

Creating Titans

Tips to start children in the world of science



Cátedra
Internacional
Galileo

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Science divulgation division



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Index

By way of introduction.	2	II. Paradigms and new visions.	
I. Identification of interests.		An unwanted effect. Imposition of labels or overloads with the "Eagerness to seek help	37
Are geniuses born or made?	6	Approach to the environments where activities are carried out interest.	39
What is IQ and how is it related to success	9	III. Pitfalls, stumbles and managing success.	
Myths about what genius is	12	Avoid falling into the hands of people who profit from expectations	50
Search identify the children's interests.	17	Avoid the false prestige trap	53
Remember that these can reach to vary from moment to moment	22	Accompany during disappointments	56
interests other than those we aspire	24	Knowing how to accompany you in your moments of triumph without losing ground	58
Are there features that identify a child with outstanding skills?	26	Start planning	59
Skills development hard and soft	30	References	71
comprehensive growth	32		

By way of
introduction

"A scientist in his laboratory is not just a simple technician; he is also a child who faces a natural phenomenon that impresses him as if it were a fairy tale."

Marie Curie

If we think of a small child between two and three years old, the first thing that comes to mind are two factors:

- a) His inexhaustible energy and;
- b) His curiosity about everything.

Both conditions are fantastic to help you discover the world around you and, it is at this moment, that you have the opportunity to start the extraordinary tour of those activities that you are passionate about.

Figure 1.

Every child is born with immense curiosity.



It is important to always keep in mind that the most important thing is:

- a) Seek to identify the interests of the little ones;
- b) Remember that these may vary from one moment to another;
- c) That their interests may be different from those that we aspire to;
- d) That we should not impose labels or overload them with the "desire to seek to help them";
- e) Seek to bring them closer in the most realistic way to the environments where the activities of their interest are carried out;
- f) Avoid falling into the hands of people who profit from the expectations;
- g) Avoid the trap of false prestige;
- h) Accompany during disappointments;
- i) Knowing how to accompany them in their moments of triumph without losing ground.

The above lines serve to provide the kind reader with a brief perspective of the book and we hope that it will be useful to accompany both parents, guardians and naturally children to find their wings to take flight.

Figure 2.

Collaborating in the formation of the little ones.



In fact, it is very likely that if you have this book in your hands, you will meet a little one with outstanding abilities.

Finally, it is important to remember that this is an informative book in such a way that the objective is to provide a first approximation to serve as a first impulse to enter the vast world of children with outstanding aptitudes.

Figure 3.

Involve them in activities like turtle releases.



Note: Participation in a program authorized and monitored by professionals in Cancun.

1

Identification of interests

"Teach your little ones to use
their wings, but try to let them
choose their skies"

Aldebaran Martinez

Identification of interests

Are geniuses born or made?

There are multiple positions on this question. In this order of ideas, the authors consider that geniuses are not born or made, they conform. That is to say, it is a lucky mixture of the two factors, let's see this point in a little more detail.

Figure 3.

Make science a sensory experience.



Note: Science activities in elementary school.

Unquestionably, it is necessary to be born with certain abilities, capacities and characteristics superior to the common population so that a person can be identified and differentiated as a genius from the others. Most of these characteristics can be detected from very early stages if there are adequate

parameters of comparison and attention is paid to the little ones, at this stage, teachers have a critical role, since, if they manage to identify those who present performance characteristics superior and curiosity beyond normal parameters. Teachers with the appropriate empathy to be able to approach the little ones could identify and share these findings with their authorities and the student's parents, in such a way that they could be guided to help the development of the little ones.

Figure 4.

Participate in activities such as building and testing bridges.



Note: Testing the strength of wooden bridges developed by master's students.

Although detecting in their first years of life those who present characteristics that we could classify as possessing higher-order intelligence would be great, it is likely that, due to the large number of children who share the classroom, these findings are unlikely to occur. and instead, the child is identified as having "attention deficit." For this reason, observation and detection by parents is critical, and it will be necessary for them to take into account some parameters to consider if they are accompanied by a little genius.

