WORLD GIFTEDNESS CENTER

WorldTalentWeb

Newsletter of the World Giftedness Center

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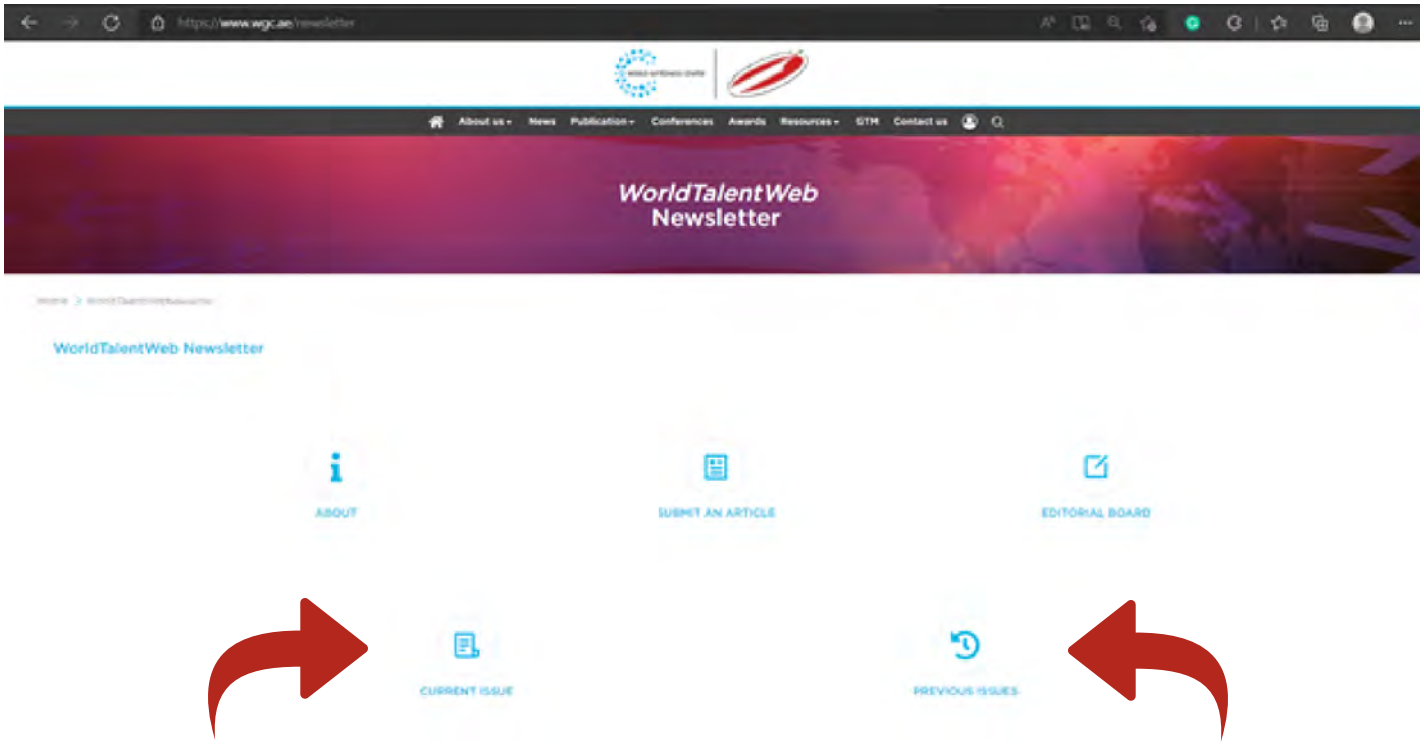
Announcing the WorldTalentWeb Homepage

We are very pleased to share with you that the ***WorldTalentWeb newsletter*** is now hosted and published on the WGC website.
Current and previous issues can always be accessed via the website.

https://wgc.ae/newsletter



WORLD GIFTEDNESS CENTER

Invitation to participate in the Applied Research Global Award of Gifted Education

Greetings from the WGC of Hamdan Bin Rashid Al Maktoum Foundation for Distinguished Academic Performance.

It is our pleasure to announce the first cycle of the
Applied Research Global Award of Gifted Education

This award recognizes international researchers whose doctoral dissertations and subsequent research are expected to provide a promising contribution to the fields of giftedness, talent development, and related areas. It aims to encourage solid research in gifted education and talent development worldwide.

Eligible applicants are only those researchers who have a maximum of five years involvement in research after their PhD as of the application's point of submission.

The award amount of 25000 US Dollars will be granted every year to one laureate.

Applications are to be filled out using only English and submitted online via the WGC website (https://wgc.ae/awards) by 10 May 2022 at the latest (midnight UAE time). Only research prepared and published in English will be considered.

All submissions should adhere to the Award's criteria. Non-eligible submissions will be excluded.

Please visit the WGC website
(https://wgc.ae)
for more information.

For any further inquiries,
kindly send an email (wgc.awards@ha.ae)
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WORLD GIFTEDNESS CENTER

Invitation to participate in the School Global Award initiative of Gifted Education

Greetings from the WGC of Hamdan Bin Rashid Al Maktoum Foundation for Distinguished Academic Performance.

It is our pleasure to announce the first cycle of the
School Global Award initiative of Gifted Education

This award aims to encourage best practices and distinguished efforts in the areas of gifted education and talent development. It is intended for all those involved in gifted and talented education from KG1 through pre-university level. For example, teachers, principals, and counselors involved in gifted education in public or private schools worldwide may apply for this award.

The award amount of 25000 US Dollars will be granted every year to one laureate.

Applications are to be filled out using only English, and submitted online via the WGC website (https://wgc.ae/awards) by 10 May 2022 at the latest (midnight UAE time). Any document prepared and submitted in a language other than English will not be considered.

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Letter from the Editors: The Mentoring Edition

Penina Barry & Jennie Quinn

Penina and I are very excited to bring you the April edition of the WTW Newsletter affectionately known as *The Mentoring Edition*. Affectionately, because mentors and mentoring are terms dear to us both as beneficiaries of expert mentoring and as early adopters of the process of mentoring to enhance outcomes for gifted and talented students.

In our former lives as Gifted Education Coordinators in schools, we drew constantly on the skills and qualities gained from our own mentors who had challenged us, championed us and charged us to make a difference. The wisdom and expertise of these mentors helped us understand that it would take a village to serve our gifted students and no one Gifted Education Coordinator could do the task on their own. A dilemma that could only be solved by tapping into the gift that is mentors and mentoring.

