NEWSLETTER OF THE WORLD GIFTEDNESS CENTER

# WorldTalentWeb Newsletter

WORLD GIFTEDNESS CENTER

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WORLD GIFTEDNESS CENTER

# 2ND WORLD GIFTEDNESS CENTER INTERNATIONAL CONFERENCE

Practice Meets Research
Latest Trends in Talent Development

## KEYNOTE SPEAKERS

**Prof. Joseph Renzulli & Prof. Sally Reis**

**Prof. Abdullah Aljughaiman**

**Prof. Heidrun Stoeger**

**Prof. C. June Maker**

The 2nd World Giftedness Center International Conference aims to unite distinguished researchers and practitioners from various nations. Eminent scholars will present the latest advancements in gifted education and talent development, while adept practitioners with exceptional initiatives in giftedness will exhibit exemplary practices. This event will serve as a platform for researchers and practitioners to engage in fruitful conversations and share their insights. Through insightful discussions and a variety of webinars focused on crucial topics in gifted education and talent development, attendees will have the opportunity to exchange ideas and experiences.

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# August Editorial

## Enhancing Exceptionality through STEM

**Jennie Quinn & Penina Kiss**

Welcome to the August edition of the WTW newsletter, an edition dedicated to Science, Technology, Engineering and Maths (STEM) and its undeniable impact on learning and in particular gifted learners since it came into focus in the 1990s. "STEM education refers to solving problems that draw on concepts and procedures from mathematics and science while incorporating the teamwork and design methodology of engineeńng and using appropriate technology" (Shaughnessy 2013, p. 324). Our August edition highlights the way STEM initiatives are enhancing outcomes for exceptional learners and building strong foundations critical to the development of future problem solving skills.

The role of Science and Technology is developing and impacting on society more than ever before. It is hard not to recognise that our world is changing at an increasingly rapid pace as witnessed in the recent bushfires in Greece and the record breaking global temperatures during the month of July. Recent comments from the UN secretary general, António Guterres that the era of global warming has ended and “the era of global boiling has arrived” give a sense of urgency regarding the crucial importance of STEM education in society today.

Our current students are charged with tackling increasingly complex problems that cannot be solved without proficiency in STEM. But is STEM education on it’s own enough?

A recent article from Schiepe-Tiska et al., (2021) argued that STEM education should not be solely focused on the teaching of knowledge and cognitive skills but on a multidimensional approach involving both cognitive and non-cognitive outcomes. By non-cognitive outcomes in STEM education they were referring to the importance of fostering skills that develop positive attitudes towards life long learning and build solid social-emotional capabilities. In a world that will increasingly need individuals who are morally courageous to implement cutting edge STEM solutions their article calling for changes to policy, teacher training and teaching regarding multidimensional STEM goals resonated strongly.

With this in mind, I recently, had the good fortune of listening to Nathan Wallis, a neuroscience educator from New Zealand who discussed the critical importance of providing the brain the time it needs for optimum development in the first seven years of life through immersion in play based learning. Giving children the gift of time to develop the foundations of life long creative and critical thinking through play based problem solving and social interaction.

Nathan reminded us of how exhilarating it is for students to immerse themselves in initiatives like building a dam in the local creek or making a bridge to cross it. The learner is compelled to engage in an intoxicating combination of fun, camaraderie and problem solving all the while learning to design, modify, adapt, test and persevere with tasks to completion. Making the mistakes that encourage further critical analysis and persistence to completion empowers learner self efficacy. If we put pressure on students to always have the right answer the first time they will learn to give up for fear of failure - something we often observe in many of our gifted students.

Building the foundations for an integrated approach to Science, Technology, Engineering and Maths and enabling children to learn these concepts through hands on activity and experimentation is truly a wonderful thing and surely something worth pursuing. So too is taking the time to build social and personal capabilities early on ensuring the prefrontal cortex can be effectively utilised for the critical action of higher order thinking and learning.

