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Academic talent development programs: a best practices model

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Abstract This article aims to describe how schools should structure the development of academic talent at all levels of the K-12 educational system. Adopting as its theoretical framework the *Differentiating Model of Giftedness and Talent*, the author proposes (a) a formal definition of academic talent development (ATD) inspired by the principles and practices adopted in education, music, and sports and (b) seven constitutive characteristics of exemplary talent development programs. He develops his proposal around an enriched K-12 curriculum as its keystone component. Other characteristics recommend that school administrators make this curriculum available on a daily basis, as early as the kindergarten level, to selected high-achieving students; they would belong to full-time high-ability groups. The author argues that most current so-called gifted programs, mainly exemplified by pullout classes and regular classroom enrichment, have little to do with 'proper' academic talent development. The article ends with a brief survey of existing ATD programs and a look at future implementation problems.

Keywords Academic talent development · Acceleration · Enrichment · Giftedness · Grouping · Talent

The present text aims to extend and update one section of an earlier article (Gagné 2011) in which I first defined and described the concept of talent development (TD) within the framework of the *Differentiating Model of Giftedness and Talent* (*DMGT*) and then applied it under the label 'academic talent development' (ATD) to the K-12 education system. Considering that many APER readers might not have yet encountered descriptions of the DMGT, I judged desirable to offer a very brief overview of this talent development theory.

References preceded by the author Françoys Gagné, can be downloaded from the author's web site:http://gagnefrancoys.wix.com/dmgt-mddt.

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Brief overview of the DMGT

Differentiating the two key constructs

In the field of gifted education, the terms 'giftedness' and 'talent' represent two crucial constructs. Unfortunately, most educators use them as synonyms; for example, they say: 'gifted and talented children are…' without ever asking themselves if they see any differences between the two labels. In practice, professionals use the terms 'gifted' and 'giftedness' much more commonly; the field is named 'gifted education,' and the term 'gifted' appears in the name of all its major scientific publications. Sports and arts, on the other hand, prefer by far to use the label talent (Gagné 2013). But, professionals and scholars in all these fields use their preferred label, giftedness or talent, to identify two distinct concepts: high potential or aptitudes on the one hand, and high achievement or excellence on the other hand (Gagné 2009). For instance, a gifted underachiever is a student whose academic achievement is significantly below his recognized potential, usually an IQ score. Here, the two distinct concepts are clearly identified: We are comparing a low achievement to a high potential. In summary, the distinction between potential and achievement is strongly imbedded in our way of viewing

human abilities. It would reduce a lot of ambiguity if we adopted distinct labels when we refer to high aptitudes as opposed to high achievements.

That is exactly one of the DMGT's unique qualities: differentiating clearly between outstanding natural abilities, the gifts, and systematically developed high-level competencies, the talents. Think of giftedness versus talent as approximate synonyms for high aptitude versus high achievement, high potential versus high accomplishment, or my own use of high 'natural abilities' versus outstanding 'systematically developed competencies.' Borland (1989) was one of the few scholars in the field to recognize the value of that distinction. He stated: 'Gagne's [sic] use of the terms *giftedness* and *talent* appears to be the least arbitrary and the most useful of those proposed thus far. The distinction between competence and performance is a real and meaningful one, and it allows for the building of a model that permits the operationalization of the concepts' (p. 23).

This differentiation serves as the basis for the DMGT theory of talent development: Talent becomes the outcome, the result, of a long developmental process that has its origin in outstanding natural abilities. The DMGT (see Fig. 1) has five major *components*. First, the basic trio, the core of the DMGT, includes the natural abilities on the left, the G or 'gift' component; they serve as the 'building blocks' that will be transformed through the developmental process, the D component, into those outstanding competencies (knowledge and skills) that constitute talented behaviors, the T component. Additionally, two large groups of catalysts constantly modulate that developmental process; they belong to either the individual (I catalysts) or the environment (E catalysts). The figure shows that each of the five components has a series of subcategories: major *subcomponents*, as well as more specific *facets*.

The basic trio

The talent component is the easiest construct to understand and measure. It is defined as the outstanding mastery of *systematically developed competencies* (knowledge and skills) in any *field* of human occupation, to a level that places the individual among the top 10 % of learning/training peers. As shown in Fig. 1, talents can appear in all fields of occupation, and all academic areas. Here are concepts associated with various levels of talent: expert or elite status, eminence, prodigy, genius. In schools, talent manifests itself through high grades and exam scores, outstanding homework or projects, and so forth. On the other hand, giftedness is defined as the possession of outstanding *natural abilities*, also called aptitudes, which place an individual among the top 10 % of age peers in at least one ability *domain*. The DMGT proposes six domains; the cognitive domain contains of course the main

