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TABLE OF CONTENTS:

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April Editorial

Penina Kiss & Jennie Quinn

Welcome to the April edition of the World Talent Web newsletter, we are so glad you have joined us. It's been a busy start to the year here in Australia and our work with talented and neurodiverse learners has kept Penina and me energised and motivated in our quest to meet their diverse needs.

We had some compelling headlines in the NSW media last week that have sparked a measure of anticipation and hope regarding our gifted students. "**Every school in NSW to offer gifted education programs**". It's a lofty target encompassing more than 2000 schools and something long overdue and desperately needed to create access and engagement in quality differentiated learning for our gifted students.

We have long been concerned that our gifted students sit in classrooms where many teachers do not understand how to identify or meet their nuanced academic and social-emotional needs. Historically, preservice teachers in Australia have had little training regarding gifted students and the research literature tells us this has a profound impact on both teacher efficacy and equitable outcomes for gifted and twice-exceptional students (Troxclair, 2013; Rowan and Townend, 2016; Bianco and Leech, 2010; Geake and Gross, 2008; Gierczyk and Hornby, 2021; Foley-Nicpon et al., 2013).

The difference preservice training in Gifted Education can have for teachers of the gifted resonated with me as I read an article submitted by Veronica Lenard for the April edition of the WTW newsletter. Veronica is a university student and former editor of the Sydney University student newspaper, Honi Soit. She has documented her educational journey for us, peppered with teachers who strove to understand and cultivate her ferocious talent. Her beautiful article titled, *Things I learned along the way*, is a letter of gratitude to the teachers who supported her journey and empowered her to reach her potential. It's a thought-provoking piece that details Veronica's experiences and the teachers who met and nurtured her educational and social and emotional needs.

We have two further articles for your enjoyment. Dr Rena Subotnik writes about the importance of *Insider Knowledge for promoting equity and high performance in talent domains* and how it can enhance or impede the path to creative productivity. Dr June Maker, in her article, *Changing our Thinking and Practices about Talent Development to Fit the 21st Century Context* discusses REAPS and Centers as the sparks that ignite engagement in talent development with a focus on ethical, critical and creative thinking. Penina and I are both eternally grateful to these two wonderful women for the professional development they have provided to our system of schools in Sydney over many years. Their passion and wisdom have inspired our teachers and built their capacity to meet the needs of gifted learners. Using the REAPS model to foster creativity and ethical thinking was one of the highlights of our work in the Newman program.

In closing, I'd like to share with you a recent happy encounter. I had the good fortune to run into one of my past students, a founding member of the Newman Selective Gifted Education program at the school where I worked in 2016. He joined the program in Year 3 and is now at University studying to be a teacher. He told me that being recognised all those years ago for his exceptional ability as a gifted writer changed the course of his young life. As educators of the gifted, we know the profound impact that recognition and cultivation of talent can have on well-being and the motivation to reach learner potential. I couldn't help being thrilled that we would have an exceptional teacher in the ranks with an understanding of the critical importance of gifted education. He has promised to write an article for us about his experience in the Newman program.

With best wishes,

Jennie and Penina

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The Things you Learn Along the Way

By Veronica Lenard (https://honisoit.com/author/veronica-lenard/) - April 25, 2023 -
PERSPECTIVE (https://honisoit.com/category/perspective/)

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I know how much I've appreciated being able to exist in these spaces.

I've never been very good at endings. At saying thank you, at saying goodbye, at having to walk away when you know that there are still things you haven't said — whether it was out of awkwardness, or a sense that I didn't know how to say what I had wanted to.
Each time that a term, semester or year winds up, I would feel the onset of the panic and I'd end up stuck. Often, I have not been able to explain how much I have appreciated a gesture, or thank those who I feel were instrumental to my experience.

This seems odd for a person who talks so much. I know that I talk a lot. I've been told this practically my whole life. It didn't always start this way. My mum once told me that my garbled speech concerned her enough to ask at daycare whether they thought I might have a speech issue. They explained that instead it seemed like I was thinking too fast for my little mouth to keep up. I've spent the rest of my life trying to work faster, trying to keep up with my thoughts. And getting stuck in the gap in between, when I can't.

I feel a great debt to the teachers that have taught me over the years. I know the ways that I've thrived in carefully cultivated classroom environments. I know how much I've appreciated being able to exist in these spaces. I've never really been able to tell them what this meant to me.

I started school with teachers who enthralled us with stories of paperbag princesses, reward lists that involved them rolling down a hill or letting us be the teacher for the rest of class, and comforted me as I clumsily found myself accidentally slamming my fingers in the door trying to get back to my desk too quickly. I still remember the effort that they invested.

My Year Four teacher decided that every time we cleaned up, we would listen to the song "How Does She Know?" from *Enchanted*. I don't know why he had picked this song. Maybe he explained it to us, and maybe it slipped my mind. Maybe we accepted it, not needing to question it. We would wander around the room no longer daunted by the previously boring task, as it was easier to bop to a dancing princess wandering her way through Central Park. I could still quote you the lyrics. I still remember the joy he cultivated in our classroom.

I had four Year Five teachers. That is a weird amount of teachers to have in one year, but between a move between schools and two teachers at each, it was a little chaotic. Amidst this, I ended up with my arm in a cast for about a term. A word of warning: don't try to stop a slamming door from closing if it has a panel of glass in it. Things were harder to do with no use of my dominant hand. The combination of a mid-week work trip and notably knotty hair left me unable to tie up my hair for school — or at least unable to without starting the day in tears from the process of detangling. My final Year Five teacher had offered for me to pop up to the classroom before class started, and she would tie it up for me. She did it each morning when I needed it. I still remember her kindness.