In this edition we are delighted to share articles showcasing the work of authors in three unique aspects of STEM. Brigitte Merz from the university of Erlangen–Nuremberg examines societal and equity conditions needed to encourage talented women to enter into STEM careers. Gülşah Batdal Karaduman from Istanbul University-Cerrahpasa and Todd Kettler from Baylor university look at the importance of developing STEM literacy showcased through STEM initiatives at Baylor University. Finally, Educational Psychologist, Kathleen Stone follows up from her 2020 WTW Article on the Programme for International Student Achievement (PISA) with a fascinating insight into the assessment post the Covid pandemic.

Due to the overwhelming response to our STEM theme we will be showcasing more STEM articles in the October edition of the WTW newsletter including an interview with two of our SCS schools on nurturing learner self efficacy, exceptionality and social and emotional capabilities through unique STEM initiatives.

We hope our STEM editions ignite further exploration and inspiration in your work with gifted individuals.

**Jennie and Penina**

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# Why should women go into STEM at all?

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There has been a small but steady increase in the number of women choosing STEM careers in recent years. This shows that the many policies and programs being implemented are working. A turnaround seems possible in the medium term. And it is essential. Global challenges such as climate change, pollution and strong population growth, which require high levels of technological and scientific expertise, are increasing.

But why should women get involved when they face difficult working conditions, have to fight harder for personal recognition in STEM professions than in 'typical' women's professions and are confronted with prejudices about their performance every day?

There are many reasons why women are underrepresented in technology. Some are historical. The technology industry has traditionally been male-dominated. Even today, there are companies and industries with cultures that make it very difficult for women interested in technology to start a career in the field. The phenomenon of fewer women than men working in STEM fields can be found around the world. In the physical and life sciences, the proportion of women is relatively high. The 'gender gap' or the difference between the percentage of women and men, is particularly pronounced in mechanical engineering and computer science (Wang & Degol, 2017; World Economic Forum, 2021).

Girls' performance in mathematics does not in any way argue against STEM choices. Marginal differences between boys and girls in mathematics, in no way justify young women's decisions against STEM studies or against STEM careers (Else-Quest et al., 2010). Girls perform very well in school and even outperform boys overall. For example, female students in Saudi Arabia outperform boys in the school system, but this excellent 'performance' does not carry over into the vocational system (Stoeger et al., 2022). In the world of work, especially in technical fields, girls continue to lag behind. Is this because they receive less support in the vocational system than in the school system? Why do girls or women seem to be less interested in technology than men?

Women may be discouraged from pursuing technical careers by the perception that technical careers are more suited to men. If STEM is generally perceived as a 'male domain', women and girls may feel that belonging to STEM does not seem to fit with their personal image of 'femininity' (Betz & Sekaquaptewa, 2012). But how do you make it clear to interested girls and qualified women that they are of course welcome and, last but not least, that their skills are really needed in the technology sector?

Several factors are at work. Interventions would need to be broad-based. For example, socialization and environmental influences, such as a lack of appropriate role models, as well as individual conditions, such as confidence in one's own STEM skills, can lead to women having low confidence in STEM (Stöger et al., 2019). This low confidence may be related to 'stereotypes'. The stereotype that girls are less talented than boys in STEM subjects influences female students. According to Hilton & von Hippel (1996) *"stereotypes are beliefs about the characteristics, attributes, and behaviors of members of certain groups"* (p. 240). Generalized assumptions about men or women, boys or girls are called gender stereotypes (Heyder et al., 2020).

Unconscious gender stereotypes held by parents or teachers also lead girls to rate their mathematical abilities lower than those of boys, regardless of their actual performance (Steinmayr et al., 2019). Gender stereotypes can act as self-fulfilling prophecies: parents' or teachers' perceptions, can influence their daughter's or student's perceptions of themselves, with negative effects on girls' behavior and performance (Hannover & Wolter, 2019). One way to combat prejudices, stereotypes and distorted perceptions is to inform the environment (parents, school, preschool) and the girls and women themselves about these powerful connections that are at work from early childhood.

Working with appropriate role models can also help. The best role models for girls with STEM interests are women who are perceived as competent in their technical profession (Gladstone & Cimpian, 2021). Similar preferences, values, and common interests increase effectiveness as young women or female students identify with them. Role models should give the impression that their successes are truly achievable (Aish et al., 2018). The more visible and successful women in STEM are, the more 'normal' female STEM careers become, the easier it may be for the next generation of young women to enter. Ideally, STEM role models can be found directly in the family or among acquaintances.