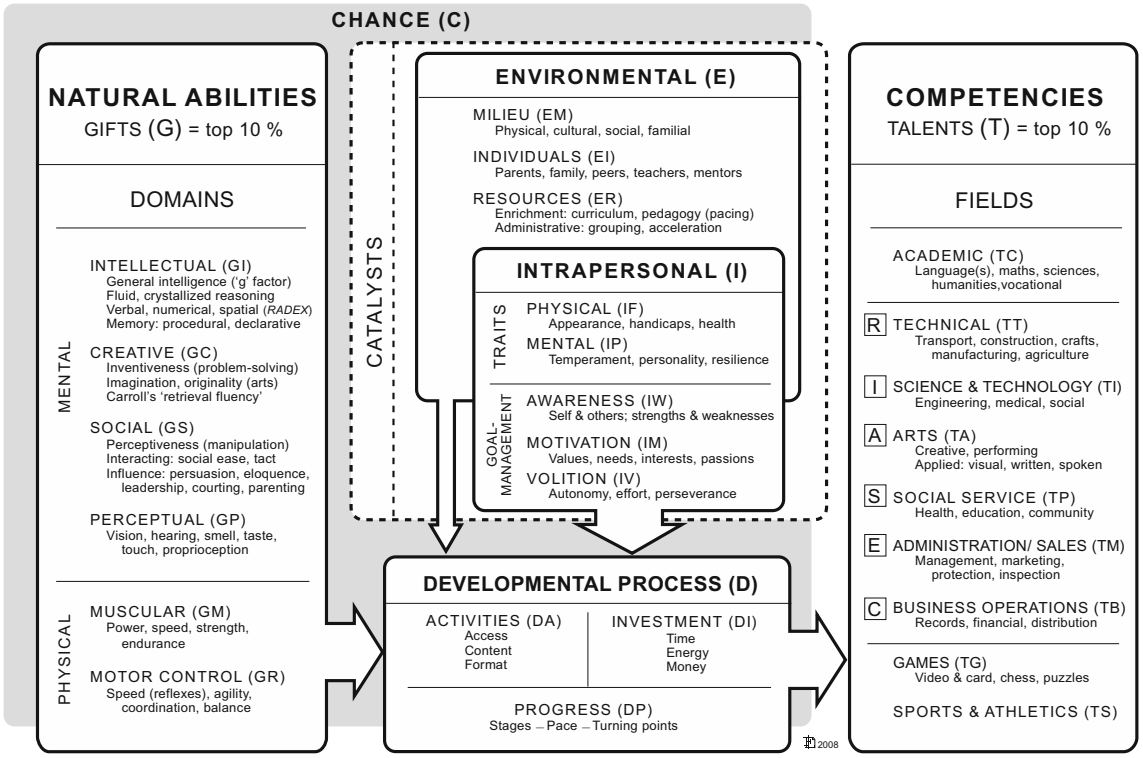

Fig. 1 Gagné's Differentiating Model of Giftedness and Talent (DMGT 2.0)

building blocks of academic talent. Giftedness has a trademark characteristic: ease and speed in learning. When formal tests are not available, we can just look at how fast learners progress when compared to their peers. Music teachers and trainers in sports automatically look for that rapid learning pace when they try to identify promising musicians or athletes. Both gifted and talented individuals differ in the intensity of their outstanding abilities. Above the top 10 % minimum threshold mentioned in the formal definitions, the DMGT proposes four additional levels (Gagné 1998): *moderately* gifted or talented (top 1 %), *highly* (top 1:1000), *exceptionally* (1:10,000), and *extremely* or *profoundly* (1:100,000).

The talent development process can be subdivided into three distinct subcomponents: activities (DA), investment (DI), and progress (DP). Each of them contains three specific facets (see Fig. 1). The talent development (DA) activities begin when individuals gain access (DAA) to a structured program of enriched activities (DAC), within a specific learning format (DAF). The investment (DI) subcomponent quantifies the intensity of the talent development process in terms of time (DIT), psychological energy (DIE), or finances (DIF). Ericsson's (2006) construct of deliberate practice fits well within the DIT/DIE subcomponents. The progress subcomponent also has three facets: stages (DPS), pace (DPP), and turning points (DPT). In school systems, there is just one acknowledged system of developmental stages, namely grade levels. Measures of pace represent the main quantitative dimension of progress: How fast compared to same grade peers do students master the learning program. For academic high achievers, acceleration through grade levels represents the mirror image of repeating grades for slower learners. Finally, turning points correspond to major happenings during the course of the developmental process, like the death or illness of a close one, obtaining an important scholarship, being accepted in a special school, and so forth.

The two sets of catalysts

Among the five I subcomponents, the most 'popular' is mental traits (IP); it covers both temperamental and personality traits. Think of variables such as emotions, mental toughness, beliefs and perceptions, morality and ethics, perfectionism, self-concept and self-esteem, anxiety, and literally hundreds of others. The most significant distinction *within* the I component concerns motivational issues, identified by two related but distinct constructs: motivation (IM) and volition (IV). For most people, the term 'motivation' brings to mind two separate concepts: (a) *what* motivates us (IM), the nature of the goal and its intensity, and (b) *how intensely* we will work (IV) to reach that goal. *Action Control Theory* (see Gagné 2010) proposes a clear differentiation between goal identification and goal attainment. Intrinsic and/or extrinsic motives, passions, needs, perceived pressures from outside sources influence the goal-identification activities. Then, after choosing a desired goal, students (athletes, etc.) invest energies in reaching it; the loftier the goal, the more time and efforts students will need to reach it. For its part, the E component has three subcomponents: milieu, individuals, and resources (see Note 2). The first one includes broad environmental influences (e.g., geographical, social, or cultural aspects); economic issues (e.g., family income) also belong to this subcomponent. Look at it roughly as the 'socioeconomic' subcomponent. The second one includes of course parents and siblings, but also teachers, trainers, peers, or mentors. Think of it as the 'psychological' subcomponent. The third one covers all forms of talent development resources and programs available in a particular 'milieu'; it is the 'educational' subcomponent.

The dynamics of talent development

The basic dynamic process at the core of the DMGT implies all five components: outstanding natural abilities (G), usually from a specific domain, progressively give rise (D) to the high-level competencies (T) typical of a particular field of talent; and both groups of catalysts (I and E) constantly intervene to 'catalyze' that long-term process. We also observe all kinds of interactions *between* components (e.g., the efforts by teachers and parents (EI) to influence the motivations (IM) and personality characteristics (IP) of children), as well as *within* components (e.g., how personal qualities (IP) affect a person's choice of goals (IM), or how cognitive abilities (GI) contribute to the growth of creative (GC) or social (GS) natural abilities). The DMGT gives significant importance to the role of chance, a concept borrowed from Tannenbaum (1983) that groups all non-controllable (positive and negative, distal and proximal) causal influences of talent emergence. Chance manifests itself mainly through the genetic background we receive at birth, as well as the family environment in which we are raised. The main dynamic theme has been labeled 'what makes a difference'; it addresses the key question of the relative predictive power of the DMGT's causal components (G, D, I, E) through their facets (see especially Gagné 2004).

Academic talent development: program parameters

We can define the concept of talent development (TD) at two levels: *global* or *specific*. Globally, it refers to a (more or less) structured *theoretical model* that brings together a

certain number of causal influences, personal and environmental, that affect the emergence of outstanding achievements through a long developmental process. The DMGT fits perfectly well within that global meaning. Specifically, the term can designate the *developmental process itself*, a label that now describes perfectly the D component in the DMGT. Within that perspective, the label brings together all the components of those diversified resources we, in education, commonly bring together under the umbrella label of 'gifted programs.' Parallel resources exist in other fields, such as arts and sports. Note that scholars in our field use the label 'talent development' (TD) without the 'academic' qualifier; in fact, if we consider that talent development happens in hundreds of different fields of human activity, we should adopt in education the more specific label 'academic talent development' (ATD). I will respect the TD label when citing authors who use it, but return to the more appropriate ATD label everywhere else.

