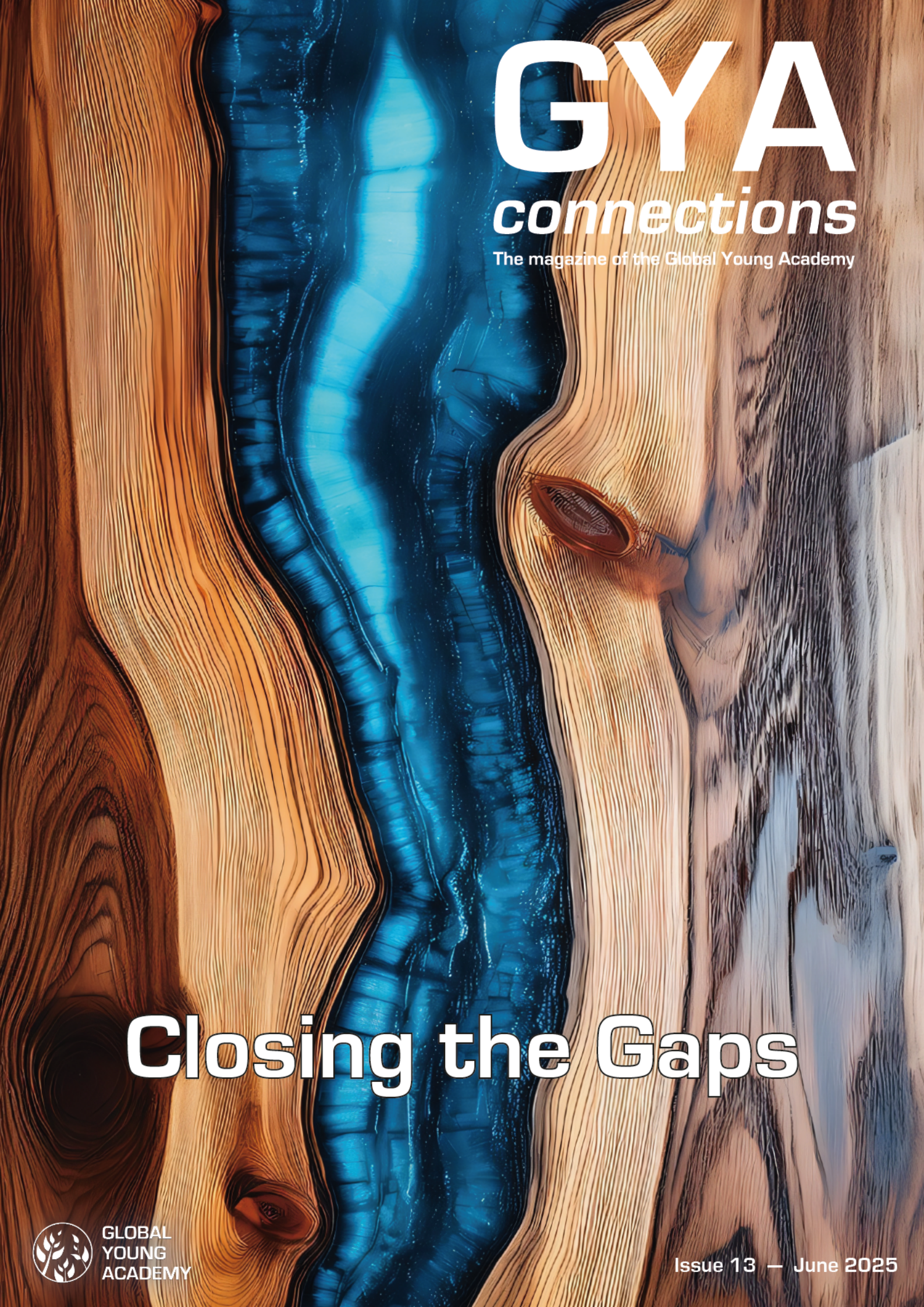

GYA connections

The magazine of the Global Young Academy

Closing the Gaps

GLOBAL YOUNG ACADEMY

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01 Closing the Gaps

02 GYA Activities

03 Meet the New GYA Members 2025 46

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Editorial

by Reem Abou Assi
GYA Connections Editor-at-Large, 2024-2026, GYA Member 2024-2029

When does science become a true pillar of humanity's heritage?

In an era where artificial intelligence can optimize nearly every aspect of our lives, the fundamental role of science remains centered on enhancing human well-being, but how can this be effectively achieved?

The significance of this inquiry is evident in the growing emphasis on science for diplomacy, science for communication, and science as a solution to critical global challenges such as biosecurity, climate change, AI in education, sustainability, policymaking, the translation of research into societal impact, and advancements in healthcare. Addressing these issues requires an approach that prioritizes inclusivity and innovation.

The objective of GYA Connections 13 is to underscore the transformative power of "closing gaps", and bridging scientific, social, and technological divides for the advancement of humanity. By building upon the intellectual and scientific heritage of past generations, we can create a future where science serves as a catalyst for progress, fostering a more equitable and sustainable world.

As you explore this issue, you will gain insights into the experiences of GYA members and their teams as they navigate diverse global contexts. Through first-hand engagements, they have leveraged the GYA platform to propose creative, multidisciplinary solutions addressing critical challenges.

With a strong commitment to the United Nations Sustainable Development Goals (SDGs), AI inclusivity in education, scientific leadership, and socio-environmental issues, GYA members and alumni have effectively integrated diverse perspectives. Their work reflects a forward-thinking approach that bridges generational gaps, engaging diverse audiences such as Millennials and Gen Z, to foster a more inclusive and impactful scientific discourse.

Together, let us unite in our efforts to offer solutions and close the gaps, ensuring that the future aligns with our collective aspirations.

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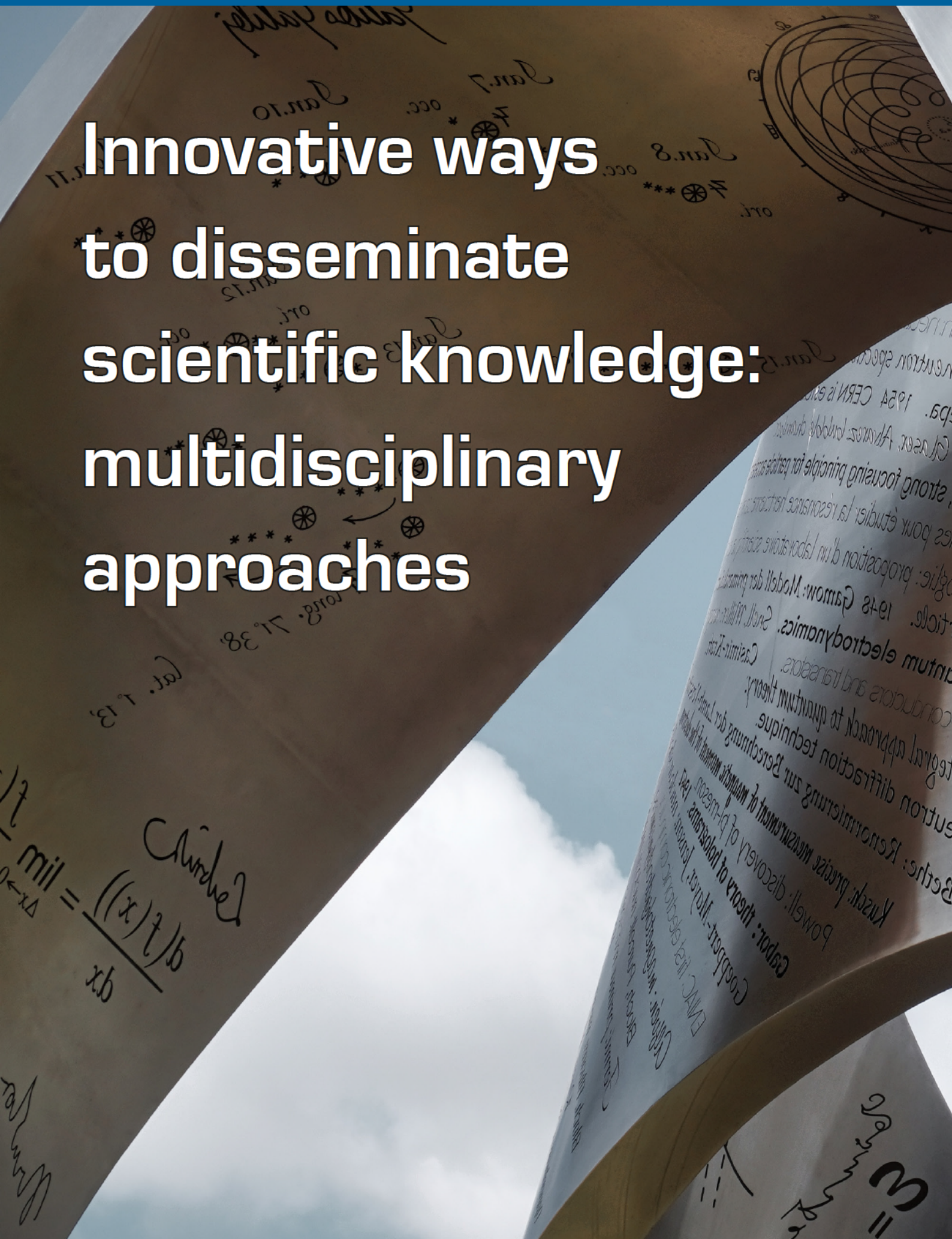


Innovative ways to disseminate scientific knowledge: multidisciplinary approaches

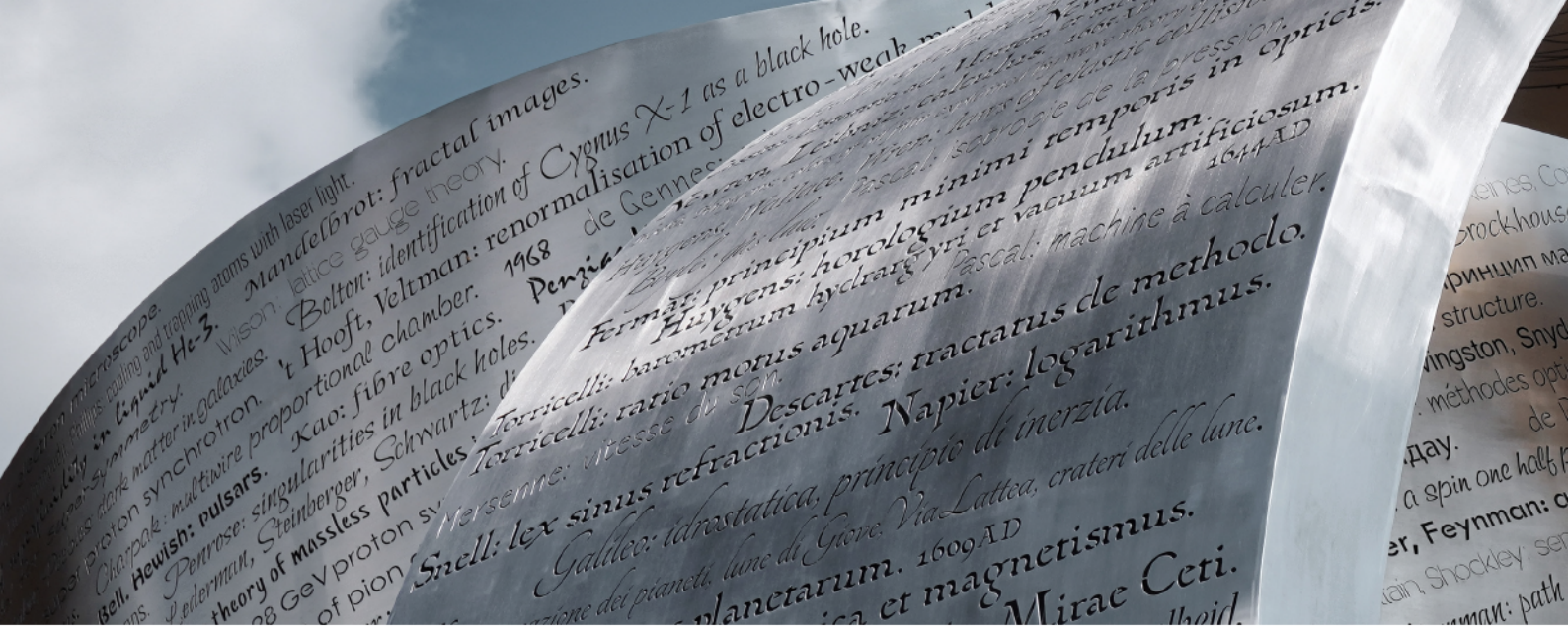
Nesrin Alrefaai

Traditional methods of disseminating scientific knowledge, such as academic journals and conferences, often limit accessibility to and engagement with broader audiences. Moreover, conventional scientific communication methods frequently require specialised knowledge for both access and comprehension. Even when open access is provided, it is often impeded by language barriers, internet connectivity issues, and institutional subscriptions, particularly in the Global South. Nonetheless, as global challenges such as climate change, health crises, conflicts and wars demand wider understanding and engagement, there is a growing need for innovative approaches to science communication.

To communicate scientific knowledge effectively, it is essential to reach diverse audiences, including underrepresented and marginalised communities. This suggests a need to explore and implement innovative, multidisciplinary methods that bridge the gap between science and the public and overcome cultural, linguistic, and educational barriers, allowing scientific insights to be accessible to all. By utilising innovative tools, tailoring content to resonate with specific communities and addressing their unique needs, these approaches can enhance inclusivity and public engagement, promote a broader understanding of science, and encourage informed decision-making.

Innovative dissemination methods often involve interdisciplinary collaboration, bringing together experts from different fields to create engaging and informative content. This collaboration can result in more comprehensive and nuanced representations of scientific topics, encouraging a broader understanding of complex issues. By fostering dialogue between scientists, artists, and educators, these approaches can inspire new perspectives and solutions to global challenges.

Scientists have increasingly turned to tools like digital media and online platforms to disseminate scientific knowledge to a global audience.[1,2] Social media, podcasts, blogs, and video-sharing platforms provide accessible and engaging ways to share scientific research with diverse audiences. These platforms allow scientists to present their research in a relatable and friendly format using visuals, animations, and storytelling to enhance understanding. Interactive technologies such as virtual reality (VR), augmented reality (AR), and interactive simulations offer even more immersive and engaging ways to explore scientific concepts.[3] By providing hands-on experiences and allowing users to interact with scientific concepts, these technologies can enhance comprehension and



retention of complex information. However, these tools are subject to funding and are not very accessible to disadvantaged and marginalised communities.

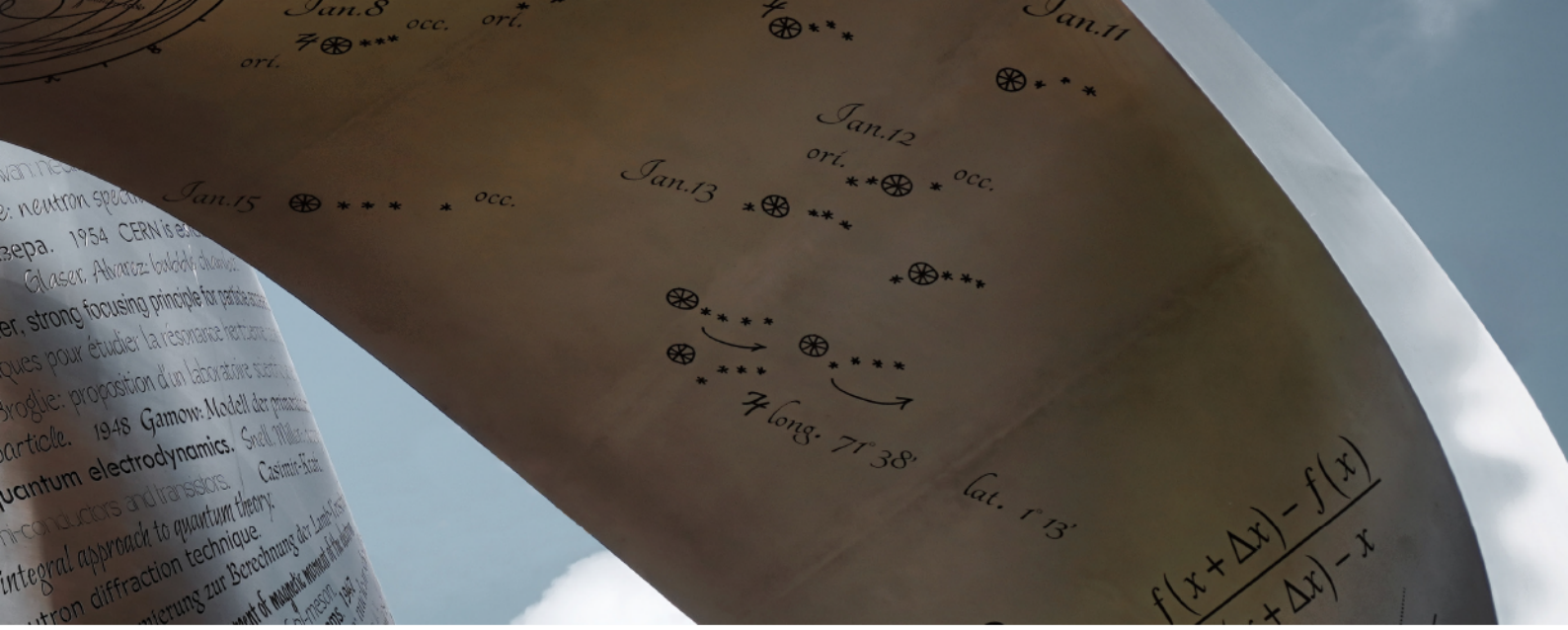
Integrating science with the arts offers opportunities to convey scientific concepts through creative expression. Theatre performances, visual arts, and music can communicate scientific ideas in ways that resonate emotionally with audiences, fostering a deeper connection to scientific issues. Such collaborations between scientists and artists can inspire curiosity and promote dialogue about scientific topics. Theatre has long been recognised as a powerful educational tool. Educational theorists such as John Dewey believed that cultural and artistic venues like educational theatre are useful for moral growth and social change within communities and have emphasised the importance of experiential learning, where learners actively engage with the subject matter.[4] Theatre provides a platform for experiential learning by allowing audiences to experience scientific concepts in a contextualised and relatable manner. This engagement can lead to increased understanding, retention, and application of scientific knowledge. Extensive research has investigated the effectiveness of incorporating drama into science education, with several case studies documenting the application of drama techniques for teaching early years science.[5,6] Additionally, platforms such as Kide Science illustrate innovative practices in this domain. Kide Science, a "research-based pedagogical model from Finland", presents a model that integrates drama into early childhood science education.[7,8] This program facilitates the teaching of science and inquiry-based lessons through play and storytelling.

