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In September of 2015, one of the greatest medical writers of the twentieth century passed away. Oliver Sacks, MD was a British neurologist who was well-known for his book, ***Awakenings*** (1973), the story of patients who became ill from sleeping sickness in the 1920s, and were subsequently treated by Sacks in the late 1960s and 1970s. He used a new drug for that time, L-dopa, to bring them out of their stupors of fifty years or more. These patients, who were permanent residents of Beth Abraham Hospital in the Bronx, New York, regained some cognitive functioning and a sense of reality in the new world they encountered. (It should be noted that Sacks spent most of his professional career in California and New York.) ***Awakenings*** was subsequently made into a hit movie in 1990 starring Robin Williams and Peter De Niro. Three other books that I particularly like by Sacks are ***Uncle Tungsten: Memories of a Chemical Boyhood*** (2001) which is about his learning chemistry from his Uncle Dave–a technologist and entrepreneur. It also covers British culture prior to and after World War II. His parents, who were physicians, sent him to the safety of a private school in the country during the German bombing of London (World War II–Battle of Britain). This was a traumatic experience for a young boy separated from a loving and deeply religious Orthodox Jewish family. Unfortunately, he was seriously mistreated by the owners of this school, and suffered mentally from the hateful headmaster and school bullies. (George Orwell and Freeman Dyson have described similar experiences in English private schools.) As a six-year old, Sacks had an intense fascination with prime and Pythagorean numbers which helped him to mentally escape from the oppressive private school environment. After returning to London in the summer of 1943 at the age of ten, he began visiting his Uncle Tungsten (nicknamed after the metal) again and studying chemistry with him. In regard to this mentor relationship, he said: “Above all, I delighted in being able to visit Uncle Tungsten again–his place, at least, seemed relatively unchanged (though tungsten was now in somewhat short supply, because of the vast quantities needed for making tungsten steel for armor plating). I think he also delighted in having his young protégé back, for he would spend hours with me in his factory and his lab, answering questions as fast as I could ask them. . . .” (p. 34).

Musicophilia: Tales of Music and the Brain (2008) is a “tour de force” analysis of the relationship between brain functions and musical talent and performance. This is a major work in a difficult area of human cognition which every composer and performer should read and discuss with colleagues. It analyzes (in the context of doctor-patient dialogues) various neurological disorders related to hearing, music, playing music and disruptions in musicality usually brought on by accidents, aging or strokes. Some of the neurological disorders are: loud and repetitious hallucinations of the same songs or notes, tone and rhythm deafness, the inability to integrate notes into meaningful compositions or performances, amnesia, aphasia, and Tourette’s syndrome. In addition, he includes fascinating discussions of positive characteristics such as perfect pitch and synesthesia.

Gifted students can learn and be inspired by Sacks’ medical research and patient interview techniques. In ***Musicophilia***, they will learn about his different research areas as related to his patients’ unusual responses to music. The book also has an extensive bibliography. His discussion of many of the materials listed in this bibliography and his interactions with patients are illuminating. For example, ***Chapter 5: Brainworms, Sticky Music and Catchy Tunes*** and ***Chapter 6: Musical Hallucinations***, are excellent examples of how he explains medical research and engages in interactions with patients. The main theme of these chapters is “hallucinations in the sane (p. 77).” His experiences with patients’ music disorders demonstrated that they were neurological rather than psychiatric problems. He even uses literary insights to comprehend this dynamic. There is a story by Mark Twain (**A Literary Nightmare**, 1876, pp. 42-43 in Sacks’ book) in which the protagonist experiences repetitious “jingling rhymes.” A couple of days later he meets his pastor friend who becomes accidentally infected with these jingles. Then the pastor soon accidentally infects his entire

congregation. Gifted students will be well-informed and entertained by ***Musicophilia*** because the author is a great healer both as a physician and story teller.

The last book (his autobiography) that I highly recommend is ***On the Move: A Life*** (2015), a personal account of Sacks' life and professional career in Britain and the United States. In reading this account of his life from when he was in his twenties until his passing at eighty-two from ocular cancer, I was impressed with his ability to use patients' case histories to construct insightful understandings of complex neurological conditions. He was an outstanding literary talent, a synthesizer of difficult medical ideas, and a high energy individual with many different interests. Gifted students who concentrate on literary analysis and biology should find his books to be very useful.

Here are some suggestions for stimulating students in the gifted classroom:

1. Emphasize the humanities by studying such authors and satirists as Mark Twain, Charles Dickens, and Jane Austen. Outstanding poets should also be included–William Wordsworth, Henry Wadsworth Longfellow, Emily Dickinson and Mary Oliver, among many great talents in English and American poetry.

2. Use concepts of STEM education for gifted students by adapting recommendations from Harry Roman and other technology, science and engineering experts who have applied their ideas to elementary and middle school classrooms. As most of you know already, Roman has written many insightful articles on this topic for ***Gifted Education Press Quarterly*** and ***Gifted Education News-Page***.

3. Encourage the study of art, music, dance, creativity, discovery and invention through visits to museums, viewing DVD and television shows, reading about outstanding inventors and highly creative individuals, attending lectures and live performances, and taking lessons in these and other performing arts areas.

4. Work with other teachers in your school to achieve a synthesis of 1-3 above. This is obviously difficult to accomplish, but it is essential to achieve in order to bring our schools into the twentieth-first century of educational development.

Articles – Winter 2016

1. Harry Roman examines some of the skills necessary for effectively teaching STEM topics to gifted students. This article was previously published in the April-May 2015 and June-July 2015 issues of ***Gifted Education News-Page***.

2. Hanna David discusses research on what makes an effective teacher of the gifted.

3. Kathryn P. Haydon discusses some methods for developing creativity in the classroom and home.

4. Michael Walters describes one of the great anthologies of world literature published by W. W. Norton & Company.

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Quotations

Teachers open the door. You enter by yourself. Chinese Proverb.

Music codes the inner life of human nature. Yo-Yo Ma, world renowned cellist. From an interview on Symphony Hall, SiriusXM Satellite Radio, October 2015.

Music is a higher revelation than all wisdom and philosophy. Ludwig van Beethoven.

Music in the soul can be heard by the universe. Lao Tzu.

The secret to your success as a musician is your ability to communicate to that audience, and that doesn't necessarily mean talking. *Wynton Marsalis, 1961- (jazz and classical musician, director of the Jazz at Lincoln Center Program). From interview in* ***JazzTimes: 1998/99 Jazz Education Guide***.

I look at music the same as I look at my bloodstream, my respiratory system, my lungs. It's something I have to have. I was born with music inside me. *Ray Charles, 1930-2004 (soulful pop singer, composer, pianist).*

''Democracy'' in music doesn't work. The concept of majority rule is basically anti-creative, by definition anti-individualistic. Bach, Beethoven, Brahms, or Stravinsky did not create by common consent or committee vote. Neither did Caruso or Casals or Furtwängler or Mitropoulos or Michelangelo. . . *Gunther Schuller, 1925-2015 (American composer, conductor and musician). From a lecture, 1980.* ***Maurice D. Fisher, Publisher***

"School Won't Change – Until We are Brave Enough to Change the Way We Teach Teachers"

Harry T. Roman
Teacher, Author, Inventor & Retired Engineer

My Inspirational High School Science Teacher

These words were said to me in the very last conversation I had with my life-long teacher, friend and mentor – my inspirational high school science teacher….a man who started integrating the curriculum back in 1964. His remarkable way of demonstrating how the world of work related to science and our other subjects totally rocked my young world, forever changing the way I solved problems.

From that time forward, I yearned to see the connections between subject matter. That two-year-long, double period course, known then as integrated science, super-charged my desire to be an engineer…..and a teacher; and for the last 50 years has been my splendid dual passion. Along the way, I also honed my gifts for writing and invention. I have never stopped learning since Morris Lerner lit my flame, helping me to fashion a steering wheel and some strategic maps to go along with my finely-tuned, high horsepower engine.

His many assigned ten-page papers (with formal references and footnotes) made us examine the technical, economic, social, and cultural impacts of the scientific topics we were writing about. His classroom pedagogy and commentaries later resulted in my "360-degree problem solving philosophy," a paradigm I often use in conducting professional development courses for teachers, write about in this newsletter, and discuss in my Gifted Education Press teacher resource books (which GEP has published over the last eight years). He was as hard on our writing as our English teachers. Often he gave us two grades on our papers – one for technical content and one for spelling/grammar! What would your gifted students think of this?