The concept of 'program' I will use here differs significantly from most services or provisions covered under the 'gifted program' umbrella. It endorses a seminal distinction initially proposed by Tannenbaum (1983) and later adopted by Borland (1989). Here is how Tannenbaum differentiates programs and provisions.

> A program is a comprehensive offering, sequenced over a long period of time, usually designed as a requirement, and very much a major part of the total school curriculum. Thus, the school offers *programs* in mathematics, literature, art, social studies, and the like. (#) A *provision*, on the other hand, is more fragmentary, an ad hoc offering, relatively brief in duration, often designed by an individual teacher with special abilities rather than by a curriculum committee, and supplemental to the major offerings, not integral with them. (2009, p. 515)

Borland (1989) built on Tannenbaum's distinction. Although he considered 'that there is nothing at all wrong with provisions for the gifted' and that they 'may be among the most valuable [opportunities] offered to students in their school careers,' he judged provisions to have a major drawback, namely that they are not 'programmatic,' that there is 'no guarantee that all gifted students in the system will be exposed to them.' He summarized the main differences as follows.

> In many respects, programs are everything provisions are not. Whereas provisions are often temporary expedients, programs are designed to be permanent features of school districts' educational offerings. Whereas provisions are fragmentary, programs have well-articulated sequences of goals, skills, and content. Whereas provisions are extracurricular, programs consist of activities that constitute a prescribed part of the course of study of identified gifted students. Whereas provisions are optional, programs are required for all gifted students who move through the system. (1989, p. 44)

Borland considered his definition 'a list of the specifications of an ideal program,' but added: 'even if these specifications are met, there is no assurance that the program will be a good one' (1989, p. 45). These two scholars did not introduce, as I will do below, the label 'academic talent development' to qualify the ideal programs they had in mind. While adopting the basic ideas put forth by Tannenbaum and Borland, I will propose additional characteristics as essential constitutive elements of exemplary ATD programs.[1]

Circumscribing the target concept

Talent development is not a new concept in gifted education, but it came into common use only recently. It now serves as preferred label for many conceptual models aiming to understand the emergence of talents, as well as some intervention resources.

A bit of history

If we go back just a few decades, the talent development label disappears from the titles of books or chapters, as well as subject indexes; for instance, we can observe that phenomenon in two well-known edited handbooks from that period (Barbe and Renzulli 1975; Passow 1979). After 1980, the expression became increasingly common, helped possibly by the immense popularity of Bloom's (1985) *Developing talent in young people*. Soon after, Renzulli and Reis (1991) ended a politically oriented article with the following statement: 'Talent development is the 'business' of our field, and we must never lose sight of this goal, regardless of the direction that reform efforts might take' (p. 34). Unfortunately, they did not define that key expression. In the 1990s, the number of publications that included 'talent development' in their title grew steadily. For instance, the administrators of the Belin/Blank Center in Iowa used it in the title of their series of proceedings from the biennial Wallace symposia (Colangelo and Assouline 2001), while the late John Feldhusen (1992) named

[1] This seminal conceptual distinction between provisions and programs, twice advanced three decades ago, had literally no impact on the terminological habits of practitioners; terminological fuzziness remains one of the saddest differentiating characteristics between social and natural sciences! Note also that the recent [shame on me!] discovery of that distinction decided me to substitute 'resources' for 'provisions' as the label of the third environmental subcomponent.

his theoretical model *Talent Identification and Development in Education* (*TIDE*). A cursory look at the tables of contents and subject indexes of recent handbooks (Balchin et al. 2009; Callahan and Hertberg-Davis 2013; Colangelo and Davis 2003; Dixon and Moon 2006; Kerr 2009; MacFarlane and Stambaugh 2009; Plucker and Callahan 2008; Renzulli et al. 2009; Shavinina 2009; Sternberg and Davidson 2005) confirms its more frequent use by academics. Some researchers believe that the growing popularity of the 'talent development' expression marked a major paradigmatic change. For instance, Olszewski-Kubilius (2009) stated:

> In 1983, when I entered the field of gifted education, there was a paradigm shift occurring. People were beginning to use the term talent development and, in fact, my center at Northwestern University was one of the first to incorporate the term into our title—The Center for Talent Development, or CTD. This was not just semantics, although it may have appeared so to outsiders, but indicative of an important conceptual shift in thinking among leaders in the field of gifted education and those who studied exceptional ability. (p. 81)

Unfortunately, she did not specify the nature of that conceptual shift. In a similar vein, Brody (2009) affirmed: 'More recently, we have seen a shift in our field away from a focus on "gifted education" to one on "talent development," with the new terminology reflecting a growing realization that using a measure of general intellectual ability as a sole predictor of achievement is not adequate' (pp. 93–94). Again, we are left in the dark as to the exact relationship between the two halves of that sentence. Moreover, Brody did not specify if the change in terminology was just that, a new label given to the same old ideas, or if it brought significant changes in prioritized services within our field. In summary, in spite of its increased use, the long-term developmental process that leads to academic excellence remained without clear definitional and descriptive parameters until the summary proposal I included in a text (Gagné 2011) pursuing a broader outlook.

