and their students.

The Teaching for Intellectual and Emotional Learning (TIEL) model is a scaffolding tool for teachers interested in developing the complex curriculum required by advanced learners, and in fostering high-level development in others, in ways that are consistent both with the mastery approach and with the growth mindset. It provides a framework for thinking about the cognitive
and emotional components of teaching and learning, helping educators and students consider the connections between the intellectual and emotional dimensions of their learning, and thereby addressing and motivating gifted development in diverse kinds of learners. It has been used effectively in a wide range of classroom settings, from full-time gifted programmes to regular classrooms that include students with diverse learning challenges and special needs (Folsom 2004, 2006).

Graphically represented by a colour-coded wheel (see Figure 1), the TIEL model includes five thinking operations identified by Guilford in his investigation of the structure of intellect (1977), and five qualities of character described by John Dewey as seminal to effective learning (Archambault 1964). The thinking operations (cognition, memory, evaluation, convergent production and divergent production) and the qualities of character (reflection, empathy, ethical reasoning, mastery and appreciation) were selected because of their connections to contemporary theoretical and empirical work on optimal learning and gifted development. Although they are paired on the TIEL wheel through an analysis of connections in the empirical and theoretical literature, the specific operations and qualities, as well as the pairing, should be considered flexibly and heuristically, not as rigid or exclusive, but rather as ideas that help educators and students think systematically about interconnected dimensions of thinking, feeling, and learning.

**Cognition and reflection**

As used here, the thinking operation *cognition* includes observing, discovering, knowing, being attentive and recognising relevant information. Dewey described observation as being allied with *reflection* in identifying connections and organising facts, and advocated that teachers strike a balance between ‘routine and reflection’ (Zeichner and Liston 1996). Instead of following a traditional one-size-fits-all routine, a teacher who effectively uses the cognition/reflection axis...
is better able to differentiate learning activities and assignments for advanced students, whether in a gifted or regular classroom.

**Memory and empathy**

Memory plays an essential role in forging connections from new to old information, among concepts and between experiences. In order to identify and address the misconceptions that interfere with learning, and to motivate interest in new knowledge, teachers need to activate students’ prior relevant experience; that is, their memories. One of the best ways to do this is to engage their empathic attention, which is one of the reasons that stories work so well as motivators for learning (Bruner 1996).

**Evaluation and ethical reasoning**

The thinking operation *evaluation* includes analysing, criteria-setting, decision-making and self-monitoring. The explicit teaching of self-organisation skills – setting criteria, making decisions, planning, and evaluating one’s own achievements – helps students become more responsible learners (Folsom 2004); works to reverse underachievement (McCoy and Siegle 2003); and plays a central role in addressing learning disabilities (Konrad and Trela 2007). *Ethical reasoning* is connected to evaluation through the processes of setting criteria and making decisions. The evaluation/ethical reasoning axis can be particularly helpful with those learners who have intense feelings about ethical issues (sometimes associated with giftedness; see for example von Karolyi 2006).

**Convergent production and mastery**

Guilford (1977) describes *convergent thinking and production* as the search for the one right answer, and as including logical and sequential thinking. It is linked to *content mastery* through a shared focus on domain-specific foundational knowledge. Underachievement is a predictable result for students whose urge to mastery is frustrated by instruction that does not challenge them, a frequent problem for exceptionally capable learners (Neihart et al. 2002).

**Divergent production and appreciation**

According to Guilford (1977), *divergent production* refers to creative thinking that produces ‘alternative ideas . . . which satisfy a somewhat general requirement’ (p. 92). Inventing, designing and composing (and other processes involving divergent production) depend on an appreciation of the beauty, diversity, and possibilities inherent in human nature and the world around us.

**Conclusions**

The mastery model, the theory of mindsets and the TIEL model work to build bridges between gifted education and regular education, and make connections between cognition and emotion.
Taken together, the three perspectives advocated here have many implications for those interested in the policy and practice of gifted education. These include the suggestion that educators:

1. integrate cognitive and emotional processes in their teaching, in fluid, dynamic, and interactive ways, both explicitly and implicitly;
2. minimise categorical distinctions, for example, by labelling programming challenges rather than children;
3. provide all students with optimal levels of challenge, by subject area, as this changes over time;
4. celebrate successful learning processes and resilient responses to setbacks, rather than inherent ‘gifts’ or ‘talents’; and provide a wide range of programming options to address individual and developmental diversity.

Many of our colleagues writing in this volume are advocating similar or allied perspectives, based on their work in this field around the world. As we move forward into the twenty-first century, these policies and practices can help us do a better job of addressing gifted learning needs and fostering high-level development in diversely gifted students everywhere.

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Future Perspectives
Suggested priorities for gifted education over the next decade

How should gifted education develop over the next ten years in Canada and the United States? The first thing to do is to improve the quality of teaching and learning in general education classrooms. Too often, parents see gifted education as a remedy for inadequate teaching, classroom discipline problems and low expectations. Teachers who understand how to challenge all of their students intellectually and encourage their social/emotional learning — and who are given the time, support, and resources they need to do that — are much better prepared to recognise individual developmental differences, plan appropriately differentiated learning experiences and recommend other settings or options on an as-needed basis. The needs of all students — including the intellectually advanced — will be much better met if all teachers have the training and support that they need to provide high-quality learning experiences, and when a range of learning options is available to address individual developmental differences, by subject area.

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