We also applied what we learned with a laboratory activity every single week, and technical electives that had us using head and hands to build and test something practical; two full years of this regimen without let-up. Not one of thirty students who took this course ever quit or dropped out.

Morris also taught me something else that is very important. It is the teacher who controls the learning in a classroom – not standards, guidelines or hierarchy. It is up to the teacher to make it all make sense. How effectively a student learns is all about how teachers were: trained/educated; motivated to tie things together; and their commitment to excellence throughout their career. Teachers first and foremost are the catalyst for learning.

A New Teaching Legacy Grounded in Critical Skills

Before we can ask that teachers be trained and educated differently, we need to understand the world the students of tomorrow will experience. The work-a-day world is a multi-dimensional environment that expects its workers to solve problems cooperatively, through inter-disciplinary, team-based project activities – assessing, evaluating, and making tradeoffs as necessary. Here are the critical skills globally competitive employers will look for. Please notice also how all these skills depend very much on a solid bedrock foundation of good communication skills.

1) Analyze Information

In an information-rich company, people with good planning, organization and analysis skills will be in key positions to manage, process and interpret the huge flow of internal and external data and information. With solid logical and analytical skills, employees should be able to understand the significance of the information and recommend action.

2) Convert Information Into Knowledge

All innovative companies strive to convert raw data and corporate-gathered information into saleable products and services. Executives use this knowledge to help them gain competitive and strategic advantage over other companies. Significant value is placed on individuals who can convert data and information into knowledge, and do it quickly, efficiently and consistently.

3) Sell New Ideas to Management

The ability to implement new ideas and concepts is the real measure of success. To bring ideas to fruition, one must be proficient in selling ideas to the executive who can grant access to the necessary corporate resources. Remember — no one will give poorly packaged and presented ideas the time of day, regardless of how promising they may appear.

4) Communicate Concepts Clearly and Succinctly

This skill is a 'biggie.' Careers have been – and continue to be – severely jeopardized because of poor communication skills. In fact, without them, one's career could be permanently stunted. Employees *must* be articulate. Today's managers often judge employees by how well they express themselves, both orally and in writing. Communication skills are the absolute foundation for all the others.

5) Plan for Timely Commercialization

Getting new products to market is the way companies sustain their cash flow and generate new sources of it. Timely implementation begins with people who know how to plan, organize and execute the commercialization process. Knowing how to plan well allows an employee to handle a variety of different projects, and sends a clear signal that one knows how to use precious corporate resources efficiently and effectively.

6) Be a Team Player

Team-work and collaboration among corporate departments has become a mainstay of industry problem solving. Team members must possess excellent communication skills, present new ideas effectively, and resolve to act together to address corporate problems and needs. Articulate leaders connect their team members and their assigned tasks to the big corporate picture. Selecting the right mix of team members is as important as formulating the problems the team must address.

7) Do Multi-Dimensional, Integrated Problem Solving

Making sound business decisions require more than just the technical and economic aspects of a problem. The environmental, safety, social, political, and regulatory considerations of a new product are also important. Employees need a balanced education so they can make tough choices from a multi-dimensional selection of options. Employees who can think and reason about problems on multiple levels simultaneously are essential in today's complex decision-making environments.

8) Seek Learning Opportunities

Learning must be constant. Continually improving or rejuvenating one's skills to meet new corporate challenges is absolutely essential. Employees must develop and maintain a life-long discipline of learning, honing skills, building new knowledge, and setting new goals. The global economy is a very unforgiving place**.**

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Knowing what will be expected of school graduates, let's ponder how the training/education of teachers might be changed to make the school-to-work transition as effective as possible.

Teaching Relevance

I do love the tradition of student teaching, and wish my profession of engineering had a long-standing component like this in its undergraduate education pedagogy. With the subject of relevance uppermost in many discussions about making students more receptive to their education, I would be a huge proponent of student teachers working in or apprenticed to companies in which their students might eventually wind up working in. For example, if science and math teachers worked for a summer in a high tech company, actually doing meaningful work, don't you think they could show relevance to their students about how algebra, general science, physics, chemistry and geometry are used in problem solving on the job? I would also like to see veteran teachers periodically working in industry and business to keep their relevant skills sharp and focused.

Teaching Teamwork

The currency of the business world today is team-based, head and hands, problem solving….so teach teachers to do this while in school, study the dynamics of team-building and operation, and the leadership of student teams. This is where giving student teachers a big dose of STEM/STEAM concepts will go a long way. Using invention notebooks and being able to seriously work with students on written and oral communication will produce big dividends in college and on-the-job. Demanding and grading good communication skills should be the job of all teachers.

Co-Teaching

Teacher teams that experience the co-teaching of subject matter is vitally important, as business prides itself on inter-disciplinary, multi-faceted problem analysis. For example, when attempting to install large scale applications for a solar power station – something on the order of several hundred acres…have a team of student teachers (in the disciplines of science, math, environment,

history, and geography) assemble to discuss the analysis and explore how these disciplines are connected. Develop solutions that take into account all subject concerns, a mediated solution if you will.

Paying Extra Attention to Grades K-4

Whenever I visit a school, I always ask K-4 teachers why they became teachers, invariably learning they love children….and that is a good thing. I also learn that most of them shoot for these grades because they are not good in math or science…a big problem. Turning children off to math/science in the early grades makes it very difficult to get them back, especially when 70% of the annual economic growth of our country comes from high tech; and critical jobs that need to be filled in areas that support such growth are going unfulfilled. Target K-4 teacher education for major overhaul, teaching teachers to pay lots of attention to math and science! It is vital to our national economy and the rounded education all students deserve. Build the math especially into the lower grades. Show how it works.

Subject integration is an important issue here as well. Students in the formative grades need to think in an integrated manner, seeing problem solving as an iterative process. Coupling this with good communications skills is a powerful approach that will demand new teaching paradigms for collegiate schools of education.

Asking Questions is Very Important

Teachers need to encourage students to become question-askers, seeking to know as much as possible about things being discussed in the class, or where trying to complete a team-based design challenge. It has often been said that smart students know the answers to questions, but gifted students are the ones who ask the key questions, cutting to the heart of the problem.

Oral/Written Communication Skills

Teachers must have great oral/written communication skills – the enablers for all the other skills; and they must be able to work these skills into everything they do in the classroom – exercises, design challenges, general written work, etc.

No More Zero-Sum Outcomes

I see this all the time when the new teaching process *du jour* comes to town. It gets treated like a new course to teach….and since most of the academic day is already assigned to subject matter, the new approach becomes something like an elective, a special class, and after-school activity, or even something else. I see this in the current STEM/STEAM model, and it frosts my "you-know-what." Integrate the damn curricula and move toward a two-tiered kind of educational model. Start with selected dissertation delivered topics in the morning with the cherished class bells; and by afternoon, the students work in studio formats applying what they are learning…..and no class bells. Eventually, no bells at all. In the world of business, there are no bells and the employees are learning all day from each other.

Look for the connections between subjects and how clusters of subjects can be taught together such as math, music, science, and art; or maybe social studies, civics, geography. Turn the pizza-pie slice model of education on its head as it should be. In the 1970s, industry abandoned the piece-meal model of the assembly line on its head and started concentrating on the total quality of the whole product, using employee teams as their central focus for continuing education on the job.

Remember the Ford mantra…."Quality is Job 1." That was 45 years ago. So isn't it time for schools to catch-up? Total product management is just an analogy for on-the-job integrated learning and problem solving. Business employees are constantly applying what they just learned. Why can't students do so every day in their schools?

In retrospect we not only need a radical new way to teach teachers…..but the collegiate professors as well, the delivery system for making new teachers…..needs to change as well.

Epilog

As I look back on that life-changing two years in high school, I think it really was a high school G&T course, an urban oasis, with many incredible innovations. About half of the students who took Morris Lerner's integrated science class placed in the top 30 students out of a graduating class of 635. The school's three co-valedictorians came from that group. It was the best educational experience of my life; and I was incredibly fortunate to have met and befriended such an incredible science teacher, who incidentally was

president of the National Science Teachers Association (NSTA) in the 1970s. Morris later went on to found Newark's nationally recognized Science High School, still vibrant and challenging as he had original conceived it. I owe this man more than I can ever repay. Before he passed in 2008, he gifted me with his personal technical library, books I treasure beyond description. I miss him terribly; but know full well my responsibility to influence others to make school better than it is today…..to pass the torch and keep the light glowing bright.