Critical survey of existing models

Most of the time, the global perspective described earlier reigns: The term talent development identifies conceptual models that aim to explain the emergence of outstanding achievements, whatever the label given to them (e.g., giftedness, talent, excellence, eminence, and expertise). Over the past two or three decades, many scholars have proposed such models, but few of them adopted explicitly the TD label. Subotnik et al. (2011) recently surveyed a sample of nine different talent development models, subdividing them into three different groups: (a) a set of three models (Tannenbaum's Star model, Sternberg's WICS model, and Feldman's coincidence model) 'that represent efforts to identify variables associated with the transformation of potential into notable accomplishments' (p. 27); (b) a set of four models (Renzulli's Enrichment Triad model, Piirto's Pyramid model, Gagné's DMGT, and Stanley's Talent Search model) 'that takes components of talent development and places them into a sequence, although the sequence is not framed specifically as a developmental process' (p. 28); (c) a set of two models (Bloom's TD model; Subotnik and Jarvin's SP/A model) whose variables 'change in importance according to developmental stages' (p. 29). Although not stated explicitly, the description of the three categories—and the presence of the SP/A in the last group—suggests that the authors perceived a progressive rise in quality from the first to the third group; as additional evidence, the authors proposed at the end a 'talent development mega-model' that builds directly on the first author's SP/A model placed in the third category. This is not the place to critique either the three-group (three-level?) category system, the placement of specific models in a particular category (e.g., placing the DMGT in a category where 'the sequence [of components] is not framed specifically as a developmental process'!), or the omission of some well-publicized talent development models, like Ericsson's development of expertise through deliberate practice (Ericsson 2006), the level of service (LoS) approach (Schroth 2013; Treffinger and Selby 2009), or Ziegler and Philipson's (2012) actiotope model. In fact, most chapters in two recent compendiums of models or conceptions (Renzulli et al. 2009; Sternberg and Davidson 2005) would warrant a close examination as potential ATD models.

With respect to the specific perspective described above, I have been unable to identify talent development resources that clearly label themselves as (academic) talent development 'programs.' This is the case with all existing service options, such as pullout classes, summer camps, governors' schools, and other similar 'gifted programs' that belong to the specific approach. But, whatever the labels used, do all these resources represent exemplary instances of academic talent development? To answer this key question, we need to define that concept and then operationalize it through its main constituent elements.

Defining academic talent development

During the two decades that followed the initial English appearance of the DMGT (Gagné 1985), I centered my efforts on mapping the structure and contents of four components, G and T first, and then the two groups of catalysts I and E. About a decade ago, as part of a major

update of the theory, I realized the need to bring the D component to the same level of analysis as the other four. Readings and observations first led to two interrelated developments: (a) a detailed mapping of the D component into its subcomponents and facets and (b) a formal definition of academic talent development (ATD) as it should be implemented in educational systems (Gagné 2009). Because of the broadening popularity of the DMGT outside gifted education (e.g., McPherson and Williamon 2006; Trankle and Cushion 2006), the basic definition needed to be general enough to cover any field where talents can emerge. It was simultaneously adapted to the educational context (Gagné 2009). Later (Gagné 2011), I introduced a list of the constitutive characteristics that define ATD programs. In recent years, I identified additional changes to improve that initial proposal, both the definition and its associated constituent characteristics; they led to the present update.

Mapping TD processes and programs

Mapping any DMGT component means subdividing its content into relevant subcomponents and more specific facets. Figure 1 illustrates the results of that process for all five components. Of course, there is much more content within a given component than what a figure can convey. That additional content will take the form of detailed explanations targeting each of the identified facets, as well as additional facets not included in the figure. As described earlier, the basic nine-facet structure (see Fig. 1) of the D component has been set, but additional details remain to be assembled and published.

We can break down any talent development program into three main components (Moon and Rosselli 2000): (a) the identification of the target population, (b) the definition of the program's developmental goals, and (c) the content of the proposed developmental intervention, both in terms of its curriculum and its administrative parameters. Can we identify within each of these three components key characteristics that would constitute 'best practices,' in other words practices that would foster the maximal academic fulfillment of their outstanding aptitudes? In search of possible models from which to borrow relevant guidelines, I surveyed a diversity of existing gifted programs (e.g., pullout classes, weekend activities, grade skipping, special selective high schools, AP program, and summer camps); I found a huge diversity of practices, but little homogeneity. I also looked outside our field, especially at talent development in music and sports. I found there much more convergence and homogeneity in principles and practices; it helped identify principles and practices that appeared especially fruitful in fostering the maximum fulfillment of outstanding aptitudes. To illustrate the main elements of this general developmental approach, let us look at music as a typical well-structured TD program, more specifically at the learning of musical instruments.

Borrowing from music (and sports)

In order to cover the totality of the talent development process, including the identification of future talented musicians, we will begin with the first learning steps of young children, usually taught by a music teacher from the local community; these teachers rarely need more than a few weeks to detect outstanding musical aptitudes (McPherson and Williamon 2006). In the absence of easily available valid tests of musical aptitudes (Hallam 2006), similar to the group IQ tests and achievement tests common in school systems, music teachers usually infer outstanding aptitudes from their observation of a learning pace significantly faster than these novices' learning peers. Other signs will contribute to explain this rapid pace, such as high intrinsic motivation, concentrated effort during lessons and home practice, longer practice time, or strong will power, all of them demonstrated predictors of long-term involvement (Gagné 2004; McPherson 2000). Music teachers will immediately adjust the difficulty of the official music curriculum to keep pace with these students' rapid progress, thus matching instruction pace with learning pace. Thus, in 1 year, talented music students will easily cover two, sometimes 3 years of the normal music curriculum.

If, after a year or two, the teachers observe that these young talented musicians increase their gap with learning peers even more, they will propose a more formal talent development path, characterized by an even more densely enriched—more accelerated, thus difficult—music curriculum; it might imply joining a group of similarly advanced peers, for instance, by entering a specialized institution, to foster exchanges and collegial emulation. It might imply as well choosing a more specialized music teacher (Sosniak 1985). This new step or stage will be an occasion to define more advanced achievement goals and, because of the clear longitudinal path toward professional excellence offered in music, maybe start dreaming about such lofty extrinsic goals as professional eminence and fame. As they pursue their talent development process to more advanced stages, the most talented among them will never be slowed by the average pace of their peer group, as talented as that peer group might be. This respect and encouragement of individual learning paces explains why we encounter a fair number of prodigies in music, but almost none in K-12 education! Readers can easily imagine quasi-identical scenarios to summarize the talent development course in any sport.

Formal definition

The above discussion has set the scene for the revisions of both the ATD definition and its associated constituent characteristics. Here is the newly revised ATD definition.

> Depending on the perspective adopted, the expression academic talent development (ATD) designates either (a) a structured long-term program of learning activities anchored in a constantly challenging academic curriculum directed toward the attainment of high-level excellence goals, or (b) the systematic pursuit by academic talentees of personal long-term excellence goals within such a structured program.