Another way to expose girls to role models, provide long-term-support and stimulate their interest in STEM is to involve them in structured mentoring programs. Mentoring has a centuries-old tradition, as we know from famous personalities who have achieved the extraordinary because they were accompanied by a personal mentor (Ziegler, 2009). Mentoring is also suitable for promoting STEM among young women.

On the one hand, the large number of mentoring programs for female high school and university students that have been established in recent years shows that the issue of 'women and STEM' has arrived in society. On the other hand, it can be noted, that mentoring programs are not ‘self-sustaining’ and need to meet certain quality criteria. Ongoing training of mentors is valuable, and mentors with pedagogical training or a pedagogical background (e.g., teachers) are well suited for mentoring (Stöger & Ziegler, 2012). In structured mentoring programs it is important to match the mentoring pairs very carefully (Finkelstein & Poteet, 2007).

The more insight mentors gain into their mentee’s lifeworld or, according to Ziegler (2009), their ‘sociotope’, the better they can respond to the mentee and contribute to expanding and optimizing the mentee's repertoire of actions (‘actiotope’). In this way, the mentees are supported in achieving appropriate goals and, together with the mentor, the environment is improved (Ziegler, 2009). Ideally, parents or teachers are also involved in the mentoring process to encourage the interest in STEM (Stöger & Ziegler, 2012).

But getting more women into STEM careers will require the cooperation of many. Politicians and business leaders in a growing number of countries recognise the importance of increasing the number of women in the labour market. To achieve this goal, they need to take action to improve gender equality and work-life balance. Engineers and computer scientists in particular have a reputation for being time-consuming professions that require constant availability, high levels of stress, overtime and a lot of business travel.

Olsson et al. (2023) surveyed students in 37 countries about their plans for taking leave when starting a family. The study found that, on average, young women in all these countries planned to take longer parental leave than their male peers. The research also showed that for both women and men, intentions to leave were negatively associated with career aspirations. This also needs to be taken into account when it comes to gender equality. Obviously, this is not just an issue for STEM, but for all professions.

Again, why should women go into STEM at all, when they still bear the main burden of family care, which of course affects their professional lives? Why should women get more involved in science when they are much less likely to win a Nobel Prize than their male colleagues? Until 2022, Nobel Prizes were awarded to 898 men and 61 women (Nobel Foundation, 2023). This means that only 6.4 per cent of all Nobel Prizes have gone to women. One of them was Marie Curie, mother of two girls, who won the Nobel Prizes for Chemistry and Physics at the beginning of the 20th century.

What societal conditions and what equality policies are really needed in the 21st century to encourage interested and talented women to seize the opportunity for their personal development and to shape the future for all of us? We must all continue to research and implement the right interventions to close the equity gap. The societal effort needed to achieve this must not be weakened, so that women can truly realise their career opportunities in STEM on an equal level.

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# Creative Stem Education at Baylor University

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For happy and successful societies to exist today, STEM is necessary to prepare students for success in college, career, and life. The acronym STEM (science, technology, engineering, and mathematics) has been adopted by numerous programs as an important focus for renewed global competitiveness for countries, but conceptions of what STEM entails often vary among stakeholders (Breiner et al., 2012). In recent years, the STEM acronym went from designating four disciplines (science, technology, engineering, and mathematics) to describing practices, groups, careers, centers, resources, initiatives, and programs. STEM means an integrated curriculum (Bybee, 2013). STEM is not a single curriculum; rather, STEM combines curricula from science, math, engineering, and technology; and encompasses teaching and learning through a transdisciplinary integration of these disciplines. (Vasquez, 2015; Cianca, 2020). STEM education in the early years provides a context for designing active learning ecologies that connect with children's natural curiosity about their world. It engages children in authentic investigations, using critical and creative thinking in systematic ways to build knowledge, acquire skills and cultivate confident dispositions for learning (Yelland, 2021).