Additional Readings

For more about my thoughts on gifted education and what tomorrow's school might look like, check out my previous writings listed below.

Teach STEM Right – Change the Academic Day! ***Gifted Education News-Page***. Volume 23, No. 2, Dec. 2013/Jan. 2014.

Solving Real World Problems in the Classroom – A Realistic Application of STEM/STEAM Principles. ***The Journal of the Illinois Association for Gifted Children*** (IAGC). March 2014.

Changing Education-Thoughts about Creating and Inventing Tomorrow's School. ***The Journal of the Illinois Association for Gifted Children*** (IAGC). March 2015.

Defining What Characterizes a Great School for the Gifted. ***Gifted Education Press Quarterly***. Volume 29, No. 2/Spring 2015.

See information on Harry Roman's Latest Book, Just Published by Gifted Education Press:

How an Engineer Uses Math – Real World Practical Examples for the Gifted Classroom in Environmental, Power, and Energy Areas – Middle and High School (2015) by Harry T. Roman**.** Excellent introduction to real world math, science and engineering problems. http://amzn.to/1GEklCn

Does the Gifted Student Need a Gifted Teacher?

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Introduction

Regarding teachers of the gifted:

1. Is it recommended, or is it better for gifted students, that their teachers should be gifted individuals?

2. Should teachers of gifted students be especially talented regarding all aspects of teaching but not taking their intellectual abilities into consideration?

The second question, namely, the required characteristics of a gifted and talented teacher, has been widely discussed. The characteristics that are considered most important for being good teachers – whether in the regular system or for gifted students, have not changed since this question has been first discussed. This article will offer a summary of the characteristics of the good, ideal, or recommended teacher according to studies published around the world.

The first question, whether teachers of the gifted should be gifted, will also be answered – to the best of my knowledge for the first time in the literature dealing with this issue.

Why is student/teacher adequacy of special importance in gifted education?

One of the most common complains of both gifted students and their parents, as well as in websites of gifted families is: "the teacher hates my child," or in a more moderate version: "In order not to make my daughter feel bad, the teacher never mentions her giftedness." Many parents whom I have met both during public lectures for parents of the gifted and in private consultations

have been convinced that the teacher of their daughter or son "harasses" the child. If, for example, in their municipality the enrichment program for the gifted takes place on Mondays, according to them: "all social activities of the (origin) class take place on Mondays, so my daughter has either to miss these activities or her enrichment program." About 25 years ago a mother of two gifted children, who was a psychologist, approached me during a concert's break and told me that though her son was gifted, he was not mathematically gifted, and thus, the decision of his teacher to have two math classes on the day of the enrichment program caused him so much distress that he finally decided to leave the enrichment program in order not to have to learn by himself a subject he was not very good at and did not particularly like.

Without getting into the question whether these behaviors of teachers in regular classes describe the situation accurately or they are exaggerated, and without trying to discover the reasons for such non-supportive feelings and behaviors against gifted children, let us try to find whether it is possible to minimize the damages resulting from them to most gifted children's learning, most of the time in regular classes.

The structure of the article

The issue of the cognitive level of teachers – not just for gifted students but in general as well – has been considered a taboo in many countries. While many studies have examined the personal characteristics of ideal teachers of the gifted – their educational level, their organizational level and their emotional capabilities – attempts to find studies dealing directly with the cognitive level, or – the cognitive giftedness of the teacher of the gifted, have produced no results.

In this article I intend to:

1. Summarize the adjectives appearing in the scientific literature regarding the qualities of the "good," "outstanding" or even "excellent" teacher – both in general and in teaching the gifted in particular;

2. Present the two paths in the discussion of the ideal teacher for the gifted;

3. Show that existing descriptions of the good teacher of the gifted include the cognitive giftedness component, and thus crack the taboo on the demand that teachers of the gifted should have very high cognitive abilities;

4. Give examples of gifted teachers from three countries;

5. Conclude that: Gifted students need gifted teachers.

This article is meant to be a platform for further investigation of this issue, based primarily on data about teachers of the gifted and teachers in the general education system from a variety of countries.

1. Adjectives replacing that of the "good" teacher

The use of the term: "a gifted teacher" has been very rare. There have been many possible replacements for it. As each of them has many – maybe too many – definitions, let us closely observe just those belonging to one of them: "**effective teachers."**

The characteristics of an "effective teacher," according to Gentry et al. (2011), are:

- A strong grasp of subject matter and high expectations of students;
- The skills to balance students' intellectual achievements and interpersonal needs in the classroom;
- The ability to set high, realistic goals and present information in a manner that facilitates student learning;
- Effective teachers care about and have positive interactions with their students;
- They possess professional, interpersonal, and intrapersonal knowledge;
- They develop strong student-teacher relationships;
- They seek new solutions through continued learning;
- They are primarily focused on teacher knowledge, pedagogical skills, and dispositions.

According to a survey conducted by Babbage (2002), effective teachers:

- Challenge students, adopt various teaching methods to actively involve students in class;
- Are enthusiastic and encouraging;
- Connect learning at school with students' lives.

Roberts (2006) described effective secondary teachers as those who:

- Support students' interests and provide challenging opportunities that help students make their decisions about their career interests;
- Teachers of secondary gifted students regularly plan, pre-assess, and differentiate to ensure continuous, meaningful learning.

According to Demmon-Berger (1986), the five main characteristics of effective teachers are: 1. strong cognitive skills, 2. knowledge of subject content, 3. flexibility, 4. enthusiasm in their delivery of instruction, and 5. strong classroom management skills. The first four characteristics are associated either with components of intellectual giftedness or with emotional characteristics of gifted and creative people.

Witcher et al. (2003), who studied 912 undergraduates and graduate students from various academic majors enrolled at a university in a mid-southern state, revealed the following nine characteristics that students considered to reflect effective college teaching: (1) student-centered (58.88%); (2) knowledgeable about subject matter (44.08%); (3) professional (40.79%); (4) enthusiastic about teaching (29.82%); (5) effective at communication (23.46%); (6) accessible (23.25%); (7) competent at instruction (21.82%); (8) fair and respectful (21.60%); and (9) provider of adequate performance feedback (5.04%). Except for the first characteristic, "student – centered," all other 3 that were considered most important by the students – "knowledgeable about subject matter," "professional" and "enthusiastic about teaching" are closely related to components of giftedness or excellence, which is the materialization of giftedness.

Ableser (2012), who had written in length about exemplary teachers admits that: "In addition to the term exemplary practice, research and studies have used a range of terms including teaching excellence, effective teaching, high quality and best practices. According to her: "For the purpose of this research, the terms will be used interchangeably" (ibid, p. 66).

In addition to "effective teacher," outstanding, excellent teachers are also called: "high-ability teachers" (Howley et al., 2012); "ideal teacher" (David, 2014a; Tzidkiyahoo, 1975); "an exemplary teacher" (Ableser, 2012; Becker, 2000; Collinson, 1996; Gentry et al., 2005, 2011; Hativa, et al., 2001; Lowman, 1996); "an expert teacher" (Ethell, & McMeniman, 2000; Welker, 1992); "a great teacher" (Bishop, 1968; Davis & Rimm, 2004; Feldhusen, 1997); "an outstanding teacher" (Thompson, et al., 2008); "inspirational teachers" (Araújo et al., 2011); "accomplished teachers" (Sheingold & Hadley, 1990); "academically talented teachers**"** (Fulbeck, 2014; Spiro, 2013); and teachers who have an available a variety of ways and techniques (Ghamrawi, 2014).

It should be noted, however, that "**excellent teachers**" do not appear in this long list. To be "excellent" is, according to Ziv (1990), is to realize one's high potential, namely her or his giftedness.

2. Two paths in the discussion of the ideal teacher for the gifted

When dealing with the question: "Who is the ideal teacher of the gifted student?" – two different basic approaches should be discussed that do not necessarily contradict each other.

The first is of those who prefer to avoid definitions, tend to characterize such a teacher as "having a positive attitude towards the gifted," "loves children," "dedicated to work," "invests a lot in teaching," "innovative," and so on.

The second consists of researchers, teachers and psychologists who prefer quantifying the demands of such a teacher, and thus set a minimum educational level they perceive as necessary, and sometimes even the subject matter(s) the teachers have specialized in; a teacher who had been highly evaluated, appreciated and honored not only by her or his superiors but also by the students and their parents. As to the experience the teacher should have – all agree that the teacher must have some experience. While some believe that "more is better" others tend to think that a teacher with "too much experience" might be tired, worn out or just "too old" to connect to young, energetic people.