Figure 5.

Participating in science events is good, but arriving at a national or international event catapults the enthusiasm of the little ones.



Note: Coexistence during a national science event in Nayarit.

Before developing this topic, we are going to exchange the term genius for the concept used since 2006 by the Ministry of Public Education (SEP), in Mexico of people with outstanding aptitude, although it seems only a name change, later we will see that avoiding the genius label will save our little ones a lot of hassle.

Figure 6.

Providing an environment conducive to developing their skills is an important factor.



Note: Material used for studies on the Pygmalion effect.

It is important that, although the concept of the SEP (2006, p. 59) in its document Proposal for intervention: educational attention for students with outstanding aptitudes for outstanding aptitude mentions:

“Children and young people with outstanding aptitudes are those capable of standing out significantly from the social and educational group to which they belong in one or more of the following fields of human endeavor: scientific-technological, humanistic-social, artistic or motor action. These students, due to their specific needs, require a facilitating context that allows them to develop their personal abilities and satisfy their needs and interests for their own benefit and that of society.”

Figure 7.

Children with outstanding abilities can be anywhere.



For this work we will focus on those related to the scientific - technological.

Now, it is important to mention that finding people with outstanding aptitude is not as strange as we might think, in Mexico it is estimated that there are currently an average of 2 million people who classify as such. But how do we identify them?

Figure 8.

It is of great importance to be attentive to participate in the science programs promoted by the different organizations.



Note: Final exhibition in a science program.

What is IQ and how does it relate to success?

In the first instance, we could give in to the temptation of hiring a psychometric test to measure your intelligence or what we know as Intelligence Quotient (IQ). There are different tests for this, one of the most used being the Wechsler Intelligence Scale for Children-IV (WISC-IV), which was standardized for Mexico in 2007 in a sample made up of children in basic education. This test is used regularly to measure intelligence, however, it is essential to remember that it is just a tool that gives us an overview of the cognitive functioning and intellect of those evaluated in such a way that it should be considered part of a comprehensive evaluation. . Let's see a little more about it.

We can conceptualize IQ as the ability to understand and solve problems. Certainly it is a concept that since its appearance in 1912 has gone through great changes and adaptations and that, if we weigh it in its proper measure, is a good beginning to have a photograph of

where our little ones are in relation to their environment.

Figure 9.

Seeking that the little ones participate in projects that seek to provide solutions to real problems is very useful.



Note: Participating in science program activities.

If we start from the use of the tools that allow us to obtain a CI scale, we can obtain parameters that are located in one of these ranges (this scale may vary depending on the source used):

90-109	Normal or average.
110 – 119	normal bright
120 – 129	Higher.
130 or more	Very superior.

We wish to emphasize that it is always useful to have a parameter that helps us "recognize the terrain", but we must not fall into the trap of absolutes, for example, in relation to IQ, fallacies have been constructed such as that the World Organization of Health (WHO), considers that a "super gifted" person is one with an IQ greater than 130. As far as the authors were able to verify, there is currently no statement by the WHO, in this regard, in such a way that so that although it is useful to know where our little ones are located, it is in no way a determining condition for their success or failure. In addition to this, it will be interesting to see that, although there are people with a really impressive IQ, this is not unequivocally related to their contributions to the body of knowledge or benefit to humanity, suffice it to mention that two of the great minds from whom his IQ was derived are not so impressive at first glance as they hovered around 160 points. We refer to Albert Einstein (assigned IQ) and Steven Hawkin, who, without a doubt, have marked a milestone in their fields of knowledge, in contrast, we have Terrence Tao with an IQ of 230 who,

He has undoubtedly had an exceptional career with important contributions to the body of knowledge, but he has not managed to break the barrier of genius like Grigori Yákovlevich Perelmán with an IQ of 238 who recently solved the Poincaré conjecture (considered within the so-called problems of the millennium) .

Figure 10.