It seemed less cumbersome to incorporate both the program-oriented and ipsative perspectives in a single definition, thus making clear that the ATD label has at least two applications. Note the reappearance (Gagné 2009) of the neologism *talentee* to identify any individual actively involved an a talent development process or program; the expression 'academic talentee' fits the specific learning context of ATD programs much better than the ubiquitous—and overused—'gifted student' label.

Descriptive Characteristics

Seven (7)—initially six (Gagné 2011)—constituent elements ensue from the above ATD definition; they highlight the 'best' practices that proper ATD programs should implement.

1. An enriched K-12 curriculum;
2. Systematic daily enrichment;
3. Full-time ability grouping;
4. Customized/accelerated pacing;
5. Personal excellence goals;
6. Highly selective access;
7. Early interventions.

With respect to the three program components earlier identified, the first four characteristics target the content/format component, the next one the excellence goals, and the last two the talentee population. Together with the definition, they summarize the essence of a DMGT-inspired ATD model. Most of these constituent characteristics appeared a decade ago in a keynote speech titled 'Ten commandments for talent development,' or TCTD for short (see Gagné 2007). As a 'keystone' characteristic, the first one deserves its first rank hands down; grouping all the others according to program components solved a conundrum, namely trying to create some hierarchy among them. Except for the last one, which targets the point of departure of a sequence of ATD programs, I consider the six other constituent characteristics as necessary components of a DMGT-inspired ATD program. Indeed, how can a 'constituent' element be anything but necessary!

1. An enriched K-12 curriculum

By definition, 'academic' talent development aims to attain academic excellence, and academic excellence results from an outstanding mastery of the formal K-12 curriculum; it is that specific curriculum that we must enrich for academic talentees to experience regular learning challenges. Any service that does not have as its mission to implement that keystone characteristic cannot receive the DMGT's ATD label. Indeed, recall that it also constitutes the key element in Tannenbaum's definition of a proper 'gifted' program. What does the term curriculum embrace? For lack of a consensus among professionals on the exact meaning of the term curriculum (see eponymous Wikipedia entry), the term will mean here both the content of specific subject matters at a particular grade level, and their integrated structure within and between grade levels; it includes as well instructional strategies. The image of 'enrichment' should convey a simple principle advanced decades ago by Julian Stanley in his Talent Search model, namely ensuring a proper match between the proposed content and the students' most advanced level of mastery, and maintaining that match by also matching the teachers' instructional pace with the students' learning pace (Brody 2009; Lee et al. 2008). The recently proposed 'advanced academics' model (Peters et al. 2014) recommends a similar curricular priority.

I chose the term 'enriched' with the clear awareness that I was 'delinquently' rejecting the politically correct custom of my colleagues, most of whom have adopted the term 'differentiation' (e.g., French 2009; Kaplan 2009; Renzulli 2009; VanTassel-Baska and Little 2003). It is a very sad thing that perceived political pressures or public stereotypes (e.g., a non-enriched curriculum is a 'poor' curriculum) force professionals to put aside proper terminology. I have argued repeatedly for the rehabilitation of the concept of enrichment, for the simple reason that it best describes the type of differentiation *specifically appropriate* for fast learners. For them, the regular curriculum, especially the instructional pace imposed by slow learners, seems akin to the slow stop-and-go pace car drivers face during rush hour!

What does an enriched curriculum look like? At the broadest level, that of a structured set of subject matters, it does not differ substantially from the regular curriculum; most adaptations appear to target specific contents at particular grade levels, as well as instructional strategies (e.g., Hertberg-Davis and Callahan 2008; Tomlinson 2009; VanTassel-Baska and Little 2003). For instance, Rogers (2009) identified seven research-based content—and

instructional—modifications that provide 'significant academic benefits for gifted learners' (p. 264): abstract concepts, complex contents, multidisciplinary themes, sequence reorganization, links with human and social issues, introduction of professional inquiry methods, and subject acceleration. With respect to instructional strategies, I described in TCTD (Gagné 2007) four different types of enrichment, called the four 'Ds' of enrichment: in Density, in Difficulty, in Depth, and in Diversity. That particular sequence reflects a *decreasing* order of relevance, thus giving priority to Density. Also called curriculum condensation or compacting (Reis et al. 1992), it serves as the pedagogical core of the enriched curriculum. ATD specialists should prioritize it over other forms of enrichment because it offers the most relevant response to giftedness' trademark, namely ease/speed in learning. Moreover, the school time 'liberated' through faster mastery of subject matter units creates learning space for additional enrichment. The TCTD's sixth commandment (Gagné 2007) advocates: 'Thou shalt condense… foremostly' (p. 103).

2. Systematic daily enrichment

This second constituent element might look almost tautological, since the adoption of the keystone first element, with its enrichment focused on condensing the content of the regular curriculum, implies its implementation on a daily basis. But, I perceived a need for its inclusion because some teachers or school administrators are worried about the—mythic—cataclysmic impact of accelerative measures; these unfounded fears lead them to refuse that their talentees progress too far ahead while still remaining in their regular classroom. Accordingly, after allowing a burst of condensation, they will switch to other types of enrichment, like enrichment in Depth (long-term projects) or in Diversity (non-curricular short-term activities). In that way, these talentees will progress in brief rapid spurts followed by pauses occupied with 'lateral' enrichment, thus ending their school year more or less at the same level of subject matter mastery as their well-performing non-talentee learning peers. I believe instead that an enriched curriculum must propose intellectual challenges on a *daily* basis. Vygotsky's (1978) concept of 'zone or proximal development', as well as the late Julian Stanley's talent search instructional approach (Brody and Stanley 2005), aptly conveys the need to maintain students' pace at the cutting edge of their learning capacity, neither too slow to force them to idle regularly nor too fast to create feelings of helplessness. In the case of academic talentees, we must watch much more acutely for signs of unchallenging content; if there is one thing that many high-achieving students resent is having to face, day after day, the constant slow and repetitious pace imposed by their slow-learning peers in the regular classroom. Note that this particular problem very rarely surfaces in sports or arts; their talent development practices almost automatically maintain that cutting edge teaching strategy.