Attitude / knowledge /self-perception

Bishop (1968) found that teachers identified by gifted students as successful were described by these same students as:

> Motivating and inspiring, and as having positive **attitudes** with student-centered teaching styles. The same is largely true today. Parents, administrators, and students often know a **great** teacher when they see one.

McCoach & Siegle (2007) studied the attitude of 262 teachers towards gifted students and giftedness. To be more exact – they tried to find if the reports of teachers regarding this issue are consistent with what teachers perceive as the opinion of researchers. They have found that "Teachers who had received training in gifted education hold higher perceptions of themselves as being gifted." However, teachers' self-perceptions as gifted were unrelated to their attitudes toward gifted education. This means that teachers who thought they were gifted had no better attitude towards their gifted students than teachers who did not. This finding contradicts previous ones (e.g., Bégin & Gagné, 1994a; Michener, 1980). Furthermore, according to McCoach, & Siegle (2007), no difference regarding the attitude of teachers towards gifted students was found between teachers who were trained in gifted education and those who were not. This finding was consistent with some previous ones, such as that of Bégin and Gagné (1994b) who viewed 8 other studies – 5 found low correlations between education in giftedness and positive attitudes towards it, and 3 did not.

It is interesting to note, that a program aimed at teachers of gifted students learning in a regular, mixed class has been successful. Cashion & Sullenger (2000) studied the changes in the attitudes and teaching techniques among teachers who participated in a 4-week summer training course in education of the gifted in Canada. In spite of the fact that the course took place in a rural area where education for the gifted had a low priority, there was one person in charge of gifted students in only four of the 18 participating schools where the spoken language was English. There was no legal obligation to offer special education for the gifted. Almost all participating teachers used new, various learning strategies aimed at the gifted immediately after taking the course. In addition most of them asked to continue the in-service course during the following summer.

We can thus conclude that learning about gifted students and giftedness might, nonetheless, change the beliefs and thus the attitudes of teachers towards their gifted students. The study of Geake, *&* Gross (2008) examined the attitudes of 377 teachers form England, Scotland and Australia, who participated in a 2-year "education of the gifted" course from September 2003 until May 2005. 290 of the teachers were female; about half – elementary school – and the other half – high school teachers; 145 had a Masters' degree; 129 had a teaching license in addition to their first degree; 66 had a teaching license in addition to their second degree, and 5 – a teaching license in addition to their Ph.D. At the end of the course the teachers demonstrated a substantial change in:

1. Recognition of characteristics of gifted children, including their cognitive high ability; 2. Moderation of their prejudices about the social inadequacy of gifted children; and, 3. Moderation of their prejudices regarding anti-social leadership of the gifted.

In this article I have not tried to show that the attitude of teachers towards gifted students is less important than any other characteristics of the good teacher for the gifted. The first necessary condition for teaching the gifted is having a positive attitude towards giftedness and the belief that gifted students deserve education that suits their needs. However, this condition is not sufficient. It is time that the cognitive components of the teachers of gifted children should be discussed openly, and emotional characteristics, such as intensity, perfectionism, persistence and the ability to do many things at the same time – which is common to many gifted children and much more common among the best teachers of the gifted, would be appreciated.

3. The existing descriptions of the good teacher of the gifted include the cognitive giftedness component

When carefully observing any of the existing descriptions of the good teacher it is clear that all of them include the cognitive giftedness component, and thus crack the false utterance that: "the intelligence of the teacher is not so important; the main thing is that she or he is… (Here comes a long list, e.g. understanding, empathic, warm, etc.).

Free gifted education started in Israel in 1973. Just a few years later, Milgram (1979) studied gifted and non-gifted children in grades 4 to 6. She found that all students appreciated teachers who were experts in the subject matter, taught in a logical, well-built structure; and teachers who were not only intelligent but creative as well. These basic characteristics did not change in the next two decades, and similar characteristics of the good teacher have been found by *Goldberg* (1994).

Gentry et al. (2011) have conducted one of the most extensive studies of teachers of the gifted. They have examined a sample of 400+ teachers, and came to some conclusions regarding "exemplary teachers" by studying 18 teachers who were identified as such by their students. The term "exemplary teachers" – appearing in their article 42 times – is explained (in note No. 1) as:

> […] the term *exemplary* throughout this article (is used) to identify teachers selected for study on the basis of high student scores on the constructs of Appeal, Challenge, Choice, Enjoyment, Interest, Meaningfulness, and Self-efficacy (ibid, p. 124).

David (2008) has summarized the characteristics of the ideal teacher of the gifted in four groups: characteristics related to personality; professional and didactic characteristics; knowledge and experience in psychology of the gifted; and good administrative abilities. Each of these groups consists of several, more detailed qualities. For example: having a positive attitude towards excellence, creativity, productivity and leadership; being an expert in the subject matter of teaching; being able to identify exceptional abilities – not necessarily revealed during diagnosis, and being able to organize special activities for the gifted.

There are some works dealing with the issue of "the good/excellent/exemplary, etc. teacher" of the gifted from a point of view of such a teacher. Coleman (1991) has written a detailed case study about an expert philosophy teacher. The teacher's thoughts were categorized into planning thoughts and action thoughts. The conclusion of this work is that the way in which the teacher's thoughts were connected to his practice could not be satisfactorily understood without getting access to the invisible, tacit knowledge of the teacher. The teacher's hidden world was described in relation to how the researcher discovered it. The description of "Alex," as the teacher is called in the article, is of a highly gifted person. He is an expert not only in gifted education but in many other areas of special education as well such as autism, learning disabilities and intellectual disability. He planned to conduct a "Socratic-type of discussion." He was very flexible – every day he planned the next day's missions according to the learning developments of the previous one; Alex was also flexible regarding the structure of each day: sometimes he chose to be more rigid and constructive while on others the flow of the day was more flexible. Alex was without any question a gifted person. Without diminishing the value of Alex's personal traits, his excellent relationship with the class that consisted of students aged 12-18 and the dedication he showed were all characteristics needed for teaching in general and teaching the gifted in particular. Anybody who has such an amount of available knowledge in so many educational areas, as well as such a high level in the subject matter he chose to teach, must be gifted.

4. Examples of gifted teachers from three countries

A McKinsey study (Barber, & Mourshed, 2007) of twenty-five of the world's school systems, including ten of the top performers indicates the following for high-performing school systems:

1. They engage the best possible people to become teachers;
2. They develop them into effective instructors;
3. They ensure that the system is able to deliver the best possible instruction for every child.

Of all these countries, Finland has scored best in Europe in the international examinations of the 21st century. Faridi (24/6/2014) has summarized the 13 reasons for it, two of which have to do with its teachers:

> **Out-of-this-world teacher prep programs.** […] becoming a teacher is an extremely rigorous and prestigious process. Only the best of the best are accepted into education school. In addition to having high test scores, candidates must pass an interview investigating their integrity, passion, and pedagogy. Universities are committed to finding candidates that are the right fit for the teaching profession. Their programs are research-based, and teachers finish with master's degrees, including a published thesis.
>
> **Emphasis on quality of life.** The Finnish system recognizes that happy teachers are good teachers, and overworked teachers will not be at the top of their game. Teachers prep from home and only teach to students about 20 hours per week.

In Finland only the upper 10% of candidates are accepted to education departments (Tirri & Kuusisto, 2013). Thus, there is no need for special arrangements so that gifted students would be taught by "gifted teachers" – All children get such teachers. In addition, all elementary school teachers are fully capable of teaching all subjects (ibid).

In the work of Taguma et al. (2012), *Quality Matters in Early Childhood Education and Care: FINLAND*, where this is the most successful European educational system regarding international achievements and the well-being of the students, giftedness is not mentioned even once. Instead of focusing on the giftedness of students, there is a list of requirements from teachers:

I. All elementary school teachers are fully capable of teaching all subjects

All subjects – except foreign languages – are taught by the classroom teacher up to grade 7 (Tirri, & Kuusisto, 2013). That means that the teacher must be an expert in a variety of subjects.

II. Individualism

The educational legislation continues the trend of individualism, and allows diverse education according to students' needs. It stresses the worth of individuals and the principle of accepting learners as unique, including respecting their rights. As noted by Van Tassel-Baska (1992), this policy, and its implementation by Finland's able teachers, has special benefits for gifted students, as the adoption of practices such as acceleration and grouping are the main issues that usually test the level of acceptance of differentiation for the gifted.