Involving young people with the most advanced techniques will not only help them master them early, but also encourages them to find new uses or applications for them.



It is very important to highlight that in no way is a comparison between these great minds being sought, it is only intended to provide a familiar image so that kind readers can easily identify the difference in IQ between those who

around 160 and 230. If we thought of it just in terms of numbers, we would almost be tempted to say that those who are 230 are close to 70% more intelligent than those who are around 160 and, that when there is a difference as small as 8 points, very similar results should be obtained in a shared field such as mathematics, however, as it is possible to visualize, this does not happen. It is possible to conclude that the application and evaluation by a professional of an instrument that has validity and reliability for the person to whom it is going to be applied allows us to obtain a photograph of their IC, at the specific moment of its application, however, life is more like a movie than a static photograph,

In addition to the above, it is possible to verify a large number of stories where we find people who, having a great IQ, do not fit into what we could identify as

intelligent people or even those who end up in jobs that are described as suitable for those with poorly developed intellects. With that, we have the first part of the answer. It is required to have a high intellect to be part of the group of those who are identified with outstanding aptitudes, however, this is not enough to

achieve their consolidation as such. To discover what makes it up, we must first review some concepts.

Figure 11.

Living with other children contributes to the development of their social skills and, when they have the opportunity to interact with children from other latitudes, the experience can be even more enriching.



Note: Participating in activities with children from different countries in an international science event in Peru.

Myths about what genius is

In previous lines, the first of these myths was identified. The one that the WHO marks an IQ, from which someone is considered gifted. It will be enough for the kind reader to enter his browser to search for WHO criteria to consider someone as gifted, for his search engine to throw up a large number of results and he will not cease to be surprised to see that this quote appears not only in organizations and educational institutions, but in documents issued by people who participate in the formulation of public policies, this seems to give an air of authority to said statement, however, just go to the WHO page, and look for information directly and you can see that there is no such, in fact, at this moment, reflect and, When returning to the documents where this phrase is mentioned, it is possible to notice that they do not mention its source or the source mentioned corresponds to a secondary document that, when reviewing it, lacks the original source. How interesting, the kind reader has just come across one of the first myths that directly affect people and the aspirations of those who can contribute to the body of knowledge, a measure that is initially

limited by existing methodologies, which seeks shelter in the shadow of formal entities such as the WHO, which does not have, as far as the authors know, a statement in this regard And, sheltered in these fallacies, there are people who for reasons of profit or ignorance try to assign success factors that are outside their spheres of measurement to encourage or provide expectations to those who come to them.

Figure 12.

It is essential that children participate in solid programs and with consolidated organizations.



Note: Receiving the recognition as International Young Promise at the COLPARMEX International Congress.

Another myth that significantly affects the chances of development of those who have outstanding skills is labeling them geniuses, and even more so when done prematurely. Now, this condition occurs in two ways:

- a) In the first, when said status was granted in an erroneous way, either due to the halo effect, the Pygmalion effect (which will be explained later), the expectations or aspirations of those who do it more encouraged by good intentions than by evidence, or by those looking to make a profit. In this sense, when the little one leaves the niche in which the fantasy was created (it could be an educational institution, an organization, an event, etc.), when facing reality it is extremely hard when realizing that the intelligence that was mentioned so much to him does not seem to work in the outside world;
- b) Now, when the label has been placed on a person who really has characteristics that correspond to who we can identify as outstanding ability, it may encourage him to achieve more, however, if he is not in a receptive and prepared place to work with he will crash into two obstacles. The first given by his peers (classmates), who

probably begin to identify him as a target to unload their frustrations or take it out on those they can't touch (teachers, parents, authorities, etc.). By identifying the little one with the label of genius, he can come to be seen as someone outside the group and, without realizing it, the rest of those who consider themselves as the "unchosen" may congregate in a common cause to make fun of who is different and, on the other hand, there are people who, not knowing how to deal with people of superior abilities, use ridicule and punishment to cover up their frustrations and incapacity, in such a way that instead of assuming their role as trainers of people they dedicate themselves to saying "How Aren't you going to know? Don't you know everything? And you call yourself a genius? This condition is not only limited to those who should form it, but it can even occur in the family and, instead of the home being a place of shelter and protection, it becomes an extension of ridicule or mistreatment, where the successes and makes fun of failures and failures. in such a way that instead of assuming their role as trainers of people, they dedicate themselves to saying "How could you not know? Don't you know everything? And you call yourself a genius? This condition is not only limited