The goal of STEM education is STEM literacy. The approach is student-based inquiry, reasoning, collaboration, and application within real-world contexts (Cianca, 2020). A fully integrated STEM curriculum is most easily achieved at the elementary level, where students remain with a single teacher for a large portion of the day because a longer block of time organized by a single educator would make any curricular innovation more likely. It is logical that elementary teachers would be very interested in a curriculum modality that could solve the problems of teaching mathematics and science in ways that would be engaging for all concerned. Thus, a variety of STEM models have found fertile ground in the elementary classroom. (McComas & Burgin, 2020). Making engineering a part of the K–12 experience helps give students experience with building and designing. It also serves to motivate their learning of the math and science concepts that make technology possible (Rogers & Portsmore, 2004). At this point, it is important to note that these activities are prepared in accordance with their purpose and that teachers have sufficient knowledge about this process.

Pedagogical strategies are crucial to being able to create meaningful STEM education activities. One of the fundamental pedagogical strategies for teaching STEM in the early years is using real-life experience and hands-on exploration in a child-centered learning process (Leung, 2023). The three steps that should be considered in the process of designing these strategies and their descriptions are as follows (Lottero-Perdue, 2019):

1. ***Explore***: Find out more. Children learn about the problems they need to solve and explore the available materials to find out more about them.
2. ***Create***: Try an idea. Children work in small groups with an adult to create their first design. They then test their design to determine how well it meets the goal.
3. ***Improve***: Make it better. Children improve their designs, then come together to share what they've found out with the group.

Scientific progress is the product of creative thinking. Science work requires a specific form of creativity that facilitates problem-finding and solving, hypothesis generation, experimental design, and technical innovation. Scientific content and learning environment are very important. The main aim of science education should be to develop students' creative abilities: exploring, visualizing, inventing, innovating, and evaluating abstract ideas. This goal can be achieved through learning experiences that engage students in the practice of science in authentic contexts and multidisciplinary frameworks (Kettler et al., 2018).

STEM education began as a popular curriculum for providing accelerated learning to gifted students (Meyrick, 2011). Baylor University the Center for Gifted Education and Talent Development's University for Young People program for students identified as gifted and talented has been offered every June for 40 years. Classes for students entering Grades 4–5, Grades 6–8, and Grades 9–12 in the 2023–2024 school year are held on Baylor's campus. Students choose up to two courses per day in STEM, humanities, social sciences, business, and the arts, with each session lasting one week. Students are placed in groups of 12 with others in the same grades and have a mentor to help them bond with their group, identify talent areas, and start thinking about college and/or career pathways (https://gifted.soe.baylor.edu/).

The content of one of the STEM courses designed for grades 6-8 is as follows: “Unleash Your Inner Inventor: Innovating With STEM-From Velcro to iPhones, everything we use today started with an innovative idea. If you have an interest in inventing, this class will spark your creativity, inspire your ideas, and empower you to create something new. Come join us in the Baylor MakerSpace to unleash your inner inventor and design your own prototype!”

Also, this summer is Baylor University’s STEM+ Camp, designed for incoming fifth-grade students from three Transformation Waco schools. Sponsored by the Baylor School of Education, with collaboration from the School of Engineering and Computer Science and funding from Waco’s Cooper Foundation, the program consists of three one-week sessions. Camp co-director and co-founder Prof. Sandi Cooper states "STEM+ Camp Launch introduces students to STEM subjects and gives them the opportunity to engage with STEM in a positive way and see that it could be a potential career path" (https://news.web.baylor.edu/news/story/2023/baylor-partners-transformation-waco-schools-stem-camp-launch)

Students from elementary schools attend a week-long session filled with instructional STEM+ experiences presented by master teachers, Baylor education graduate students, and Baylor students majoring in education. Finishing each week strong, students test their STEM+ knowledge on Fridays with the launching of their own rockets, using the skills they gained during camp experiences to aid them in the process. Co-director and co-founder, and associate dean Prof. Suzanne Nesmith states "Exploring STEM through rockets is an incredible way to address a wide array of topics, from principles of Newton’s Third Law to thrust, velocity, acceleration, momentum, mass and propellants."