III. Acceleration

There are two main ways of acceleration in Finland, both are much less formal in any of the countries where giftedness is celebrated and highly depends on the ability of the teachers to simultaneously serve the needs of children belonging to different age-groups:

- Starting school at age 6 or 7. The Basic Education Act (628/1998) has allowed for flexible decisions with respect to acceleration. It has been possible for parents to decide whether their children will begin school at the age of 6 or 7 (previously the age was 7; Basic Education Act28/1998, Section 27; Basic Education Act 476/1983, Section 36).
- Another possibility for acceleration has been ungraded school, which allows pupils to advance in their studies within a flexible schedule. This ungraded system has been in use in most upper secondary schools since 1994 (…). The possibility of attending ungraded school at the elementary grade level has been experimented with in some schools (Basic Education Act 628/1998, Section 20). Parents have also had the right to choose the school their children attend (Basic Education Act 628/1998, Section 6) (Tirri, & Kuusisto, 2013**,** pp. 87-88).

Thus, in spite of the fact that:

> Finnish legislation does not explicitly mention gifted individuals, the education system still has a special structure: Teachers at all levels receive academic professional training, and an educational program of differentiation is standard from kindergarten onward. This means that all children are already educated according to their individual developmental and learning needs, which is the core principal of gifted education. In this respect, the Finnish educational system is highly developed with regard to gifted education (ibid, p. 89).

Finland supports special schools where the academic level is very high; these schools are not called "schools for the gifted" but the accepted students can be called "gifted" as they are high achievers and hard workers. There are also enrichment programs in mathematics and physics – both during the school year and summer courses. In addition, there is a special private boarding school for 15-18-year olds who are mathematically talented, and many summer camps in various places of the country.

All of these special arrangements could not have operated without the participation, support, encouragement and motivation of the teachers who do not perceive their profession as "passing the material" but as role models for the students who engage themselves in achieving constant learning towards excellence.

In the **United States** there has been a focus on gifted education since the beginning of the 20th century, and the existing research of giftedness goes back to the Terman longitudinal research and writing, as well as with the Hollingworth special school for the gifted, including her many studies and the first university course about giftedness. However, the focus on the teacher of the gifted was marginal during a large part of the 20th century. The late Abraham Tannenbaum and A. Harry Passow launched the first Teachers' College course at Columbia University in gifted education in 1955. In 1981 they created the Center for the Study and Education of the Gifted (now the Hollingworth Center). Tannenbaum was also a pioneer in defining gifted education as "special education." Thus, since he was appointed as a staff member of the special education department at Columbia University in the late 1960s there was – for the first time – a high level university department for specializing in giftedness both for Masters and PhD degrees. Columbia University has managed to maintain its special standing in the field of gifted education until now, both as an academic department as a part of Teachers' College, and as a unique publishing house for giftedness literature.

Mills (2003), who has studied 63 of the best teachers, as well as 1247 highly able students in the Center for Talented Youth at the Johns Hopkins University revealed that:

- The teachers in the program were more likely to prefer intuition and thinking, as compared to a normative teacher sample.
- The personality types of teachers were in many ways similar to the personality types of the gifted students:
  I. They preferred abstract themes and concepts;

II. They were open and flexible;

III. They valued logical analysis and objectivity.

However, they had very little formal knowledge in education in general and in giftedness in particular:

- The majority of teachers reported holding **advanced degrees in a content area**;
- Most teachers were **not certified to teach**;
- Most teachers reported completing **no formal coursework in gifted education**.

We can thus conclude that effective teachers of the gifted prefer abstract subjects and discussions, they are open and flexible, and appreciate logical thinking and objectivity. These teachers suit their students both in their cognitive level and style, and in their personality traits.

A similar situation has been found in the enrichment programs in Israel where more than 90% of the Israeli children were identified as gifted in order to participate. While many children who are invited to transfer to special classes after being identified as gifted prefer to stay in their regular classes, most children who are invited to the one-day enrichment programs do participate. However, the main finding of the only quantitative study of the teachers for the gifted who trained in 5 Israeli programs is:

> Partial results of the indirect measurement of the cognitive contribution regarding the teaching-learning situation and the required characteristics of the teacher of the gifted showed that the teachers did not make the required conceptual change. In spite of the fact that the participants in both programs (the one focusing on teachers' training, and the other that added the development of personal traits of teachers of the gifted – H.D.) acquired some knowledge regarding the task of the teacher in the enrichment program for the gifted, the teachers of the gifted in this program (the enrichment program for the gifted weekly program) that have not studied in any of the training programs enlarged their knowledge, based on field experience, and were similar to those studies in one of the training programs (Vidergor, 2010, p. 9).

Namely, the Israeli training programs for teachers of the gifted have no influence regarding their suitability, competence and effectiveness.

This situation can be explained by the fact that until the 2009-10 school year, most instructors teaching in the enrichment programs for the gifted in Israel were successful professionals in a variety of subjects who had a mission: to contribute one day a week to teach gifted students, in most cases for a minimal financial reward. Thus, no wonder most students who were offered to participate in these programs did participate, and the dropout rate was comparatively low. Since the 2009-10 school year all teachers teaching the gifted were required to take either the 2- or the 3-year course in one of the 3 Israeli universities (Tel Aviv, Ben Gurion, The Hebrew University) or in one of the Northern colleges (the Oranim or the Gordon Teachers' College) in order to qualify either as a teacher in a gifted class or as an instructor in one of the 50+ enrichment centers for the gifted (Professionalism of teachers of the gifted, 2009). As there has been no research regarding the potential results of this requirement aside from the study of Vidergor (2009) that had been completed before this requirement was obligatory, there is no way to know whether the requirement changed the level and competence of the teachers of the gifted. However, meeting hundreds of families with gifted children in these 5 years convinced me that the immediate result of this requirement has been that many good, experienced teachers left teaching in the enrichment programs, as they did not want to waste time learning irrelevant materials by non-professionals in the fields of gifted psychology and gifted didactics.

5. Gifted students need gifted teachers

The question: "should the teacher of the gifted be gifted?" can be answered from two different viewpoints. 1. <u>From the definitions of giftedness</u>: if we take one of the most common definitions, "giftedness is potential of excellence" (Ziv, 1990), as teachers are adults it would be expected that they had already realized their potential. The teacher's potential is – or is not – realized in teaching, so if the teacher is excellent – she or he are gifted according to this criterion and thus suitable to teach gifted students. 2. <u>From the requirements of cognitive abilities:</u> if we look at the various lists of the characteristics demanded from the teacher of the gifted, it is obvious that they all have a component of high intelligence, a wish to learn, investigate, and get into the roots of things; the wish to develop the cognitive abilities of the students while giving them a personal example of an adult who constantly widens her or his own horizons. Thus we can conclude that the teacher of the gifted should be gifted in teaching, namely – an excellent teacher, exactly as an adult gifted pianist is an excellent musician. A teacher of the gifted must love her or his students at least as much as a pianist loves both the piano and the music played on it.

It could be justifiably argued that gifted teachers should be allocated to all students, but as there are not enough gifted teachers, a priority should be given to gifted children as the educational – and very often – also the emotional needs of gifted students are difficult to satisfy. Thus the teacher contributes substantially not only to their intellectual but also to their psychological development and especially – their well-being.

When the cognitive level of the teacher is much lower than that of the student, he or she would find it very hard to satisfy the intellectual and the emotional needs of the gifted child. This assumption has not been examined in quantitative research, as this issue is a part of the "taboo" in discussing the IQ of teachers. Nevertheless, it can be concluded both from everyday life, where we can all observe that very intelligent people choose to be with those similar to them and find no common grounds with others who are much less intelligent. In countries like Israel, where the cognitive level of students in teachers' colleges is extremely low (on the entrance requirement to the Israeli college see David, 2011, 2014a), this gap in intelligence very often causes a serious problem, as I have noticed in my 30-year practice as a counselor of gifted children and their families.

There is no accepted-by-all definition of giftedness; thus, the only way to show that teachers of the gifted should be gifted is to point at both intellectual and personal characteristics of gifted children which are identical, or at least congruent, with those of good, extraordinary teachers for the gifted. Let us discus some of them.