A good mentor is invaluable and many of you will be aware that earlier this year we lost one of the giants of gifted education, the late great Emeritus Professor, Miraca Gross. She was an exceptional educator and expert in Gifted Education recognised both internationally and nationally as a leading authority in the field. Professor Miraca Gross ignited a spark in countless teachers to develop and hone their skills in gifted education and in this capacity she was certainly a mentor to both Penina and me.

We asked our friend and colleague, Bronwyn MacLeod, Director of ALDEA Education and longtime friend and colleague of Professor Miraca Gross to write a tribute to her friend and mentor. Bronwyn worked closely with Professor Gross in her capacity as Convenor of the Postgraduate Certificate of Gifted Education and gifted courses for the Masters of Education at the University of New South Wales.

This is her tribute.

In Memoriam, Emeritus Professor Miraca Gross AM
by Bronwyn MacLeod

On Friday 28 January, 2022, the news that Emeritus Professor Miraca Gross had passed peacefully from this world was released. The response from so many was deep sadness acknowledging that one of the 'greats' of this field has left us and a recognition that her work throughout her adult life has had a profound impact on gifted students, their parents and educators across the world. So many of her close friends and colleagues have already written of her achievements since her passing, so perhaps I will try to provide some insights into her drive, passion and intentions behind the legacy she leaves and why this is greater than she may have ever considered it would be.

I was privileged to have been introduced to Professor Miraca Gross as a young teacher by my Principal at the time who was a close friend and colleague of Miraca. That first meeting with Miraca was life changing and it sparked a passion in me to understand and support gifted students in my role as a teacher, a school leader and later as a lecturer and consultant. I remember so clearly the evening some 30 years ago when Miraca explained to the parents at the school in which I was working what it was like to be a gifted learner and my awe observing the way she gently and often humorously drew us all into this world of gifted children and adults. Her Scottish lilt and her small frame may have appeared to some to be indicators of a gentle and fragile person, however Miraca was fiercely determined to make a difference in the lives of gifted children across the world, constantly reinforcing the need for all educators to recognise and advocate for this minority population who are often misunderstood and underestimated.

Miraca was a highly gifted, twice-exceptional student who was raised by a single mother in Scotland in the post Second World War era, attending Boroughmuir Secondary School in Edinburgh, a selective high school for academically gifted students. Miraca believed strongly in the importance of role models and mentors for all students, but particularly for gifted students and the influence of mentors in her life was

profound. In some of her writing, she has shared stories about five teachers who influenced her as a learner, as a teacher and later as an academic. In Scotland, these were Margaret Kay, her first primary teacher to whom she credited the reason she became a teacher, Forbes MacGregor, the Principal of her primary school, who encouraged her to write and Joe Casciani, her secondary English teacher who taught her the value of self editing, each of whom she described as pivotal to how she viewed herself as a learner. Later she found mentors in the Principal of Clapham Primary School in Adelaide, Australia, Alf Pearce who demanded excellence from all his teachers and then Professor John Feldhusen at Purdue University who saw more in her than she could see herself and this is where she completed her PhD titled "Children of exceptional intellectual potential: Their origin and development". She was inspired by these educators to conduct research, write papers and books, and to be an advocate for gifted children everywhere and in turn she became a mentor and role model for myself and many of my colleagues in gifted education in a way that paid that experience forward.

Miraca began her long-term work at the University of New South Wales in 1991, becoming the Founding Director of GERRIC (Gifted Education, Research, Resource and Information Centre) within the School of Education, in 1993. Her research over the years of her tenure at UNSW investigated issues of equity, friendship, social emotional development, grouping, acceleration, twice-exceptionality as well as the experiences of the highly to profoundly gifted through her longitudinal study of 60 Australian students who were identified with IQs of 160+. In 2004, Miraca collaborated with Professors Nicholas Colangelo and Susan Assouline from the Belin Blank Center at the University of Iowa to write the first "A Nation Deceived" document on acceleration, highlighting disparities between the research on acceleration and the educational beliefs and practices.

Miraca developed the Certificate of Gifted Education (COGE), a rigorous and challenging program of study for classroom teachers and school leaders to learn more about gifted learners and their cognitive and social emotional needs. Miraca invited the 'greats' from around the world to work with her in delivering the modules within the course and there are many COGE students who would remember the excitement of knowing that the research of Francoys Gagné, Karen Rogers, Joyce VanTassel-Baska, Susan Assouline, Nicholas Colangelo, and Lannie Kanevsky to name just a few, would be presented directly from these renowned leaders during the course. In 2007, an online version of COGE was developed and through this even more educators across the world were able to access the learning this course provided. Many COGE students have chosen to continue their studies to complete their Master of Gifted Education and their PhD, inspired by their learning in COGE.

Alongside the courses for teachers, Miraca also established student and parent programs which continue to be presented in school holiday periods across each year and through government grants, she and teams from UNSW and the University of New England (UNE) developed a differentiated six module professional development program which was delivered to every school in Australia, and then followed by a series of 50 one day workshops for parents in regional and remote areas of the country.

Throughout her career, Miraca was a prolific writer of journal articles, papers, submissions and books. She was proud of the books she had published, especially the first and second editions of "Exceptionally Gifted Children", however it is her self-titled book: "Miraca Gross, In Her Own Write: A Lifetime in Gifted Education" that provides some of the most interesting insights into Miraca herself and her journey throughout her life. She achieved so many awards across the expanse of her life, from the inaugural Australian Award for University Teaching in Education from the Australian Federal Government in 1997, to the Sir Harold Wyndham Medal from the Australian College of Educators for "outstanding contributions to Australian education" in 2003, and the Distinguished Scholar Award from the US National Association for Gifted Children (NAGC) in 2005. In 2008, she was recognised by the Mensa Education and Research Foundation (USA) with the International Lifetime Achievement Award. Perhaps the award that she treasured highly was being inducted as a Member of the Order of Australia in 2008. She shared with me that as a voluntary minority, a woman who is twice exceptional and who experienced deliberate exclusion in the early years of her life in Australia, to be recognised by her adopted country in such a way, was very special and validating.

Miraca's legacy is immeasurable because of the ongoing ripple effect which began with her work early in her career. She conducted and influenced research, led discussions on educational policy, guided political decisions, taught and encouraged educators and leaders of education, students and parents in Australia and across the world and this work will not end with her passing. Miraca will be remembered each time her articles, book chapters, books and interviews are read or viewed. She will be remembered by those who were privileged to work with her and by those who now benefit from the research she conducted and the courses she helped to develop.