The move left a somewhat wary eleven-year-old wandering down new halls wondering about how she didn't know anyone. As we walked down the hallway, out walked a familiar face as if out of nowhere. It turned out that a teacher from my old school — the one who had had me when I accidentally caught my finger in the door — had moved to this school before I had. She stopped to speak to me about things about my old school and what was about to be my new school. I still remember how this conversation put me at ease. I could make this change.

My Year Six teacher loved owls. I also love owls. I don't remember if I did before Year Six, but I know that I've loved them a whole lot more ever since. On our Canberra excursion, I remember standing in the middle of the Sportex exhibit in the Australian Institute of Sport. I had an excruciating headache, and was on the verge of tears. I knew I was about to cry. When I burst into tears, she took me outside and we sat down on a couch in the corridor. As we waited until I felt a little better, she showed me pictures of owls and ducklings on her phone until I calmed down. Her plan had worked, and I was sufficiently distracted to make it through the rest of the day. I still remember the care she showed me — and the owls. As I look around at the owls peppered around my room, I can still see her influence.

I began high school as a nerd (in case you were wondering, I also finished high school as a nerd). A nerd who had been told her whole schooling life to slow down and not rush so much. However, it was the only speed I could work at, otherwise everything was infuriatingly slow. This meant that I would frequently finish tasks too quickly for what the teacher had planned. My Year Seven science teacher noticed this and started preparing additional tasks, experiments or challenges for students who finished early. I remember my friend and I at the back of the class learning to magnetise objects. We both loved and continued to love science. I don't think this is a coincidence.

He would later briefly accuse me of stealing my paddle pop stick from

the name jar (a way to pick who would answer questions), but a reminder that did it seem in character for me — a person who would constantly try to answer questions in class — to make it harder for myself to talk resolved this quickly. I still remember a check in on a day that I hadn't been talking so much, just to make sure that I was okay.

Talking a lot in class became a bit of a pattern for me. I still remember an awkward moment during the parent-teacher interview with an English teacher where my mum had just been told that I didn't talk in class in Geography (somehow the only class where this was an issue). My mum decided to ask my English teacher if I talked enough in class. For context, this teacher had already dealt with me during book club and this class, so knew how chatty I was. I remember the shock on his face that I was the child that this question was being asked about.

He encouraged us to question what he was saying. That just because he was the teacher, it didn't mean he was right. Somehow, this didn't extend to me checking his translations on phrases in a book we were reading, which was met with, "You don't need to fact check that Veronica." And even then, I semi-frequently proclaim that the reason that someone doesn't demonstrate critical thinking is because they didn't have a teacher like him.

I once had a teacher who always showed complete confidence in our abilities, even when we didn't deserve such confidence. He would listen to our often wild ideas for our Design & Technology projects and support us to make them work, instead of suggesting that we try something easier. He knew the right balance to not spoon feed us the solutions. When I once expressed dismay that I couldn't figure out how stairs worked, he simply told me to go outside and look at the stairs (and you know what, it worked).

Another of my English teachers would begin each lesson with a word of the day. Much to her annoyance, she soon discovered that I already knew many of these words or could hazard a decent guess at their meaning based on their etymology. Out of a year worth of words-of-the-day, I remember the handful of words that I'd never encountered or couldn't guess. I can still picture the way that she would revel in that moment. I still remember her passion, from how she got each of us to follow a character through the Shakespeare play we were reading to the way she would say that I had killed her brain cells by making her think so much about time travel when I had chosen it as a focus area for a project. I honestly don't know if I owe her an apology or a thank you, but I certainly remember my English classes from that year.

I am quite a clumsy person. Right before our English exam, I managed to trip up two stairs and scrape both my knees on the way to the hall. Despite having blood dripping down both legs I attempted to enter the exam before being stopped by our Year Co-ordinator who took me to sick bay. Whilst this was very much the sensible decision, I was frantic and desperately wanting to return to the exam. This was until that English teacher entered and managed to calm me down. She even joked that if I did badly in the exam she would tell the Head of Department that it was because I had fallen and if I did well she would make sure I tripped before the next one. The (joking) threat had me laughing enough that when I was finally allowed to do the exam, it was fine (or at least, I don't remember it which feels like a good sign).

My Year Eleven math teacher once told me that I had panicky eyes. In her defense, she told me that because midway through her explanation of what we would study next year. I somehow communicated so much panic, that she felt the need to say that I didn't need to look so worried. I had protested that I was leaning my face in my palm, so the only part of my face visible was my eyes. She explained that was enough to communicate the panic… No matter what else was happening, her classroom felt like a place where I could just exist. This meant more to me than I could at the time express — or could even do so now. I still remember one class where she had offhandedly mentioned to my friend that they should ask me, after class, how I was going. My friend was confused but I felt seen. I appreciated the gesture.

I learnt so much in Ancient History and so much has stuck with me — even if it means that I also am stuck with facts about market gardens in Pompeii, funerary reliefs in Sparta and administrative officers in Ancient Egypt. My Ancient History teacher always knew the response our chaotic class needed. One day we were in a new classroom and noticed that there was a laminated sign on the wall that said "Modern History is better than Ancient History". When I complained that if only I had a whiteboard marker, so I could add the word "not" in between "is" and "better", one magically found its way to my desk. I once accidentally (probably) insulted a friend in the class, during a moment where, in my defense, I was really really tired (it was Year Twelve, you know?). As I spluttered apologies about saying stupid things when I am tired, he seamlessly moved the conversation on claiming that he said stupid things even when he wasn't tired.