Gentry et al. (2011), who studied the top 5-10% teachers according to students' recommendations, found that the "exemplary teachers" had a large repertoire regarding both knowledge in a variety of subject matters and didactics. This corresponds both to high intellectual level, which is the main definition to giftedness, and to what can be defined as "giftedness in teaching," namely, being familiar with didactics of the subject matter and having the emotional intelligence to teach efficiently using their creativity and flexibility.

Let us look as some representative traits of gifted teachers – in accordance with those of gifted students.

High energy level. This is important to everybody who is in touch with gifted children. One of the most frequent complaints I hear from parents who met with me for counseling sessions is: "it is exhausting to have a gifted child." Indeed, on all occasions where I have substituted for a teacher in a gifted class – whether for my research or when I stepped in for a missing teacher in my own enrichment program (David, 2005, 2007) – I felt much more exhausted after the 50-minute session than after a whole day of teaching at a teachers' college or at the Ben Gurion University. Thus, it is expected that a teacher with a low energy level would not survive teaching the gifted.

Rich, complicated language. Many gifted children, especially those who are verbally gifted, tend to integrate in their speaking (and writing) unique utterances, complicated sentences, long logical arguments, a lot of metaphors, similarities, proverbs, fables, allegories, and the like. For many of these children the negative attitude they get when doing that in the "outer world" might be paralyzing (see, for example, David, 2014b) so it is recommended that the teacher of such children would love to play with words, and feel adequate to participate in the word-games of the students. In short – would be verbally gifted as well.

Curiosity. Gifted children are known as "asking too many questions." A teacher who feels a continuing need to "cover the material," or fear of not knowing the answer to the students' questions, might be a real problem. But for a teacher who is in a constant process of learning, who needs to satisfy her or his own curiosity – such students are a blessing.

Enthusiasm. According to Demmon-Berger (1986), one of the demands of effective teachers is "enthusiasm in their delivery of instruction." Bishop (1968) requires that the teacher of the gifted has enthusiasm for working with gifted students; Babbage (2002), Patrick et al. (2003), and Robinson (2008) expect good teachers to be enthusiastic (as a personal trait).

Sense of humor. The issue of giftedness and sense of humor has been discussed at length (e.g. Holt, & Willard-Holt, 1995; Lovecky, 1992; Ziv & Gadish, 1990). Robinson (2008) has found that exemplary teachers used humor and had fun with their students.

Subject matter and content knowledge. As curiosity is one of the main characteristics of the gifted person, no wonder good, exemplary, outstanding teachers had subject matter expertise (Bishop, 1968; Mills, 2003**)** and high levels of content knowledge (e.g. Bishop, 1968; Tomlinson et al., 2000; Robinson, 2008).

Setting an example: A personal remark

In the years 2004-2006 I founded and headed the Enrichment Program for Talented and Creative Children, in the Chof Ashkelon Municipality, that included 19 villages and Kibbutzim (David, 2005, 2007). The students participating in this program studied in three

elementary schools. In order to operate the program so that it would serve as many students as possible in all these rural peripheral settlements, many of them quite close to the Gaza Strip, I needed full cooperation of the headmasters in such matters as transportation and schedules. I was deeply surprised when the headmistress who had the highest educational level of all three, and the only parent of school-age children at that time, told me her children were not going to participate in the program. When I asked why, she answered: "because I prefer them to take music and dancing classes; I do not want them to be gifted." This hard-working, diligent and dedicated person, but unfortunately not gifted, could not even understand the need of gifted children to have enrichment classes suitable to their cognitive level. I hate to think that she and the likes of her were the teachers of so many gifted children 6 days a week for 12 years.

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Why It's Essential That We Identify and Support Creativity in Gifted Children

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Modern definitions of intelligence and giftedness all include creativity. Yet, in our education system, we virtually ignore creativity in all ways—in teaching practices, assessments, and in qualifying for gifted programs. This is a disservice to all children but most especially to children whose thinking processes can only be accurately understood through this lens.

Many gifted students seem to "get along" just fine in a fast-paced, highly academic environment that incorporates neither creative learning nor learning about creativity. However, this does not necessarily mean that the deepest level of thinking is taking place. Nor is it healthy in the long run, especially in light of rising stress, anxiety, and mental health issues among young people. This article will show that creativity is an essential dimension of every student's intelligence; that it has a positive effect on well-being; and why and how to incorporate it into the everyday learning of gifted students.

Definitions of Intelligence and Giftedness Include Creativity

Expanding Theories of Intelligence

Intelligence theory has continued to evolve since Binet invented the IQ test in the early 1900s. In earlier times the primary conception of intelligence was limited to a composite score from an IQ test, whereas now psychologists and educators emphasize a more expansive view. Guilford developed the Structure of Intellect Model (1956; 1977), Gardner proposed Multiple Intelligence Theory (1983), and Sternberg put forth his Triarchic Theory of Human Intelligence (1985). All of these include dimensions of creativity. Torrance and Safter maintained that ". . . the intuitive, creative thinking processes represent mankind's highest thinking ability" (Torrance and Safter, 1990, p. 7). Most recently, Bloom's taxonomy was revised to reflect this assertion (Krathwohl, 2002).

Such evolving ideas on intelligence have moved us toward an expanding concept of "giftedness," and this concept necessarily includes creativity in the official definitions of the word (see 1978 U.S. Office of Education definition of "gifts and talents" in Marland, 1972 and Renzulli's Three-Ring Definition in Renzulli and Reis, 2003).

Three Essential Points in Creativity Science

As intelligence theories were evolving, researchers and practitioners in the field of creativity have empirically demonstrated two essential points:

1. Every human being is to some degree creative (Guilford, 1950; Richards, 2010; Richards, Kinney, Benet, & Merzel, 1988), and
2. Creativity can be developed and improved (Parnes, 1987; Scott, Leritz, & Mumford, 2004).

If we combine these two points with Torrance and Safter's statement of creativity as the highest thinking ability, as confirmed by Bloom and others, we can see that all humans are capable of this highest form of intelligence, and that this inherent intelligence can be nurtured and strengthened.

Though everyone is creative, it is important to note that people manifest this creativity in different degrees. Guilford (1950) said, "Whatever the nature of creative talent may be, those persons who are recognized as creative merely have more of what all of us have" (p. 446). In other words, while everyone is inherently creative, some individuals practice and express creativity with more intensity than others.

Creativity is Essential to Well-being and Genuine Growth

Because of the way the culture of testing is set up, with the virtual exclusion of creativity assessments, and because of the inherent bias in education against creative characteristics (Beghetto, 2010), highly creative children are at a severe disadvantage in school.

For highly creative or creatively gifted students, exercising, applying, and understanding their intensity of creative thinking is essential to their health, happiness, self-concept, and growth. But again, each of us is creative to some degree, so creativity is essential to all of us for the same reasons (Richards, 2010). In fact, research and experience have shown that creativity is highly correlated with self-actualization, which is Maslow's term for fulfilling one's potential (Davis, 2004). Davis states, "Living creatively is developing your talents, learning to use your abilities, and striving to become what you are capable of becoming. Being creative is exploring new ideas, new places, and new activities. Being creative is developing sensitivity to problems of others and problems of humankind" (p. 6). One study showed that high school students who were both creative and intelligent had the highest levels of self-actualization (Damm, 1970; Davis, 2004).

Despite the Evidence, Educational Assessment Tends to Ignore Creativity

Unfortunately, even as intelligence theory has advanced to include creativity, by and large psychologists and educators still identify people's intelligence by way of IQ testing or academic achievement, which is in a similar vein. Even though psychology has acknowledged for decades that creativity is the highest form of intelligence, our education and psychological testing system continues to use primarily IQ-type testing. In an early and seminal study, Wallach and Kogan (1965) made the emphatic conclusion that if we are going to measure IQ, it is essential that creativity be measured as well because children need to be understood and supported through the lens of both domains. Torrance and Sisk pointed out that experts have been developing assessments to measure creativity since 1898, yet these are rarely used (Torrance & Sisk, 1997). Though there is debate among academics as to how to truly assess creativity, some would argue that the tests that we do have, such as the Torrance Tests of Creativity Thinking (Torrance, 1974) which has solid longitudinal records of use (Runco, Millar, Acar, & Cramond, 2010), are better than ignoring creativity altogether.

Defining Creativity

What is Creativity, Exactly?

Since creativity is an expansive, multifaceted concept, it is essential to define the term in the way that we are referring to it. This author has found much practical value is using the lens of a "process definition" of creativity in tandem with an awareness and understanding of the creative characteristics of the person.