For me personally, I will remember Miraca as the kind and generous woman who saw me through some of the toughest times in my personal and academic life, who encouraged me to be the educator she believed I could be, and who opened pathways for my own exceptionally gifted children. I will always remember the way she spoke about the love of her life, John Gross, who stood by her and supported her throughout their lives together. I will remember her love for the different cats they raised together over the years and her love of playing bridge with him.

I, like so many others, will miss her greatly and will think of her with gratitude each time I work with gifted children, their teachers and their parents. It is her mentorship, her body of work and her sacrifices over the years that inspire me to pay it forward on her behalf.

Vale, my mentor and my friend.

In the April Mentoring Edition, we invite you to tap into how our authors have harnessed the power of mentoring to create excellent outcomes for gifted students. We start with Ahmed Hemdan's I-Mentoring chronicle about online mentoring's capacity to foster problem-solving, creative and critical thinking and to stimulate curiosity and autonomy. Miguelina Nunez, Natalia Cabal Duque and Duarte Araujo explore the interplay between equitable practices and mentoring relationships in extreme contexts and the implementation of the From the Ground Up FTGU project as a learning pathway towards excellence. And finally, Wencke Brauns and Michael Heilemann examine the success of Germany's CyberMentor program, an online mentoring program for girls in STEM.

We hope you enjoy the Mentoring Edition of the WTW newsletter.

Jennie & Penina

I-Mentoring: A Success Story from United Arab Emirates University, UAE

Ahmed Hemdan,
ahamdan@uaeu.ac.ae

Mentoring has been for decades regarded as one of the most effective approaches to enhance the performance of individuals especially when tailored to meet the needs of mentees and help them achieve their personal goals (Stoeger, Balestrini, & Ziegler, 2021). Although mentoring is not a new practice on its own, online mentoring relatively is. The relational characteristic refers to the relations between the parties involved in this situation and where one fosters the development of the other in different phases including "initiation, cultivation, separation, and redefinition". The first stage is initiation, and it involves an engagement in appropriate interaction enhancing a productive match between the mentor and mentee. Cultivation comes next and it is a sustained phase defining the functions of a more sustained relationship. Then comes the separation phase where the mentee becomes more autonomous and is believed to have achieved the intended goals of this relationship. The last stage is the redefinition and that is when the relationship is changed into collegial friendship with a less formal definition and supported mutually by the two parties (Kram, 1983; Mullen & Schunk, 2012).

Traditional mentoring remains restricted by different factors. One of the most important of these is the mindset and expectations of mentors which must be addressed when training mentors (Hudson, 2013; Straus et al., 2013; Masters and Kreeger, 2017 as cited in Mader et al., 2021). Other factors include the availability of effective mentors within the same context as well as the provisioned limited support of mentors. From here emerges a new concept of mentoring inspired by new technologies of the 21st century. Online mentoring is the alternative of traditional mentoring, and it can avoid some of the obstacles associated with the traditional one (Aronoff et al., 2010; Jaffer et al., 2013; Perlman et al., 2014). Online mentoring is defined as a computer mediated relationship between the mentor and mentee. It is a mutually beneficial rapport that extends beyond boundaries and promotes learning, support, and advisory opportunities dissimilar to face-to face mentoring (Chong et al., 2020). The question that puzzles academic researchers at this point is to identify how online mentoring may benefit students, especially the gifted and talented. Within the available sources, it is important to explore the components of online mentoring and how it has benefited gifted STEM students.

Components of Online Mentoring

Research associated with online mentoring has found that it is based on six independent components which are "Competence, Availability, Induction, Challenge, Communication, and Emotional Support" (Byrnes et al., 2019). Competence is associated with the appropriate education and career background of mentors and their previous experience in the field. Availability is measured through the allocation of an appropriate amount of time by mentors to address the needs of mentees. Induction means the collaboration between mentors and mentees and how the former introduces apprentices to practical situations where they can hone their skills. Challenge is related to the difficult task associated with how mentors will be able to help mentees and prove to be beneficial for their progress and growth. Communication is the articulation of what needs to be done clearly and accurately as to improve learning. Finally, emotional support is how mentors address the emotional needs of mentees by providing advice, boosting their confidence, and giving them positive feedback (Byrnes et al., 2019).

Benefits of Online Mentoring for Gifted STEM Students

Mentoring is an approach to learning which has emerged from practical experience (Ziegler, 2021). In order to understand its benefits for learners, especially gifted and talented groups, it is essential to explore the different contexts in which it has been applied and build an understanding of the opportunities fostered by this approach.

A study in Germany was dedicated to evaluating the effectiveness of online mentoring programs in the STEM field (science, technology, engineering, and mathematics). The program was dedicated to support girls and boost their participation in STEM and included more than 1600 participants. The results showed that mentors have successfully supported their mentees by discussing STEM- and school-related topics and advising them on career choices (Heilemann, et al., 2018). Another study also focused on STEM involving a female population of mentees found that when implemented appropriately, an online mentoring program had positive effects in regard to boosting the interest of girls in this field and enhancing their performance (Stoeger et al. 2019). Based on the results of a one-year online mentoring program for girls in STEM, data showed that online coaching was successful in surmounting the adversities of time and place that often restrict young girls and offered participants an excellent opportunity to be engaged with appropriate mentors and highly beneficial ones (Stoeger et al., 2013). Further, Stoeger et al. (2021) deduced from a nine-year online mentoring program that this approach can be useful for supporting girls. The study applied three formats of online mentoring which are one-on-one, many-to-many, and a hybrid form of the two. Results showed that all three formats yielded to an increase in the mentees' STEM achievement and catered for their individual differences. Another study conducted in Germany for 6 months has employed online mentoring in the form of one-on-one and many-to-many. The study participants were also high-achievers and they were mentored by female academics. The results showed that many-to-many group-mentoring proved to be more effective than the one-on-one as it has increased STEM communication, STEM networking, elective intentions for mentees, and their centrality in STEM networks (Stoeger et al., 2017).

In a case study concentrating on math, 5 gifted students in grade 8 were engaged in an online mentoring initiative. The results also showed that learners were highly motivated and engaged in the program and were dedicated towards completing the required tasks both collectively, and individually. In addition, learners showed an engagement with the community that has yielded outstanding results (Mammadov & Topçu, 2014).

In conclusion, research investigating the effectiveness of online mentoring for gifted learners, mainly in the STEM field, showed that this approach is highly effective in developing learners' capabilities, enhancing their performance, stimulating their inquisitiveness, and improving their autonomy.