Another interesting innovation designed to reach the wider public is the Arts at the European Laboratory for Particle Physics (CERN). Since its founding in 2011, this program has fostered collaboration between artists and physicists.[9] In 2017, Arts at CERN began to support the development and production of new artworks, following the artists' experiences and time in the laboratory, and with the support of scientific partners and experiments. Arts at CERN asserts that: "Art is a knowledge-driven field, while science is an area that contributes greatly to our society and is a pillar of contemporary culture. Therefore, artists and scientists are often following common paths: from exploration to research, followed by production, delivery and sharing with their communities and broad society. Artists across all creative disciplines are welcome to CERN to experience the way the big questions about our universe are pursued by fundamental science."[10]

CERN programmes comprise research-led artistic residencies that take place on-site or remotely and support further exploration into the forms and meaning of these exchanges through their programme of art commissions.

At CERN, the impact of using theatre to disseminate science is assessed through audience engagement. Pre- and post-performance surveys serve to measure changes in audience knowledge, attitudes, and engagement before and after the performance. Audience feedback sessions and interviews provide qualitative insights into the audience's experiences and perceptions. Importantly, this multidisciplinary collaboration and the use of theatre do not require substantial funding, resources, or designated spaces, making these approaches cost-effective methods of science communication that can be adapted to various settings.

Integrating the arts into science communication offers a powerful means of presenting complex scientific concepts in ways that are emotionally resonant and culturally relevant. More laboratories could benefit from this approach by incorporating artists into their activities, which would help make science more accessible. The application of drama, theatre, and other artistic methods has a demonstrable impact on improving the understanding and retention of scientific knowledge.



There is a pressing need for a multidisciplinary approach in teaching science, particularly in early education, as well as for employing more innovative strategies to engage communities, especially those that are disadvantaged or marginalised. This can be achieved by establishing artist residency programmes affiliated with research laboratories and creating accessible productions, exhibitions, and performances that combine art and science. Such initiatives have the potential to foster dialogue, engagement, and inclusivity, thus increasing the impact of science communication.

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Inter- and transdisciplinary approaches to solving socio-environmental issues: Bridging science, policy, and local knowledge

Luisa Maria Diele-Viegas

In "Risk Society", Beck used the title of the book as a term to designate a global conjuncture where human existence has been put at risk due to modernization and economic and technological development, all of which are leading to ecosystem degradation and natural resource depletion.[1] Socio-environmental issues resulting from these processes include climate change, biodiversity loss, pollution, food insecurity, and the emergence of new potentially pandemic-inducing diseases, all of which impact both natural and human systems.

This multifaceted and complex crisis involves multiple stakeholders and demands solutions from various sectors. It thus can be characterized as a Wicked Problem, that is, a complex social or environmental issue that is difficult to solve due to its interconnected nature, incomplete information, lack of a unique and definitive solution, and conflicting interests among stakeholders. Rittel and Weber (1973) developed the concept for social planning and defined 10 characteristics intrinsic to this class of problems (see Figure 1).[2]

In the socio-environmental context, resolving such problems demands integrative solutions that mobilize different scientific knowledge areas and knowledge systems. This requires the active participation of different stakeholders in decision-making, aiming for better alignment in problem-solving. Therefore, inter- and transdisciplinarity are key for developing such solutions.

Interdisciplinarity is the "common floor" among specializations, though it can also develop into a unique discipline (e.g., biomedicine, biochemistry). Transdisciplinarity, in turn, is the collective understanding of a problem resulting from including personal, local, strategic, and various knowledge constructions. In other words, interdisciplinarity is the collaboration among academic disciplines to approach a common issue, while transdisciplinarity searches for deeper incorporation of knowledge, involving not only academic disciplines but also non-academic knowledge such as traditional knowledge and cultural views, as well as stakeholders from different social groups including decision-makers, policy-makers, managers, third-sector actors, community leaders, Indigenous peoples, and civil society.

Inter- and transdisciplinary approaches allow a holistic comprehension of the issues and greater public engagement, facilitating the development of innovative and sustainable solutions for the long-term, while minimizing biases in decision-making. Additionally, incorporating different perspectives and knowledge allows recognition of the importance of diversity in searching for efficient, flexible, and adaptive solutions to cope with scenarios in constant change. In this sense, transdisciplinarity also promotes actions related to environmental education and raising public awareness of a problem's complexity, thereby stimulating the active participation of society in shaping more engaged and informed citizens.

Such approaches create a platform where diverse stakeholders collaborate equally, blending academic research from different areas with practical, local, and indigenous knowledge to co-create solutions. Transdisciplinarity also fosters a deeper understanding of complex challenges while ensuring that the outcomes are locally relevant, culturally sensitive, and scientifically sound. Additionally, such approaches can scale local, context-specific solutions into broader frameworks for global sustainability.

The practical application of these concepts in real socio-environmental problem-solving plays a pivotal role in achieving the United Nations Sustainable Development Goals (SDGs), which consist of 17 goals to address several Wicked Problems, including socio-environmental problems. Among the 17 goals, SDG 6 (Clean Water and Sanitation), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 14 (Life Below Water), and SDG 15 (Life on Land) are related to socio-environmental problems in greater or lower scale, demanding both inter- and transdisciplinary actions (Figure 2).

The Global Young Academy (GYA) directly addresses Wicked Problems by facilitating international, cross-disciplinary collaborations to develop actionable solutions for global challenges. Through initiatives that align with the SDGs, GYA members work on projects related to climate change (SDG 13), sustainable cities (SDG 11), and responsible consumption and production (SDG 12), among others. These projects often incorporate co-production of knowledge, integrating academic expertise with local and indigenous knowledge to develop innovative and culturally responsive solutions.

While both inter- and transdisciplinarity approaches have proven highly effective in fostering collaboration and innovation, they are not without their own challenges. Bridging the gap between knowledge systems requires open communication, trust-building, and flexibility. Academic and policy silos often hinder the integration of diverse perspectives, and institutional barriers that discourage cross-sector collaboration also exist. However, these challenges present opportunities to rethink how we approach global challenges.

A key strength of the GYA's approach is its emphasis on team formation that crosses traditional dis-

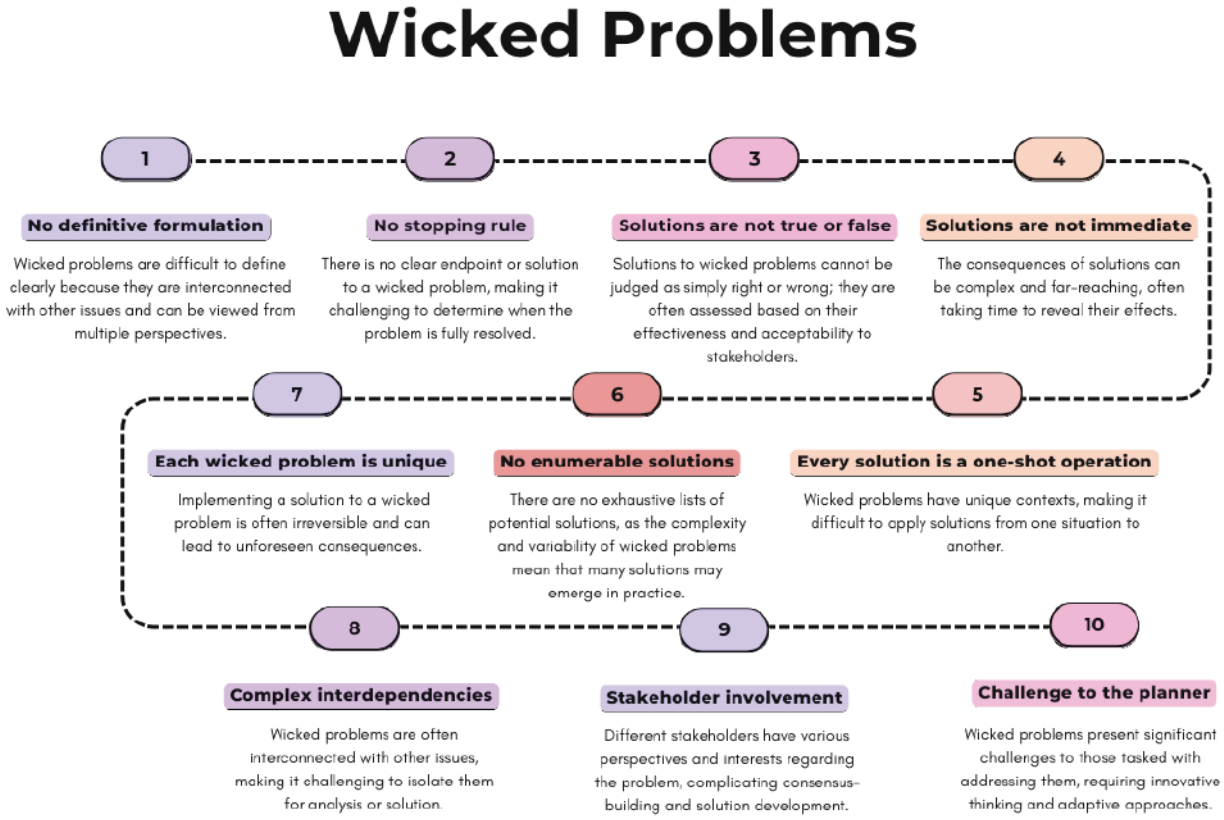

Figure 1. Ten characteristics intrinsic to Wicked Problems, following Rittel & Weber (1973).

ciplinary and geographical boundaries. This model enables early-career researchers to engage in collaborative efforts that blend natural and social sciences, technological advancements, and policy considerations. By fostering such multidimensional teamwork, the GYA exemplifies how inter- and transdisciplinary research can transition from theoretical discussions into real-world applications.

Through interdisciplinary working groups, GYA members collaborate on projects that address biodiversity conservation, climate change adaptation, and science diplomacy, ensuring that knowledge generated in academia reaches decision-makers and communities. Moreover, the mentorship and networking opportunities within the GYA help researchers develop the skills necessary to navigate the challenges of interdisciplinary work, such as communication across fields, integrating diverse methodologies, and engaging with policymakers and stakeholders. In this sense, the GYA contributes to shaping future leaders capable of addressing the complexities of global sustainability.

Inter- and transdisciplinary projects can offer more robust and equitable solutions by emphasizing the importance of inclusive knowledge co-creation. Such projects democratize knowledge production, giving local communities a stake in decision-making processes that affect their environments and livelihoods. Moreover, transdisciplinary research can help to bridge the gap between short-term policy needs and long-term scientific research. By working closely with policymakers, researchers can ensure that their findings directly apply to real-world decision-making, helping shape policies aligned with the SDGs.

Those approaches are vital for addressing complex socio-environmental challenges as we look toward the future. By fostering collaboration, enhancing understanding, and co-creating innovative solutions, these approaches create an environment where policymakers, scientists, and local stakeholders work together to address the interconnected challenges of climate change, biodiversity loss, and other wicked societal problems.

To achieve the SDGs, we must continue to break down disciplinary barriers and foster collaboration across sectors. Such a collaborative framework must also ensure that the solutions are scientifically rigorous and politically and culturally feasible, allowing the development of more effective and sustainable strategies that can significantly contribute to resolving these urgent issues.

Figure 2. Possible inter- and transdisciplinarity approaches for socio-environmental-related SDGs.

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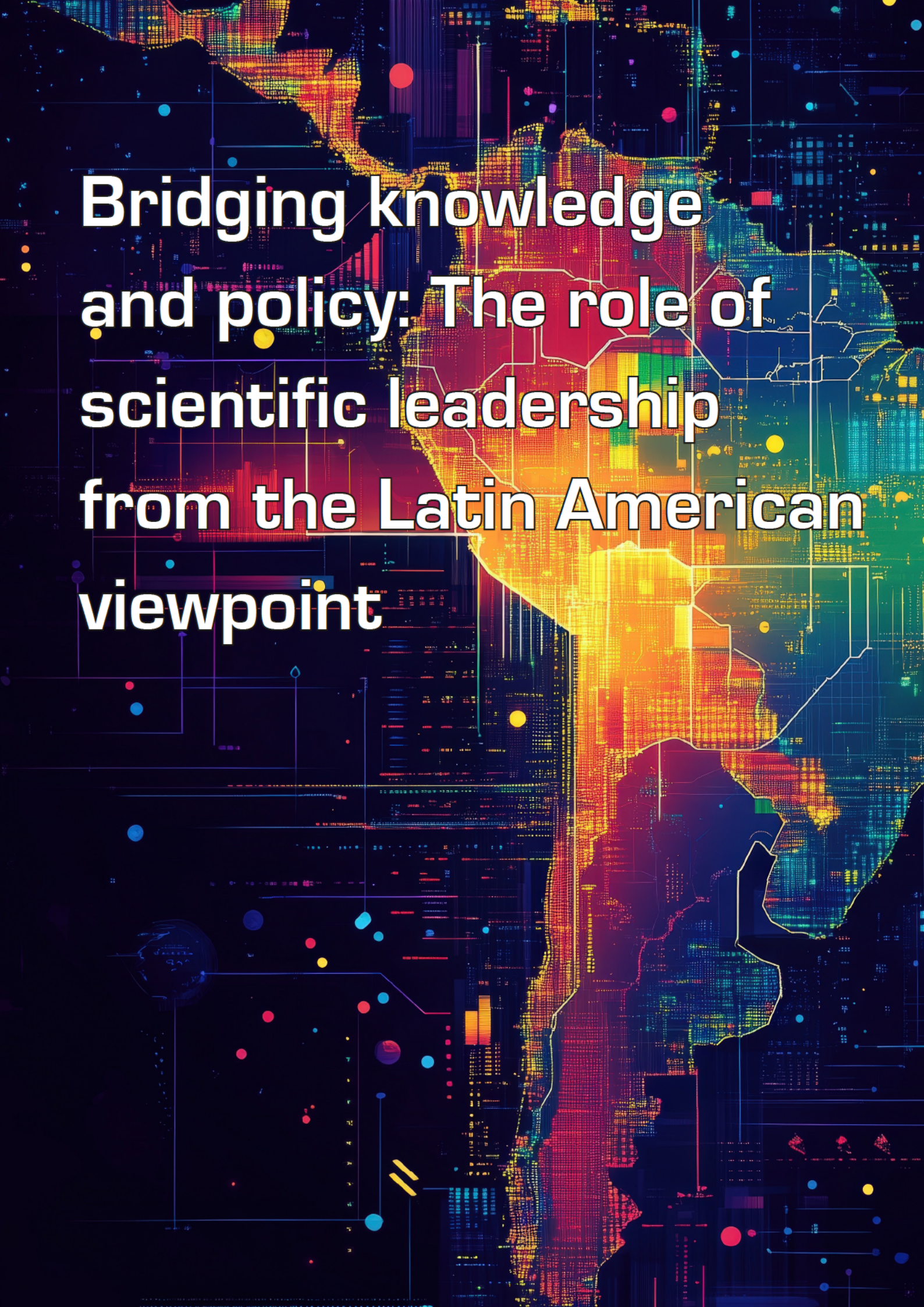

Bridging knowledge and policy: The role of scientific leadership from the Latin American viewpoint

Luisa F. Echeverría-King and Bransilav Pantović

Scientific leadership can inspire and guide innovation by strategically directing impactful scientific endeavors and research initiatives. While scientific leadership may not always be a central focus within scientific agendas and among personnel, it is vital to encourage discussion among researchers at every stage of their careers about this topic, particularly early-career researchers (ECRs), as they face many issues engaging with policy, funding constraints, institutional inertia, or limited access to decision-making platforms.