I've always enjoyed being in a classroom. I've been lucky to have teachers that created these kinds of spaces. It obviously isn't possible to mention all my teachers or moments in class, so there are many other things that I've learnt along the way that were not mentioned in this piece, but I trust that those involved in them know who they are. From teaching me to crochet or being there to ask me how an exam was every time I returned to the library and so many other moments in between, I've kept these things with me and will continue to do so. I don't know if my teachers meant to teach me these things. Perhaps, it was their intention all along. Perhaps, it was a happy accident. Either way, I know that I wouldn't be the person that I am without their influence.

I still wish I was better at saying thank you. I've tried resorting to crocheting something as a distraction from the words I couldn't find. Maybe it's time to look for the words again. This is me trying.

Insider Knowledge Promotes Equity and High Performance in Talent Domains

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Introduction

Conceptions of talent development, like the Talent Development Megamodel (TDMM, Subotnik et al. 2011) need to mature with updated insights and research. This article describes a new featured component of the model - the role of insider knowledge in enhancing or impeding the path to creative productivity aspired to by the young people we work with. Insider knowledge is, by definition, information that is relevant to success but is not broadly known or is known only to a few with more access to resources, mentors, and expertise in a domain.

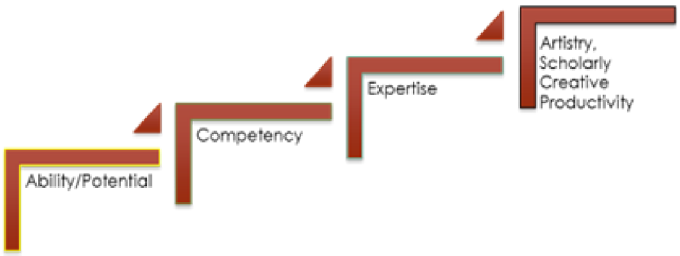
An early study explored the creative process employed by some of the U.S.' most STEMM talented students (Subotnik, et al., 1993). Each year, secondary students competed for university scholarship money by submitting a research paper to a jury of established scientists. Most of the submissions described results from a section of a larger study assigned to the young participants while serving as interns in a university or industrial laboratory. In comparison, a smaller number of the participating adolescents presented research they had conducted independently on their own research question. Based on the literature on creative problem finding (Csikszentmihalyi & Getzels, 1988; Runco & Nemiro, 1994) the study authors predicted that problem finders would be more likely to achieve success as early career researchers in science. The authors were surprised to discover that those who were part of an established laboratory working on a given problem received mentoring, guidance, and introductions to patrons that ended up being more important at that time in their talent trajectory. This counterintuitive discovery shed light on important developmental factors that affect creative productivity and U.S. traditional STEMM career paths from secondary school onward.

The work on insider knowledge described here was conducted with colleagues, Paula Olszewski-Kubilius and Frank Worrell, co-creators of the TDMM and the projects that have grown out of that approach. Insights into factors resulting from unequal access led to this exploration of what knowledge, skills and insights tend to be implicit rather than explicit and shared widely.

Domain talent development

What is the talent development approach? In talent development, high ability matters, but the focus is on abilities in something. For example, how are abilities transformed into creative musical compositions, mathematical problem solving and finding, or athletic grace? Talent development in any domain takes place over time – in school, at home and in the community, as well as beyond school to post-secondary education, and training and careers.

Potential abilities, when combined with opportunity, psychosocial skills, practice, and personal drive can lead developmentally to competence and expertise in a domain. Ultimately, domain trajectories may lead to the end goal of TDMM: providing the wherewithal to pursue a transformative and positive contribution to a field.



TDMM incorporates the following principles:

- A focus on abilities, especially domain specific abilities
- Although individual differences in abilities clearly exist, abilities are still malleable and subject to enhancement.
- Opportunities for enhancing abilities are critical at every point in development.
- Opportunities must be taken by talented individuals.
- Over time, performance-based psychosocial skills grow increasingly important for talent development.

Insider knowledge

The topic of implicit knowledge is not new. It is presented as hidden curriculum in education and sociology. And in our field, it is closely associated with tacit knowledge or practical intelligence. Robert Sternberg, Richard Wagner, and Elena Grigorenko conducted fascinating work in this arena. The difference between our approach from that of Sternberg (Sternberg et al., 2000) and Wagner (1987), however, is that we view insider knowledge not as an intelligence, but as something teachable if made evident and available.

We argue that a major stumbling block to taking opportunities is fear.

Too often, talented students fear taking on challenging opportunities. Mental skills training that incorporates addressing the fear associated with performance anxiety is taught explicitly in the realms of elite music and sport (Gould et al., 2001; Jarvin & Subotnik, 2010). However, such skills are unlikely to be part of the curriculum for K-12 students, even at specialized science high schools where students are involved in high pressure activities such as science fairs and research projects at affiliated universities and industries.

Social skills are equally important. For example, if you have a creative solution to a problem, you need to convince others to consider your idea. Skills of persuasion and rhetoric can be shared by mentors or coaches. Additionally, most creative work today takes place in teams - whether in the lab, in a spaceship, or on the stage. Psychology holds a rich science of communication, persuasion, and teamwork (Reyes & Salas, 2019), but the skills derived from that work are not widely shared with youth outside of elite performance areas.

Mentors can provide psychosocial support and encouragement for continued achievement, or cultural enrichment and guidance regarding educational and career paths for gifted children from low-income backgrounds (Subotnik, et al., 2020). Or they may provide a sounding board for ideas and make connections to helpful people. Mentors may be able to access financial resources in domains like sports and the arts and offer advice on how to avoid "underminers" – those who may discourage unusual talent paths or disparage creative ideas that challenge the status quo.