I-Mentoring Program at the UAEU

The Special Education Department at the UAEU conducted an online mentoring program from 2020 until present. Different schools in Abu Dhabi were invited to participate in this initiative. These schools nominated gifted students based on several criteria such as academic achievement, accomplishments, and by collecting data about their interests survey. The program consisted of three phases. The first phase started in December 2020 until January 2021. This phase included students' orientation and assigning to enrichment clusters. More than 80 students participated in phase one. During this phase, students received training to use an e-platform that included all technical features that should help them access materials and resources needed to go through the I-Mentoring program. Students were divided into three enrichment clusters: STEM, book club, and young researchers. In each enrichment cluster, one of the Special Education Department faculty supervised the cluster's activities and students' performance for two months. The mentors met the students once every other week. The purpose of phase one was to get students involved in several topics related to the enrichment cluster and get them ready for the next level of the international I-Mentoring program. A related purpose was to brief students with some future jobs related to STEM fields. A total of 60 gifted students participated in phase two. This phase encompassed an international training program. In the international program, a team from the USA, consisting of professors and practitioners, in collaboration with teachers from Abu Dhabi and the UAEU mentors, trained students on problem-solving skills through learning about the Real Engagement in Active Problem-Solving model (REAPS; Maker & Pease, 2021). This training lasted for two months (May and June 2021) in which students received extensive training on solving an environmental problem (plastic waste). Students were mentored by their teachers who worked with ten groups of gifted students. Each teacher supervised a stakeholder group in which students' activities throughout the different steps of the REAPS model were monitored and supervised. The international team met with the students 3 times per week for two months to walk them through the several steps of solving the environmental problem. The case study that was presented to students included solving plastic pollution problems in Abu Dhabi and beyond.

The purpose of this activity was to experience the REAPS model at a high school level by solving an ecological problem that is important to local and national interest groups or stakeholders in the region. The number of participating students in each group was 5 to 6. Students were told that each stakeholder group will present the findings and solutions to a panel of experts who will listen to each group and decide which solutions to recommend for implementation. Each stakeholder group was informed to gather and organize information, identify and define the problem, generate solutions, decide on the best solution, develop a presentation about the proposed solution, evaluate the presentation, and reflect on their own learning (using Thinking Actively in a Social Context, TASC). The problem that was presented to gifted students was about the plastic waste and how, during this class, each stakeholder group will develop solutions to the problem of plastic pollution in Abu Dhabi. At the end of the students' presentations during phase 2, the panel of experts who evaluated the students' presentations, international collaborators, supervising teachers, and mentors from UAEU acknowledged the great efforts accomplished by gifted students in producing such high-quality ideas and products. Students were informed that some proposals will be selected to participate in phase three of the I-Mentoring program. Students were given a couple of months to work on developing their proposals. Three proposals qualified for phase three after careful evaluation from the UAEU team of mentors. Two groups of gifted students were connected to two professors from the Colleges of Engineering and Information Technology to serve as mentors who will advise students in the implementation of their proposals. A third group was referred to Hamdan bin Rashid Centre for Creativity and Giftedness to implement the proposed project.

Figure 1 shows the I-Mentoring platform that included several enrichment resources for students in phases 1 and 2. Figure 2 shows a screenshot from one of the stakeholder groups' solutions. Figure 3 shows a screenshot from a stakeholder group's work.

Figure 1
I-Mentoring Program E—Platform

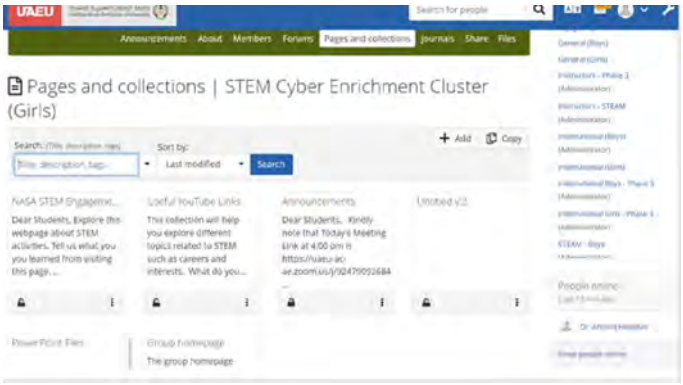
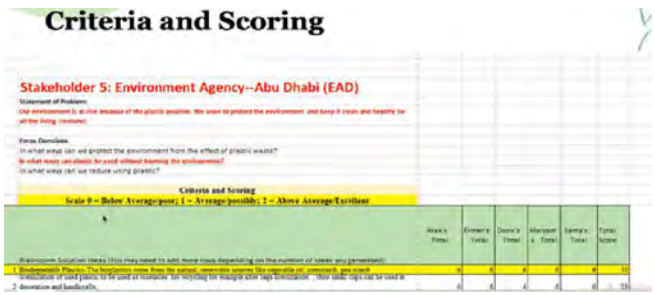


Figure 2
A Screenshot from One the Stakeholder Groups' Solutions

Figure 3
A Screenshot from a Stakeholder Group's Work



Conclusion

Online mentoring is a very promising enrichment program for gifted students. Students voiced their enthusiasm and appreciation of this unique opportunity which helped them foster their problem-solving skills in addition to other skills such as creativity, critical thinking, and presentation skills. Amid the turbulence caused by the COVID-19 pandemic, such online programs served as an outlet for those students to build their capacities and make use of their skills.

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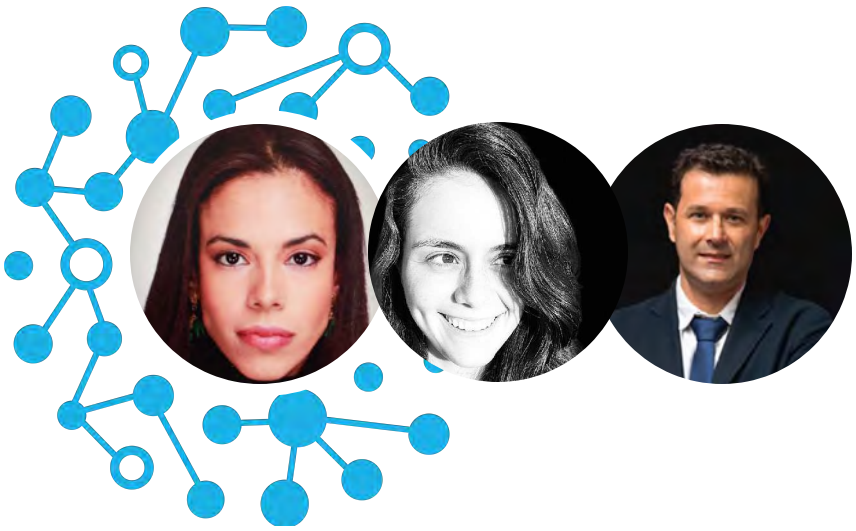
Bio:

Dr. Ahmed Hassan Hemdan is an associate professor at the Dept. of Special Education, College of Education, United Arabic Emirates University. He received his PhD from the University of Arizona, Tucson, USA in 2006 in Special Education/Gifted. He is currently the Editor-in-Chief of the International Journal for Research in Education (IJRE), UAEU. His research interests include assessment and education of gifted and talented students, developing and adapting assessments to the Arabic culture for students with special needs, designing and adapting enrichment programs for gifted and talented students, and the educational psychology of preschool children. He is currently a member of several professional associations such as the World Council for Gifted and Talented Children (WCGTC, UAE Delegate), the American Psychological Association (APA), the European Council for High Ability (ECHA), and the Arabic Council for the Gifted and Talented (ACGT). He participated in several regional and international conferences and chaired several sessions. He published several research articles and book chapters in peer-reviewed international publications in cooperation with different authors around the world. He led several national research grants in the fields of special education and early childhood. He won several national and regional awards for his scholarly achievements. He also led several national projects funded by the MoE, UAE to develop assessments that identify special needs.



Mentorship in Extreme Contexts: From the Ground Up*

Miguelina Nunez, Natalia Cabal Duque and Duarte Araujo

Rocky Mountains in Colorado, USA (Image by Joshua Woroniecki // Pixabay)

Education measures put in place during the COVID-19 pandemic to mitigate learning loss among students has triggered scientific exploration of mentorship, hybrid, and virtual learning spaces in the context of talent development. In fact, a cursory search of the terms: 'talent development,' 'education,' 'hybrid learning,' and 'virtual learning' yielded 56,600 results on Google Scholar, 36% of which were published within the last two years. A similar keyword search for 'talent development,' 'education,' and 'mentorship' produced 90,100 results. Nearly 30% of the studies cited therein were published sometime during the pandemic (since 1 January 2020). Consider that these scientific studies likely took place against an extreme backdrop; after all, the experience of the COVID-19 pandemic is certainly far "removed from the ordinary or average" (*Extreme*, n.d.).

**This is Part 1 of a multifaceted report on equitable practices, mentorship, and new ways of learning beyond the Covid-19 pandemic.*

For this reason, close examinations of mentorship in extreme contexts makes sense. One such context can include extreme sports because physical activity (PA) like that which is associated with mountain biking, would - from the perspective of a novice watching the sport in the context of the United States - require more novel and diversified movement forms than would a sport like baseball, for example. Indeed, mountain biking is less accessible than baseball as entertainment and as physical activity because it is relatively new, having gained popularity in the mid-late 1970s (i.e., the American public does not routinely see examples of novel movement forms via international mountain bike race coverage as it would via international baseball coverage) (Berto, 2008); it requires expensive gear that is not subsidized by the (United States) school system as well as access to uniquely dangerous terrain, hence the umbrella term 'extreme sports' (Huddart & Stott, 2019). Novel movement forms are interesting and relevant to key topics in talent development like self-regulated learning, creativity, embodied cognition, and the person-environment interaction emphasized in many giftedness and talent development models, most notably in Ziegler's (2005) Actiotope Model of Giftedness (AMG). According to Hristovski et al. (2011), "the emergence of highly novel movement forms requires a self-organizing system which, under suitable boundary conditions, can create new behavioral structures." Moreover, "viewed at an ecological level of analysis, the work of sports practitioners has progressively transitioned toward the facilitation of an evolving relationship between an organism (athlete and team) and its environment (sports competition)" (Woods et al., 2020). In other words, *it matters that it is with your body that you do it*.

From the Ground Up (FTGU) is a project spearheaded by professional mountain bikers, Alexey Vermeulen and Ryan Petry (see Figure 1). In late 2020, the athletes put out a nationwide (United States) call for novice bicyclists interested in getting out of their comfort zones to train professionally toward completing the Leadville 100 MTB race in Leadville, CO, USA. The Leadville 100 MTB race is 160km in length, starting at 3,100m and ultimately reaching 3,850m above sea level. Altitude sickness typically occurs above 2,500m. Professional training and mentorship from Vermeulen and Petry ran for approximately eight months for the novice riders rather than the typical 18 months cited by past and present Leadville participants (Vermeulen & Petry, 2020). The case of FTGU is particularly compelling because it provides an example that goes against gender-typing of abstract work like providing care, teaching, or mentoring (Park, 1996): **the project is a unique example of equity building in the learning process toward excellence.**

As such, this case study is concerned with the interplay between equitable practices and mentoring relationships in extreme contexts. It employs perspectives from the fields of cognitive psychology, sport ecological psychology, and neuroscience, and is further aided by self-reports from FTGU participants themselves. Given that Vermeulen and Petry have both participated in and completed the Leadville 100 (the duo consistently placed highly in the final rankings of the race), and as evidenced by their 'professional athlete' statuses, this paper explores the implementation of the FTGU project as a learning pathway toward excellence.

Talent Development and Physical Activity

FTGU promotes physical and mental health, as well as talent development by means of sport, specifically mountain biking. Health, understood as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (Constitution of the World Health Organization, 1946) serves as a cornerstone for talent development. Following the Actiotope Model of Giftedness (AMG), talent development is shaped by the constant interaction of exogenous resources – namely economic, cultural, social, infrastructural, and didactic – known collectively as *educational capital*, and endogenous resources also known as *learning capital* (Ziegler et al., 2019). Learning capital is divided into different yet cohesive types located within the person, hence related to bodily and mental states. Interestingly, the organismic type relates directly to the body's function as it refers to the physiological and constitutional resources of a person, while the actional repertoire (behaviors) and attentional resources are notably associated with mental processes (Phillipson et al. 2013). Health promotion, defined as "the process of enabling people to increase control over, and to improve their health" (World Health Organization, 1986), is thus determined by the appropriate involvement of educational capital and provides an opportunity to enhance learning capital.