Ideally, scientific leaders with a clear vision and well-defined strategy establish guidelines and objectives, cultivate a collaborative and safe environment that fosters creativity, out-of-the-box thinking and supports the innovation and dissemination of knowledge.[1] However, what truly distinguishes scientific leaders is their capacity to engage and connect across diverse contexts.[2] That is, although these individuals may demonstrate excellence within their scientific domains, their essential power lies in their ability to establish transdisciplinary collaborative networks, such as those between research and policy, and to support the skill-building and training of fellow researchers.

Nevertheless, engaging in discussions about science, technology, and innovation (STI) issues and leadership often reveals significant imbalances and competition, overshadowing opportunities for collaboration. By focusing on leadership in this context, we highlight the critical role of adaptability and resilience in scientific management. These qualities are essential not only for navigating diverse geopolitical, socio-economic, and cultural landscapes but also for achieving strategic positioning both locally and internationally. Therefore, leadership models must be tailored to the unique dynamics of each setting to effectively address and navigate complex and distinct needs.

For example, scientific leaders can act as catalysts for social progress through STI initiatives in regions that face structural challenges and resource disparities, such as Latin America. In this case, focusing on unique challenges and specific needs presents a valuable opportunity for scientific leadership and management to gain a deeper understanding of the region.[3]

In other words, customized leadership models address the region's unique characteristics, aim to build stronger local and international partnerships, promote inclusive participation, and ensure that STI initiatives contribute meaningfully. Therefore, these models are paving the way for significant advancements in STI, impact visibility and development across a wide range of settings.

The international role of scientific leadership in closing gaps

Scientific leadership plays a crucial role in bridging societal gaps, especially in Latin America, where disparities in resources and infrastructure have historically limited the region's scientific progress.[3] Addressing these challenges could require a leadership approach that transcends borders and connects local researchers with a global network of scientists and experts. A notable real-world example of this is the GYA, which brings together young scientific leaders from around the world to foster international collaboration and the integration of diverse perspectives and solutions. Participation in this kind of global networks might be vital for effective knowledge exchange and resource sharing in joint projects. On the other hand, this approach not only maximizes benefits but also distributes risks, empowering individuals — especially those from less developed or low-investment countries in STI — to overcome challenges that often hinder independent efforts.

This dynamic results from a setting where partnership goes beyond traditional boundaries and scientific leadership not only drives innovation but also encourages and inspire synergies among diverse actors while empowering local capacities through education and knowledge transfer.[4] This process is based on the active development of new skills and technologies while envisioning a broader impact to create an environment where advancements can be effectively replicated, adapted to diverse contexts, and scaled for broader application. To be precise, capacity-building is a powerful catalyst for the long-term sustainability of progress. By widely embracing this vision, Latin American countries can shift from passive recipients to active contributors in the global STI ecosystem, thereby solidifying their position as relevant players on the international stage.

Further developing scientific leadership in Latin America offers a remarkable opportunity to showcase the region's capabilities and highlight its talent and potential in vital strategic areas of innovation. That is, demonstrating that Latin American ECRs are capable of generating high-impact scientific solutions positions them to claim a more prominent role in the global STI ecosystem. By introducing regional scientists and their achievements on the international stage, we not only unlock new avenues for funding and collaboration but also contribute to reshaping the perception of the region. Reflecting on the importance of scientific leadership is, therefore, essential for advancing toward a more adequate, equitable, inclusive, and collaborative science management framework that can bridge the historical gaps in STI.

Dimensions of approach

Effective scientific leadership in Latin America must emerge by recognizing the key issues impacting the local region prior to establishing international collaboration. This process ensures that research aligns with local needs, addressing both social and economic challenges. That is, scientific leaders must engage with their communities, institutions, and governments to understand the issues that require immediate attention. Identifying these local needs and tailoring research agendas to meet them is a vital responsibility of scientific leadership.

After identifying these problems, they must be addressed through STI and collaborations with already identified strategic partners, both nationally and internationally. This approach helps create networks that strengthen the collective response to challenges and thereby amplify the impact of local efforts.[4]

In this context, scientific anticipation is particularly critical for detecting emerging trends and identifying strategic research areas that enable scientific leaders to stay ahead of future needs.[5] It enables leaders to remain at the forefront of global knowledge while adapting to local realities, specific social and economic need and resources.[6] By prioritizing this strategy, scientific leaders ensure that their work is both locally relevant and internationally impactful, the region is likely to elevate its research and secure a prominent position on the international stage, paving the way for groundbreaking advancements and greater scientific impact.

Finally, scientific leadership measures can be con-

solidated by influencing public policy and ensuring that research outcomes lead to actionable solutions that significantly improve the well-being of local communities. By taking these steps, leadership can create a positive and lasting impact on society, drive meaningful change, and promote innovative decision-making that resonates with communities' needs and challenges.

In summary, effective scientific leadership in Latin America requires a holistic approach that strengthens local capabilities and adequately promotes science-driven decision-making while considering local challenges and needs. This way, leadership can anticipate emerging trends and prepare the ground for innovative solutions that align with regions' society. Mentioned steps represent a solid strategy for connecting scientific knowledge with development and innovation in Latin America, allowing scientific leaders to drive meaningful change.

Scientific leadership and science diplomacy: The essential link

In the complex landscape presented, science diplomacy appears as a facilitative practice and the connective element that integrates the aforementioned components into a cohesive system. Indeed, science diplomacy is the tool that allows local efforts to align with global agendas, where scientific networks from across the world share resources, ideas, and most importantly, a shared vision for the advancement of science. Through diplomacy, researchers and leaders are not only able to engage in dialogue but also to co-create solutions that address complex issues such as climate change, public health, and sustainable development.[7]

Science diplomacy, along with proper leadership training, fosters collaboration between countries and regions with varying levels of development, helping to overcome political and economic barriers.[8] This ensures that countries with fewer resources have access to the technologies, funding, and partnerships that would otherwise remain out of reach.[9] In this way, diplomacy bridges the gaps between scientific communities, providing a platform for shared progress and mutual benefit.

The Inter-American Institute for Global Change Research (IAI) provides a real-world example of bridging the gap between science and policy-making through its Science, Technology, and Policy (STeP) Fellowship. This program equips ECRs with the necessary skills to tackle global and regional challenges. Through interdisciplinary training and mentorship, fellows learn to apply their expertise to real-world issues such as climate change, emerging technological issues and sustainable development while effectively communicating scientific insights to policymakers. Moreover, the program fosters collaboration by connecting participants with regional experts and stakeholders, enhancing their understanding of local socio-political landscapes and building networks for impactful science diplomacy. By integrating science into policy processes, the fellowship empowers ECRs to become leaders in evidence-based decision-making. This initiative highlights the importance of targeted training to develop a new generation of scientific leaders in Latin America and the Caribbean.[10]

Beyond the immediate benefits of collaboration, science diplomacy opens up broader reflections on the future. It forces us to ask questions such as: How can we build a more equitable and collaborative scientific ecosystem? How can science not only be a space for technological advancement but also a bridge to peace, cooperation, and sustainable development?

These questions form the core of the challenge presented by science diplomacy: understanding that, in an interconnected world, solutions cannot be individual. We need strong scientific leadership, global networks of collaboration, and above all, diplomacy that acts as the glue binding these efforts together, guiding the exchange of knowledge, involving diverse actors, and ensuring that scientific outcomes are translated into real, sustainable change.[11]

A notable example in Latin America, when addressing this crucial issue, is the São Paulo Innovation and Science Diplomacy School (InnSciD SP). This initiative demonstrates how tailored programs can empower the region and particularly ECR from di-

verse backgrounds to effectively engage in policy and diplomacy. Located in São Paulo, InnSciD SP is dedicated to equipping participants with skills to thrive at the intersection of science, technology, and international relations. The program focuses on cultivating essential competencies such as communication, negotiation, and collaboration. By creating inter-sectorial networks that connect scientists with policymakers, InnSciD SP addresses pressing global challenges, including climate change, artificial intelligence, and public health. This program not only highlights the need for adaptability but also emphasizes the transdisciplinary approach essential for effective leadership in the field of science and science diplomacy.

All of this should inspire us to rethink the role of science in society and envision how leadership in Latin America can make meaningful contributions to the global/regional landscape of knowledge and development. The goal is to bridge divides and create an inclusive and resilient future, where scientific leadership, guided by diplomatic principles, transforms science into a powerful force for progress. Through this vision, we can lay the groundwork for a more equitable and just world, with science at the forefront of innovation and societal growth.

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Closing educational gaps with artificial intelligence: A pathway to inclusivity and innovation

Elvan Ceyhan

Education remains a pillar of societal advancement and personal development in our rapidly changing world. Yet, significant disparities persist in access, quality, and inclusivity within educational systems, especially in under-resourced and developing areas. Addressing these disparities requires transformative approaches, with artificial intelligence (AI) emerging as a promising tool capable of reshaping both teaching and learning practices. My recent completion of the "AI in Education" course at Auburn University, United States, inspired me to integrate these insights into my own teaching and provided me with a deeper understanding of how AI can enhance accessibility, personalisation, and innovation within education.

The following discussion explores how AI can contribute to bridging educational gaps, considerations for its responsible deployment, and preparatory actions necessary for the future. Where relevant, I will share my own experience with AI in a graduate-level computational statistics class, illustrating its practical impact.

Closing educational gaps with AI: Expanding access through virtual classrooms

In many regions worldwide, physical access to quality education continues to be a substantial barrier, especially in remote and underserved areas. AI presents a transformative potential to address these challenges by enabling virtual classrooms and extending learning opportunities to students who would otherwise face significant obstacles to access. AI-powered digital platforms equip educators with tools to create interactive and immersive lessons and thus allow students to engage meaningfully with educational content even in the absence of traditional school infrastructures.

One of the key benefits of AI in virtual classrooms is real-time translation and transcription capabilities, which help to overcome language barriers and enhance accessibility for non-native speakers and students with hearing impairments. These tools can instantly translate spoken or written content into multiple languages, allowing students to follow lessons and interact with material that might otherwise pose comprehension challenges.[1]

Furthermore, AI-enabled glossaries and language support features offer students instant access to definitions and explanations of complex terms, often in various languages. This support not only fosters inclusivity but also empowers non-native English speakers to participate more fully and comprehend the material in ways that traditional

methods may not provide. Through these AI-driven tools, students from diverse linguistic backgrounds can overcome language-related obstacles, engage fully with educational content, and ultimately gain a richer understanding – making education accessible across geographic and linguistic boundaries.[2,3]

Personalized, student-centered learning for diverse needs

Among AI's most compelling applications in education is its capacity to personalise learning and hence place each student at the core of their academic experience.[4] AI-driven platforms like Khan Academy and DreamBox Learning can evaluate data on students' learning preferences, strengths, and areas for improvement, then adapt lesson plans and feedback to enhance engagement and comprehension.[5,6] This individualised approach empowers students to learn at a pace suited to their unique needs, making it particularly advantageous for those with disabilities, diverse linguistic backgrounds, or specific academic support requirements.[3]

In computational learning, AI tools have demonstrated significant promise, particularly in providing customised coding support. Platforms such as CodeCombat and Codio create engaging, interactive environments where students receive personalised, real-time feedback on coding structure and debugging.[7,8] In my graduate-level Computational Statistics course, for instance, students benefited from targeted feedback that directly addressed their misunderstandings and included supplementary resources focused precisely on their areas of need, especially in tackling intricate computational tasks requiring extensive coding.

Beyond computational learning, real-time translation tools like Microsoft Translator and Google Translate address linguistic barriers, enabling students from diverse linguistic backgrounds to engage fully with educational content.[9,10] These tools translate spoken or written lessons in real time, fostering inclusivity for non-native speakers and students with hearing impairments. Such capabilities empower educators to create a classroom environment that is accessible across linguistic divides and provide every student the equal opportunity to succeed.

In addition to providing feedback, AI's adaptability provided students with valuable insights, helping them overcome challenges and build confidence. This responsive guidance fostered active participation, ownership of progress, and deeper comprehension. Despite challenges like equitable access and privacy concerns, AI has the potential to create a more inclusive and impactful educational experience. By responsibly integrating AI, educators can support every student's academic journey, ensuring they have the resources to succeed.

Enhancing teacher capabilities

While AI serves to enrich the educational experience, its role is not to replace teachers but to enhance their capabilities, supporting a more tailored and effective teaching environment. By automating routine tasks such as grading, attendance tracking, and feedback, AI enables educators to allocate more time for meaningful interactions and personalised instruction. This shift allows teachers to focus on understanding each student's unique needs and providing targeted guidance where it has the most impact.[11] Moreover, AI offers educators real-time insights into student performance through data-driven analysis, highlighting areas where students may need additional support or where specific concepts could benefit from reinforcement. Such a proactive approach allows teachers to address learning gaps promptly and to tailor their instruction to foster individual growth.[1]

In my own experience, I utilised AI tools to develop lecture materials and design assignments that not only assessed students' comprehension but also encouraged them to explore AI applications in statistical analysis. Through engagement with AI-based assignments, students observed firsthand the relevance of AI, adding an experiential learning dimension to the course, and deepening their grasp of the subject. This approach demonstrates the dual role of AI in education – as a tool for teachers to enhance instructional efficiency and a bridge for students to engage more actively with course content.

Promoting lifelong learning

In today's rapidly changing world, learning extends well beyond formal education and encompasses a lifetime of skill acquisition and growth. AI plays a pivotal role in supporting this continuum by offering flexible, adaptive platforms suited to learners at any stage of life. From professional development programs to practical vocational training, AI-powered tools empower individuals to acquire new skills and knowledge continuously, enabling them to stay competitive within an evolving job market.[11] These AI-driven platforms deliver personalised recommendations based on each learner's progress, allowing users to build on their strengths and address knowledge gaps at their own pace. Such tools make the process of upskilling and reskilling more accessible and engaging, thereby helping individuals remain current with industry advancements or even venture into new fields.[3]

In my own curriculum, I integrated AI not only to teach foundational concepts in statistical analysis but also to cultivate a curiosity for lifelong learning among my students. By engaging with AI applications in this course, students gained practical skills essential in today's technology-driven world, and reinforced the view of learning as a continuous journey rather than a finite goal. Through this approach, students gained insights into how AI can support ongoing personal and professional development and can foster a mindset that embraces adaptability and continuous learning – an invaluable asset for navigating the future job landscape.

Guidelines for responsible AI use in education

As AI becomes more integrated into education, establishing ethical guidelines is essential to ensure responsible and transparent use. Both educators and students need to understand AI's role within their learning experiences and to engage with these tools thoughtfully and ethically. Clear guidelines help establish standards for AI usage, thereby fostering a culture of accountability and respect for its capabilities and limitations.[12]

Given that many AI systems rely on data to tailor learning experiences, protecting student information is essential. Educators and institutions must enforce strict data protection policies, ensuring that all collected information is securely stored, anonymised where feasible and possible, and used solely for educational purposes.[13, 12, 14]

Equally important is adherence to academic honesty. While AI serves as a valuable aid in research and analysis, students should recognise that it is not a substitute for original thought and comprehension. Institutions should emphasize that AI-generated results are intended to complement, not replace, students' independent work, and thus encourage them to critically assess AI outputs and integrate these insights meaningfully. Students should be reminded to acknowledge any AI assistance used in assignments, as such transparency upholds the integrity of academic work, thereby positioning AI as a tool for learning rather than a shortcut.[15, 14]

Implementing these guidelines effectively is a great challenge and is still in the making. Institutions could consider offering orientation sessions or workshops dedicated to responsible AI use and academic integrity. Instructors might incorporate targeted examples in assignments and demonstrate how AI tools can enhance analysis without substituting independent thinking. Developing a code of conduct or resource set for AI usage can also help clarify expectations and establish AI as a supportive resource rather than an endpoint.

While these guidelines create a foundation for responsible AI use, each educational setting may adapt them to its distinct needs, values, and technological resources. Flexibility is key; institutions should refine their approach over time, informed by feedback and evolving best practices in AI-enhanced learning.

