STEM+ Declaration

In **Movimiento STEM+,** our strategic objective is to **forge invincible talent** ready to face the **challenges of the 21st century**.

Since the 1970s, in educational settings, there has been a reflection on the need to establish training strategies **that promote the integration of different disciplines** of knowledge and strengthen, among others, **the acquisition of cognitive skills**, such as critical thinking and problem solving in girls, boys, adolescents and young people.

The world has sought the implementation of an education that can meet current requirements, **adapting the qualification of human talent** to these changing and evolving needs, emphasizing the role of **creativity as a fundamental quality** to promote the development of **science, technology, engineering, and mathematics** in the most imaginative and innovative way possible, in order to solve the problems of our world.

Thus, **STEM Education** emerges as the possibility of integrating science, technology, engineering and mathematics in school education to seek interdisciplinary learning based on projects, which encourages inquiry so that students with **STEM training** become innovative, capable of establishing meaningful connections between school, their community, work, and real-world problems.

"The acronym **STEM was first introduced** by biologist **[Judith A.] Ramaley**, member of the National Science Foundation of the United States of America (NSF). This scientist was the architect of the 2001 reorganization of the words that made up an old acronym, SMET, which was used throughout the 1990s to refer to the fields of science, mathematics, engineering, and technology. (Bustío, 2019, p.7).

Later, the **STEAM Approach** is proposed, in which the *A* represents the *Arts*, acknowledging their role in interpreting science and technology, and highlighting their presence in all aspects of daily life.

"The term **STEAM** was used for the **first time by [Georgette] Yakman in 2006**, whose proposal focuses on a new educational theoretical framework that places technology and science in a context in which they are interpreted through the arts and engineering" (Bustío, 2019, p.7).

Now new acronyms have emerged such as **STEAM+H** and **STEM+E** to make explicit the importance of the Humanities and Entrepreneurship as central components for the construction and application of knowledge, in addition to acronyms that emphasize disciplines that are in STEM, such as **STEM+M**, which focuses on medicine, or **STEM+C**, with a focus on computer science, among others.

In **Movimiento STEM+** we recognize the importance of working the **STEM disciplinary fields** rigorously, and we also respect that **artistic disciplines, the humanities**, among others, deserve their **own curricular space** in an educational and community development project. Reducing them to their connection with **STEM** would not be appropriate; however, we emphasize that many of them are **key to triggering innovation**. That is to say, **STEM** is strengthened and enhanced by allowing interactions with other fields, among them the arts, business, philosophy, and/or humanities.

In **Movimiento STEM+** we have **added the + sign to our logo** to celebrate inter and transdisciplinarity, which allows us to promote all the initiatives and new strategies that arise from **STEM.**

In **Movimiento STEM+** we are intentional when promoting full representation, participation and leadership of girls and women in these fields of study. Our conviction has been and will continue to be, **placing the person at the center**, working **collaboratively** and combining **creative thinking** with **scientific evidence** and a **vision oriented to human flourishing**. We reinforce innovation, design, ethics, inclusion, curiosity, entrepreneurship and imagination, allowing for the creation of diverse solutions to the most pressing problems of the communities we serve.

We generated the standard of competence before the **CONOCER** so that teachers from **Latin America** can be certified as **STEM Teachers.** We also developed the **STEM+ Instructional Framework**, which holds **official validity** from the Mexican government, and we hope it will soon influence the educational policy of other countries in the world. This Framework is based on the following educational methodologies: the 5E Model, Project-Based Learning, and Design Thinking. They **place the students at the center** and promote learning experiences in which they **can explore and build** their own definitions of various concepts while interacting with their peers and their environment.

With STEM Education, the impossible becomes possible!

This framework arises from the **STEM Education Framework** of **Global STEM Alliance - The New York Academy of Sciences**, which integrates, among other elements, specific components of the proposal of **Georgette Yakman** and socio-emotional skills according to the **CASEL Model** (Collaborative for Academic, Social and Emotional Learning). The **STEM skills and socio-emotional skills** included in the STEM approach are:

STEM skills:

- Critical thinking
- Problem solving
- Creativity
- Communication
- Collaboration
- Data literacy
- Digital literacy and computer science

Socio-emotional skills:

- Self-awareness
- Self-management
- Social awareness
- Relationship skills
- Responsible decision-making

On the other hand we have **scientific evidence** of the **transformative power of STEM Education**, which contributes to the following **strategic axes** (Movimiento STEM+, 2020):

- **Inclusion with a gender perspective and a focus on women:** We align ourselves with the Women's Empowerment Principles (WEPS) of UN Women, and collaboratively carry out tangible and intentional actions to generate enabling environments for women's integration, continuity, and leadership in these areas.

- **Workforce Development for the Fourth Industrial-Technological Revolution:** We address the mechanisms and strategies for developing 21st-century skills and promoting access to the opportunities offered by this Revolution in the labor markets, with special emphasis on priority sectors and quality jobs.

- **2030 Agenda with a focus on the Environment:** Through our actions, we contribute to the promotion of STEM skills, which are transformative and develop a sense of agency to solve environmental, economic, and social challenges.

- **Innovation and Entrepreneurship:** The implementation of our pedagogical model and the strengthening of disciplinary learning promote innovation and entrepreneurship capabilities. We also support collaborations with key stakeholders to energize the environments where STEM talent can thrive.

With STEM Education, the impossible becomes possible!

We foster **STEM vocations** and believe in mandatory **vocational guidance** with a gender perspective and appropriate to the labor context. We seek to integrate **Artificial Intelligence** and other **Exponential Technologies** into our programs because we know they are essential for the **jobs of the future**, **innovation**, and **entrepreneurship**.

We constantly strengthen our actions to carry out global initiatives that **promote** an **engaged, empowered, and globally responsible citizenship.**

In Movimiento STEM+ we believe:

**STEM develops the inner power to face
the great challenges of this century!**

References:

Bustío, R. (2019).*Science with Art: A Mathematics Perspective.*Spain. Retrieved from: https://repositorio.unican.es/xmlui/bitstream/handle/10902/16776/Bust%C3%ADoVillanuevaRoberto.pdf?sequence=1&isAllowed=y

Cilleruelo, L. and Zubiaga, A. (2014). *An approach to STEAM Education. Educational practices in thecrossroads art, science and technology.*Spain. Retrieved from:https://www.augustozubiaga.com/web/wp-content/uploads/2014/11/STEM-TO-STEAM.p

df

CASEL. (2016). Illinois Social Emotional Learning Standards. Recuperado de: https://www.casel.org/wp-content/uploads/2016/08/PDF-7-Illinois-SEL-Standards.pdf

Global STEM Alliance. *STEM Education Framework.*Recovered from:https://www.nyas.org/media/13051/gsa_stem_education_framework_dec2016.pdf

STEM Movement. (2020).*STEM Education Strategy for Mexico. Vision of Intersectoral Success for the Four Strategic Axes.*Recovered from:https://movimientosteam.org/publicaciones/