Sport belongs to a broader domain known as physical activity (PA) (Westerbeek & Eime, 2021). There are multiple definitions for PA. The most predominant, implemented since 1985, defines PA as "any bodily movement produced by skeletal muscles that results in energy expenditure" (Caspersen et al., 1985). Important authorities such as the World Health Organization (WHO) rely on the aforementioned definition, albeit with a slight variation adopted in 2018: "that *requires* energy expenditure," instead of "that *results* in energy expenditure." More recently, a wider definition of PA has been proposed in an attempt to emphasize its complexity by addressing relevant features that acknowledge the role of psychological, social, cultural, and environmental factors. As a result, PA is defined as an activity that involves people moving, acting, and performing within culturally specific spaces and contexts, and influenced by a unique array of interests, emotions, ideas, instructions, and relationships (see Figure 2) (Dominski & Piggin, 2020; Piggin, 2020). On the one hand, this definition highlights the importance of the interaction between the person (learning capital) and the environment (educational capital) as seen from an ecological perspective of sports. The ecological perspective of sports maintains that the person is inextricably linked to the environment and thus, theories assessing the health enhancing benefits of physical activity (HEPA) that disentangle the environment, especially the natural environment from the person – e.g. via the over prioritization of internal regulation at the expense of other emergent behavior – fail to adequately explain "why PA behaviours in natural environments have different consequences than those in indoor environments" (Araújo et al., 2019). In the context of this paper, it matters that mountain biking is an outdoor activity.

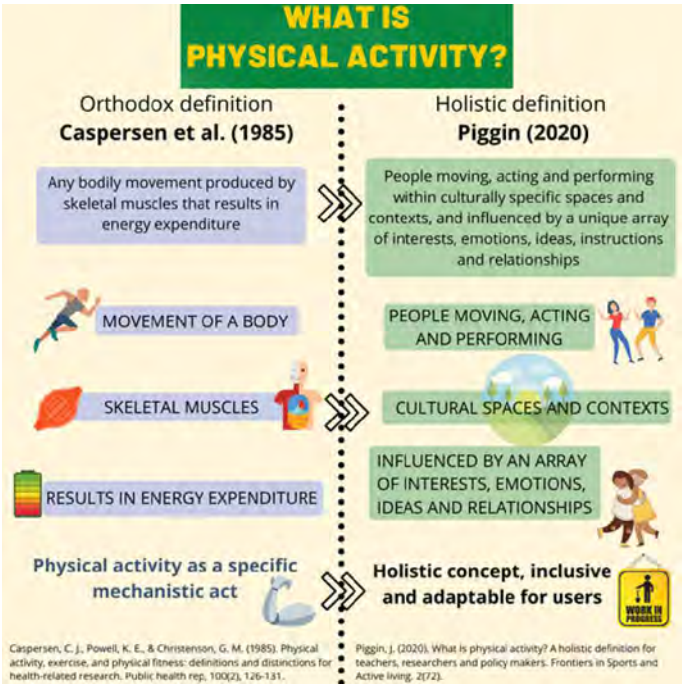


FIGURE 2
Image posted with permission. credit: https://blogs.bmj.com/bjsm/2021/01/02/physical-activity-in-a-pandemic-time-for-a-new-definition-infographic/ (Dominski & Piggin, 2020)

From this perspective, PA helps forge an ever-evolving relationship between person and environment (Araújo et al., 2019; Woods et al., 2020). Furthermore, as directed by the WHO in its latest Global Action Plan, the promotion of PA itself requires an integrative approach including factors that support its realization (e.g., sociocultural, environmental factors) as well as factors that come into the environment from the individual, i.e., educational strategies (World Health Organization, 2019) or suitable *educational capital* engagement. Indeed, all these components are involved as part of the work methodology implemented by FTGU.

Some important aspects of how the human body works are relevant to our understanding of the physical and mental benefits of this project. The body is composed of highly specialized and interconnected systems, which are equally essential for its proper function. This implies that how one body system functions, can alter the performance of the other systems within the body. The brain, part of the nervous system, is implicated for (among many other functions) a person's behavior and cognitive processes, i.e., learning, memory, attention, reasoning, planning, and is influenced by the other systems. It is most notably connected to the endocrine system (Wirth, 2014), which is ruled by hormones that regulate multiple processes in the body (e.g., cognition, blood sugar control, tissue growth), to the immune system (Bondy, 2020), in charge of the body's defenses against external and internal hazards, and to the cardiovascular system (Song et al., 2020), in command of the delivery of oxygen and nutrients to the entire body for its operation. **Therefore, to address the body's function, a sound strategy must have an impact on all systems**. PA is precisely one of those actions that has an impact on every system of the body (Barton & Cardillo, 2020). Importantly, it is the means through which PA improves physical and mental health (learning capital) that contributes to talent development.

Furthermore, the effects of increased participation in PA also carries major socioeconomic and environmental benefits (educational capital). These outcomes are fundamentally in accordance with the achievements intended by the latest General Assembly for Sustainable Development of the United Nations ("*Transforming our World*," 2015).

Disease, Brain Function and Socioeconomic Impact

In 2020, the WHO reported that globally, 1 in 4 adults are insufficiently active and more than 80% of the adolescent population do not meet the recommended levels of PA. In general, people who are insufficiently active have a 20% to 30% increased risk of death in comparison to those who are sufficiently active ("*Physical activity*", 2020). Physical inactivity is one of the main risk factors for the development of noncommunicable diseases, namely cardiovascular diseases (e.g., heart attacks and stroke), diabetes, depression, and cancer. Noncommunicable diseases cause the death of 41 million people every year (71% of all deaths globally). Among these, around 15 million deaths occur at ages 30 to 69 (premature deaths). Cardiovascular diseases are the main leading cause of death in the world with almost 18 million deaths each year ("*Non communicable diseases*," 2021). Noteworthy, these diseases represent massive healthcare expenses worldwide, with an impact on social and economic development. Researchers suppose that high productivity losses associated with functional detriment are also a consequence of premature deaths ("*Economic Impact of NCDs*", 2020). Depression is currently a leading cause of disability among both adolescents ("*Adolescent mental health*," 2021) and adults-affecting around 5% of the adult population; depression is a main contributor, therefore, to the global burden of disease ("*Depression*," 2021). A remarkable recent study showed that in the United States, noncommunicable diseases, especially mental health conditions (e.g., depression) and cardiovascular diseases, impose a tremendous economic burden with an estimated loss of USD 94.9 trillion (USD 265.000 per capita), with an annual tax rate of 10.8% in aggregate income between 2015-2050 (Nugent et al., 2020). To address this major concern, the main health and development agencies worldwide are working to promote PA.