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The previous paragraphs are enough to understand the importance that:

- a) Prior to assigning the character of a person with outstanding aptitude to the child, its existence must be carefully verified;
- b) The ground must be prepared (the school, the family, their places of coexistence), so that they are not considered as someone different, but as someone who can contribute;

- c) You must be willing to contribute time and resources for your training, since you will need them on your way.

It is very important to support every child in their training, in such a way that they should be hugged frequently, they should be given positive reinforcement, they should be encouraged to achieve things and have goals, but this is far from putting labels on them and not be prepared for the consequences. These brief lines serve to help parents and guardians who are in these avatars remembering that each child is different, special and unique.

Figure 13.

Each child is unique and unrepeatabe.



Now we can visualize the importance of the environment in which children with outstanding skills develop. We must seek to shelter them under the friendly wings of an environment that promotes and stimulates their development, however, it is important to remember that providing the best framework and giving them the best education options will contribute to their development, however, no correlation has been found that demonstrates that a conducive environment significantly increases intellectual performance in children, however, it is easy to understand that an inadequate environment significantly or totally blocks the development of children.

Figure 14.

Accompanying him by promoting his interests will help him reach his maximum development.



Note: Receiving the prize of the Absolute Award for International Delegations in Colombia.

Starting with a topic as basic as having adequate food, a hygienic place, materials for their study, an adequate space and respect for the people with whom they live and live are critical for their performance. In this way, it is possible to understand that giving all the favorable conditions to someone who lacks outstanding aptitudes will not help them to become what some call geniuses, however, the lack of an adequate environment can block the development of those who can make significant contributions to the field of knowledge.

Figure 15.

Support their development from early stages.



At this point it is possible to conclude that people with outstanding abilities are not born and made, they conform.

Figure 16.

The triumphs are the sum of each decision and hours of intense work.

Note: With the first book in which he participates and the National Award in Nayarit.



In summary, it can be said that it is necessary for children to have skills that allow them to stand out significantly from their peers and can be integrated into a favorable environment, in such a way that they can reach their full potential in an integral way and with it, settle for the person who generates contributions to the body of knowledge.

Figure 17.

Accompany and encourage them to choose their path.



Note: Exhibition at the end of the science program.

Seek to identify the interests of the little ones.

Being a father is not easy, in fact, the phrase "children do not come with a manual for their upbringing", is recurrent among those who are in these avatars and, more than once, parents (mainly those who are released as such) , receive an incessant "bombardment" of "well-intentioned" advice ranging from the "right" name for their first-born, to how to feed, dress, educate and even protect them against different evils ranging from the "evil eye" until curing them of "empacho". Certainly many of these tips can be classified in the category of innocuous and even simply anecdotal, however, some of them could contain dangers ranging from health,

Specific forms of behavior based on their gender or the preferences of those who are part of their family nucleus. The most common example is that when a girl is born she is usually given dolls and household accessories, while boys are given small prams and action figures. The suggestion is that new parents welcome gifts and give them to their little ones (in reality they are just toys), but the important thing is not to pigeonhole them. In this environment and considering that many times economic resources are not so abundant that we could buy so many toys so that they can freely choose those that they like the most, The suggestion is to take them to libraries or children's spaces where they can select different types of toys and see how they interact with them, which one they pay more attention to, which one they enjoy playing with the most. We can also take them to toy stores where there is the opportunity for the little ones to see the toys up close and

We can see your reaction. In this way (and with great courtesy) guide those who want to give gifts to the little ones, mentioning how much they enjoyed playing with a certain type of toy.