Students engage in the typical STEM subjects (science, technology, engineering, and math), and “+” indicates additional subjects, beginning with the inclusion of art. The artwork created by students throughout the week is showcased at Family Night, which includes a rocket launch facilitated. The overall goals of STEM+ Camp Launch are to:

- Orchestrate a positive learning environment that promotes STEM fields as potential career path;
- Communicate the importance of STEM with families and provide opportunities for families to learn how to support learning at home; and
- Provide professional development to teachers in the classrooms where STEM+ students are placed during the regular school year.

Kindergarten through fifth-grade teachers are invited to attend one-day professional development workshops each session. It is critical that all elementary students spend significant time every day engaging with the hands-on practices of science and STEM because this early exposure encourages students to consider STEM-related careers and enroll in advanced science and mathematics courses in middle and high school.

To establish the depth of STEM understanding and the efficacy of the camp experience, students take two surveys at the beginning and end of each week’s session: the S-STEM (Student Attitudes Toward STEM) and STEMaSE (Self-Efficacy for STEM activities) surveys. These validated assessment instruments align with the research-based curriculum being used in the camp. The S-STEM survey determines students' initial attitude toward STEM, and how it might change by the end of STEM+ Camp Launch. STEMaSE assesses students' self-efficacy in science, technology, engineering, and math as integrated STEM learning occurs.

There is much that remains to be done to increase resources and research to support STEM education at all levels of education, beginning with early childhood. It's good for young children to participate in engineering design challenges (thinking, creating, experimenting, and trying again). Providing students with opportunities for engineering games, practicing high-quality engineering design challenges and integrated STEM units is a good thing. Learning how to facilitate STEM education for young children is good for teachers and parents alike. As the field grows in the coming years, educators will adjust their practices accordingly. Creative activities and classes for STEM education at Baylor University continue to increase day by day.

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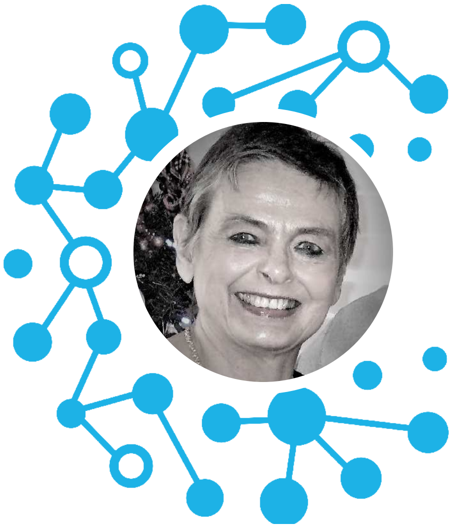

# RIP - Reading International Pisa

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**Abstract**

The title "RIP - Reading International PISA" refers to the reality that global education has been one of the many victims of the COVID-19 pandemic. The April 2020 World Talent Web Newsletter provided an overview of the various sub-scale elements of PISA that have relation to Gifted and Talented students. That 2020 article was written in the early stage of the pandemic which had permeated the world with the severe levels of quarantine. COVID-19 affected all aspects of life and the education of children. This new PISA article is an interim status report on the level of survival and potential recovery of international testing. It has a focus on PISA 2018 Reading, as well as integrating aspects of PIRLS 2021 Reading. The primary message is one of optimism in PISA recovery, and evidence will be forthcoming in the PISA 2022 results to be released in December 2023. It also continues to reinforce the message that scores of Top Performers are valuable to the overall achievement profile in improvement of a country's PISA mean score and rank.

PISA (Programme for International Student Achievement) was launched by the OECD (Organization for Economic Cooperation and Development) in the year 2000. This articulated international testing has a cycle every 3 years in Reading, Math and Science. The sample includes member countries of the OECD as well as non-OECD partner countries. Every three years one of the subjects of reading, math or science is the major focus, with the other two subjects tested but not analyzed to as great an extent.

| Reading | Mathematics | Science |
|---|---|---|
| 2000 | 2003 | 2006 |
| 2009 | 2012 | 2015 |
| 2018 | 2021/2022 | 2025 |

PISA tests 15-year-old students on real-world problem-solving skills and has established the reputation as a high profile assessment of transnational educational achievement. Each new testing cycle report provides extensive trend data and significant sub-scale data on improvement across the world.