Together, these guidelines promote a responsible educational environment where AI supports academic growth while preserving respect for personal accountability, data privacy, and academic integrity.[11, 15]

Looking ahead: The long-term process for adapting to AI

Integrating AI into education requires a long-term, strategic commitment, shifting from a product-focused perspective to a process-oriented approach that prioritises continuous improvement, adaptability, and active student engagement over traditional content delivery. AI's potential to transform education lies in its capacity to evolve with learners' needs, which calls for a framework as flexible and dynamic as the technology itself. [11, 16]

A sustainable approach to AI in education begins with ongoing educator training, equipping teachers with the skills necessary to incorporate AI tools effectively and adapt to technological advances. This training fosters confidence and innovation, enabling educators to view AI as an extension of their instructional methods rather than a fixed add-on. Additionally, fostering collaborative networks among educators, technologists, and researchers supports the sharing of best practices, case studies, and feedback on AI tools, thereby building a community committed to refining and optimising AI's role in education.[10]

Iterative feedback mechanisms are critical for evaluating AI tools' effectiveness and aligning them with educational goals. Regular assessments ensure that AI integrations continue to support impactful learning and provide educators with insights into which methods succeed and where adjustments are needed.

The ultimate objective of integrating AI in education is to establish a flexible framework that emphasises digital literacy, ethical engagement, and adaptability. This approach fosters an environment where students are not passive recipients of AI-driven content but active participants in a dynamic learning process, one that empowers them to navigate, question, and leverage AI as an integral part of their educational journey.[17]

Conclusions

As we work to close educational gaps, AI offers an unprecedented opportunity to transform education by making it more personalised, accessible, and impactful. Leveraging AI's capabilities enables us to foster a more inclusive educational environment where every student has the resources and support necessary to succeed. By adopting these technologies responsibly and thoughtfully, we can bridge divides in education and chart a course toward a future defined by equitable, innovative learning for all.

Looking ahead, integrating AI into education presents both challenges and opportunities. To realise AI's full potential in creating a more inclusive educational system, it is crucial to continue refining our approaches and adapting AI tools to diverse and evolving learning environments. Implementing these tools with a commitment to academic integrity, data privacy, and student autonomy will foster a culture of trust and innovation.

This transformative journey is about more than simply embracing new technology; it is about building a resilient, adaptable framework that ensures ethical and meaningful AI use. In doing so, we can empower educators, enrich learning experiences, and equip students with the skills needed to navigate and contribute to a rapidly changing world. Thoughtfully integrated, AI becomes not just a tool, but a pathway to a more just and forward-looking global education system, where all learners have access to the opportunities they deserve.

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Artificial intelligence in education: Musings from a millennial

Fun Man Fung

In 2023 I received an email from a young person who lacked work experience but could write like a seasoned professional. I wondered "Did this person use AI to assist in the writing, or are they just wise beyond their age?"

By the spring of 2024, substantially more young people began writing me using such intricate and compelling language - structures that most humans do not have the natural flair to write. I revisited my previous questions and realized that a generation of youths (and senior youths) had become adept at harnessing technology to write smooth-sounding emails, a task that used to take hours to craft. How much time they were saving! As a person who values time as the most sacrosanct commodity, I tend to reply to emails quickly and directly, moving on to the next one without hesitation. Of course, my counsels would remind me that such an approach is probably too curt – that is, it is not what you say, but how you say it.

I continue to ruminate on this issue. Perhaps I am unable to distinguish between those who use AI, and those who do not? And for that matter, is the ability to discern the use of AI or not a skill that will become one for the robots, rather than a skill for the sentient being with a pumping heart and soul?

So of course I asked AI the above question, and here is the response: "While AI boasts impressive capabilities in data analysis and algorithm development, discerning truly wise choices remains a uniquely human challenge. Unlike machines that rely on cold calculations and pre-programmed rules, human decision-making processes are a complex interplay of emotions, experiences, and biases."

This inherent human complexity, often referred to as "intuition" or "gut feeling", can be a powerful guide but one that is also prone to distortion. Our desires, fears, and social conditioning can subtly influence our decisions, potentially creating a disconnect between what we perceive as the right path and the one aligned with our core values. For instance, the allure of immediate gratification might tempt us to prioritize fleeting pleasures over long-term goals. On the other hand, the fear of failure might deter us from pursuing meaningful endeavors, leading to stagnation and regret.

This internal struggle is a defining characteristic of the human condition. Yet, this very ambiguity grants us the opportunity to learn, grow, and continuously refine our internal decision-making processes. Through introspection, critical thinking, and exposure to diverse perspectives, we can gradually sharpen our discernment. Much like a sailor learns to navigate by interpreting the wind and currents, we too can learn to navigate the complex currents of our internal compass. I vividly recall that, a decade ago, when I began teaching in my Alma Mater in Singapore, one of the most common responses from students when I asked how they derived the answers to a problem was succinct and telling: Google.

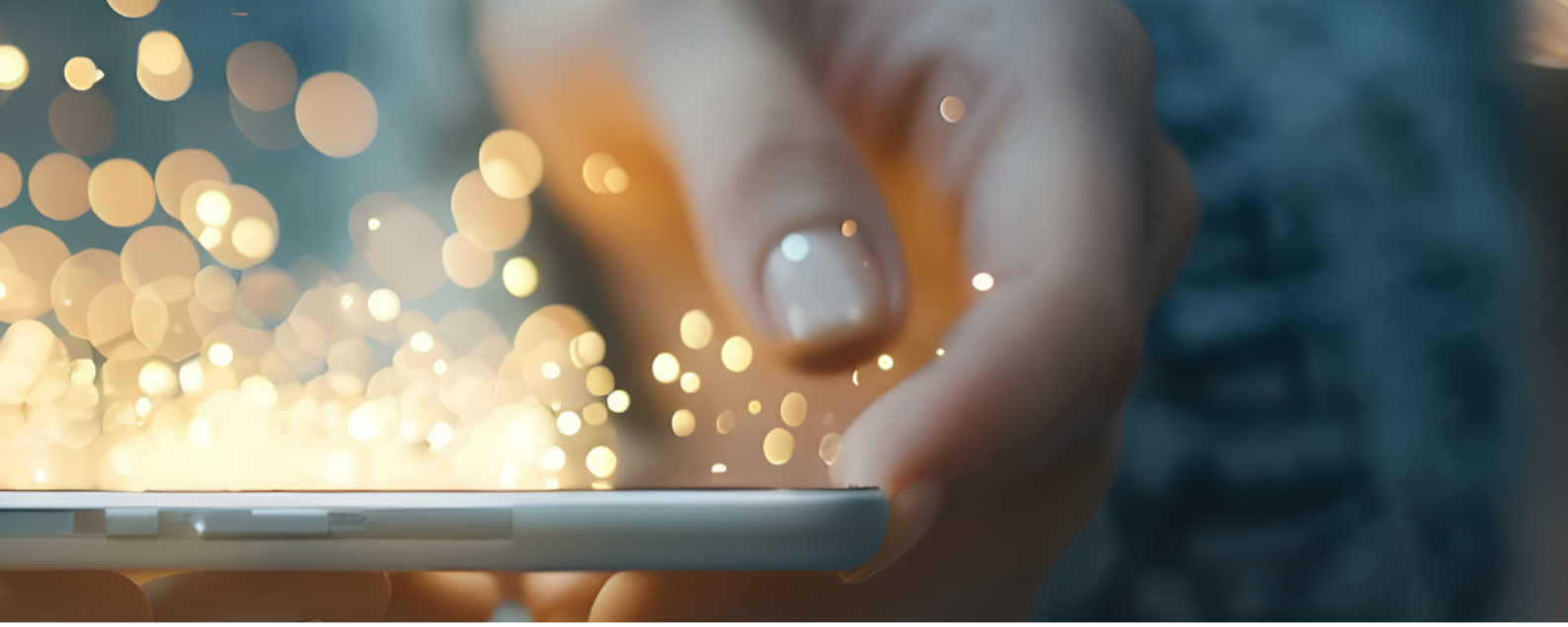
Today, quite a number of young people I know use AI daily.[1] For under 10 Euros per month, they pay a subscription to a service that churns out quick and creative images that would otherwise cost them minimally 50 times as much, and take 10 times longer to find an image that they desire.

Even more interesting (some might say scary) is that people use AI to talk and share emotional thoughts, treating it as if it were a real person.

Some opine that AI is so good at imitating a real person by using language that we are more likely to accept, since AI are less likely to throw tantrums and when we read their writing, we do not feel that they are writing angrily or attacking us.

But what this means is, presumably there are more people who are dependent on AI to speak to, to seek directions, to seek help, forgetting that AI is also capable of providing non-factual information.

This was unlike the 1990's, when MSN Messenger, ICQ, mIRC, and other such messaging services allowed people to connect. Back then, people were behind the words and chats, be they friends or strang-



ers, they were still human. Of course, this is not to say that humans were incapable of spreading inaccurate messages or misinformation. We remember well the classic "Telephone Game" or "Whisper down the message". Today, we have come to the era where we trust numbers and data more than words and phrases that sound like music to our ears. And indeed, we trust messages derived from AI more than we trust people. This shift marks a profound change.

I have a hypothesis that before the advent of the World-Wide-Web, with tools such as Netscape Navigator and Internet Explorer, and search engines like Google and Altavista, and OpenAI, people thought harder about various scenarios, deliberated through different possible outcomes before making a decision. The rapid pace of events today, alongside the assistance provided by AI and tools like Google maps and Citymapper for instance, has shifted how we approach decision making. Nowadays, we no longer need to memorize bus routes or street names, as technology seamlessly handles these tasks for us.

But as humans, I encourage us to strive not for algorithmic precisions - let the robots do it - but to continue to develop a nuanced understanding of our own motivations and biases.[2] This involves recognizing the limitations of intuition and seeking out complementary perspectives to inform our choices.[3]

Ultimately, the difference between humans and machines lies not in having the "correct" answers but in the complex, beautiful journey of searching for them. Our capacity to learn, adapt, and refine our internal compass is what truly sets us apart from AI, making the journey of discernment itself a worthy endeavor.

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From research to reality: Academia's contributions to achieving SDG 6

Ganbaatar Khurelbaatar and Jan Friesen

In 2015, the Sustainable Development Goals (SDGs) were adopted by all United Nation (UN) Member States as part of the 2030 Agenda for Sustainable Development. The SDGs aim to promote peace and prosperity for people and the planet, with a strong focus on sustainability.

Among these goals is SDG 6, which aims to ensure the availability and sustainable management of water and sanitation for all by 2030. However, as we approach the halfway mark to this deadline, progress remains significantly behind schedule, particularly in meeting the water-related targets of SDG 6.[1] For example, to meet the goal of universal sanitation access by 2030, efforts would need to increase fivefold. This disparity between ambition and reality underscores the urgent need for more effective interventions and solutions.

In response to the slow pace of progress on SDG 6, UN Water, which coordinates efforts for entities and organizations working on water and sanitation issues, introduced the SDG 6 Global Acceleration Framework in 2020 and the United Nations System-wide Strategy for Water and Sanitation in 2024. These frameworks identify five key accelerators: financing, data and information, capacity development, innovation, and governance as essential areas to focus on to overcome barriers and speed up progress. While these areas are crucial, a significant but often overlooked component is the need for comprehensive planning at various scales for sanitation solutions.

Bridging data gaps and developing sanitation plans

Once data and information gaps are addressed, a vital next step in ensuring progress towards SDG 6 is the development of regional or national water and sanitation master plans. These plans are critical because they help in comparing different sanitation solutions, quantifying financial needs, and prioritizing actions across regions. A country-wide or region-wide sanitation strategy would enable stakeholders to assess the feasibility and cost-effectiveness of various solutions for wastewater collection, treatment, and disposal, be they centralized, decentralized, or hybrid systems.

The role of academia is crucial in this context. Researchers and institutions need to develop planning tools that can work in different settings, from well-documented regions to data-poor or remote locations, and at local, regional, or national scales. These tools would allow for more informed decision-making and better allocation of resources to achieve the SDG 6 targets.

Efforts of the Working Group on Water Sensitive Infrastructure Planning

One example of such academic contribution comes from the Working Group on Water Sensitive Infrastructure Planning (WASP) at the Helmholtz Centre for Environmental Research (UFZ) in Leipzig, Germany. This group is focused on creating tools that aid in preliminary planning and decision support for wastewater management at different scales.

ALLOWS: A local scale, scenario-based planning tool

Among the tools developed by WASP is the Assessment of Local, Lowest-Cost Wastewater Solutions (ALLOWS), a decision-making and planning tool designed to identify cost-effective wastewater management solutions. Developed by van Afferden et al. (2015), ALLOWS enables stakeholders to design alternative wastewater systems, ranging from centralized to decentralized setups, or even hybrid models.[2] By using both spatial and economic analyses, the tool helps to compare the costs of various scenarios, enabling stakeholders to determine the most suitable and cost-efficient solution for specific settlements.

Since its development, ALLOWS has been further refined and applied in different contexts, from local to regional scales, and under varying conditions, including regions with limited data availability. For instance, a study by Khurelbaatar et al. (2021) has shown how the tool can be used to estimate costs in data-scarce regions.[3] Depending on the level of detail of the input data, the ALLOWS tool allows for preliminary planning at different levels of detail, which in turn helps estimate the costs of implementing different wastewater management scenarios. These estimated costs, when aggregated on a larger scale, will be crucial in assessing the overall financial requirements for achieving SDG 6.

OCTOPUS: A Global Wastewater Infrastructure Optimization Tool

Where ALLOWS focuses at the settlement scale and the most appropriate local solution, its scalability to larger areas is limited by spatial and computational constraints. To overcome these limitations, OCTOPUS was developed by Friesen et al.[4] This tool is designed for large-scale wastewater infrastructure optimization, taking into account the economies of scale that allow larger wastewater treatment plants to operate at lower unit costs.

OCTOPUS focuses on optimizing treatment sites and wastewater networks to reduce costs associated

with sewer-bound wastewater management. The tool has been applied to 140 countries with relatively low access to sanitation, demonstrating the potential for significant cost savings through optimization. The results from OCTOPUS show how a comprehensive, optimized approach can make wastewater treatment more affordable and efficient at a large scale.

Integrating local and global tools for comprehensive sanitation planning

By combining the capabilities of both the ALLOWS and OCTOPUS tools, a comprehensive approach to sanitation management planning can be developed at both local and global scales. Local-scale planning enables stakeholders to tailor wastewater solutions to the specific needs and conditions of a given area, while regional or national planning allows for the identification of optimization and cost-saving opportunities. Together, these tools enable the creation of comprehensive wastewater management strategies that are both locally specific and regionally coherent. This scaling-up process is crucial for countries aiming to achieve SDG 6. Once the most suitable sanitation solutions are identified at the local level, they can be scaled up to larger regions or countries. This not only supports better allocation of resources but also enables the development of coherent national strategies that align with global SDG 6 targets.

Scenario-based approaches for sustainable sanitation solutions

Another key aspect of these tools is their ability to support scenario-based planning. Scenario-based approaches enable planners to explore different development trajectories based on changing factors, such as water consumption patterns, climate change impacts, the introduction of new technologies, or advancements in wastewater treatment technologies. This flexibility enables decision-makers to prepare for different future scenarios, making their sanitation strategies more resilient and adaptable to change.

For instance, changes in water consumption due to population growth or shifts in climate patterns may alter the demand for sanitation services. By using tools like ALLOWS and OCTOPUS, decision-makers can evaluate the implications of these changes and adjust their plans accordingly. Similarly, as new technologies emerge, these tools can help assess how the adoption of these technologies would impact costs, infrastructure needs, and overall progress towards the SDG 6 targets.

The path forward for achieving SDG 6

To close the gap between the ambitious targets of SDG 6 and the current slow pace of progress, it is essential to adopt a comprehensive approach that includes both data-driven decision-making and effective planning tools. The SDG 6 Global Acceleration Framework has identified key areas where action is needed, but more emphasis must be placed on planning sanitation solutions at the local, regional, and national scales.

Tools developed by researchers, such as ALLOWS and OCTOPUS, offer valuable solutions for bridging this gap. These tools enable stakeholders to compare different wastewater management scenarios and optimize infrastructure, thus playing a vital role in helping countries meet SDG 6 targets.

As we approach 2030, collaboration between governments, academia, and international organizations will be critical. Academia's role in developing and refining planning tools for sanitation management, especially in data-poor regions, is essential. Governments must prioritize the development of sanitation master plans that incorporate these tools, thereby ensuring that they are well-prepared to meet their populations' needs, while advancing global progress towards the SDG 6 targets.

In conclusion, although significant challenges remain in achieving SDG 6, the development and implementation of preliminary planning tools such as ALLOWS and OCTOPUS offer a promising path forward.