Figure 18.

Let each little one select their favorite activities.



Figure 19.

Each museum is like a window to knowledge.



Note: Hammurabi's code. Louvre Museum, Paris.

These years are critical for beginning to open little ones' eyes to different interests and, to be honest, for young parents to have the opportunity to explore new options as well. Many people did not have the opportunity in their youth to visit children's museums (either because there were none in their community, they did not take them, or they simply did not know they existed). In a large part of the Mexican Republic, museums are free on Sundays,

They could attend interactive museums, natural history museums, science museums, children's plays, outdoor activities, etc. (Naturally in a pandemic environment there are different levels of restrictions, but there are always options including electronic ones where there are different types of pages that offer virtual tours, activities to do at home or remote interactive groups).

Figure 20.

Keep an open mind to find what is amazing in each place.



Note: Meteorites available to everyone all the time outside the Palacio de Minería, Mexico City.

Providing this overview to little ones will make it much easier for them to select their interests from a very early age and will be of great help for parents to have a

first guide to the interests of your little ones.

Figure 21.

Each museum makes it possible to visualize organisms that would otherwise only be confined to the imagination.



Note: A sunfish (Mola mola) at the Royal Ontario Museum.

Now, it is time to make a very important comment. Parents must be able to accompany and observe their little ones to see their preferences without "getting carried away by their own desires". In other words, this is a critical moment where we must, as adults, be able to identify what they want and what catches our little ones' attention. It is easy to imagine that if parents are musicians they will want and "see" qualities and abilities in their children that may not correspond to reality, it is what is known as the

Pygmalion effect name where a person has the ability to see in another what they want or the ability of a person to influence the performance and results of another with their expectations and beliefs.

Figure 22.

Sometimes the interests of the little ones result in professions very different from those considered "traditional".



Note: With representations of fossils in the Ehecatl park. Mexico state.

We can imagine a similar condition in parents who have astronomy, chemistry, biology, a particular sport or art as a profession or hobby, in such a way that, sometimes, without wanting it, they convey the desire that their children follow in their footsteps. and reach the heights that they desire or, that they reach achievements and goals that they were denied or could not reach.

The previous lines are fundamental since, certainly, the kind reader could think, it is obvious that children follow in the footsteps of their parents for several reasons:

- a) It is a path already traveled and therefore safer;
- b) You already have intellectual capital, relationships, investments, rights or other developed and, therefore, your path will be safer;
- c) You already have the basic books and materials for that subject;
- d) We have the necessary experience to help you solve your doubts;
- e) It is more comfortable for him to ask questions for which it is feasible that we have an answer;
- f) A "family tradition" is continued;
- g) They are the "safe" races because there is always work;
- h) They are the "right" careers for your gender, social status, etc.

The above are just some of the many reasons why, many times, without wanting it, we guide and sometimes force the little ones to "get a taste" for the profession "for which they were surely born".

Figure 23.

Professions like paleontology may seem like a distant option to those who see so-called "common" professions.



Note: With representations of dinosaurs in the Ehecatl park. Mexico state.

While this is done with the best of intentions, the result can be disappointing at best and can even be disastrous. Suffice it to recall the case of the children who are born into a renowned family of lawyers and express the heretical idea of studying biotechnology engineering, being an anthropologist or venturing into fields such as volcanology or astrobiology. In many cases, the omens of failure, unemployment and ending up in a trade

diametrically opposite to the one studied will appear. Certainly, it is likely that the assessments of the relatives have a high degree of validity from the point of view of their professional practice (since they most likely do not have direct contact with the field of work of the profession mentioned by the children). , such as the fact that his opinion is based on a specific moment in time and this may vary diametrically in the near future (it is enough to see how our way of life was modified by the SARS-CoV-2 pandemic).

Figure 24.

with fossils.



Note: An excellent visit to the paleontology laboratory of the Faculty of Higher Studies Iztacala. Mexico state.