Additional examples of insider knowledge include: the most effective way to get a new policy or curriculum accepted in a school is to identify, approach, and convince the opinion leaders among the faculty. They are the ones that others look to for direction (Atkins, et al., 2008). Figuring out who are the opinion leaders is essential for school administrators and policy makers. A study conducted at the University of Mannheim (Lerchenmueller, et al., 2019) found that scientists who claim explicitly in their articles that their outcomes are very important are more likely to be cited. Sports psychologists Steve Portenga, Job Fransen and Arne Gullich have shown that, with some exceptions, specialization in sports before adolescence tends to lead to burnout (Fransen & Gullich, 2019; Portenga 2019). Additionally, sociologist Izabela Wagner has shown that judges of violin competitions tend to mark down those who perform a repertoire that the judge is known for (Wagner, 2015).

A study of insider knowledge in STEMM

To explore insider knowledge from the perspective of TDMM, we identified a sample of 14 outstanding scientists from academe, medicine, and the tech world of STEMM innovation ranging in age from their 30s to 70s. The protocol employed elicited experiences and insights at different stages of the participants' development, including regrets and lessons learned. The results are published in a special issue organized by Heidrun Stoeger and Albert Zeigler in the Annals of the NY Academy of Sciences (Subotnik, et al, 2023). A summary of results follows.

At the pre-university level, three themes were widely supported:

- Outside of school STEMM programs provided our participants with a social group that shared their interests and passions.
- Science and mathematics competitions had some downsides, turning some students off after bouts of losing. On the flip side, however, competition participation is attractive on applications for admission to universities.
- Having authentic research experiences in labs provided excellent socialization into the STEMM enterprise. This reinforced the results of the study described at the beginning of this article (Subotnik, et al., 1993), and supports the efforts of the World Giftedness Council's Global Mentoring project.

Two themes stood out in the transition to university stage.

An enormous disconnect exists between secondary school science and math curriculum and the authentic practice of mathematics and science that is introduced at the university level.
Consequently, being good at school mathematics and science does not prepare one for the creative process of discovery and setbacks in authentic mathematics and science. This outcome reinforces how important it is to get research experience as soon as possible, even at the high school level.

Graduate themes included:

- The importance of choosing an advisor who will attend to you and prepare you to launch your own career.
- It is difficult to study at the intersection of two or more disciplines in most universities. Very few universities are accommodating to cross-disciplinary approaches.
- Give talks at conferences often so that you can get feedback about your work, and people get to know and hear about you.

The following themes focused on careers in academe as well as careers in the business or tech world.

- For academe, a big challenge is being able to manage your creative work while providing sufficient attention and care to doctoral students and post-docs.
- Far more graduate students are avoiding academe as a career. This may be due to a shortage of positions, but it is also because not enough is done to show what a rewarding life it can be.
- One psychosocial skill that all our participants wished they'd had help with was being able to understand what motivates others so you can engage with them in your ideas.

There are limitations to this work on insider knowledge. Acting on insider knowledge may go against one's personal or cultural values. Also, it can be tricky for a student to determine whether the insider advice they are getting is correct or current. For example, at least one of our participants regretted taking classes recommended by a respected peer. This speaks to the fact that a catalogued body of insider knowledge does not yet exist for different domains. Nor is there evidence for the best ways in which this knowledge and these skills should be delivered. The authors of the TDMM are interested in this challenge and hope we have engaged your interest as well. An ongoing study at the UC Berkeley Academic Talent Development Program queries STEMM talented high school students to determine their familiarity with insider knowledge, including the themes reported here.

Conclusion

In sum, the authors of TDMM are continuously assessing TDMM. We argue that insider knowledge is a category of tacit knowledge: it is action-oriented, practical and gained from experience, but different in that it can be taught and made explicit to benefit more aspiring individuals. Further, some domains, particularly in the performance areas, make mental and social skills part of their curriculum, while most talent domains leave these skills in the realm of the implicit. If we are concerned about a more equitable world of talent development, we must recognize insider knowledge as an integral component of talent development that needs to be catalogued and made more explicit.

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Changing our Thinking and Practices about Talent Development to Fit the 21st Century Context

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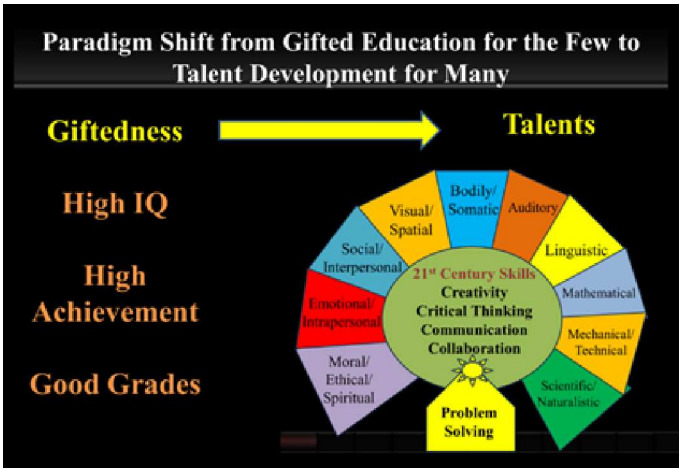
The world we live in is very different from the past, even in our own lifetimes. Just think of the changes in technology and ease of accessing information from many sources such as the Internet. We could not have imagined this 40 or 50 years ago! Given that the rate of change has accelerated in recent years, clearly the world of our students will be very different from our world of the past and even from the world we live in now. Why, then, are we continuing to use IQ tests developed more than 100 years ago, and those evaluated against them, to identify the students to serve in special programs? Think carefully about it. The world of our students is unpredictable: scientists and other researchers have warned that even the survival of our species may be in jeopardy (Sternberg, 2019). He writes "If humans do not begin to transform the world and the environment in which they live in a new and more positive direction, they will go extinct not because they lacked the ability to survive, but because of their hubris in believing that they were somehow genetically predisposed to exist forever…" (Sternberg, 2020, p. 233). As we think about our mission to provide the best education for students with the highest potential to address and create solutions to important problems, we must re-think our concepts and practices. Dai and Chen (2013) provided a framework for analyzing ways of thinking, called *paradigms*, in the field of giftedness and talent. Our paradigms consist of four components: definition [What?], assessment [Who?], purpose [Why?], and development [How?]). Changes in thinking and practices needed in the field are described in the following sections.