The last published PISA data is from 2018 with the major focus on Reading. A new technology framework for the reading assessment reflected what and how people read in the electronic format as well as the proliferation of reading material. There was greater emphasis on the ability to find, compare, contrast, and integrate information across multiple sources of text.

Results of PISA 2018 were released in December 2019. At that point, global dynamics had been on a normal trajectory. Table 1 shows PISA results in a traditional league table format, only ranking 1-30 of 77 countries/economies. This league table format is continually controversial among critics of PISA as being detrimental in comparisons across countries. The high rankings are welcome and publicized, but low rankings showcase the educational deficits of less achieving countries.

Table 1 has two extra columns, the percentage of students scoring at the Low level below Proficiency Level 2, and the percent scoring at High levels 5 and 6. Among OECD countries. between 10% and 15% of students were top performers in reading. On average across OECD countries, only 1.3% of students were proficient at Level 6 in reading. (OECD)

Evidence of top performer percentages provided by PISA data can be cited in communication advocating for the value of Top Performers contributing to high scores in total mean and rank of a country.

**PISA 2021/2022 - MATHEMATICS**

PISA 2022 has a major framework of Mathematics with a participation of 84 countries/economies. The minor frameworks are Reading and Science, plus a new framework of Creative Thinking with participation of 66 countries. The results from the Creative Thinking domain should be of special interest to the field of gifted. The optional framework of Financial Literacy was repeated with a participation of 20 countries/economies. The PISA 2022 data collection was computer-based in 79 countries/economies and five countries/ economies were paper-based. The results from PISA 2022 are scheduled to be released in December 2023, with anticipation of discovering COVID-19 factors that may have affected valid data.

TABLE 1 – PISA 2018 – 1-30 – READING

| Rank | Country/ Economy | Mean | LOW Below % PL 2 | HIGH % PL 5-6 |
|---|---|---|---|---|
| 1 | China B-S-J-Z | 555 | 5.2 | 21.7 |
| 2 | Singapore | 549 | 11.2 | 25.8 |
| 3 | Macau | 525 | 10.8 | 13.8 |
| 4 | Hong Kong | 524 | 12.6 | 14.8 |
| 5 | Estonia | 523 | 11.1 | 13.9 |
| 6 T | Canada | 520 | 13.8 | 15.0 |
| 6 T | Finland | 520 | 13.5 | 14.2 |
| 8 | Ireland | 518 | 11.8 | 12.1 |
| 9 | South Korea | 514 | 15,1 | 13.1 |
| 10 | Poland | 512 | 14.7 | 12.2 |
| | | | | |
| 11T | New Zealand | 506 | 19.0 | 13.1 |
| 11T | Sweden | 506 | 18.4 | 13.3 |
| 13 | United States | 505 | 19.3 | 13,5 |
| 14 | Japan | 504 | 16.8 | 10.3 |
| 14T | United Kingdom | 504 | 17.3 | 11.5 |
| 16T | Australia | 503 | 19.6 | 13.0 |
| 16T | Chinese Taipei | 503 | 17.8 | 10.9 |
| 18 | Denmark | 501 | 16.0 | 8.4 |
| 19 | Norway | 499 | 19.3 | 11.3 |
| 20 | Germany | 498 | 20.7 | 11.3 |
| | | | | |
| 21 | Slovenia | 495 | 17.9 | 7.8 |
| 22T | Belgium | 493 | 21.3 | 9.5 |
| 22T | France | 493 | 20.9 | 9.2 |
| 24 | Portugal | 492 | 20.2 | 7.3 |
| 25 | Czech Rep. | 490 | 20.7 | 8.2 |
| 26 | Netherlands | 485 | 24.1 | 9.1 |
| 27T | Austria | 484 | 23.6 | 7.4 |
| 27T | Switzerland | 484 | 23.6 | 8.1 |
| 29T | Croatia | 479 | 21.6 | 4.7 |
| 29T | Latvia | 479 | 22.4 | 4.8 |
| 29T | Russia | 479 | 22.1 | 5.4 |

**COVID-19 EFFECTS**

The release of a PISA article in the March 2020 issue of the World Giftedness newsletter had coincided with the onset of the COVID-19 pandemic. School participation was being suspended and replaced by provisions for home schooling under virtual guidance by teaching staff with direct supervision of parents. The COVID-19 disruption became more profound as the pandemic continued throughout the year 2020, and into 2021, which was to be the next PISA testing year with the focus on Mathematics. Testing year 2021 was postponed, and well into 2022 there were still variances in school attendance.