Serve the above as a prelude to invite parents or guardians to "raise their antennas" and be able to listen to the interests and wishes of their little ones, in a broad and generous way. To accompany them to learn more about what life is really like for those who practice the profession they like, to identify the pros and cons of said profession, to see the countries where they have the greatest work field and the greatest prestige. In short, accompany them to see a much broader picture of everything involved in participating in that field of study. It is important to remember that to accompany is to guide generously, without tipping the balance by our desires, rather, always seeking to provide them with the most complete and real information to which we have access and later in this book we will see some recommendations to carry out this purpose.

Figure 25.

with prototypes.



Remember that these may vary from one moment to another.

Now, let's imagine that for a moment our little ones have expressed their fervent desire to become paleontologists and, in a first impulse of euphoria, we go and buy all the equipment that "a professional paleontologist occupies" at this point the question arises, Where got the list of everything a paleontologist needs? (but that's another topic), at first, the gifted equipment is received with great emotion (like any gift) and, for at least a short time, we think that we have not only given the proper guidance to our little one, but, in addition, we have given him the first tools so that he can carry out his future profession with great success. Everything is going from strength to strength until, without warning, the little boy suddenly announces that he wants to be an astronomer. Once recovered from the surprise,

first few days until the little boy announces again with all emotion that now he wants a microscope because he wants to be a biologist. Unless your economy can afford these changes, the wisest thing is to continue reading the book to identify

strategies that allow the kind reader, take their little ones to achieve an immersion in the professions that are of interest to them without disbursing significant amounts of money.

Figure 26.

Dinosaurs are a powerful attractor for little ones.



Note: Representation of dinosaurs in Niagara Falls, Canada.

The first advice is that when your little ones tell you of their fervent desire to study a particular profession, it is important that they ask what led them to that decision. It is possible that

They can identify a movie (we remember those that have dinosaurs, stars or biology as their central axis), a talk at school, a particular video or the enthusiastic talk of a family member or acquaintance on a particular topic. It is important to guide

our little ones to explore more about the subject, accompany them to ask themselves the questions:

Where do they work?

What do they do?

What do they have to study to practice that profession?

In such a way that, if they identify a strong inclination towards that profession, they can bring it closer to professionals and to the environment where they can develop these skills, such as science clubs, astronomy clubs, etc.

Finally, we wanted to leave this paragraph at the end of this topic to highlight the phrase. Accompany with love and understanding those who are looking for where to focus their lives. It is not easy to find the profession of our lives, having the support to change is invaluable to keep looking until you have the right profession or activity.

Interests different from those we aspire to.

Although, one might think that this topic has already been touched on, there are factors that are important to take into account in order to open the panorama to our little ones, since daily life can lead us, inadvertently, to propose a profession by imitation. For example, when parents take their little ones to work, involve them in their activities (a situation that is not only good, but also desirable to generate strong ties with the little ones) or when they talk about what they do at home. Although, as we have mentioned, this results in something desirable, it can have an important influence on the way in which children perceive and create an opinion about it. If to the above, we add that these talks are given with great enthusiasm and examples,

This, without a doubt, is a great source of information because they are sharing with them what happens during the actual exercise of a profession and creates links with the family, however, it is always important to open more options for them

so that they have a wider range of options, for this it is suggested:

- a) Get out of the routine, taking the little ones to visit museums, play areas, open doors of entities dedicated to research, science clubs, etc. Getting out of the comfort zone and inviting him to see plays, art, ballet, etc. Undoubtedly, these activities will not only help the little ones to have a broader view of the activities they could develop, but will also significantly nurture their comprehensive training;
- b) Give them toys that promote their thinking, beyond "toys that think for them", that is, toys where they can think and contribute, learn and rehearse;
- c) To accompany them in these playful discoveries, there are currently museums that are designed more like "babysitters" instead of being discovery sites, where for a fee parents "disregard" children for a few hours, or places where children they are "deposited" so that they "pass the

time” while the parents do other things. Accompanying them implies sharing their time and although, in some activities they cannot enter directly, it is always suggested to be on the lookout and be able to talk with them at the end of the activity;

- d) Encourage them to ask questions keeping in mind the phrase "I don't know, but we can investigate it", so that our little ones know that we do not always have all the answers, but, undoubtedly, we have the scientific spirit to investigate and arrive at a satisfactory answer.