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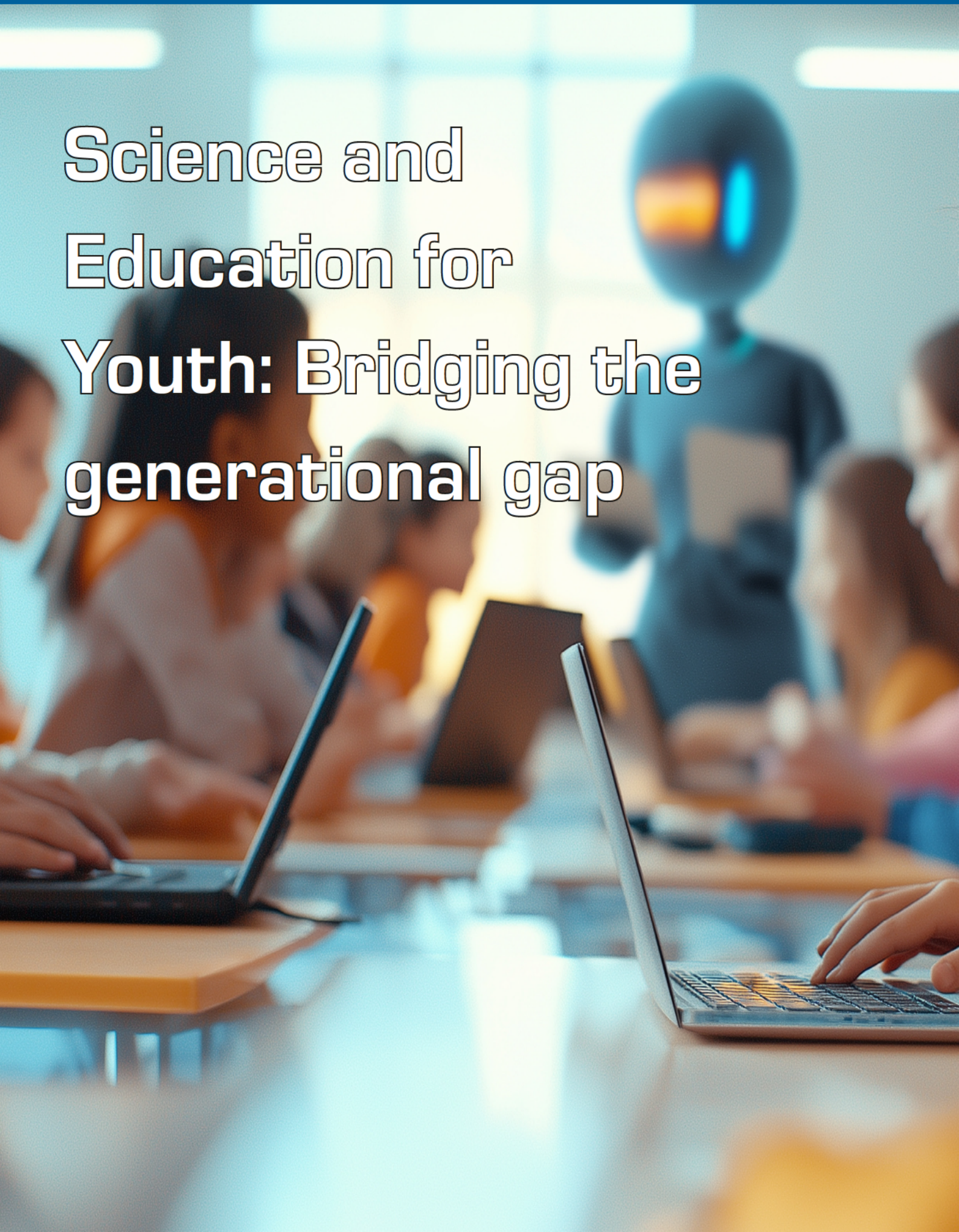

Science and Education for Youth: Bridging the generational gap

Reem Abou Assi and Chan Siok Yee

After the global lockdown in 2020, educational institutions were forced to shift entirely to remote and online learning. This sudden transition exposed significant gaps in many educational systems, leaving them struggling to meet students' needs and engagement expectations. This was especially the case for Generation Z (born roughly between 1997 and 2012), who now dominate higher education.

This generation relies on the internet, social media, and digital tools for communication and learning. Given this mind-set, imagine using books alone to teach critical topics like climate change, recycling, science communication, or the United Nations Sustainable Development Goals (SDGs). Such an approach would likely fail to engage this generation.

Moreover, many Gen Z learners are drawn to alternative career paths, freelancing, and side hustles instead of traditional 9-to-5 jobs, and thrive on hands-on experiences, interactive learning, and gamified or entertainment-based education. Thus, educators must embrace dynamic, tech-driven, and immersive teaching strategies to truly engage them.

In May 2024, the GYA's Science and Education for Youth (SEY) working group (WG) adopted the strategy of addressing Gen Z's engagement with science via extracurricular activities. SEY WG Co-leads Reem Abou Assi (Al-Kitab University, Iraq) and Natisha Dukhi (Human Sciences Research Council, South Africa) collaborated with various GYA WGs to produce several successful activities.

In September 2024, the SEY WG and the GYA and the UN SDGs WG launched a series of talks and training sessions aiming to put SDGs into practice and raise awareness about them within higher education institutions. These talks targeted both students and lecturers. Topics such as climate change's impact on societies and health were addressed, with events taking place both online (via Zoom) and physically on the campus of Al-Kitab University, Iraq.

These training sessions have inspired a group of researchers to take action in the recycling sector, leading to the development of a project titled "The Art of Recycling From Trash to Trend: Transforming Plastic into Fashion." The project was a collaboration effort between GYA members, who used it as a mentorship platform for early-career researchers, including Gen Z. This initiative leverages scientific methods to recycle plastic by collecting and converting used plastic bottles into fibers, which can then be spun into threads and used to create small-scale clothing items such as headbands, wristbands, and accessories.

Figure 1. The journey of phase 1, The Art of Recycling from Trash to Trend: Transforming Plastic into Fashion project (September 2024 – January 2025). Mentee Team includes Abdullah Noah Zrnan, Hassan Mohammed Hassan, Zainalabdeen Sabah Ali, Aisha Marwan Abd Al Majeed, Hudhaifa Hayder Abdali, and Yara Ahmed Mudhehere.

Of course, awareness alone is not enough to drive change; action is essential. Previously, this research group explored the key challenges of translating climate change awareness into meaningful action. Interestingly, both genders demonstrated a high level of climate change awareness (>90%). However, only 47.2% of participants considered taking action against climate change to be important.[1]

This low engagement rate was attributed to key challenges identified in extracurricular activity participation. Notably, Gen Z participants tend to exhibit low retention and cohort rates in such initiatives. The retention rate refers to the percentage of students who continue participating in the same extracurricular program over time, while the cohort rate measures the percentage of participants who enroll at the beginning of an activity and remain engaged until its completion. Addressing these challenges is crucial to fostering sustained involvement and long-term impact.[2]

Interestingly, recycling and green activities ranked second among the extracurricular activities investigated (see figure 1). However, the preferred mode of participation remained online rather than in-person, reflecting Gen Z's inclination toward digital interaction.[3]

Science communication skills

Recognizing that online platforms are the primary medium through which the targeted generation prefers to learn and engage in activities, the SEY WG in collaboration with the GYA's Women in Science (WiS) WG designed a two-day online symposium focused on Communication Skills and Science Communication (see figure 2). For this event, GYA members and alumni worked together to produce comprehensive training with hands-on experiences. Collaborators included GYA Co-Chair Yensi Flores Bueso (University College Cork/University of Washington, Ireland/United States) Executive Committee member Siok Yee Chan (Universiti Sains Malaysia), GYA members Pooja Devi (CSIR-CSIO, India) and Luisa Maria Diele-Viegas (University of Mississippi, United States), and GYA alumni Anindita Bhadra (Indian Institute of Science Education and Research), Lisa Herzog (University of Groningen, Netherlands), Isil Kurnaz (Gebze Technical University, Turkey), and Robert Lepenies (Karlshochschule International University, Germany). The event was designed to be inclusive across generations and addressed science communication at all research stages, from undergraduate to postgraduate levels. Notably, Gen Z participants were highly engaged, and seized extensive opportunities to interact with speakers and peers, fostering a dynamic exchange of ideas and experiences.

Figure 2. The team involved in the activity: GYA Executive Committee (EC) member Sam Chan Siok Yee, Teoh Xin Yi, Rana Sejare, and GYA members Reem Abou Assi and EC member Sri Fatmawati..

Expert speakers provided invaluable guidance on refining science communication skills, and emphasized their significance for career advancement and professional growth. The talks covered a wide range of relevant topics while introducing fresh perspectives and practical strategies to enhance science communication. Additionally, participants benefitted from skill development sessions, gaining valuable insights across various domains. Gen Z attendees in particular showed a strong interest in digital communication and the application of science on social media, highlighting their enthusiasm for leveraging online platforms to share scientific knowledge effectively. Female participants dominated this online event, a noteworthy observation that highlights their strong engagement and interest in the topic

Giving a voice to women and girls in science

Another joint activity that combined a strong belief in the role of women and girls in science with the urge to further empower them, the SEY and WIS WGs collaborated to encourage more females to have a voice and a role in the scientific community. Recognizing that women and girls in different regions face unique challenges and require tailored advice and support to thrive in their respective fields, the WGs recorded a spontaneous multilingual video encouraging girls and women to dare more, collaborate in teams, choose their company wisely, and take pride in their journey. The video served as an inspiring call to action, reinforcing the importance of confidence, support networks, and perseverance in the pursuit of scientific and professional growth. Their collective effort showcased a shared commitment to empowering women and girls in science, reinforcing the message of unity, support, and global scientific engagement.

It is worth highlighting that the majority of Gen Z participants accessible for evaluation were from the Middle East, specifically Iraq, a country that is beginning to flourish and regain its momentum after years of devastating conflict. With that in mind, analyzing how this generation thinks is worth exploring to foster an exchange-based relationship between generations rather than one of competition or conflict. Understanding their perspectives, values, and aspirations can help bridge generational gaps and create a more collaborative and supportive environment for growth and innovation.

For instance, during a random question round aimed at understanding students' academic and professional preferences, an interesting trend emerged. The majority of participants (59%) expressed a willingness to work 16 hours in a job they love, whereas only 25% were willing to work eight hours in a job they dislike. Interestingly, 16% of students were undecided, and

Figure 3: The content and speakers' team of the Online Communications Skills Symposium.

unable to choose between the two options. This insight highlights the emphasis that Gen Z places on passion and fulfilment in their careers over mere stability or shorter working hours.

Do-it-yourself cosmetics

Further SEY WG activity of note was titled "DIY Cosmetics", designed by current GYA Executive Committee members Chan Siok Yee (Universiti Sains Malaysia) and Sri Fatmawati (Institut Teknologi Sepuluh Nopember, Indonesia). This hands-on cosmetic-making workshop was part of the 2023 Borneo Science Adventure Tour, a series of science outreach programs aimed at engaging students in rural areas. The tour took place across three rural districts in Sabah state, East Malaysia, Kota Marudu, Pitas, and Kudat. Organized by the Academy of Sciences Malaysia (ASM), with the GYA as a strategic partner, the initiative sought to cultivate interest in science and enhance public awareness of the role of science, technology, and innovation (STI) in everyday life. Through interactive learning, the program aimed to bridge the gap between theoretical knowledge and practical applications, particularly in underrepresented communities.

The program attracted over 500 students and offered free participation in engaging science activities. Students received step-by-step guidance to create lip scrubs and lip balms/sticks using Do-It-Yourself (DIY) kits made from natural ingredients and recyclable materials. To promote safe cosmetic use, informational leaflets were distributed in both English and Malay, ensuring accessibility for the local community.

The program garnered significant local attention through news coverage and social media. Building on this success, the team refined the workshop and conducted similar science outreach at SRJK(C) Shu Ren, a rural school in Melaka, Malaysia, as part of the "Greenastic Camp." This iteration of the cosmetic-making workshop emphasized the use of eco-friendly and natural ingredients, aligning with the camp's sustainability theme. A brief survey among participating students revealed strong engagement.

Building future bridges

Building on these experiences, future initiatives will focus on engaging youth and children as an effective, hands-on approach to empowerment. This vision is being realized through two ongoing projects:

1. Children's storybooks: These stories cover critical areas of children's knowledge development, fostering curiosity and learning in key subjects.

2. Multilingual Coloring Book: Designed to introduce the basics of climate change and recycling, this book will be available in four languages (Arabic, Kurdish, Turkish, and English), making environmental awareness more accessible to diverse communities.[4]

These initiatives aim to create meaningful educational tools that inspire and empower younger generations.

Finally, a key success factor behind every milestone achieved by the SEY WG is its team-driven approach, where GYA members actively collaborate, contribute, and support one another. This collective effort not only advances science, inclusivity, and empowerment, but also plays a crucial role in closing the engagement gap, ensuring that more voices – particularly from underrepresented communities – are included in meaningful scientific discussions and initiatives.

This spirit embodies the core values of the GYA, where dreams have no boundaries, and members benefit from a truly global network that fosters innovation, support, and collective growth.

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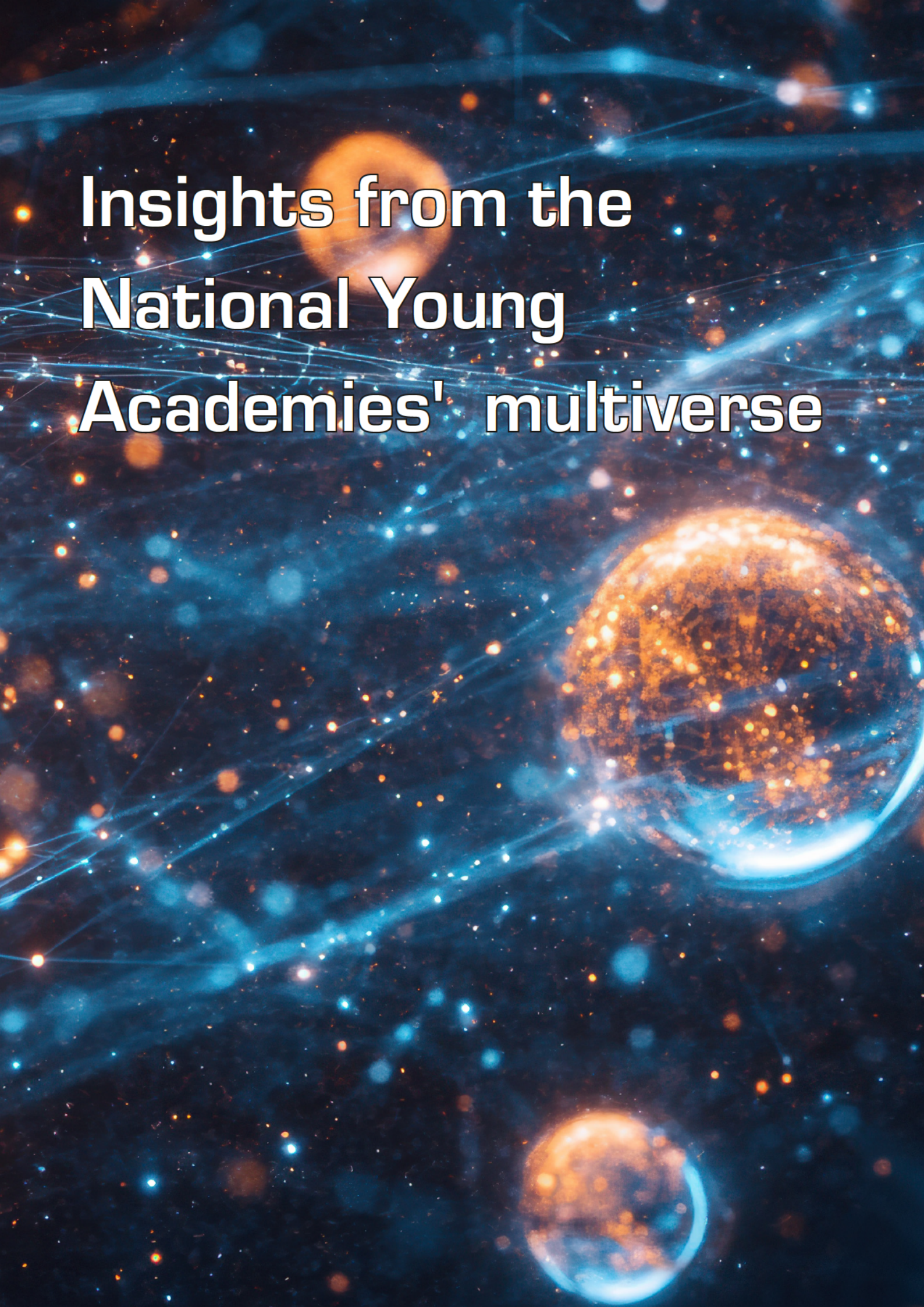
Insights from the National Young Academies' multiverse

David Fernandez Rivas and Anna-Maria Gramatté

As a member of the Global Young Academy (GYA), the Young Academy of Europe (YAE), the Dutch Young Academy (DYA), and the Young Academy Twente (YAT; University of Twente, The Netherlands), GYA member David Fernandez-Rivas (University of Twente, the Netherlands) has a one-of-a-kind perspective on the world's Young Academy (YA) movement.