3. Full-time ability grouping

This third constitutive element directly ensues from the preceding one: How can we best deliver daily enrichment to talentees, if not by grouping them with a single specially trained teacher? Yet, this administratively sensible solution, especially its 'full-time' variety, touches a very sensitive subject, probably even more sensitive in our field than the subject of academic acceleration (see # 4 below). Commonly discussed in gifted education handbooks before the turn of the present century (e.g., Colangelo and Davis 1997; Davis and Rimm 1985; Heller et al. 1993), the subject of ability grouping has almost disappeared from recent handbooks, not only as a separate chapter on the subject (e.g., Balchin et al. 2009; Callahan and Hertberg-Davis 2013; Dixon and Moon 2006; Heller et al. 2000; MacFarlane and Stambaugh 2009; Shavinina 2009), but even as an entry in encyclopedia-type handbooks (e.g., Kerr 2009; Plucker and Callahan 2008). In spite of its controversial status, I have been defending for most of my career (e.g., Gagné 1987) the appropriateness of this administrative measure. Indeed, the ninth commandment in TCTD (Gagné 2007, p. 109) states clearly: 'Thou shalt group…fulltimely!' The demonstration I made in that text for the unavoidable adoption of full-time grouping in ATD programs seems to me as valid today as it was a decade ago. Indeed, I would invoke additional arguments today on top of those presented in the TCTD article. For instance, an evaluation study (VanTassel-Baska et al. 2008) confirmed the enormous time and financial involvement required to train regular elementary classroom teachers to implement language arts enrichment modules in their classroom. A team of university specialists had to invest hundreds of hours of professional time over a period of 2 years to train a dozen or so elementary school teachers to an acceptable level in the proper use of these enrichment materials, which covered about a third of a school year in just one subject matter!

Here is a summary of the defense I made in TCTD. Opposition to the full-time grouping of talentees remains hard to understand in view of both the research evidence on the positive academic impacts of grouping (Kulik 2003; Rogers and Span 1993), and the accumulated evidence on the almost total lack of any enrichment activities in regular classrooms that specifically target academically talented students (Archambault et al. 1993). At all levels of the K-12 educational system, teachers prioritize students with

learning difficulties who stand at the other end of the achievement continuum. Moreover, the curriculum of most pre-service teacher training programs reflects the low priority of talented students' needs; courses on 'special' populations give only lip service to the characteristics and educational needs of gifted students (Croft 2003). In that context, responding adequately to the special educational needs of fast learners becomes literally a 'mission impossible!' That inescapable conclusion leads directly to the generalization of full-time grouping as the only effective way to create appropriate classroom conditions for sustained daily enrichment; by grouping thirty or so students around a single teacher, it also provides a very efficient use of very limited specialized resources. Here are the main advantages of full-time grouping: (a) It answers a full-time need with a full-time solution; (b) it facilitates the enrichment of all subject matters in the regular curriculum; (c) contrary to most pullout services, it does not require adding a (costly) teacher to the school faculty.

Note finally that this third constituent element excludes from exemplary ATD models popular activities like summer camps, once a week pullout classes, or weekend enrichment activities. This statement should not be taken as a critique of their potential usefulness; as confirmed by their wide dissemination and popularity (Archambault et al. 1993; Cox et al. 1985), they could play a useful complementary role within a well-structured ATD program. But they lack too many of the defining ATD characteristics to constitute intrinsically adequate prototypes of academic talent development. Moreover, a large dissemination of ATD programs would certainly render many of them obsolete.

4. Customized/accelerated pacing

Grouping talentees to offer an enriched curriculum does not mean that all individual differences in learning pace have disappeared; these individual differences produce over time an increasing gap between slow and fast learners, what has been called a 'fan-spread effect' (Gagné 2005). Moreover, analyses of achievement test scores, as well as results from talent searches, show unmistakably the large gap in knowledge and skills between mildly talented students and their exceptionally talented peers (Gagné 2005; Lupkowski-Shoplik et al. 2003). Consequently, those who progress significantly faster than peer talentees should be allowed, if they so desire, to move ahead at an accelerated pace. Unfortunately, most accelerative measures face strong resistance from a majority of administrators, teachers, and parents; they ignore or refuse to accept the overwhelming scientific evidence in support of all forms of accelerative enrichment (Colangelo et al. 2004; Rogers 1991). Borland (1989) summarized that conundrum as follows: 'Acceleration is one of the most curious phenomena in the field of education. I can think of no other issue in which there is such a gulf between what research has revealed and what most practitioners believe' (p. 185). Similar statements abound in the gifted education literature, including a remarkable metaphor with medical practice proposed by Durr (1964, p. 96). In summary, allow me to recall the TCTD's seventh commandment: 'Thou shalt accelerate…asneededly!' (Gagné 2007, p. 105).

5. Personal excellence goals

Four qualifiers (excellence, personal, challenging, and long-term) describe the educational goals that talentees would be invited to set for themselves, with only the first two appearing in the above subtitle. Excellence goals must be understood normatively, which means in relationship with the expected achievements of learning peers. Of course, as members of a highly selective group (see #3 and #6) their reference base differs from that of regular classroom students. They are no longer 'big fishes in a little pond' (Marsh and Hau 2003; Plucker et al. 2004), but have become smaller fishes in a much bigger pond, a pond of talented classmates. So, these goals should far exceed the level of academic excellence typically expected within the regular curriculum. Obtaining high marks in a regular classroom has nothing to do with academic talent development; most academically talented students can attain such goals much too easily. Note also that their normative status distinguishes them from 'personal bests,' which can apply to the academic goals of all students. The adjective *personal* means that the talentees not only choose these educational goals themselves but can also revise them periodically; they should have full ownership.

The third adjective, *challenging*, means that these personal excellence goals should incite talentees to leave the security formerly offered by their 'big fish' status and accept to test their learning limits, not only in cognitive terms, but also with respect to their motivation and volition. Finally, the fourth qualifier refers to a goal-setting process that looks ahead far beyond a few weeks or months, trying to encompass at least a full segment (e.g., elementary, middle school, and high school) of the K-12 educational trajectory. Consequently, they cannot apply to popular activities such as summer camps, once a week pullout classes, or weekend enrichment activities; they need to target main academic objectives relevant to the enriched regular curriculum. They also must involve a substantial investment in time and effort. On the other hand, they need not be ultimate or peak achievement goals, like completing a Ph.D. or winning an Olympic medal, at least not before entering high school. Of course, if some young talentees entertain with passion long-term career

plans, so much the better! But such passionate involvements remain quite rare.