PA performed on a regular basis and to a certain intensity (moderate to vigorous) is shown to have a major role in the prevention and treatment of noncommunicable diseases and improves mental health and well-being (World Health Organization, 2019). Moreover, there is a clear connection between disease and brain function. For example, the link between psychiatric diseases, i.e., depression, and cognitive function directly involves the brain (Vance et al., 2013). However, other types of diseases can also negatively affect cognitive performance. For example, cardiovascular diseases and their risk factors (e.g., high blood pressure and obesity) ("*Cardiovascular diseases*," 2021) are related to deleterious functional changes in cognition (Song et al., 2020). The body's metabolism has been proven to adapt via PA and it plays a determining role in cardiovascular disease prevention and management (Koay et al., 2020). Accordingly, the latest and most influential guidelines in the world highlight PA as a mainstay for cardiovascular disease prevention (Arnett et al., 2019) (Visseren et al., 2021). Also, diabetes is known to reduce cognitive performance and affect the brain's structure (Moheet et al., 2015). Furthermore, cancer itself can impair cognitive performance and also the treatments for cancer may have transient, and sometimes permanent, cognitive aftereffects (Pendergrass et al., 2018). Inactivity is a major determinant of cancer development (Koelwyn et al., 2020), and therefore PA has a determining role in *cancer prevention* (European Commission, 2021).

PA performed outside, in the natural environment (as opposed to a mechanistic indoor environment) draws greater benefits to the person within a shorter period, the aftereffects of which persist for longer periods of time (Araújo et al., 2019):

"*It was observed that, compared with indoors, exercising in natural settings was associated with greater feelings of revitalization and engagement, and reduction in tension, anger and depression. Exercisers reported a greater enjoyment and satisfaction with outdoor activity and declared a greater intent to repeat the activity again*" (Araújo et al., 2019, pp. 2).

Interestingly, research about PA in extreme settings, like the Leadville 100 MTB race, has revealed that the many benefits of PA in (extreme/hostile) nature are incongruent with traditional sport psychology theories. According to Araújo et al (2019), PA in extreme contexts like that which climbing, mountaineering, and surfing afford the person, is associated with "a profound positive relationship with nature" (p. 3). In fact, the anxiety and fear that often accompanies PA in extreme or hostile environments is critical to the later transformations *of the person* that emerge as a consequence of person-environment interaction (Ibid).

Indeed, PA endorses improved immune responses, behaviors, and cognitive processes. The immune system provides protection against foreign organisms along with a crucial balance of many processes within the body. Its dysfunction, apart from an increased susceptibility to infections, is an important feature to most common chronic diseases, which not only include the above- mentioned noncommunicable diseases but also autoimmune diseases (i.e., rheumatoid arthritis), osteoporosis, and neurological disorders (Nieman & Wentz, 2019). Moreover, such conditions lead to an excessive immune activation that can also affect multiple aspects of the nervous system. Importantly, it can alter brain plasticity, also known as neuroplasticity, which refers to the inherent capacity of the brain to undergo change (Bondy, 2020). Neuroplasticity among other brain functions is of paramount importance for cognitive functions. PA under certain conditions, serves as an enhancer that promotes beneficial brain functions and behaviors. This positive relationship has been proven in short- and long-term studies (Lippi et al., 2020), as well across the lifespan (Etnier & Chang, 2019). PA has the capacity to induce functional and structural changes in the brain that favor cognitive functions and wellbeing, and to counteract normal aging (Mandolesi et al., 2018). Additionally, PA also plays a major role in the prevention and modulation of neurological and psychiatric diseases. These effects are achieved by changes to the genetic machinery of the brain, and growing evidence has proven those changes to be inheritable (Fernandes et al., 2017) -- a determinant feature for the public health and development of current and future generations.

How does this relate to From the Ground Up? As previously mentioned, duration, intensity, and whether PA takes place in- or outdoors are important factors in terms of PA outcomes. The physical demand exerted during FTGU achieves the recommended characteristics for the prevention of cardiovascular diseases (Visseren et al., 2021), most types of cancer (Moore et al., 2016) (Song & Giovannucci, 2016), as well as neurological and psychiatric conditions (Fernandes et al., 2017). Moreover, it improves metabolic (Koay et al., 2020), immunologic (Nieman & Wentz, 2019), and cognitive functions (Mandolesi et al., 2018) (Fernandes et al., 2017). PA plays a decisive role in health, socio-economic development, and the environment. Altogether, FTGU appropriately engages the person's educational capital while enhancing her learning capital. Therefore, it represents a strategy to promote health and talent development, which ultimately brings socioeconomic and environmental benefits.

In Part 2 of this report, we will describe FTGU through a sports ecology framework. We will also introduce our methodology for analyzing mentorship gains during the project and explore the role of externalities in the learning process.

To learn more about From the Ground Up, visit https://www.fromthegroundup.bike/.

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Sixteen Years of Online Mentoring in CyberMentor: A Track Record of Research and Recognition

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How can the success of a mentoring program be measured? Is it enough to look at the numbers of participants? If a program is free of charge, does the program's ability to repeatedly secure funding indicate success? Or a program's length of continuous operation? How do reputation or awards factor into the assessment?

For CyberMentor, our online mentoring program for girls in science, technology, engineering, and mathematics (STEM), we decided when the program was conceived that a frame of accompanying research was essential for evaluating program effectiveness and to allow for evidence-based continuous improvement of the program. Looking back on 16 years of ongoing program operation, it has been clear that this decision has been a key element of the program's success. To show the importance of the accompanying research for the program's long-term success, we will briefly describe the program and its history and then look at the program's research design. Finally, we will describe some of the honors and awards with which CyberMentor has been recognized over the years, which we attribute in large part to the evidence-based approach set out for the program by its founders, Prof. Dr. Heidrun Stoeger and Prof. Drs. Albert Ziegler, in 2005.

Program Background

CyberMentor is Germany's biggest research-based online mentoring program for girls in STEM. Each year, up to 800 students from grade 5 onward are accompanied by a personal mentor, who encourages the girls' STEM activities, serves as a role model, and advises on studies and career questions via the members-only online mentoring platform. Women with a professional or scientific background in STEM or doing graduate work in STEM can apply as mentors. Students (mentees) and mentors are matched with each other based on mutual STEM interests. Within the platform, participants communicate with their mentoring partner and the whole CyberMentor community via messaging and chat tools. Program participants also have access to a comprehensive collection of projects and materials in various STEM domains that form the basis of collaboration activities between mentees and mentors, both in individual mentee–mentor dyads and in larger groups. Finally, CyberMentor provides participants with extensive training material on effective mentoring to ensure that mentoring relationships can flourish.