Creativity as a problem solving process. Torrance's process definition states that creativity is: "The process of sensing difficulties, problems, gaps in information, missing elements, something askew: making guesses and formulating hypotheses about these deficiencies; evaluating and testing these guesses and hypotheses; possibly revising and retesting them and finally communicating the results" (Torrance, 1988, p. 47). In other words, creativity in essence is a problem solving process that makes use of the mental functions Torrance described.

Creativity as the characteristics of a person. Davis (2004) has done comprehensive work in the area of creative characteristics, which we like to call creative strengths. He undertook a literature review to collect all descriptors that had been used to denote creative personality traits. Finding over 200 adjectives, he distilled these into 16 categories (see accompanying chart) to "summarize the main, recurrent traits of creative people found in the literature" (Davis, 2004, p. 84). Though these characteristics are presented as true of "creative people," since we know that everybody is creative, we all have them to some degree. Each person has a constellation of creative strengths and intellectual strengths (Haydon & Harvey, 2015). Some children are naturally inclined to exercise these creative strengths in a manner that is intense, all-encompassing, and that can't be "turned off." Some are less inclined toward creative thinking and prefer a straight academic approach to learning. Regardless, we believe that all learners—including intense, gifted learners—should have access to strategies and activities that help develop their creative thinking capacities, which supports their overall learning, engagement, growth, and self-knowledge.

Davis Categories of Recurrent Personality Traits of Creative People

1. Aware of creativeness
2. Original
3. Independent
4. Risk-taking
5. High Energy
6. Curious
7. Sense of humor
8. Capacity for fantasy
9. Attracted to complexity, ambiguity
10. Artistic
11. Open minded
12. Thorough
13. Needs alone time
14. Perceptive

15. Emotional
16. Ethical

Source: Davis, G. A. (2004). *Creativity is forever*. Dubuque, IA: Kendall/Hunt Publishing, p. 84.

How to Support Creativity in Gifted Students

To truly support creativity in the most effective manner, we can take a three-pronged approach. In practice, and in this frenetic world with little time for anything but preparing for tests, even just a little goes a long way.

Step 1: Awareness

Guilford (1977) wrote, "Knowing the nature of your abilities, you will be able to turn them on when you need them and you will learn how to exercise them in order to strengthen them" (p. 12). Guilford's statement describes c*reative self-efficacy* (Beghetto, 2010), or knowledge of one's creative capabilities. This is important for all students—in fact, all people. It is essential for gifted students to understand the nature of their creative thinking because of the intensity with which life hits them, and because that intensity often manifests as sensitivity that intensifies the creative strengths. This intensity is often misunderstood as a deficit, and can be quickly diagnosed as psychometric problems by professionals who do not have a robust understanding of giftedness (Webb et al., 2005). When students understand their creative characteristics, they can work to apply them as strengths and advocate for learning approaches that support their deepest learning.

This author co-wrote a book entitled *Creativity for Everybody* (Haydon & Harvey, 2015) to provide an enjoyable, beginner resource on the science of creativity. In a fun and visual manner, the book highlights important points related to the framework of creativity, points that can be life-changing for readers. While it is not written for children, upper-level elementary students and older have provided positive feedback. This is also an excellent resource for a parent or teacher to read, to then be able to support and communicate a clear understanding of creativity and creative strengths to students.

Step 2: Application

The second step in supporting students' creativity is pointing out how they already apply their creative strengths in real life. For example, take Nathan's story:

Nathan is a highly creative student who also tested high on IQ tests, but in elementary school was not considered a high-achieving student. Though he was an avid reader, he had a hard time with writing and therefore was constantly pressured to improve his writing at the expense of all else. Nathan's true strengths were in problem solving, especially in coming up with new and novel ideas as related to math and science. However, he was under the impression that he was not particularly adept at these subjects because he didn't always arrive at the "right" answer. Though his thinking was always correct, it was unique and sometimes too advanced for the teacher. Until his creativity as applied to math and science were pointed out by a teacher specializing in creative learning, he was unaware of these strengths and, indeed, felt inadequate in the mainstream school setting. After he became aware of his strengths, his self-concept and ability to adapt to school improved. Ultimately, Nathan was accepted into one of the most selective boarding high schools in the United States.

And then there's Jacob:

What about average-IQ, highly creative Jacob? He had tested at a young age fairly average on intelligence tests. But he had a high degree of creativity brewing inside, manifested in extreme empathy and the ability to sense gaps and spot problems that frustrated others. This creativity had no channel or pathway for expression; its inability to be expressed was bottled up inside, making him appear to be distracted and hyperactive. Consistently in school he was placed in special education programs, and was under the impression that he was inherently quite a poor learner. This combination of high creativity unidentified and unexpressed is lethal to a student, and it was with great gratitude that as a sophomore in high school Jacob learned about his creative strengths. He eagerly and quite naturally understood creative problem solving, and almost immediately gained confidence to express his fertile imagination by writing a screenplay and recording some of his useful inventions to solve real-world problems. Knowing his creative strengths, Jacob has been able to apply these for greater success in traditional school subjects in high school. His parents have moved beyond a feeling of despair to one of hope and delight in his life prospects.

Step 3: Opportunity

The final step in supporting gifted students' creativity, which really is a life-long journey, is to find plenty of opportunities for them to exercise creative strengths, at home and outside of school as well as in school, integrated with content. In an ideal world, all teachers would teach in accord with models such as the Torrance Incubation Model of Teaching (Torrance, 1979; Torrance & Safter, 1990). This model integrates the development of creative thinking skills with the teaching of academic content. It is a way to teach creativity skills while teaching creatively. It is a simple model to follow, and can be implemented at many experience levels. The Torrance Incubation Model provides scaffolding for a teacher to beautifully marry content and higher-level, creative thinking, which naturally deepens learning and increases student engagement. (For more on this topic, please see the first issue of the *Torrance Journal for Applied Creativity*, scheduled for publication in December 2015).

The story below illustrates how the integration of content and creativity set high-achieving Beth up for lifelong self-expression, growth, and self-knowledge, even in periods of low-creativity school work.

Beth is a high-IQ, highly creative child. She mastered her academic work in grade school, but always felt frustrated and bored with the material. The challenge work her teachers gave her was always more of the same convergent-type thinking, and definitely didn't exercise her percolating creativity. The only opportunities she had to apply her creativity seemed to get her in trouble, such as whispering jokes and puns in class, and passing notes.

In fourth grade, Beth attended an enrichment program that introduced her to creative writing, which ignited a life-long pathway for self-expression and application of her insights. She thrived in this setting that approached traditional subjects like math and science in a creative, hands-on manner. Her number one strength was her creativity, and in these classes she was able to dig deep and achieve truly meaningful learning where she felt like she was applying her whole mind. This experience saved her from total disgruntlement with learning, as she could look back on it and keep up her writing on the side as the years went on. However, as she moved on through school, she often longed for those learning experiences that were uplifting and allowed her to think deeply as she applied her original thinking.

Beth had some experiences in English courses where her own insights and creative thinking were required, and in these she thrived. She made straight A's and A+'s and attended an elite university, but almost always felt that something was missing and certainly felt inadequate to those of her classmates that seemed to effortlessly learn math and take multiple choice tests without reading too far into them. Upon graduating from college, it took her years to realize that creativity had been her strength all along. When she realized this, she was able to reflect on her experiences, understand her frustrations, and provide plenty of ways to nurture and apply her creative thinking as an adult.

Creative Learning Knows no Bounds

Though we have discussed various types of gifted students in this article, creative learning can be applied with equally positive results to children of all types of intelligence, degrees of creativity, socio-economic status, and levels of speaking the dominant language. In many ways, creativity—and creative learning—is the great equalizer in education. Since everyone has a unique constellation of creative strengths, when presented with the opportunity to express them, all students have the ability to apply them. When structured authentically, there is no ceiling on a creative thinking and learning. There are many dimensions to creative thinking, and each individual can contribute what he or she has to contribute, versus, for example, a multiple choice problem where there is one right answer and your "intelligence" is reflected by your ability to arrive at a certain answer or memorize facts. This is why Torrance (1995) was able to early on apply his models for teaching creativity and teaching creatively to many misunderstood groups of students, including deviant boys sent away to boarding school and underrepresented minorities. Torrance and Sisk (2001) wrote, "[The Incubation Model of teaching] is ideally suited not only for gifted and talented children but for all of the other children in the regular classroom. All children are curious and want to know" (p. 90). Smutny, Haydon, Boloños, and Estrada Danley (2012) applied Torrance's work on creativity to educate teachers on how to discover and support the creativity of Spanish-speaking students, even in the face of language barriers.