Figure 27.

Participating in events always contributes to the generation of new ideas.



Are there characteristics that identify a gifted child?

We will certainly remember the phrase previously mentioned in this work that each child is different, special and unique. Bearing this in mind, we will be able to make our detection of differentiating characteristics more efficient. We must remember that a valid and reliable psychometric test applied and interpreted by a professional will provide us with an "initial picture", however, a broader and more generous observation and validation process is required in order to adequately guide our decision-making and thereby supporting our little ones in the best possible way.

Figure 28.

Being attentive to your inclinations.



An important fact is that outstanding aptitudes can coexist with conditions such as dyslexia (such as the one presented by Churchill and Einstein), in such a way that, if we evaluate a child guided by only one of these criteria or identified flaws, we will see our judgment contaminated and with This will give us an erroneous result. In other words, it is not appropriate to disqualify someone for having a disability, thinking that this condition is incompatible with outstanding aptitudes.

Figure 29.

Accompany him in his activities discovering his strengths and areas of opportunity.



Note: Participation in an International.

Fine, but are there any conditions or behaviors that allow us to intuit that a child has outstanding skills? Without wishing to be reductionist, we share some ideas that we hope will serve the kind reader to arouse their curiosity and take a closer look at the behavior of their little ones:

Figure 29.

Being able to guide the little ones in discovering their interests.



Note: Participation in science activities.

It is intensely curious. This condition can become exasperating at first, but beware, this is where the long path of accompaniment begins and we suggest a phrase for it, when they ask you something that you do not know and you have no idea what to do, you can tell them; I don't know, but we can investigate. There are two basic moments in this sentence:

- a) In the first, you come down from the pedestal of maximum authority that you know everything and, therefore, you teach him that there are no immutable truths and;
- b) The second as important as the first, you tell him that you are going to accompany him to discover what you do not know. This will undoubtedly leave an indelible mark on the little one and will encourage a love of research.

Figure 30.

Accompany him to discover different fields of knowledge.



It has inexhaustible energy. This seems to be a characteristic of every young child, but for those with an outstanding ability profile it seems to reach its epitome. He presents a level of energy and interest in the things that he is passionate about that goes from being dispersed in the rest of the issues that surround him to one of total concentration, in such a way that, added to this characteristic, presenting a intense interest in the topics that you are passionate about, a great capacity for observation focused on the topics of your interest.

Figure 31.

They are always on the lookout for new experiences.



Note: Visit to Machu Picchu.

an excellent memory. Which can remember details that most would go unnoticed and is capable of repeating dialogues from movies, cartoons or talks that interest it, curiously, there are things that simply do not adhere to it, such as family relationships or things that are not of interest to it.

Ability to identify relationships. They are able to see what goes unnoticed by most (for example, Galileo was able to see and link facts that many had already seen in advance, but did not understand). That's where a lot of the flashes of genius come from.

Figure 32.

Visit to Teotihuacan.



Note: Knowing the periods of decline of the Teotihuacan and Maya civilizations and identifying their coincidence with the so-called solar minima, hypotheses are provided to the body of knowledge.

A flexible, structured, original and fluid way of thinking. It is very interesting to talk with these little ones since, on a recurring basis, they surprise us with simply sensational thoughts and reasoning. In fact, talking with them could give us ideas and new directions.

Excellent ability to solve problems. In some way, presenting or involving them in problems that for many are simply a headache, for this they can turn out to be from fun to a challenge and, curiously, many times they manage to propose creative and applicable solutions.

Figure 33.

Creating a refrigerator that does not require electricity.