6. Highly selective access

This sixth constituent element follows directly from the first two defining characteristics: An enriched curriculum offered on a daily basis. Academic talent development requires not only outstanding learning abilities, but also, as with any other developmental program, demonstrated probability of future success. This general statement requires at least two precisions: (a) What the qualifiers 'highly' and 'outstanding' do mean concretely and (b) what criteria of demonstrated excellence we should use to give access to an ATD program. Concerning the first question, recall that the DMGT operationalizes 'outstanding' as membership in the top 10 % on any valid measure of the targeted ability (Gagné 1998), either aptitude or achievement. This choice of minimum threshold circumscribes a student population whose achievement level differs quite significantly from that of students in the above average groups of typical tracking systems (Kulik 2003), or the approximately top 30 % high school students in most German gymnasiums (see eponymous Wikipedia entry). This DMGT-based minimum access threshold is just that, a minimum threshold; there are selective special schools in the USA and abroad that receive each year hundreds of applications above their admission capacity from academically talented (top 10 %) students; they have adopted—or been forced to adopt for lack of competing institutions—much more stringent access criteria (Finn and Hockett 2012; Kolloff 2003). On the other hand, program coordinators should adopt a 'funnelling' approach in the case of very young candidate talentees; they would set a more generous initial threshold because very young children have not yet accumulated much proof of their promising status, and then would conduct a progressive winnowing of students who encounter serious achievement problems within the ATD program. In other words, program administrators must not weaken their high excellence goals to keep underachieving talentees; it is the talentees' responsibility to invest their best cognitive abilities and socio-affective dispositions to remain in the program.

The second question concerns the choice of admission criteria into an ATD program. The most logical answer consists in finding criteria with maximal predictive power of high achievement in the program; programs with many years of activity should have gathered that kind of information. These predictors can be found among the dozens of variables included in the four causal components (G, D, I, and E) of the DMGT. There is of course a limited pool of scientifically proven predictors, crowned by intellectual aptitudes (Macintosh 2011), which includes as most powerful predictors intrapersonal characteristics such as conscientiousness, deliberate practice, love of learning, will power, and 'grit' (e.g., Duckworth et al. 2007; Ericsson 2006; Gagné 2004; von Stumm et al. 2011). The relative predictive power of these variables will certainly vary to some extent from one ATD program to the next. In fact, a proper answer to that question would require book-length analyses to cover the enormous scientific literature on the subject.

One last question has special relevance within the DMGT context: the relative importance of measures of cognitive abilities (with giftedness as its outstanding manifestation) as opposed to measures of school achievement (and academic talent as its outstanding manifestation). Various surveys of identification practices in school districts (e.g., Coleman and Cross 2001; Cox et al. 1985; Johnsen 2009) have shown that two identification instruments outrank all others in terms of their prevalence: (a) IQ scores from group-administered cognitive ability tests and (b) scores from local subject exams and/or standardized achievement tests (SATs). Indeed, the domination of that pair of measures has led me to propose the acronym IGAT—intellectually gifted and academically talented—to describe the typical population of students in US gifted programs (Gagné 2007). In other words, being bright is rarely sufficient to deserve the gifted label; students must also show high academic performance. The IGAT acronym conveys that idea of 'bright achievers.'

If both sources of information dominate identification criteria, which of the two should receive priority: IQ scores or SATs? At first glance, indices of talent appear simple, both at the data collection and interpretation levels. Yet, that easy metric and straightforward meaning hides a much more complex interpretive situation. According to the DMGT, talents (T) result from the progressive transformation of high natural abilities (G) through a long developmental process (D), with the catalytic help of personal characteristics (I) and environmental influences (E). Consequently, measures of talent incorporate the *combined* influences of all these distinct sources (G, I, D, E), which give them very complex roots. They have roots in the genetics of high natural abilities, roots in passion and interest for a field's knowledge and skills, roots in unfailing perseverance and will power, roots in parental and teacher support, and, let us not forget it, roots in lots of chance, both good luck and bad luck. This is no doubt why achievement measures predict so well future achievement, much better by far than any measure of potential. For instance, Marques et al. (2011) found correlations above .90 between consecutive aggregated subject matter achievements in grades 6–8. For his part, Muijs (1997) observed an 'extremely strong relationship [between] school achievement in wave 1 [Grade 4] with school achievement in wave

2 (…) a fact born out by a Pearson correlation of .88 ($p < .001$) over time' (p. 272). Talent scouts usually identify future talentees by observing the non-competitive learning activities of a mixed group of learners (e.g., regular schooling, music lessons, and playful sport participation); they will look for outstanding and precocious achievements, in other words emerging talent, as well as signs of strong motivation and volition.

In summary, the above discussion leads to the following conclusion: If forced to choose between IG and AT measures, I would not hesitate to prioritize academic talent, even if it meant that some selected students would not reach the minimum giftedness threshold of top 10 %. Other scientifically confirmed significant predictors, like those mentioned above, can easily compensate for under threshold natural cognitive abilities.

7. Early interventions

This final desirable practice confronts a common administrative practice in school districts, namely to delay structured enrichment until at least Grades 3 or 4. The justifications given appear associated with worries about (a) less reliable selection procedures with younger children, (b) a still fragile development, and (c) moving too rapidly from the playful early school environment to the more achievement-oriented regular classroom 'treadmill' (Rogers 1991). That postponement policy contradicts a fundamental law of individual differences in development: Precocity can manifest itself… precociously! Indeed, the existence of the *Wechsler Preschool and Primary Scale of Intelligence* (WPPSI-III) confirms that intellectual precocity becomes easily noticeable by ages 3 or 4, and sometimes manifests itself well before that (Gross 2004; Winner 1996). Indeed, many children who enter kindergarten already know the alphabet, can write their name, read some words, and even do simple arithmetic computations. Their intellectual precocity makes them better prepared than the average first grader to tackle the Grade 1 curriculum. Dozens of studies (see Gagnier 1999) have shown that the level of cognitive development, as measured by IQ and/or school readiness tests, predicts academic achievement in the first grades of elementary school much better than students' chronological age. The correlation between chronological age and academic achievement among cohorts of first graders ranges between .10 and .25 (Gagné and Gagnier 2004), whereas the predictive power increases to .50 or more when using school readiness tests (Jensen 1980). In terms of explained variance (r^2), the difference between the two predictors amounts to at least a 6:1 ratio! Yet, most school systems maintain chronological age as the almost unique admission criterion, no doubt for administrative simplicity. In the meantime, the vast majority of precocious learners stay in preschool or cannot skip to Grade 1; they lose a full year of progress, impatiently waiting to confront a more challenging curriculum.