PISA 2021 field trial administrations began in March 2020. OECD recognized that countries around the world had shut down businesses, services and schools due to the pandemic. Most schools were unable to complete their Field Trials in 2020 because of school closures amid the health emergency. As a result, OECD postponed field trials until 2021, and the main PISA testing to 2022, leading to 4-year test span between 2018 and 2022, where the tradition had been 3 years.

**PISA 2025: SCIENCE**

PISA 2025 will focus on science. It will also include a new assessment of foreign languages. The PISA 2025 innovative domain will assess Learning in the Digital World, which would measure student ability to engage in self-regulated learning while using digital tools.

**PIRLS 2021**

Another international assessment is PIRLS (Progress in International Reading Literacy Study). PIRLS is conducted by the TIMSS and PIRLS International Study Center at Boston College and the IEA. PIRLS has been conducted every five years since 2001 and is recognized as the global standard for assessing trends in reading achievement at the fourth grade. PIRLS 2021 was the fifth assessment cycle, with 20 years of trend results. It assessed students in 57 countries versus 70 countries in PISA. Results were released on May 16, 2023 and available online.

PIRLS 2021 provides the only internationally comparative fourth grade achievement results collected during the pandemic. The PIRLS 2021 framework also went through a transition to implement an innovative digital assessment in a new group adaptive design. PIRLS 2021 data was collected over two years during the COVID-19 pandemic, due to schools facing many disruptions. Administrators of PIRLS also adapted rapidly to the COVID-19 school disruption situation. They included context questionnaire items specifically targeted to collect information about the challenges in schools and students during COVID-19. PIRLS 2021 reporting provides thorough integration of circumstances related to testing during COVID-19, The report has integrated valuable commentary to understand concern for COVID-19 factors related to results.

Table 2 provides the ranking of 1-30 in PIRLS 2021. The levels of achievement in PIRLS are distributed in terms of four benchmarks: Low, Intermediate, High, Advanced. Percentages are the portion of total students achieving each Benchmark. Major changes are in % High and Advanced.

TABLE 2 - PIRLS 2021 – RANK 1-30

| Rank | Country | Mean | % Low | % Inter Med. | % High | % Advance |
|---|---|---|---|---|---|---|
| 1 | Singapore | 587 | 97 | 90 | 71 | 35 |
| 2 | Ireland | 577 | 98 | 91 | 67 | 27 |
| 3 | Hong Kong SAR | 573 | 98 | 92 | 68 | 21 |
| 4 | Russian Fed. | 567 | 98 | 89 | 63 | 21 |
| 5 | N. Ireland | 566 | 97 | 87 | 81 | 23 |
| 6 | England | 558 | 97 | 86 | 57 | 18 |
| 7 | Croatia | 557 | 98 | 88 | 56 | 15 |
| 8 | Lithuania | 552 | 97 | 86 | 54 | 14 |
| 9T | Finland | 549 | 96 | 84 | 53 | 14 |
| 9T | Poland | 549 | 97 | 85 | 52 | 14 |
| | | | | | | |
| 11 | United States | 548 | 95 | 81 | 52 | 18 |
| 12T | Chinese Taipei | 544 | 97 | 85 | 50 | 10 |
| 12T | Sweden | 544 | 95 | 81 | 50 | 15 |
| 14T | Australia | 540 | 94 | 80 | 48 | 14 |
| 14T | Bulgaria | 540 | 93 | 78 | 49 | 18 |
| 14T | Czech Rep. | 540 | 96 | 82 | 47 | 11 |
| 17T | Hungary | 539 | 94 | 79 | 49 | 13 |
| 17T | Denmark | 539 | 96 | 81 | 48 | 11 |
| 17T | Norway | 539 | 96 | 81 | 47 | 11 |
| 20 | Italy | 537 | 97 | 83 | 44 | 8 |
| | | | | | | |
| 21 | Macao SAR | 536 | 96 | 82 | 45 | 9 |
| 22 | Austria | 530 | 96 | 80 | 41 | 7 |
| 23 | Slovak Rep. | 529 | 94 | 79 | 42 | 8 |
| 24 | Latvia | 528 | 94 | 78 | 40 | 8 |
| 25 | Netherlands | 527 | 96 | 79 | 37 | 6 |
| 26 | Germany | 524 | 94 | 75 | 39 | 8 |
| 27T | New Zealand | 521 | 90 | 71 | 41 | 11 |
| 27T | Spain | 521 | 95 | 78 | 35 | 6 |
| 29T | Portugal | 520 | 94 | 75 | 36 | 6 |
| 29T | Slovenia | 520 | 94 | 75 | 35 | 5 |