In addition to sharing David's unique insight and observations, this article seeks to reflect on what Young Academies are, why they were founded, some of the positives and negatives of their various organizational structures, as well as the work that they do.[1]

The very first Young Academy was established at the turn of the millennium. According to its website: "The German Young Academy was established in 2000, and founded with the conviction that young academics in Germany generally have little opportunity to develop freely or shape the academic system." This desire for agency is what has driven the YA movement ever since, and what led to the founding of the GYA in Berlin, Germany, in 2010.[2]

At the time, early- and mid-career researchers (EMCRs) were not much included in the conversations and processes in which the traditional academies were already active.[3]

Thus, YAs were established to provide a voice for young scientists around the world, often with the support of established scientists. These YAs promote science as a career of choice for young people and help build their skills and capacities in science leadership. Through this training, YAs also help narrow the gap between science in the developed and developing world. This is particularly true for the GYA, which has members and alumni in over 100 countries around the world and provides many opportunities to engage with more senior academies through its membership in the International Science Council, InterAcademy Partnership, and other strategic partnerships such as being a member of the Scientific Advisory Board of the United Nations Secretary-General. Indeed, YAs such as the GYA encourage novel approaches to solving scientific problems of international significance and promote much-needed intergenerational scientific interdisciplinary dialog and long-term networking.

Moreover, EMCRs face many specific challenges during this period of their lives and careers – they face a high workload and job insecurity, as well as research-funding variability. They may also be going through a tenure process, or be balancing the demands of starting or sustaining a young family (oftentimes with a partner facing similar academic career issues). Further challenges might be integrating

into a foreign society, learning a new language, the perennial challenge of applying for financing, or facing gender-based or racial discrimination.[4]

As a reaction to these systemic challenges, YAs strive to have greater gender-balance in their membership than most of the established science academies the world over. Additionally, most YAs tackle issues of how to improve the science ecosystem, for example, through research assessment or Open Science issues; YAs also work on projects that tend to be interdisciplinary in nature, making them well-placed to tackle ongoing global issues. In 2019, national and trans-national YAs compiled a "Declaration on the Guiding Principles of Young Academies", detailing their efforts in addressing excellence in their respective memberships, as well as how diversity & inclusivity, responsibility, knowledge-based evidence, independence & transparency, and integrity lay the cornerstones of YAs and their work.[5]

Taking the movement a step further, in The Netherlands, nearly every university now has a local YA such as that at the University of Twente, which is dedicated to "creating an inspiring environment of young scientists, who are at the beginning of a promising academic career and offering them the opportunity to reach their full potential by actively shaping the UT."[6]

Taking a geographical step upwards, nowadays National Young Academies (NYAs) exist in more than 50 countries the world over, and are often connected to the country's established science academy. Examples abound, as illustrated in the GYA's publication "The World's Young Academies 2025".[7]

In Europe, there also exists a continent-wide YA, the Young Academy of Europe, a pan-European initiative of young scientists for networking, scientific exchange and science policy.[8]

With its vision of science for all; science for the future, and its mission to give a voice to young scientists and researchers around the world, the GYA has been around since 2010, with members from currently more than 70 countries. As is done in a majority of YAs, GYA members are selected not only for their academic excellence, but also for their commitment to engage with society at large.

While some YAs are connected to a "parent university", most NYAs are connected in some way to that country's established national science academy. In The Netherlands, for example, The Young Academy is an independent division of the Royal Netherlands Academy of Arts and Sciences. Of course, some NYAs operate without the support of established academies, and take the form of a non-governmental organization or similar structure.

Irrespective of what (legal) form these relationships between young and established academies take at any level, it is evident that in recent years we have seen an increase in collaborations between both types of academies and/or between their respective networks, and recognition for the (often interdisciplinary) work that the YAs do has markedly grown.

For example, on a national level there are many cases of successful joint activities between a country's YA and the established academy. Similarly, the YAE is working closely with the Academia Europaea (AE) on a European level. Also in Europe, ALLEA – the European Federation of Academies of Sciences and Humanities, began inviting YAs from the continent to become members of the network in 2021, and both groups of academies now hold joint annual meetings every two years, to discuss and start joint project ideas.

At the same time, the continent's YAs set up the Young Academies Science Advice Structure (YASAS) in 2020, which enables European YAs to collectively be part of the European Commission's Scientific Advice Mechanism, together with a number of established academy networks from Europe forming the SAPEA science-for-policy consortium, and contributing experts from among their membership to bring scientific evidence into EU policy-making.

In Africa, the Network of African Science Academies (NASAC) started collaborating extensively with African YAs in 2023, by creating the position of a Liaison Officer at their secretariat, organising regular online meetings, and inviting YAs to participate in their recent Annual Meeting in November 2024. As a direct outcome of that meeting, in March 2025, African YAs were invited to join NASAC as Young Affiliates.

Globally, the ISC opened affiliate membership to the world's YAs in 2022, and organised its first General Assembly and Conference that saw the participation and contributions of YAs and similar associations in Muscat, Oman, in January 2025.

Further along these lines, in October 2022, at the first Joint Meeting and Conference of the InterAcademy Partnership (IAP) with the world's YAs, IAP member academies began to look into membership options for YAs. In March 2025, it was announced that YAs could apply for IAP Young Affiliates status. The GYA has been a full member of IAP since 2019, and some of its members are currently serving on IAP leadership committees.

As expected from the diverse geographical and professional trajectory of YAs representing each level, there is a rich variety of activities and impact that they can have. Beyond specific target communities and audiences, each academy caters to their geographical level, but there are clear links and explicit interest for them to also collaborate on topics beyond their immediate level of focus.

At the same time that YAs from various levels develop closer collaborations, leaders of these YAs are

continuously aligning corresponding objectives and efforts to converge or synergize with established academies. This alignment will lead to a better use of academicians' time, which is largely financed by taxpayers' contributions.

The YA landscape has continued to be very dynamic in recent years, with more established every year. Some have been founded with the support or cooperation of their parent academy, while others are independent and grew out of initiatives by EMCRs in the country. In some cases, GYA members and alumni were part of the group that set up a new YA.

Some observers could (somewhat jokingly) point out that YAs will naturally age, and turn into the "traditional" academies over time, so why bother with YAs in the first place? However, due to their limited membership terms, YAs have a built-in "forever young" feature, whereby new member cohorts come in and past members exit after a few years. Moreover, the long-term effects of these networks hold great promise for the future academic, governmental and possibly industrial leadership roles that alumni represent.

David's journey through the Young Academies multiverse: A first-person narrative

Simultaneously becoming a member of all four types of YAs was not my original plan. Having studied and worked in Cuba, I always had ambitions to contribute to advancing academic work in less economically advanced countries. During my Bachelor's and Master's degree studies, I had the unique opportunity to visit the Technical University of Dortmund in Germany, and The Abdus Salam International Centre for Theoretical Physics in Trieste, Italy, where I became motivated to work at the international level. During my PhD student years in The Netherlands, I realized that good math skills or physics knowledge would not be enough to "change the world" and that other actions would be required from my side if I were to make an impact with my research.

My experiences in Germany and Italy helped me understand the importance of an institution for researchers from developing countries (like I was then) to interact with scientists working elsewhere. Indeed, communication between scientists, industry, governments, and other stakeholders cannot be taken for granted: it is often overlooked, and only through continued efforts and coordinated actions can good results be efficiently implemented.

Therefore, joining the GYA in 2019 seemed like a necessary step to fulfil my ambitions. I had heard about the GYA from two GYA founding members from the University of Twente – Hans Hilgenkamp and Wilfred van der Wiel. Both colleagues had been role models for me over the years, and they assisted me in preparing my application package.

I can share two main learning experiences from my time as a GYA member, and these are: the power of multidisciplinary collaboration towards policy, and the impact of international events on a diverse community.

For starters, my first GYA Annual General Meeting (AGM) as a member took place online due to the COVID-19 pandemic. Despite the lack of in-person contact, we managed to do great work during the AGM and after, particularly in the GYA's long-standing Young Scientist Ambassador Programme working group, which I joined and later co-led with Chandra Shekhar Sharma, who at the time of writing is a GYA Co-Chair.

Despite the global pandemic, GYA members managed to organise a number of virtual activities, including the publication of several articles with multinational and multidisciplinary authors' lists. Examples include contributing a session to the World Health Summit in October 2021, contributing an item in Humanities and Social Sciences Communications titled "Mitigating losses: how scientific organisations can help address the impact of the COVID-19 pandemic on early-career researchers", writing about Open Science in the Data Science Journal, or initiating a Call to Action on Supporting Latin American Early Career Researchers.

The second learning was that Young Academies are places where EMCRs navigate global, national, and local developments with each other and with external stakeholders. This can lead to wonderful demonstrations of solidarity and support, for example in light of ongoing budget cuts to academic funding or in response to natural disasters and war. However, it can also lead to unexpected polarisations and heated exchange, for example in response to the ongoing conflict between Hamas and Israel, or between Ukraine and Russia.

The importance of multinational organizations like the GYA should be further highlighted as a point for dialogue, particularly in the ever more divided public sphere, which increasingly sees divides along nationalist arguments caused by politics and economics. For example, my overall contribution to the GYA has been severely affected by a political rift between my country of birth and the United States, which made it impossible for me to attend the GYA's 2024 AGM. Unfortunately, my case is not an isolated one: many academicians suffer from discrimination, and face hurdles to obtain visas that prevent them from attending important events.

Moving to the local context, I was invited to join the YA at the University of Twente around the same time that I was preparing my application for the GYA. This was mostly due to grants and prizes I had recently received. When it was established in 2012. it was called

Young Academy@Twente; it is now known as the Young Academy Twente (YAT).

I am happy to have been part of the changes made to the selection criteria of the academy, which are now more inclusive to different career paths, including, for example, university teachers, and are less focused on grant money received or noteworthy prizes. It is my opinion that YAT now has a lean and flexible adaptive working process, and emphasises taking responsibility in issues like climate change, equality, etc.

I attribute the YAT's efficiency to having members at one (mostly) technical disciplines university, which may help them to agree on specific procedures, execute more focused work and react faster to local/national events. Indeed, I have seen very effective work performed by the YAT concerning a number of activities: Recognition & Rewards, Everyone Professor, etc., which are mostly aligned with concerns of other YAs at the Dutch national level.

My main contribution as a YAT member can be grouped in two areas: 1) In different working groups helping to provide clear instructions and onboarding for new members and recognition about differences between tenure track and assistant professors; 2) as a member of the Prizes and Awards Committee, with the main task of guaranteeing more visibility for younger researchers in selecting nominees and helping their applications for national and international recognition.

Both activities have helped me to clarify how diverse the expectations of scientists can be with respect to the work that is expected from each of us. Particularly, the importance of "winning" or even "competing" is not always clearly stated to young academics, and in contrast, is often associated with stress and unhealthy working cultures. This expectation mismatch is important to acknowledge in relation to the almost perennial situation in universities where resources are limited, and there are no clear instructions on how to allocate time and effort to advance the careers of individuals and the collective (faculty, university, etc.).

Moving up the geographical scale, somehow unexpectedly I was approached in 2020 by a colleague, who at the time was a part of the leadership of the Young Academy of Europe (YAE), with the question of whether I would like to join them. Of course, I realized that there could be some value in joining as a way to bridge the existing two academies I already was familiar with.

My statement of interest suggested initiatives contributing to a stronger attention to developing "innovation" or an entrepreneurial mindset in scientific activities – both educational and research – that work not only in "idyllic" conditions (such as those found in more developed countries), but also in less fortunate parts of the world. The hope was that I could help develop more career opportunities for young researchers, and more tangible results for our society.

In the end I was accepted, and most saliently, I worked with the YAE's Diversity Task Group, and participated in the Academia Europaea's 2023 anniversary, the Academia Europaea Jubileum. I also joined the YAE Board, and acted first for one year as Secretary, and later as Communication Vice-Chair. In the past few years, the YAE has done great work in building and strengthening links with the European Research Council (ERC) and other academic organizations.

My main learning experience from the YAE was that aligning a small group of scientists along a course of action, even when being "geographically close" is not easy. Contrary to the other YAs I have been a part of, when I joined the YAE, there was not a central support staff that could assist in office-executive operations. Thus, the superhuman effort performed by the Chair and Board members was and is impressive.

By 2023, I came to the realisation that I was missing a vital step in my YA journey, and began asking around about the supercompetitive process of nomination for the Dutch NYA, De Jonge Akademie (DJA). After talking to some active members, I understood how different in nature and scope their work was compared to my previous YA experience, and it motivated me to submit my application.

At the time of writing, I have been a member in the DJA for just one year, and am very optimistic about the work so far. Members rally around existing activities, and similar to other YAs, new initiatives are welcome. Along with other members of my cohort, we applied for internal funding and we will start working on a project titled "The AI challenge in the environmentally-conscious academy". Moreover, the DJA organises two or three meeting opportunities in a year, including "work-weekends" and visits to local entities, such as municipalities, rectors of universities, etc., for outreach activities.

Notably, this period has been filled with big challenges, including the tensions around international conflicts that are affecting all YAs, but also by the arrival of a new populistic Dutch government that has a clear agenda to shake-up academic activities. The DJA has been very active in supporting protests against cuts planned by the Dutch government, and has written articles to inform the public on the theme. Being in the same time zone, and in a country that is well connected electronically and via amazing infrastructure does provide an advantage over working within the YAE and the GYA contexts.

That all being said, in recent years I have managed to connect members, support staff, and executive members from my various YA affiliations to each other on more than one occasion. I look forward to continuing to do so and to sharing my experiences from the past five years as a four-level YA member. My main

ambition is to keep learning about the dynamic challenges that academics face and find ways to jointly solve them before I get "too old".

Moving forward together

As David's experiences show, YAs and the EMCRs they bring together continue to face numerous challenges. At the same time, societies around the world face a number of threats, be it climate change, war and conflict, loss of freedoms, etc.

Science and scientific discoveries can provide insights and answers on how best to tackle these challenges, but to do so, all academics need to be given a chance to contribute and be heard.

All stakeholders should recognize that YAs are places where future academic leaders are trained in interdisciplinarity, intergenerational dialogue, as well as science advice and science communication skills. Going forward, their voices should be brought to the table even more than is already the case, and roads towards greater collaboration between the YAs and established academies and their networks should be further explored and taken to ensure that EMCRs and their YAs can truly contribute – locally, nationally, regionally, and globally – for the benefit of all society.

GYA member David Fernandez Rivas (University of Twente, the Netherlands) is an engineer, scientist, educator, and co-founder of academic startup companies BuBclean and FlowBeams. He enjoys doing scientific research and ensuring its results are deployed into society on three topics: biomedical technology, renewable energy, and chemical process intensification through microfluidics. He wrote the book Empathic Entrepreneurial Engineering, which is a guide to solving problems, based on the real experiences of scientists and academic company founders.

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GYA Senior Project Manager Anna-Maria Gramatté is a social scientist by training and has been working as a science manager for the past two decades. After spending a few years in German university administration and at the German National Academy of Sciences Leopoldina, she came to the Global Young Academy in January 2017. Among a wide variety of tasks, she is the GYA's point of contact for the global network of Young Academies. As such she was one of the organisers for the 2022 Worldwide Meeting of Young Academies (jointly with IAP) and supported the GYA's contributions to the ISC Conference and General Assembly in 2025.

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Endnotes and References

1. Definitions of "Academy" are abundant, and we focus here on organizations of scholars and scientists with defined aims to promote science and maintain scientific standards. The webpages of academies provide a comprehensive list of ambitious goals, from which we can highlight common characteristics. For example, academies tend to distinguish their members among other peers, that is, its members have been "excellent" or excelled in at least one or more activities that make them stand out. Still, the way that members are inducted or elected can widely vary, sometimes leading to an undesired image that may not resonate with other societal actors. Traditionally, science academies were formed by lifelong members who were selected for membership in the later stages of their careers, thereby providing no spaces for EMCRs in their midst. In recent decades, the role of science and research has also become increasingly relevant in governmental work and when talking to the public. As a result, national science academies have expanded from "learned" societies into more executive agencies, joining or supporting projects of direct impact and visibility for society, e.g., writing white papers or assisting in social projects. Very often, academies act as sounding boards for governments and tend to be respected among different stakeholders in society.

2. For a detailed history of the GYA, check out "Looking back: Creating the vision of the GYA" by past GYA Co-Chair Koen Vermeir in GYA Connections 6, 2018. Link available here: https://globalyoungacademy.net/wp-content/uploads/2018/04/2018_Connections_Issue6-1.pdf

3. Definitions of what makes an EMCR can vary from country to country, depending on the features of the national research system, but most YAs work with a "academic age range" instead of a biological age, and define an EMCR to be a person 3-10 years post-PhD. This results in most YA members being between 30-40 years of age.