It is a very sad state of affairs that although early entrance provisions have never become popular, research evidence has shown their numerous benefits. After examining all 68 evaluative studies of early entrance, Rogers (1991) concluded that it constitutes a very desirable initiative for the vast majority of children. Summarizing the results of their own evaluation of the socio-affective impact of early entrance to kindergarten in Quebec, Gagné and Gagnier (2004) argued that a small but significant percentage of unsuccessful cases of early entrance to school could explain, at least in part, the continuing resistance of many educators and parents toward that practice. In summary, this seventh constituent element strongly recommends that school administrators make this initial service the cornerstone of their school district's talent development program. As the TCTD's fifth commandment adjures: 'Thou shalt intervene…earliestly!' (Gagné 2007, p. 102). Of course, labeling early entrance a 'cornerstone' implies that it should be followed by the other building blocks of a comprehensive ATD program, all the way from kindergarten to college.

Final comments

How would ATD programming look like in a typical school system, and where can we find existing examples of the DMGT-based ATD model? These are the last two questions we can briefly address within the limits of this article.

With respect to the first question, a comprehensive ATD programming system would offer a structured sequence of ATD programs covering the whole K-12 educational course. It would begin in kindergarten or first grade with an early entrance policy for intellectually precocious children. Beyond that initial entrance component, academic talentees would follow a parallel, constantly enriched pathway all the way from kindergarten to the end of high school, or the end of secondary education for those accessing college early (e.g., Noble and Childers 2009). That pathway would be available to all children manifesting clear indices of future outstanding academic achievement; it would incite them to set for themselves challenging academic excellence goals. Ability grouping would not necessarily mean enforcing an 'enriched' age-grade lockstep; educators would still occasionally allow further acceleration because of remaining large individual differences in learning pace *within* the talentee population. This comprehensive programming system would substitute the labels 'gifted children' and 'gifted education' for the more relevant terms

'talentee,' 'academically talented,' and 'academic talent development'. Educators would still use the gifted label, but in a more specific context; it would refer to natural abilities, for instance, when talking about 'gifted learners,' exactly as proposed within the DMGT framework. But (academically) talented would become the more common expression, if only because it represents the main criterion of access and progress within ADT programs. Teachers endorsed with the responsibility of guiding talentees through the program would be called 'ATD teachers' instead of 'gifted teachers'—awful!—or 'gifted ed. teachers.' Professional associations could follow suit; for instance, the American NAGC could even rename itself *National Association for the Development of Academic Talent* (NADAT), again a much more precise representation of its mandate, what Renzulli and Reis (1991) called 'the business of our field.'

The second question looks at the implementation of the ATD model in K-12 classrooms. As explained in more detail in the initial presentation of the ATD model (Gagné 2011), the two more popular prototypes found in elementary classrooms (Archambault et al. 1993; Cox et al. 1985) are pullout classes and regular classroom enrichment (RCE). Both practices ignore most of the key characteristics described above, especially the crucial principle of constant enrichment of the formal school curriculum. In the specific case of RCE, major evaluation studies (e.g., Archambault et al. 1993; Robinson 1998; Westberg and Daoust 2003) have shown that the vast majority of these provisions offer little more than a lip service response to talented students' needs. The results revealed, among other things, that teachers offered these activities no more than two or three times a month; even worse, the activities usually targeted the whole classroom, leaving little specific enrichment for talented students. The authors concluded:

> The results of this survey paint a disturbing picture of the types of instructional services gifted students receive in regular classrooms across the United States. It is clear from the results that teachers in regular third and fourth grade classrooms make only minor modifications in the curriculum and their instruction to meet the needs of gifted students (Archambault et al. p. 5).

From these results, one can understand the label of 'busywork' Julian Stanley (1979) used with disdain to describe most of what passes for regular classroom enrichment.

If we encounter virtually no DMGT-based ATD programs in primary schools, we can observe interesting examples of ATD-style academic enrichment at the high school level, for instance, the 165 highly selective public high schools—still <1 % of the 22,568 public high schools—identified by Finn and Hockett (2012) in 30 states in the USA, or the network of 50 or so selective high schools in New South Wales, Australia (see eponymous Wikipedia entry). Finally, when systematically implemented with a truly enriched curriculum (Kulik 2003; Seifert 2009), self-contained honors classes also represent good examples of academic talent development. Yet, most school systems fall very short of answering the educational needs of their academically talented high school students. For most of them, the school system has planned a single path: An age-grade lockstep coupled with a slow-paced curriculum that covers the 13 years from kindergarten to 12th grade. And that harsh judgment of academic monotony extends to almost every developed country.

As limited as it may be, this sample of existing programs demonstrates that the DMGT's ATD model can be implemented in our field. On the other hand, their small number, especially their almost total absence in elementary and middle schools, suggests that extensive dissemination lies far in the future. The specter of elitism hangs constantly over our heads (Benbow and Stanley 1996); the low priority in schools of talented students' educational needs remains a serious obstacle to increased public investment; the ambivalent attitudes of many teachers and administrators have deep roots; resistance toward the two main administrative provisions needed to fully implement the ATD model, namely full-time grouping and acceleration, will not disappear easily. Changes in terminology will also happen very slowly; the 'gifted' label is too deeply embedded in our professional lexicon to expect a rapid increase in use for the terms 'talented' or 'talentee.' In summary, just as students do with regard to their educational goals, we should split our ultimate trajectory into a coordinated series of more modest intermediate goals; at the same time, if we believe in the ATD model, we must maintain constant pressure on educational authorities and the school community. As stated in my 11th commandment (Gagné 2008): 'Thou shalt advocate …unremittingly!' (p. 237).

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