Definition: What?

"Intelligence" as defined by Lewis Terman (1924) was a score of 130 on the IQ test he modified from Alfred Binet's test developed in 1904 in France. Is it possible to describe something as multifaceted and multidimensional as intelligence with a number? Of course not. Psychologists (c.f., Gardner, 1999), researchers (c.f., Maker, 1993; 2005; 2020; Sternberg, 2020), teachers, parents, and the public have recognized this, but why not practitioners and researchers in our field? In many programs, an IQ of 130 or above still is used to give the label of "gifted" and eligible for special services. In addition to recognizing varied talents, an important shift in thinking is to focus on *creativity* and *knowledge structures* rather than isolated, unconnected knowledge. In an important study, 1541 CEOs from 60 countries and 33 major industries identified creativity as the most valuable characteristic of future top managers, along with the other 21st Century Skills (Berman & Korsten, 2010). In Figure 1, talents identified in studies by the DISCOVER team, the 21st Century Skills, and relationships among the components are shown. Importantly, interest and passion for solving a problem is the spark that ignites talents! An essential question we must ask is this: How is this child (or student, or young adult) stimulated to engage in talent development? (Sak, 2021). A high school participant in our online Real Engagement in Active Problem Solving (REAPS) course expresses this idea as she wrote inspirationally about her group's process: "This blog takes you on a journey through the experiences of a passionate group of people who aimed to transform waste management through their analytical minds, teamwork, and effective communication abilities." (Eman Al Shaibani, 2024, https://www.globalcooperativesynergygroup.org/blog).

Figure 1.
Paradigm Shift in Definition (What?)



An important way to connect talents with each other and ideas within and across academic disciplines is knowledge structure, which distinguishes between experts and novices in a domain. When knowledge is structured in the mind in hierarchical order with the most

inclusive concepts and ideas at the top, others below them, examples, and many connections, including remote ones, individuals have the "… rich, diversified associative network (Lubart et al., 2013, p. 42)" that facilitates creativity. This organized, integrated, and interconnected knowledge structure enables information to be accessed and used more easily than isolated facts and information (Lubart, et al).

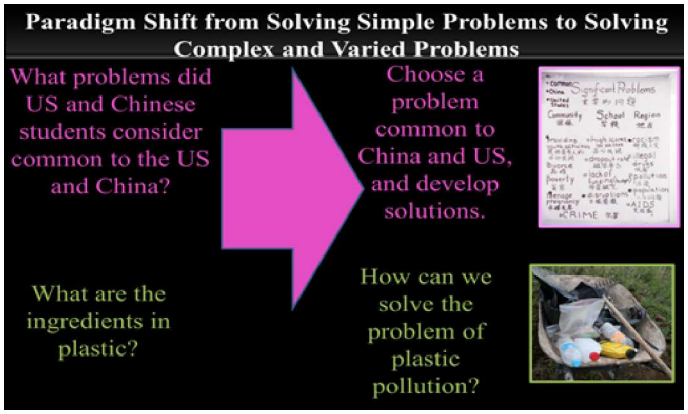
Assessment: Who?

In IQ and achievement tests, and in most classrooms, the focus is on solving simple problems with a clearly defined problem, one method for solving the problem, and one right answer. Even in classrooms with an emphasis on learning procedures and other skills, many teachers do not value the contributions of students who think differently or in creative ways (McCoach & Siegle, 2003). Thus, students do not get good grades. Teachers' practices and recommendations are strongly influenced by their beliefs. In Saudi Arabia, even though the national definition includes six different types of talents, teachers nominated students based on intelligence, academic achievement, and creativity (Aljughaiman and Ayoub (2017).

Achievement scores and grades used as "identifiers" often are aggregated rather than separated (e.g., Grade Point Average [GPA], overall achievement). Different scores and grades need to be separated according to different domains. In studies funded by the National Science Foundation [NSF], the DISCOVER performance assessments of creative problem solving in STEM with a focus on complex and varied problems (Figure 2) were used to select one group of students (PS) and conventional methods (CI) were used to select another group to participate in the internship program on campus. In these studies, eight of the PS students would not have met the usual GPA requirement of 3.2 on a 4-point scale (Maker, 2020). Using the actual criterion of 3.71, 18 out of 23 would not have been chosen even though their scores on the talents assessed were in the top two levels of performance.