4. On precarity for EMCRs, see also "Precarity v. academic inclusiveness" in GYA Connections 7, 2019, as well as the outcomes of the various GYA projects on The Global State of Young Scientists. Link available here: https://globalyoungacademy.net/wp-content/uploads/2019/04/GYA-Connections-issue-7-15.05.2019.pdf

5. Link available at: https://globalyoungacademy.net/declaration-on-the-guiding-principles-of-young-academies/.

6. Link available at: https://www.utwente.nl/en/young-academy/

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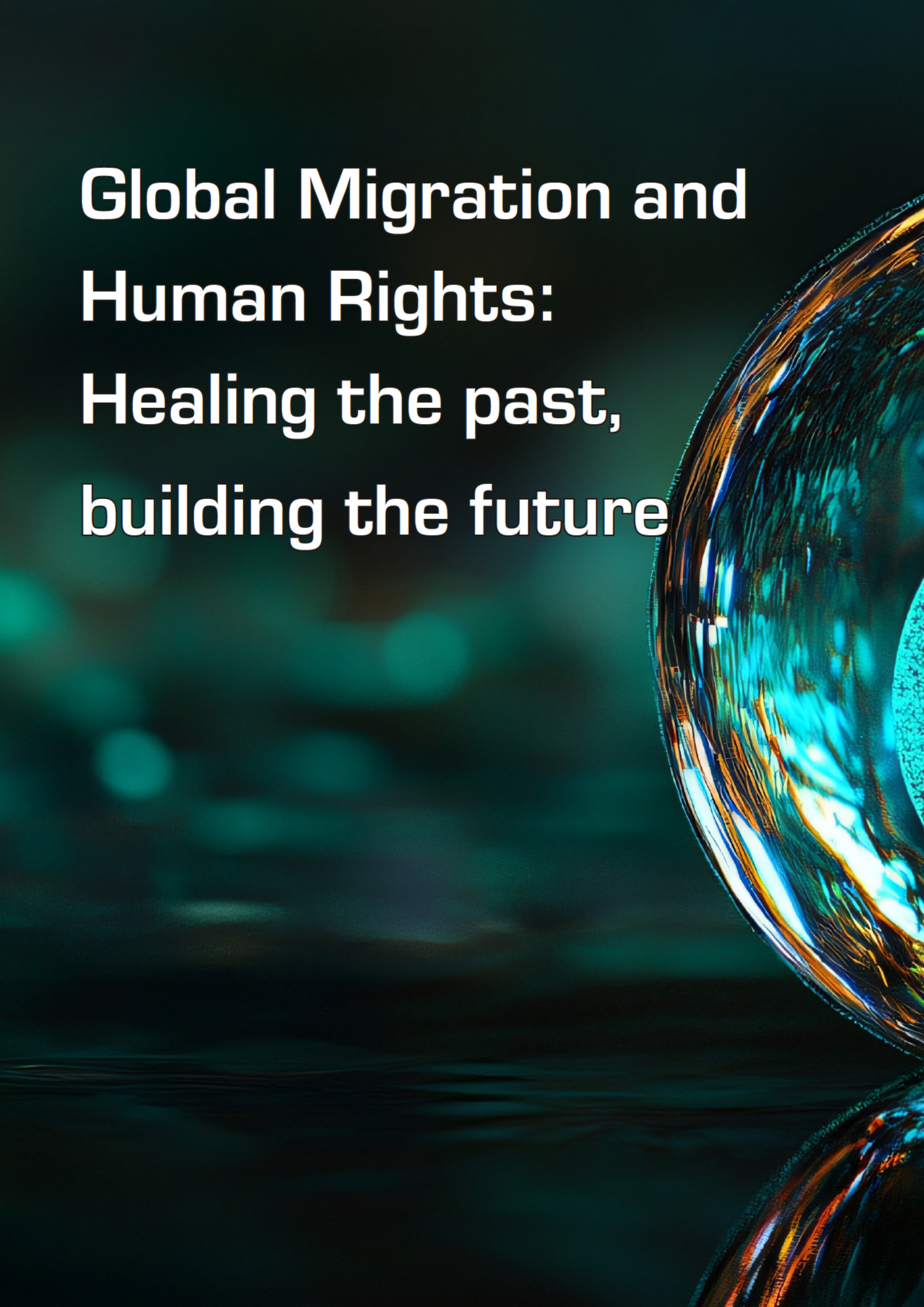
8. Link available at: https://yacadeuro.org/

Global Migration and Human Rights: Healing the past, building the future



Tomislav Meštrović and Goran Bandov

In a world where ethnic tensions and unresolved historical grievances continue to challenge sustainable peace, lessons from past reconciliations may serve as blueprints for contemporary conflict resolution. This is the reason why the GYA Working Group (WG) on Global Migration and Human Rights decided to pursue a study visit to Georgia in late September 2024, with one question in mind – is it possible to apply insights from Croatia's peaceful reintegration of the Danube Basin (1995-1998) to Georgia's interethnic and post-conflict challenges?

This initiative was financially supported by the GYA and co-led by GYA alumnus Goran Bandov (University of Zagreb, Croatia) and Tomislav Meštrović (University North, Croatia), co-leads of the aforementioned WG.

Basically, the Croatian experience – most notably the United Nations-led reintegration process of the Croatian Danube Region – offers a powerful case study on how divided communities can heal and co-exist.[1]

It can be argued that peace is not just about agreements signed by politicians; it is about how people live together after the agreements are made. And this exact philosophy guided the GYA delegation's work in Georgia, where unresolved tensions in regions such as Abkhazia and South Ossetia continue to shape political and social dynamics.

The first part of the study visit was participation in the Black Sea Security Conference in Tbilisi, Georgia, where the GYA delegation engaged with policymakers, security experts and academics. The discussions centered on the role of international organizations in regional stability and how historical reconciliation fits into broader security frameworks. It was also remarked that security is not just about borders, but also about trust. Therefore, the discussions there definitely underscore current developments in the world, but also the importance of addressing deep-seated grievances in conflict-affected areas.

In addition to such high-level policy discussions, the study visit included hands-on engagement with local universities. A particularly impactful event was the workshop entitled "Positive Peace: Trauma, Dialogues, and Multifaceted Sustainable Solutions". This event was jointly organized by the East European University and the Tbilisi Humanitarian Teaching University in Georgia, in collaboration with Croatian institutions including the University of Zagreb and University North. The workshop introduced Johan Galtung's concept of positive peace, distinguishing it from negative peace (i.e., a mere absence of conflict) and emphasizing the importance of resilience, economic stability, strong institutions, equitable resource distribution and human rights through the lens of Croatia's peaceful reintegration.[2]

Students and faculty also explored the role of trauma in reconciliation, discussing how war's emotional and psychological consequences shape societal attitudes long after the fighting stops. This is because you cannot talk about peace without talking about trauma, and why the session also drew on insights from the COPE project (Cooperation in Adult Education for Traumatised Learners) – an Erasmus+ initiative that addresses the educational needs of refugee and displaced populations through trauma-informed pedagogical frameworks.[3,4] In other words, the workshop encouraged young academics to think about how trauma-informed approaches could be integrated into education and broader community-building efforts, and how it can be applied in the local context.

The theme of education as a tool for peace was further explored at the International Conference on Science for Sustainable Development at Caucasus University in Georgia. As part of discussions on the UN Sustainable Development Goals, the delegation emphasized the role of education in strengthening interethnic understanding. The Croatian reintegration experience demonstrated that history education must be inclusive, allowing students to critically engage with different narratives of past conflicts. Likewise, diverse historical perspectives are crucial for lasting reconciliation – because if we hear only one voice, there is a danger of history being used as propaganda.

Throughout the visit, a qualitative research approach was also used to capture the perspectives of different Georgian stakeholders. Interviews with policymakers, academics and students revealed complex views of reconciliation efforts in the country. One recurring concern was the feeling that discussions on interethnic dialogue remain overly academic, detached from everyday realities. In other words, can such efforts be readily translated to areas where tensions still exist? These worries highlighted the pressing need for grassroots initiatives that actively involve local communities in reconciliation processes, something Croatia's reintegration experience showed to be indispensable.

Another significant theme was the role of media in shaping narratives about ethnic conflicts. Several interviewees pointed out that mainstream media often reinforces stereotypes rather than challenging them, making reconciliation even harder. The media often do not tell stories of people working together, but rather convey stories of division; so we see the need for more balanced, inclusive storytelling.

Beyond gathering insights, the GYA delegation also provided practical policy advice. One of the key recommendations was the possibility of integrating trauma-informed education into Georgian university curriculums to help young people process historical conflicts in constructive ways. The Croatian experience showed that reconciliation efforts must go beyond political gestures and actively address the emotional scars of past violence. Young people have to understand and cope with historical trauma, otherwise there is a danger of them inheriting its divisions.

The study visit also underscored the importance of community-driven peacebuilding.[5] Croatian reintegration efforts succeeded in part because they actively involved local leaders and institutions in shaping reconciliation policies. Applying this lesson to Georgia, there was a recommendation to expand community-based dialogue initiatives where people from different ethnic backgrounds could engage directly. There is a need to understand that we cannot impose peace from above; it has to be built from below.

A major takeaway from the visit was the need to strengthen international academic collaborations. The team encouraged Georgian universities to partner with institutions abroad to exchange knowledge on peace studies and conflict resolution. One concrete outcome was the proposal of a collaborative network of academics and students dedicated to continuing discussions on reconciliation beyond the study visit. The GYA is also envisioned to help in this process. The reason behind it is that real peacebuilding happens when people keep talking, even when it becomes hard or uncomfortable.

The GYA Global Migration and Human Rights WG's study visit to Georgia demonstrated that historical reconciliation is a complex, but in a way essential process that requires engagement at multiple levels – from high-level policy discussions to community-led initiatives.

The Croatian experience provided a valuable framework for thinking about how divided societies can move forward, but the visit also reinforced that every conflict has its own unique dynamics with the need for tailored solutions. Of course there is no copy-paste model for peace, but there are certainly lessons we can learn from each other. And one dialogue at a time, it is indeed possible to chart a path toward sustainable peace.

GYA alumnus Goran Bandov (University of Zagreb, Croatia) is a European expert in Diplomacy, International Relations and International Law with focus on Human and Minority Rights Protection, Peace Studies and Sustainable Development. He holds a PhD, is a Lawyer, Political Scientist and Full Professor.

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GYA member Tomislav Meštrović (University North, Croatia) is a medical doctor (MD) with a PhD degree from the University of Zagreb, an MPH degree from the London School of Hygiene & Tropical Medicine, and an MBA degree from the Frankfurt School of Finance & Management. He finished two specialty trainings (one in clinical microbiology and another one in sexual medicine), as well as an additional 1-year training in clinical trials at Harvard Medical School.

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03 Meet the New Members 2025

Alexandra Milanova (Bulgaria)

Assistant Professor / Humanities and Social Science

Alexandra has a B.A. in Southeast European Studies, an M.A. in International Relations and a Ph.D. in Modern and Contemporary History with summa cum laude from Sofia University. She completed further studies in Greece, Turkey, France, Switzerland, Kenya and the United States. Before switching to academia, she was involved in international project and event management in the private sector. She is a fellow of the Royal Historical Society, a councilor of EUROPEANA Network Association and a member of DARIAH-EU.

Anna Haji Msigwa (Tanzania)

Researcher / Hydrology

Anna is a lecturer and researcher at the Nelson Mandela African Institution of Science and Technology, specializing in hydrology and water resources. She completed a postdoctoral fellowship at the University of Pretoria, South Africa, supported by the Carnegie Corporation, where she led a team developing a machine learning-based early warning system for droughts in Tanzania. Anna has received several prestigious awards, including the One Planet Laureate (AWARD) and OWSD Early Career Fellowship.

Borgar Aamaas (Norway)

Senior Researcher / Climate

Borgar has worked at CICERO, a multidisciplinary climate research institute in Oslo, Norway, since 2010. His main area of academic expertise is on emission metrics and nearby themes such as emissions, mitigation, and emission scenarios. He has wide experience with both academic and commissioned research and likes to work interdisciplinary and communicate science in multiple ways. Borgar is a member of the Young Academy of Norway until 2027, and earned a Ph.D. in meteorology and climate at the University in Oslo.

Daniel Bryan Schwab (United States)

Science Policy Expert / International Research Collaboration

Daniel is a science policy expert specializing in international research collaboration, research integrity, and STEM education. He serves as Senior Advisor for Policy & International Programs at the U.S. Department of Energy's Office of Science, balancing international cooperation and research security in emerging technologies. Previously, he was an AAAS Science & Technology Policy Fellow at the U.S. Department of Defense and an Embassy Science Fellow at U.S. Embassy Tokyo. He is the founder of STEM for Development.

Duc A. Hoang (Vietnam)

Research Fellow / Education

Duc Hoang is a Research Fellow at RMIT University Vietnam. With a Ph.D. in educational leadership, Harvard CSML certification, and 25 scholarly publications, he bridges research and practice in education. He is also a Fellow of the UNESCO Chair on Technology and Engineering Education for Children and Youth, Grand Award Judge of Regeneron ISEF 2024, Board Member of the Global Young Vietnamese Scholars Network, and Seasoner Advisory Board for the British Council Vietnam.

Elena Kuzmin (Canada)

Assistant Professor / Pharmaceutical Sciences

Elena is an Assistant Professor at the Centre for Applied Synthetic Biology, Concordia University, and an Adjunct Professor at the Goodman Cancer Institute, McGill University. She holds the Canada Research Chair in Synthetic and Functional Genomics. Elena conducted undergraduate and graduate studies at the University of Toronto, and postdoctoral work at the Goodman Cancer Institute. Her main research area is integrative synthetic and functional genomics, focusing on complex genetic interaction networks.

Élise Devoie (Canada)

Assistant Professor / Psychology

Élise is an Assistant Professor in Civil Engineering at Queen's University, Canada. Her research focus is the impact of climate change in permafrost environments, and her work aims to improve our predictive capacity and understanding of drivers of change in these systems. She works with Northern communities, bringing together interdisciplinary teams through modelling, laboratory study, and fieldwork to try to solve real-world problems facing people who live in cold regions.

Emelda Chukwu (Nigeria)

Medical Microbiologist / Infectious Disease Epidemiology

Emelda is a Medical Microbiologist, Senior Research Scientist, and Head of the Center for Infectious Disease Research at the Nigerian Institute of Medical Research. With over a decade of expertise in infectious disease epidemiology and antimicrobial resistance, she has sig-nificantly advanced AMR surveillance and One-Health research, addressing microbial diversity, disease transmission, and host-pathogen interactions. Passionate about health policy advocacy, she works to bridge the science-policy gap.

Erick Onyango Komolo (Kenya)

Visiting Lecturer / Law

Erick is a practising lawyer and academic/researcher, and Listed Counsel of the African Court of Human & Peoples' Rights. He serves as the Ombudsman for Amnesty International, Kenya, and is a Member of Tax Appeals Tribunal, where he adjudicates cases on tax law and administration. He also Chairs the TAT Committee on Trainings, Capacity Building & Resource Mobilisation & is Senior Lecturer, Faculty of Law, Egerton University. Erick also serves as Visiting Lecturer at Strathmore Law School

F. Xavier Chiriboga Morales (Ecuador)

Insect Ecologist / Plant Sciences

Xavier is an insect ecologist studying biocontrol microbes against fungi. His Master's degree in Plant Sciences focused on the effects of plant quality on densities/sizes of insects at three trophic levels, and he led a research unit on the management of tropical crop pests and a laboratory of insects diagnotics in Ecuador. Xavier's Ph.D. focused on the use of soil-beneficial organisms to control root herbivores, while his postdoc examined the use of plant combinations to control maize pests in smallholder farms in Kenya.

Guy Roussel Takuissu Nguemto (Cameroon)

Scientist / Nutrition

Guy is a dedicated scientist specializing in nutrition, diabetes, and pharmacology, with a strong focus on non-communicable diseases and their management in low- and middle-income countries. Based in Cameroon, he leverages his expertise in pharmacology and nutrition to explore nature-based therapeutic strategies. As an early career researcher, he actively contributes to advancing global health through interdisciplinary research and collaboration. His work integrates food security, epidemiology, and implementation science.

Kassa Belay Ibrahim (Italy)

Research Fellow / Electrochemistry

Kassa received his Ph.D. in Material Engineering and Nano-sciences from the National Taiwan University of Science and Technology. Currently, he is a Research Fellow at Ca'Foscari University of Venice, Italy, where he conducts research, advises Master/PhD students, and teaches various courses. His research focuses on controllable synthesis and development of novel materials for electrocatalysis in green energy production and synchrotron-based characterizations.

Khandmaa Dashnyam (Mongolia)

Head of Research and Development / Pharmaceuticals

Khandmaa earned a Bachelor's degree in biotechnology at Mongolian International University, and completed Master's and Doctoral studies in tissue engineering at Dankook University, South Korea. While doing postdoctoral work, Khandmaa was awarded project grants from Mongolia's leading pharmaceutical company, Monos Group, which led her to subsequently return to her homeland as Head of R&D in Monos Group, and CEO of Inno Hub Mongolia, where she is dedicated to supporting science-based startups.