This program design is intended to help girls and women overcome persistent gender disparities within STEM. Despite the performance of girls and women in mathematics and science having caught up with that of boys and men (Else-Quest et al., 2010), women remain underrepresented in STEM programs and professions (Statistisches Bundesamt, 2019). According to research, the persistence of gender disparities in STEM reflects individual characteristics (e.g., gender disparities in interest or STEM self-efficacy), socialization effects, and a lack of appropriate role models (for an overview, see Stoeger et al., 2012). Mentoring is one educational option that can help address these problems by facilitating individualized learning and growth among a target audience in need of additional educational support (Ziegler et al., 2021). Mentors can help mentees to optimize their learning and personal growth by playing an integral part in the planning, design, and evaluation of mentees' individualized learning processes, as well as by helping mentees to maintain their motivation (Gruber & Degner, 2012). CyberMentor follows this approach by combining mentoring with individualized role-model support. The long-term goal of CyberMentor is to lessen gender disparity in STEM by fostering the participation of women in the STEM fields. In doing so, the program intends to help lessen the skilled labor shortage in Germany as well as, at the individual level, help girls and young women improve their access to educational and professional opportunities within STEM and thereby improve their options for personal and professional development over the lifespan.

After a pilot phase with 100 dyads in the German federal state of Baden-Württemberg in 2005, subsequent funding by the German

Federal Ministry for Education and Research made it possible to extend CyberMentor across Germany as of late 2008 and thus open it to a bigger audience. Due to the success of the national program, a second funding period was approved by the ministry in 2012. At the same time, companies such as Daimler AG, IBM Deutschland GmbH, and SAP SE began to support CyberMentor as donors. Since 2014, CyberMentor has been funded by sponsors including, presently, the Deutsche Telekom Foundation; the Vector Foundation; the Baden-Württemberg Ministry of Economic Affairs, Labor, and Tourism; the Bavarian State Ministry for Education and Culture; Daimler Mobility AG; SAP SE; Capgemini Deutschland GmbH; and Harman International. Since the start of the program, more than 8,500 mentoring pairs have been successfully matched into the program.

Thanks to existing collaborations with schools and companies, we have been able to organize networking events for program participants over the last four years. These events gave mentees the opportunity to meet some of the role models in person whom they had only known online. The networking events offered interview time with women from different STEM professions, mentoring workshops for mentors, and STEM-related workshops for the girls. During the past two years of the Corona pandemic, we found viable solutions to transfer these events into engaging online events when the circumstances prevented in-person meetings.

Systematic Scientific Support Ensures Sustainable Success

Today, mentoring is widespread and mentoring programs are almost countless, yet few programs are scientifically accompanied (Buschhaus et al., 2013; Stoeger, Balestrini et al., 2021). This is problematic. Studies that do exist indicate that not all mentoring programs are equally successful and some even lead to negative outcomes for participants (e.g., DuBois et al., 2011). Findings from the accompanying research done in CyberMentor (e.g., Stoeger et al., 2013, 2016; Stoeger, Heilemann et al., 2021) provide insights into successful mentoring processes that feed into the continuous improvement of the program and are made available to other mentoring programs through various science-to-public formats (e.g., Harvard Kennedy School, 2017; MENTOR, 2019).

For CyberMentor, the accompanying research program monitors program participants over time using standardized scales and other forms of data collection (e.g., on-platform communication and networking activity). Overall program effectiveness was investigated with a randomized waitlist control group design that considered variables such as STEM interest, confidence in one's own STEM abilities, perceived confidence in study and career orientation, the intention to study a STEM subject, STEM activities, and several aspects of mentees' home and school environments. Surveys were implemented via online questionnaires before the start of the mentoring, after half a year, and after the end of the mentoring year. To record the actual decisions regarding study and career choices, researchers also carry out follow-up surveys with former mentees.

The development of the participants was compared with three control groups. The first control group is a waitlist control group, a group of girls who registered to participate in CyberMentor but were randomly selected to start mentoring one year later. These girls had similar educational backgrounds and showed comparable levels of STEM interest as the girls who began the program without the delay. The other two control groups consisted of a group of girls and a group of boys respectively with average levels of STEM interest. The participants and the control groups received identical questionnaires at fixed times. In comparison to the waitlist control group, the CyberMentor participants showed greater increases in STEM activities, higher levels of confidence in choosing a profession, and a growing intention to study a STEM subject at university. The follow-up survey of former CyberMentor mentees indicates that such positive outcomes assessed during and immediately after participation are translating into positive long-term developments for the mentees. Of all the female students surveyed who were already able to make a university study or career choice, 71% opted for a STEM field (Stoeger, 2015).

Public Recognition

CyberMentor has received various recognitions and awards in recent years. In 2016, CyberMentor was named Digital Impact Organization of the Year at the Ada Awards in Brussels, an annual award presented by the Digital Leadership Institute, a Brussels-based think tank whose mission is to promote inclusive digital transformation. CyberMentor's research-based approach was also highlighted by the Harvard Kennedy School in 2017 in its Gender Action Portal, which features optimal interventions to increase the proportion of women in STEM according to scientific criteria. In 2019, CyberMentor received the Schwarzkopf Million Chances Award in the category Move Up. The Schwarzkopf Million Chances Initiative honors projects that strengthen the self-confidence of girls and women and offer them new perspectives in everyday life. In the Move Up category, the award recognizes projects that work towards helping girls achieve the best career starts possible. The same year, CyberMentor won second place in the STEM Challenge EmpowerMINT: Talent Knows no Gender (EmpowerMINT: Talent kennt kein Geschlecht) competition organized by the Donors' Association for the Promotion of Humanities and Sciences in Germany (Stifterverband für die Deutsche Wissenschaft). The aim of the Donors' Association challenge was to raise public awareness of trailblazing projects that increase women's interest in university STEM majors and thus inspire other universities to launch their own programs. In late 2019, CyberMentor was selected as a best-practice project and highlighted in the E-Mentoring Supplement of the Elements of Effective Practice in Mentoring series published by the MENTOR initiative (MENTOR, 2019), a US-based coalition of different mentoring programs that provides guidelines for the development of mentoring programs.

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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, version 6.
8. The article should be submitted with embedded photos, and tables, and figures if relevant.
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