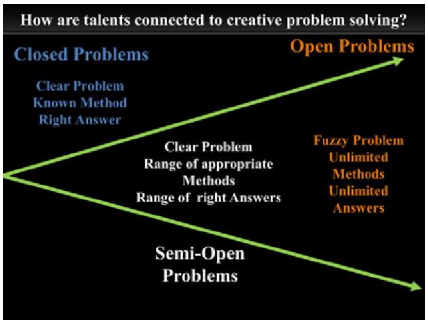
An essential shift is from identification to assessment. Identification denotes giving labels to students, while assessment is measuring or observing development of talent at any point in time and across time periods. Talent changes over time, depending on the student's motivation, interest, and opportunities for talent development (Sak, 2021; Subotnik, et al., 2011).

Figure 2.
Paradigm Shift in Assessment (How?)



Assessments must be matched to talent areas; observing what a student does also is a more accurate indicator than reading what the student says (e.g., IQ tests, achievement tests, self-perception inventories). Figure 3 shows the structure used to design the DISCOVER assessments, an effective way to observe and document students' development over time.

Figure 3.
Problem Types from Closed to Open



During the 32 years of research and practice with the DISCOVER assessments, the team has designed and studied the effectiveness of assessments of all ten talents, including many at different levels of development: K through 5, (linguistic, mathematical, visual/spatial, and interpersonal) (c.f., Lori, 1998; Maker, 1996; 2005; Rogers, 1998; Sak & Maker, 2005; Sarouphim, 2009; 2010), middle school (Sarouphim, 2004), high school (Sarouphim, 2002), middle and high school Science, Technology, Engineering, and Math (STEM; c.f., Bahar & Maker, 2020; Maker, 2020; Zimmerman, et al., 2020); and early childhood (Maker, et al., 2023). Examples can be found in the article by Maker (2021). Tasks and materials are engaging, authentic, and developmentally appropriate (Figures 4, 5, and 6).

Figure 4.
Linguistic Examples for Early Childhood

Figure 5.
Mechanical/Technical Examples for High School

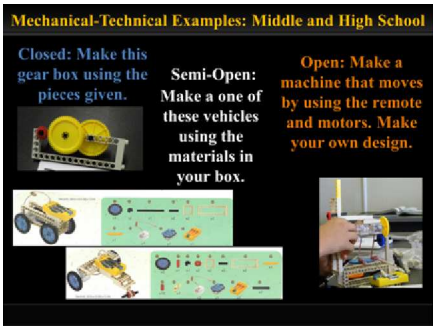


Figure 6.
Mechanical/Technical Examples for High School

Knowledge structure also needs to be assessed over time to observe students' development of integrated, connected knowledge. Including this structure is considered an assessment of developing expertise as people expand and connect their domain and cross-domain knowledge over their lifetimes (Bransford, et al., 2000; Sak, 2021; Sternberg, 1999) and "deep learning" (Loughran, 2010). Usually, it is documented using concept mapping (Ausubel, 1978; Novak & Cañas, 2008; Shavelson, et al., 1990). Students are given a list of concepts (within or across disciplines) at different levels of abstraction and asked to make a map with the most inclusive ideas at the top and others below them, make lines showing connections, and write words on the lines to describe the connections (Zimmerman, et al., 2011; 2020).

Purpose [Why?]

Some have promoted the idea that eminence in a domain needs to be the purpose of talent development (c.f. Subotnik, et al, 2011). However, others have advocated wisdom as a goal (Ambrose, 2019; 2022; Chandra Handa, 2023; Maker, 2021; Maker, et al., 2023; Sternberg, 2020). Perhaps talented students will become eminent in a field, but individual eminence for the benefit of the individual does not fit what is needed in the 21st Century context. Figure 7 shows a definition of wisdom (Sternberg, 2005). All students participate in talent development with the goal of learning to use their talents wisely.

Figure 7.
Shift of Purpose

Development [How?]

Consistency with the definition, assessment, and purposes of talent development for the 21st Century requires two shifts in the focus of teaching methods and services. Figures 8 and 9 show these important changes.

Figure 8.
Shifts in Types of Services

Figure 9.
Shifts in Knowledge and Skills

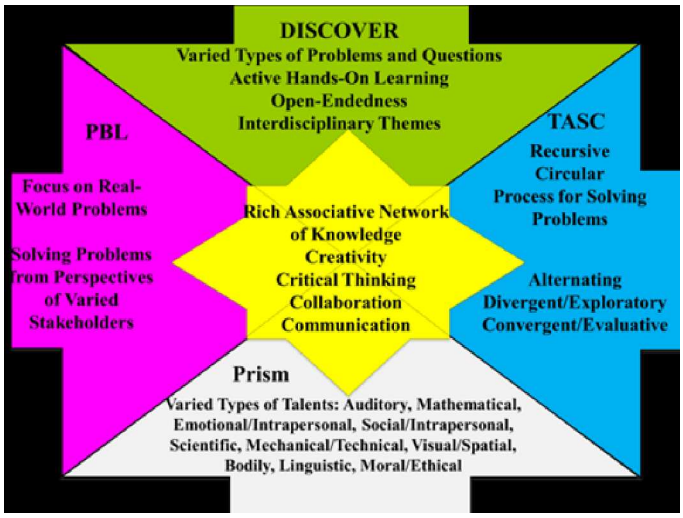
DISCOVER teams have worked with teachers in diverse settings at all grade levels in many countries. We designed, implemented, and studied the effectiveness of two methods for accomplishing needed shifts: centers in classrooms, schools, and other settings (Figure 8; Anuruthwong, et al., 2002; Maker, et al., 2015); and REAPS (Maker & Pease, 2021) (Figure 9).