Kossi Brice Boris Legba (Benin)

Post-doctoral Researcher / Microbiology

Kossi is a postdoctoral researcher in microbiology at the University of Abomey-Calavi. His work focuses on antibacterial discovery, anti-infective strategies, and One Health-based antimicrobial resistance control. With 44 papers, 40 conference communications, 28 awards, 25 fellowships, and 16 projects, he won the Best Young Beninese Researcher Award (2022). He is a fellow of the Africa Science Leadership Programme, a Young Ambassador for the American Society for Microbiology & Next Einstein Forum Ambassador.

Luisa Cortesi (Netherlands)

Professor / Environmental Sciences and Anthropology

With a dual Ph.D. in Environmental Sciences and Anthropology from Yale University, Luisa is an interdisciplinary environmental anthropologist, interested in how people understand their natural environment—particularly water—when it becomes disastrous. Currently in a tenured professorial position at the International Institute of Social Studies, she aims to strengthen the study of environmental knowledge as a key factor for adaptation to water disasters, in particular floods and drinking water contamination.

Luria Leslie Founou (Cameroon)

Head of Research / Maternal and Neonatal Health

Luria is on a mission to improve maternal and neonatal health in Africa. She holds a Ph.D. in Pharmaceutical Microbiology from the University of KwaZulu-Natal, South Africa, and is a clinical microbiologist with over 10 years' experience on antimicrobial resistance and infectious diseases. She is currently the head of research within the Research Institute of the Centre of Expertise and Biological Diagnostic of Cameroon, and holds a Marie-Curie Postdoctoral Fellow at BforCure, France.

Luz Milbeth Cumba Garcia (United States)

Advisor / Sustainability

Luz is an Advisor for Sustainability at the U.S. Department of State's Bureau of Global Health Security and Diplomacy, where she supports global HIV/AIDS initiatives through the President's Emergency Plan for AIDS Relief. During her AAAS Science & Technology Policy Fellowship, she contributed to U.S.-Mexico global health policy at the State Department & advanced Arab-Israeli scientific collaboration at USAID. She is a founding member of the Science Diplomacy Network in Latin America and the Caribbean.

Malgorzata Gazda (Canada)

Assistant Professor / Genetics and Genomics

Małgorzata is an Assistant Professor at the University of Montreal. Her research focuses on applying genetics and genomics to understand how biological traits are encoded in the genome and how specific genes mediate phenotypic traits. She has served as an eLife Ambassador, an officer for the Polonium Foundation, and an Early Career Leader at the Genetics Society of America. She is currently an Assistant preprint editor for Proceedings of Royal Society B. In 2022, she was awarded the DeLill Nasser Award for Professional Development in Genetics.

Manuela Pacella (United Kingdom)

Senior Lecturer / Mechanical Engineering

Manuela is a Senior Lecturer in High-Value Manufacturing at Loughborough University. She is a Fellow of the Higher Education Academy, a Chartered Engineer, Member of the IMechE and an MPDS IMechE Mentor. She holds a Ph.D. in Mechanical Engineering from The University of Nottingham and a Master's in mechanical engineering from the Technical University of Bari (Italy). After being awarded her Ph.D., Manuela worked as Application Development Engineer and Advanced Manufacturing Research Engineer for various multinational companies.

Marietta Papadatou Pastou (Greece)

Associate Professor / Neuropsychology

Marietta is an Associate Professor in Neuropsychology at the National and Kapodistrian University of Athens. Additionally, she is an Affiliated Investigator at the Biomedical Research Foundation of the Academy of Athens. Her work focuses on handedness and brain lateralization, but her research interests encompass various aspects of neuropsychology, cognitive neuroscience, educational neuroscience, and experimental psychology. Marietta is also interested in meta-science, particularly in systematic reviews and meta-analysis.

Martin Schletterer (Austria)

Senior Researcher / Limnology

Martin is an ecologist at TIWAG and a Senior Researcher at BOKU University. His research and teaching in the field of limnology (freshwater science) include ecological approaches, taxonomy and biogeography (macroinvertebrates and fish) using conventional and molecular approaches. Martin contributes to river science using ecohydraulics and biodiversity as a key for sustainable management and planning processes on catchment scale, linking basic ecosystem-oriented and applied research.

Mbuzeleni Hlongwa (South Africa)

Researcher and Lecturer / Public Health

Mbuzeleni is a public health researcher specializing in HIV prevention and treatment. He is a Senior Research Specialist at the Human Sciences Research Council and an Honorary Lecturer in Public Health Medicine at the University of KwaZulu-Natal. His work focuses on improving linkage to HIV care, PrEP access, and self-testing strategies, particularly among men in South Africa. He is an Academic Editor for BMC Health Services Research and a Guest Editor for Frontiers in Public Health.

Meriem Chaanaoui (Morocco)

Assistant Professor / Energy and Process Engineering

Meriem is an Assistant Professor at Hassan 1st University (Morocco), where she delivers lectures on various topics related to energy and process engineering. She earned her Ph.D. in Solar Thermal Energy Systems in 2021 from the Mohammadia School of Engineering (Rabat, Morocco). Her research focuses on CSP technologies, including the development of the world's first bench-scale parabolic trough solar dryer for phosphate sludge, and she has published several reference and impactful articles in this field.

Mojtaba Abdi Jalebi (United Kingdom)

Associate Professor / Functional Materials

Mojtaba is an Associate Professor of Functional Materials and Energy Devices, specializing in developing sustainable and cost-effective materials for renewable energy technologies. His research focuses on advanced photovoltaics, energy systems for carbon capture, and solar fuels. Mojtaba has led numerous international projects, collaborated with leading research groups, and translated his work into impactful products through spinouts and industrial partnerships. He actively promotes science communication and EDI, inspiring the next generation of scientists.

Mutshidzi Mulondo (South Africa)

Academic / Global Public Health

Mutshidzi is an award-winning global health academic championing public health strategies that prioritize mental health. She is part of the pioneering team instrumental in establishing the first Division of Public Health at the University of Free State, where she was involved in the international comparability of the public health programs. Formerly a Visiting Scholar in the Beaver College of Health Sciences at Appalachian State University, she is a recipient of the South African Health Excellence Award, among others.

Natalia Montellano Duran (Bolivia)

Director / Biotechnology

Natalia is a biotechnologist with a Ph.D. in biological sciences, specializing in bioactive molecules, soft matter, and STEM education. She is the Director of the Biotechnology program at Universidad Católica Boliviana and an advocate for scientific dissemination and technological development in Bolivia. Passionate about teaching, she has received multiple awards for her contributions to education and research. She actively promotes biotechnology in industry and academia.

Needa Chase Brown (United States)

Assistant Professor / Materials Science and Engineering

Needa Brown is an Assistant Professor at the University of Central Florida Department of Materials Science and Engineering. She completed her Ph.D. at the University of Oklahoma in 2017 and her post-doctoral training at Brigham and Women's Hospital/ Harvard Medical School/Dana-Farber Cancer Institute. In September 2021, she moved to Northeastern University as an Assistant Teaching Professor of Physics, where she was the Founder and Director of the Master's in Nanomedicine program.

Nourhan Hassan (Egypt)

Lecturer / Biotechnology

Nourhan began her career in Egypt with a Bachelor's degree in biotechnology and a teaching role at Cairo University. Her Master's research at the National Cancer Institute focused on miRNA-124 and FOXA2 in liver cancer. In 2018, she received a DAAD scholarship to pursue a Ph.D. at University Hospital Münster, Germany, investigating syndecan-1's role in breast cancer radioresistance. After her Ph.D., she worked on the BIOMET4D project in Translational Matrix Biology team at University Hospital Cologne.

Oscar Xavier Guerrero Gutiérrez (Mexico)

Researcher / Chemistry and Computer Science

Oscar is the co-President of the Mexican Young Academy and a postdoctoral fellow in the Department of Chemistry at Cinvestav, Mexico, where he develops Python-based tools to integrate Machine Learning into computational chemistry research. His current work focuses on applying these methods to the study of chemical reactivity, making complex computational techniques more accessible and efficient for chemists.

Piyush Kumar (United States)

Instructor / Environmental Medicine

Piyush is an Instructor in Environmental Medicine at the Icahn School of Medicine at Mount Sinai, New York. A biophotonics researcher and science policy advocate, he specializes in Raman spectroscopy, exposomics and environmental health. He earned his Ph.D. from Tata Memorial Centre ACTREC, India, focusing on Raman-based oral cancer progression markers. His postdoctoral work at Mount Sinai explored biophotonic tools for long-term environmental exposure and early markers in children.

Reuben Ng (Singapore)

Scientist / Behavioural and Data Science

Reuben is a behavioural and data Scientist at the Lee Kuan Yew School of Public Policy, Singapore. Trained at NUS, Oxford and Yale universities, Reuben spent 20 years in government, consulting and research. In government, he was in Singapore's Prime Minister's Office driving evidence-based policymaking through data analytics and Singapore's Smart Nation strategies. In consulting, he co-built an advanced analytics practice at a top firm, and implemented complex analytics capabilities across various industries and functions.

Rima-Maria Rahal (Austria)

Researcher / Economics and Business

Rima-Maria received a Ph.D. from Leiden University for her work on cognitive decision processes in social and moral dilemmas, which she completed at the Max Planck Institute for Research on Collective Goods in Bonn, Germany. After positions in Frankfurt, Tilburg, Bonn, and Heidelberg, she is now a researcher at Vienna University of Economics and Business. She is active in Open Science, an alumna of the Fellowship Program Free Knowledge, and a former member of the steering group of the German Reproducibility Network.

Roseline Oluwaseun Ogundokun (Nigeria)

Researcher / Computer Science

Roseline is a distinguished computer scientist, researcher, and lecturer at Landmark University, Nigeria. She is a postdoctoral fellow at Tshwane University of Technology, South Africa, and a Ph.D. scholar at Kaunas University of Technology, Lithuania. Recognized among the Top 2% of scientists globally (2023, 2024) by Elsevier and Stanford University, she specializes in Artificial Intelligence, Deep Learning, and Medical Image Processing. She is the recipient of multiple awards in Deep Learning.

Ryota Matsuyama (Japan)

Researcher / Animal Health

Ryota is a researcher at the National Institute of Animal Health, Japan, specializing in animal health. His research focuses on infectious disease epidemiology in livestock and wildlife, outbreak control, and wildlife population health. He collaborates on projects across Asia and Africa to enhance animal health. His institution is a Collaborating Centre of the World Organization for Animal Health. Since 2024, he has been a member of the Young Academy of the Science Council of Japan.

Santosh Sridhar Mysore (India)

Senior Scientist / Mining and Fuel Research

Santosh is a Senior Scientist at CSIR-CIMFR, a TEDx Speaker, and Educator with expertise in 2D Materials, Hydrogen Energy, Catalysis, Coal, Batteries, and Supercapacitors. With 100+ publications, he has led projects funded by national & international agencies, including the European Union and bilateral programs across the United States, France, Russia, Sweden and Israel. He is recipient of the INSA Fellowship, DST Young Scientist Award, BRICS Young Scientist Award, and IUPAC Junior Researcher Award.

Shadi Albarqouni (Germany)

Professor / Computer Science, AI, Machine Learning

Shadi is a Palestinian-German Professor of Computational Medical Imaging Research at the University of Bonn, Germany, and an AI Young Investigator Group Leader at Helmholtz AI. He served as a Steering Committee member at the Arab-German Young Academy from 2022 to 2023 and currently serves as a Steering Committee member at the Global Health Research Alliance for the 2024 to 2026 term. Previously, Shadi worked as a Visiting Scientist at Imperial College London and ETH Zurich.

Sinikiwe Dube (Kenya)

Research Associate / Natural Resources

Sinikiwe is a soil scientist interested in agriculture and the environment. She has a Master's degree in Natural Resources and Environmental Management from Institut Pertanian Bogor, Indonesia, through the Kemitraan Negara Berkembang (KNB) program, and a Ph.D. in Soil Science from the University of KwaZulu-Natal, South Africa. Sinikiwe was a lecturer and programs coordinator at Women's University in Africa before becoming a permanent lecturer at Marondera University of Agricultural Science and Technology.

Solange Rosa Paredes Moscosso (Peru)

Post-doctoral Researcher / Cancer Immunotherapy

Solange is a postdoctoral researcher at Universidad de San Martin de Porres and a part-time lecturer at Universidad Peruana de Ciencias Aplicadas (Peru). She holds a Ph.D. in Cancer immunotherapy and an M.Sc. in Molecular Medicine, graduated with Merit from University College London (United Kingdom). Solange is a member of the ISC Global Roster of Experts, the UKRI International Development Peer Review College, and DiploCientifica, where she is also the founder.

Syed Babar Jamal Bacha (Pakistan)

Professor / Bioinformatics

Syed is a Bioinformatics Professor at NUMS, Pakistan, with 11 years of expertise in microbial genomics and drug design. A CNPq-TWAS Scholar, he earned his Ph.D. in Brazil, focusing on genome-based drug target identification. His work spans vaccine design, AMR awareness, and STEM education. He leads the Green Youth Movement at NUMS and advocates for science policy and plant conservation. He actively shapes bioinformatics research, bridging theory with real-world applications.

Thiago de Melo Lima (Brazil)

Vice Coordinator / Chemical Engineering

Thiago earned his Chemistry degree from the Federal University of Goiás and a Ph.D. in Chemical Engineering from UFSCar, with research at Palacky University. He specialized in sustainable heterogeneous catalysts for biomass recovery. After a postdoc at CERSUSCHEM (UFSCar), he joined Fluminense Federal University (UFF) in 2018, founding the Biomass Catalysis and Valorization Group. He is vice coordinator of UFF's Chemistry program and a CNPq fellow, and he is engaged in sustainability initiatives.

Vincent Kok Sin Woon (Malaysia)

Researcher / Climate Sustainability

Vincent is a researcher and educator committed to fostering transformative resilience in climate sustainability. Named a 2023 I&ECR Class of Influential Researcher by the American Chemical Society, his research has been highlighted in Future Earth, The Guardian, and Anthropocene Magazine. Before his academic career, Vincent led green architectural initiatives for townships in Malaysia and Indonesia. His community empowerment efforts include partnerships with the U.S. Department of State, Institut für Auslandsbeziehungen, Germany, and AMATI, Indonesia.

Viviana Esmeralda Garcia Pinzon (Germany)

Senior Researcher / Political Science

Viviana is a Senior Researcher at the Arnold-Bergstraesser-Institute (ABI) in Freiburg and an Associate at the Institute of Latin American Studies at the German Institute for Global and Area Studies (GIGA). She completed a Ph.D. in Political Science with a focus on peace and conflict studies at the Philipps University of Marburg (summa cum laude) and as part of the GIGA Doctoral Programme. Her research interests span many topics at the intersection of peace and conflict studies and international relations.

Waheba El Sayed Abd El Azim Mohamed (Egypt)

Biomedical Scientist / Medical Genetics & Genomics

Waheba specializes in DNA repair, genome stability, cancer biology, and neurodegenerative disorders. With a Ph.D. in Biomedical Sciences (Medical Genetics & Genomics) from Zewail City, Egypt, Waheba has completed postdocs in the United Kingdom, Germany, and Egypt. By engaging her passion for interdisciplinary collaboration, Waheba aims to advance precision medicine through research in genomic instability, cancer, and neurodegeneration.

Yolanda López-Maldonado (Austria/Mexico)

Science Diplomat / Indigenous Science

Yolanda is an Indigenous Maya woman from Mexico and a science diplomat, working on the social dimensions of nature conservation. Her career spans both natural and social sciences, focusing on the science-society-policy interface. She has worked for academic and non-academic organizations, achieving high-level results in diplomatic environments across various social issues and scientific fields, fostering debates on how science (both Western and Indigenous) can build trust between nations and support foreign policies.

Yunjie Lu (China)

Researcher, Surgeon / Immunology

Yunjie is a liver surgeon and immunologist who has been awarded the DAAD Postdoctoral Fellowship twice. He has presided over 12 scientific research and talent projects (4 at the national level) and participated in 10 (9 at the national level). He has published over 50 papers, including in journals such as "Blood", "Hepatology", and "Redox Biology". He was once the representative of "Outstanding Chinese Doctoral Students", visited the United States for three years, and studied in Germany for a year.

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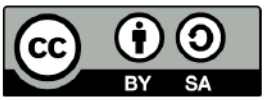
About the Global Young Academy

The vision of the GYA is *science for all; science for the future*, and its mission is to give a voice to young scientists and researchers around the world. The GYA, founded in 2010, is an independent science academy of 200 outstanding early- to mid-career researchers from six continents who are selected from across disciplines based on their academic excellence and commitment to engage with society. GYA members serve five-year terms, and the GYA presently counts members and alumni from over 100 countries. The GYA administrative Office is publicly funded and hosted at the German National Academy of Sciences Leopoldina. The wide array of GYA activities are supported by a range of international public and private funders. This publication was made possible with the help of GYA's core funding from the German Federal Ministry of Education and Research and the German State of Saxony-Anhalt.

Find out more at: www.globalyoungacademy.net



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