Conclusion

With the focus on grit (Duckworth et al., 2007) in the education narrative these days, many have adopted a mistaken understanding of what challenging learning experiences really are. Deep, meaningful learning does not have to be a stressful and frustrating

experience. In fact, learning that incorporates creative thinking skills is often the most rejuvenating for a person, because it comes hand in hand with self-knowledge and "fit" between one's learning and one's capabilities. Motivation increases when a student is asked to be truly original and inventive, even in the context of traditional subject matter such as math, science, or history. Students tend to work harder and longer, thus demonstrating the "grit" that can be joyful and absent the teeth-clenching discomfort that the word tends to evoke. Undoubtedly, creative work is hard, but it is hard in a different way than other work that is neither meaningful to the student, nor creative. When students have the opportunity to engage in learning that is truly meaningful, they have the opportunity to discover their motivations and interests, and therefore are fueled to pursue interests or goals long-term.

On the other hand, if creative learning is absent a student's experience, she doesn't fully develop her depth and range of intelligence. Even if a student has a high IQ, this doesn't mean that he is at home in academic work. As that work involves more and more of the same type of thinking, without the opportunity to explore, invent, imagine, come up with new theories, and apply learning in personally meaningful ways, the value of learning and school decreases. The child may begin to question his or her identity, his or her intelligence, or search for satisfaction in unhealthy places. Highly creative students are even more at risk. If intense creative strengths are not understood and developed productively, they can become overwhelming and confusing to the student, manifest in unproductive ways, and be mistaken for psychological or cognitive disorders.

Though models to define and assess giftedness include creativity, we as educators must do a better job following through to support this essential dimension. We can more fully support the students in our classrooms and homes by taking three steps to nurture their creativity:

1. Help them to become aware of their creative strengths.
2. Show how they already apply these creative strengths.
3. Provide opportunities at home, outside school, and at school for creative strengths to be exercised, especially integrated with content.

As we move toward giving creativity the place it deserves in our schools to match the place it has in intelligence theory, more students will thrive in deeper, meaningful learning and personal growth.

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About the Author

Kathryn P. Haydon, founder of Sparkitivity, writes, speaks, and consults to support an educational paradigm based on student strengths and creative thinking. She is a keynote speaker and specialist for families, schools, and educational organizations nationwide. Kathryn co-authored *Creativity for Everybody* (2015) and *Discovering and Developing Talents in Spanish-Speaking*

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For Gifted Students, Literature Matters

Michael E. Walters

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Recently a colleague of mine passed on. After his office was cleaned out, many of his books were distributed to professors in related fields of humanities. Fortunately I received a wonderful book, ***The Norton Anthology of World Masterpieces, Expanded Edition, Volume II***. (1995). The General Editor was Maynard Mack, Sterling Professor of English at Yale University. This paperback anthology is both literally and figuratively a very heavy object—2,989 pages. (There are currently similar volumes available through online booksellers.) In curriculum studies, the term "literacy" is very prevalent. However, literacy is not a matter of workbooks and testing materials. Instead it derives from a world of literature which includes both fiction and non-fiction. This volume is truly inclusive, but not statistically inclusive; it is based upon universal human emotions and experiences. The poet, Alexander Pope, in his poetic An Essay on Man stressed that the proper study of mankind is the study of the human condition.

The book starts in Part 1 with selections of authors from the European Enlightenment such as Voltaire and Alexander Pope. Part 2 concentrates upon the Romantic and Realistic poets; this includes Goethe, William Blake, Percy Bysshe Shelley, William Wordsworth, Alexander Pushkin, Victor Hugo, Frederick Douglass, Walt Whitman, Herman Melville, Emily Dickinson, and Gustave Flaubert. Part 3 is The Modern Period and includes William Butler Yeats, Thomas Mann, Wallace Stevens, James Joyce, Virginia Woolf, Franz Kafka, T. S. Eliot, William Faulkner, Jorge Luis Borges, Anna Akhmatova, Albert Camus, Ralph Ellison, Yehuda Amichai, and Gabriel Garcia Márquez. This is just a small selection of the authors included in the anthology that clearly illustrates the term, inclusiveness. For each of the editors present a representative selection of their work, e.g., ***Faust*** by Goethe. Before each selection there are wonderful essays written by the editors who are experts on these individuals. These essays demonstrate the influence of biography, linguistics, sociology, history and philosophy. Among these wonderful editors were Bernard M. W. Knox (Director Emeritus of the Center for Hellenic Studies, Harvard University), Sarah Lawall (Professor of Comparative Literature and French at the University of Massachusetts, Amherst), Patricia Meyer Spacks (Professor of English at the University of Virginia), and Rene Wellek (Professor of Comparative Literature at Yale University). These professors were not only experts in their fields but also wonderful writers.

I will give examples of two writers who are not usually included in today's high school and college courses. The first is the Russian poetess, Anna Akhmatova (1889-1966). Her long poem ***Requiem*** is a poetic witness to the suffering and terror of the Stalinist period in the Soviet Union. Besides being a wonderful poetic work, it is an extensive study of totalitarianism. She should be included in any curriculum that involves literature, women's studies and politics. My second example of one of the authors that should be studied by gifted students is Ralph Ellison (1914-94). His novel, ***Invisible Man*** (1953), is as relevant today as when it was written in the 1950s. Any academic discussion about the present condition of Black inner city youth can effectively use this book. Ellison's literary skills engage readers into the main theme, the alienation of Black youth. He was not a polemicist but a great literary artist.

Gifted students need and will react to this and similar volumes due to the component known as "active reading." Through active reading they will make relevant social and intellectual connections. Our present day curriculum, when dealing with literature, neglects precise elements of literacy and inclusion. Only through active reading and the study of literature can these tasks be accomplished.

Books from Gifted Education Press

How an Engineer Uses Math – Real World Practical Examples for the Gifted Classroom in Environmental, Power, and Energy Areas – Middle and High School (2015) by Harry T. Roman. Excellent introduction to real world math, science and engineering problems.

Giving a Lift to the Gifted: Ideas and Essays for Helping Teachers Inspire Higher Thinking in the Creative Classroom by R.E. Myers (2014). Please see the link at Amazom.com and a picture of the inspiring cover designed for gifted students and their teachers.

Invention, Innovation and Creative Thinking in the Gifted Classroom **(2014) by Harry T. Roman**

A Unique Book for Teaching Gifted Students How to be Inventors and Innovators – Written by an Inventor and Distinguished Technology Teacher of the Gifted – Harry T. Roman. STRETCH THE INVENTION MENTALITY OF YOUR GIFTED AND ADVANCED STUDENTS!

CREATIVE PROBLEM SOLVING –

Energizing Your Gifted Students' Creative Thinking & Imagination: Using Design Principles, Team Activities, and Invention Strategies - A Complete Lesson Guide for Upper Elementary and Middle School Levels by Harry T. Roman

SNIBBLES: REALLY Creative Problem Solving Lessons and Mind-Stimulating Exercises for Gifted Students and Their Teachers, Ages 5 through Really Old! by Judy Micheletti

STEM/STEAM Education Books –

1. STEM Robotics in the Gifted Classroom: Meet ROBO-MAN! Upper Elementary through Secondary Levels by Harry T. Roman
2. STEM—Science, Technology, Engineering and Mathematics Education for Gifted Students: Designing a Powerful Approach to Real-World Problem Solving for Gifted Students in Middle and High School Grades by Harry T. Roman
3. STEAM Education for Gifted Students! Upper Elementary Through Secondary Levels: Combining Communication and Language Arts with Science, Technology, Engineering and Mathematics by Harry T. Roman
4. STEM to STEAM Education for Gifted Students: Using Specific Communication Arts Lessons with Nanotechnology, Solar, Biomass, Robotics, & Other STEM Topics by Harry T. Roman & Robert E. Myers

LANGUAGE ARTS, HOMESCHOOLING –

Golden Quills: Creative Thinking and Writing Lessons for Middle-School Gifted Students by Robert E. Myers

HOMESCHOOLING GIFTED STUDENTS: Stimulating High Levels of Creative Thinking and Problem Solving in the Home: Upper Elementary through Middle School by Robert E. Myers