When centers are in classrooms, students have periods during the day to explore different areas or go to those areas when participating in REAPS experiences, especially when creating physical models and ways to communicate solutions. In schools or other settings, students of different grade levels and/or schools are seheduled for exploration time in the center. Materials in these centers are at many levels of complexity.

Figure 8.
Centers for Talent Exploration and Development

The REAPS model was created by working closely with teachers to design practical and effective methods that fit the curriculum, school, and classroom settings in the countries and communties. It now includes four models with unique and common contributions: Discovering Intellectual Strengths and Capabilities while Observing Varied Ethnic Responses (DISCOVER; Maker, et al., 2006; Maker, et al., 2008), Problem Based Learning (PBL; Gallagher, 2015; Jo & Ku, 2011), Thinking Actively in a Social Context (TASC; Wallace, et al., 2012), and the Prism of Learning (Prism; Maker & Anuruthwong, 2003). The focus is problem solving and the goals are to develop all the 21st Century skills and rich, diverse associative networks of knowledge.

Figure 9.
The Real Engagement in Active Problem Solving (REAPS) Model



As students are led through the steps of TASC they alternate between divergent and convergent thinking (Figures 10, 11, 12, and 13).

Figure 10.
Gather/Organize and Identify the Problem

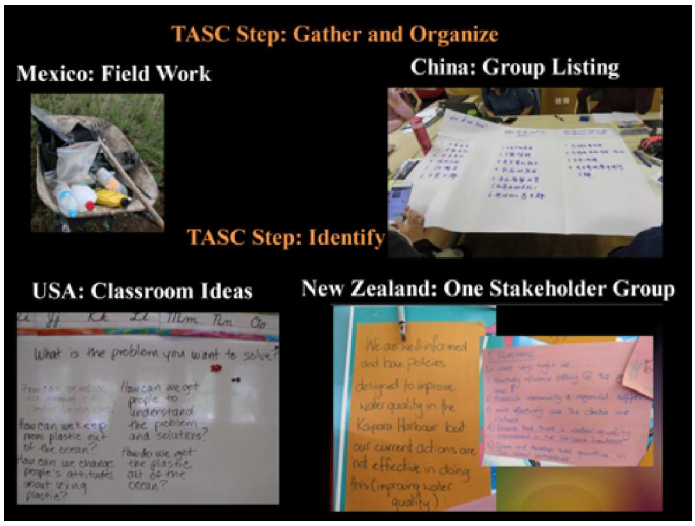


Figure 11.
Generate Ideas and Decide on the Best

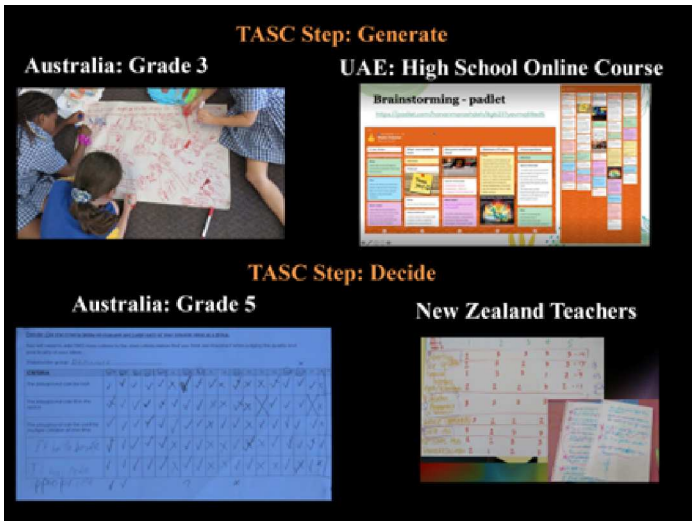


Figure 12.
Implement and Evaluate the Solution

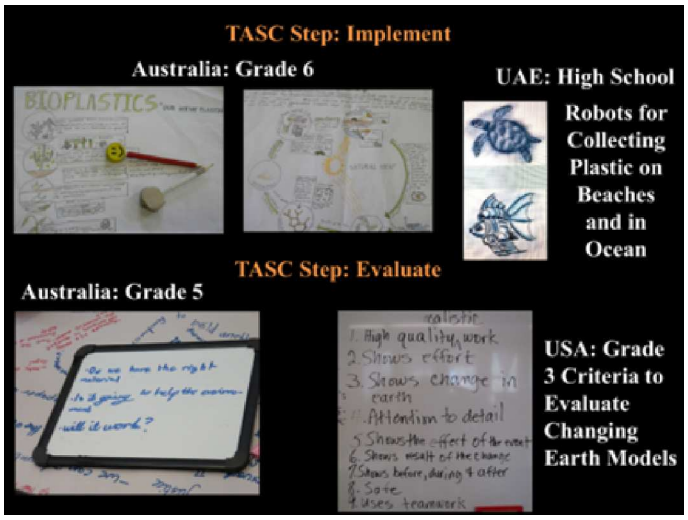


Figure 13.
Communicate and Reflect on Learning

Research on the effectiveness of REAPS has been extensive: (a) both teachers and students view engagement as the most important aspect of the model (Gomez-Arizaga, et al., 2016; Wu et al., 2015; Wu et al., 2021); (b) across grade levels, REAPS is effective in developing creative problem solving in all students in math (Bahar, et al., 2021) and science (Maker, et al., 2022); and development of the rich, diverse associative network of knowledge (Maker, et al., 2021). Student gains were strongly evident in all classrooms when used school-wide, and gains were greater when teachers implemented REAPS at a high level of fidelity, showing a clear connection between use of the model and student gains (Bahar, et al., 2021; Maker, et al., 2022; Maker & Pease, 2021; Maker, et al., 2021).