**READING FLUENCY**

The PISA reading fluency test can help understand reasons for low performance and help align reading difficulties with needs of students. PISA data show that on average across OECD countries, one in five 15-year-old students do not reach a baseline level of reading proficiency and score below level 2 on the reading test. This suggests that many of them are not yet fluent readers. Low levels of reading fluency adversely affect the mean score for PISA reading,

**LEVEL PLAYING FIELD**

A level playing field for all students permeates all areas of PISA reporting. What is relative to PISA data is whether students were channeled into different tracks or programs at a younger age or not. Though socio-economic status predicts PISA performance scores, the relationship varies, and poverty is not always an impediment. The way schools are organized matters, and PISA finds it is possible to attain both strong performance and greater equity in education.

**EARLY EDUCATION**

PISA 2018 provided evidence that a more level playing field ensures access to quality early education for more children. A strong beginning in early learning establishes neural pathways that are more difficult to develop later. Research has shown the benefits of pre-primary education in promoting the development of cognitive, language and numeracy skills, especially among least advantaged students.
The bottom line for leveling the playing field includes four recommendations:

1. Strong beginning in early learning
2. High expectations for all students, minimizing sorting students into tracks, grade levels.
3. Adequate resources in all schools regardless of socio-economic level.
4. School autonomy over student learning with centralized accountability arrangements.

**AUTHOR CONCLUSIONS**

1. The COVID-19 effect on PISA 22 testing interrupted trend continuity. and suggests post-COVID baseline updates for achievement.
2. Integration of technology was a necessary outcome of the quarantine of COVID-19 and spearheaded extended technology support in home and school.
3. PISA Proficiency Levels 1-6 are a major curriculum resource to support equity of educational goals in policy and implementation.
4. PISA questionnaires provide a valuable insight into socio-emotional, and socio-economic variables.
5. PISA recommendations outline instructional concerns in grouping students,
6. Mixed-ability instruction, high expectations and differentiation all support addressing low performing students within the regular classroom.
7. PISA Data from top performer proficiency levels 5-6 provide evidence that high achievement increases the mean score for the country. Top Performer might be alternate term for Gifted.
8. Goal of PISA continues to advance equity for low scoring students.
9. Equity of opportunity needs to also address value of high achievement for Top Performer students.
10. Achievement in reading depends on an increasing level of fluency.
11. Early childhood experience is critical.
12. Socio-emotional aspects affect PISA student achievement and nutrition, safety, belonging, love, trauma and grief can relate to the pandemic.
13. Reading can be implemented in the heterogeneous classroom through differentiation strategies, self-regulated learning, use of technology.
14. Mathematics at secondary level has a higher need for direct group instruction and closely articulated instruction to maximize engagement..
15. High teacher expertise is an important achievement factor in education.
16. Global standards in education have value., The international Benchmarks in PIRLS and proficiency Levels in PISA have research-based standards that support a level playing field globally.
17. There is PISA evidence of gender disparity in reading (lower male) and mathematics (lower female).
18. Websites for OECD (PISA) and IEA and Boston College (PIRLS) are of easy access and provide rich research.
19. The release of PISA 2022 results in December 2023 will provide valuable information on effects of COVID-19.
20. Each country benefits from professionals trained to interpret international testing research within discrete sub-scales of achievement.

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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.

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"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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