Putting It All Together

When REAPS and Centers are available to all students regardless of their level of development, they can engage in those of most interest, which also contributes to the development of 21st Century skills. Although all steps of TASC contribute to all areas, diverse talents can be seen most easily during implementation and communication, as in Figures 12 and 13. Assessment is through observation, reviewing journal entries, assessing products from work in centers, and other ways to show changes over time in both centers and REAPS participation. Materials similar to those used for the formal assessments can be available. However, if assessments such as those

in Figures 4, 5, and 6 are to be used, they should not be available in classrooms in centers. Students need novel materials to become engaged in assessments.

Teachers can facilitate development of the rich, diverse associative network of knowledge needed for creativity (Figure 14). They can use interdisciplinary themes to select problems, connect them to the curriculum (including important concepts and information), then discuss and show these connections during REAPS. They can ask students to make individual and group concept maps showing connections among ideas, concepts, and facts they are learning. If students start a journal at the beginning of a REAPS experience, they can continue adding ideas and concepts as their learning progresses.

Figure 14.
Developing Rich Diverse Associative Networks of Knowledge

Development of wisdom can be seen in students at all levels and in all the countries in which REAPS has been implemented. Students in Mexico (Figure 10), collected trash in the environment to identify what problem to solve, (considering intrapersonal and interpersonal interests). Students in grade 3 in the USA (Figure 10) listed "How can we get the plastic out of the ocean?" (extrapersonal) and "How can we get people to understand the problem and solutions?" (interpersonal) as problems they wanted to solve. Students in Australia (Figure 12) proposed developing biodegradable "Bioplastics" as a long-term solution to plastic pollution rather than the short-term solution of recycling. Similarly, a UAE group proposed bamboo as the main ingredient because of its sustainability. The waste management stakeholder group in the UAE (Figure 12) proposed creating robots resembling turtles and fish to find and collect plastic on the beach and in the ocean (extrapersonal). Another group in Australia used the criterion of "Will it help the environment?" (extrapersonal) to evaluate their solution (Figure 12). The high school students from the Navajo Nation presented solutions to the desertification problem from the perspective of farmers, ranchers, and herders (Figure 13) that has all the aspects of wisdom. In all the examples above, students' solutions were designed for the common good, not for personal gain, but to make the world a better place!

Teachers can facilitate development of wisdom during REAPS experiences: posing real, important problems; choosing stakeholder groups representing various (even competing) perspectives and interests; providing criteria such as "Is it sustainable? Does it protect life now and in the future? Does it harm any living beings?" and "Does it preserve the environment for our children and grandchildren?" After each stakeholder group has presented solutions, teachers can arrange a discussion in which students create solutions that are acceptable to all stakeholder groups.

Future Directions

In addition to continuing to write and teach others to use REAPS and centers, the DISCOVER team created a website to connect youth with passion and commitment from all over the world to think globally and act locally: (https://www.globalcooperativesynergygroup.org/). Along with an ecologist from the World Health Organization (WHO) and colleagues from the United Arab Emirates University (UAEU), we are conducting a study of wisdom in the solutions of high school students in the online course (Maker, et al., in preparation).

Changes in thinking and practices are essential for the survival of our field and to the success of our students in the future. As Eman wrote in her blog, "As we venture forth on this mission let us remember that our actions today shape tomorrow's world—a world where innovation thrives and our planet flourishes. Join us in creating a future for generations to come." (Eman Al Shaibani, 2024, https://www.globalcooperativesynergygroup.org/blog). If we educators continue to live in our past, how can we expect to prepare our talented students to live in their future?

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Call for Articles

We would like to invite you to write an article for the WorldTalentWeb newsletter. The theme and writing style are open for the author to determine. Articles could take the shape of an interview with a specialist in the field, a report on research or a recent event, a book or resource review etc. The guidelines for the article are listed below.

Please submit your article to the following email: WorldTalentWeb@ha.ae

Guidelines for submitting an article for the WorldTalentWeb newsletter

1. A submitted article should be between 800 to 2000 words, not including references.
2. WorldTalentWeb newsletter caters to the international community and thus, all articles should be written in English.
3. American or British spelling is accepted.
4. All non-native English speakers should make sure to check their articles for language accuracy before submitting them.
5. The article should be in Times New Roman font, size 12 pt.
6. Authors should avoid using footnotes.
7. Authors should adhere to the APA style and/or formatting guidelines provided in the APA Manual, 7th Edition.
8. The article should be submitted with embedded photos, and tables, and figures if relevant.
9. The article should be submitted as an email attachment as a Microsoft Word document.
10. Articles should be word-processed and single-spaced with 1 inch (2.54 cm) at the top, bottom, left, and right of every page as per the APA 7th edition requirements.
11. Authors should strictly observe the copyrights-requirements and cite the work of others correctly.
12. Relevant permission should be obtained if photos of people are used. An email giving permission to use photos publicly is sufficient.·
13. Authors should include their full name, title, institutional affiliation, and a high-resolution color photo.
14. If an article was published before elsewhere, then only submit a summary of the original document with acknowledgment.
15. Authors are encouraged to use supportive pictures.
16. The editorial team reserves the right to edit articles accepted for publication.

The current and previous issues of the newsletter can be accessed on the WGC website:
https://wgc.ae/newsletter

Call for Advertising Conferences

Looking to share your conference with the world?

Send a brief description of the conference to:

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(not more than 70 words)

“The WorldTalentWeb newsletter’s team is very happy to advertise your conference.”

Editorial Board

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WORLD GIFTEDNESS CENTER

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