They relate well to older people. Curiously, they manage to interact with people older than them.

Figure 34.

Participating in international events.



Note: Due to his mental process, he manages to successfully participate in meetings with older people.

They achieve accelerated learning. Unlike their peers, they achieve the goal in less time and usually with higher order results.

It is important to remember that the previously mentioned characteristics are only with the desire to guide, the little ones may have others or lack several of these, therefore, the accompaniment and monitoring of parents and guardians is elementary.

Skills development hard and soft

The time has come to talk about what are the skills identified as hard and soft.

It is feasible to conceptualize hard skills as those that are essential to perform the activities required for a specific position and that have the characteristic that they can be observed, measured or quantified.

For example:

- a) Accounting Processes;
- b) Command of a computer program;
- c) Welding process;
- d) Surgical procedures;
- e) Fly a plane, etc.

These skills can be learned, practiced and shown, so that, for example, in the case of a welder:

- a) You may be asked to perform high-level welding (just seeing how you set up your equipment, materials, and execute the job tells us if you know how to do it);

- b) It is possible to evaluate the quality of it;
- c) That rating can be based on criteria such as the resources used to achieve the weld (whether material was wasted, the amount of energy used, the amount of hazardous waste generated), the speed with which it was performed, etc.

In short, you can have many parameters that are already previously established to evaluate.

Figure 35.

Microscopy study at IBt UNAM.



Note: The development of these skills allows them to move from the field of ideas to obtaining tangible findings.

On the other hand, soft skills are as essential as the first ones, but they have a small detail, they cannot be measured directly, they can only be evaluated at the moment they are exercised and, naturally, it is common for the results to be surrounded by other factors that complicate its evaluation. Within the soft skills we have:

- a) The ability to organize teamwork;
- b) The negotiation;
- c) The incentive;
- d) The power to generate a sense of belonging;
- e) Create commitments.

Figure 36.

Direct groups, inspire, mark the route in all activities, whether academic or recreational.

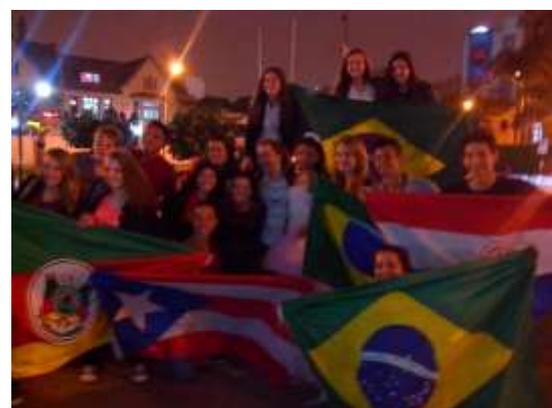


As it is possible to visualize, these skills go from being discreet and imperceptible to being highly visible and dramatically decisive in the result or execution of an activity. That is why it is so important today to master the two types of skills and for this, it is required that the little ones be accompanied and guided.

This is a critical time to draw the attention of parents and guardians to the importance of the socialization of children and that they can develop skills to live and work effectively. Let's remember, we seek to support them not only to achieve the maximum performance of their abilities, but our most important objective is that they achieve happiness.

Figure 37.

Participating in an international



comprehensive growth

This should be the central axis of thought for both parents and guardians when thinking about how to contribute to the development of little ones. One of the big mistakes when you have the opportunity to be with someone with outstanding skills is that we focus only on their hard skills, neglecting soft skills and, worse still, neglecting the integral development of the little ones. It is desirable to pay attention to the interests of the little ones and encourage their interests related to the arts, sports and areas that are not entirely related to their abilities that dazzle everyone. An example of them is music, although we can say that a person who reads musical notes predominantly activates one area of the brain, who plays an instrument predominantly activates a different area from the previous one, in such a way that whoever interprets a work by reading the musical notes gets to stimulate the brain in a generous way. Very well, we could say that this seems like an exercise to improve the mental capacity of our little ones, however, it is much more than

Therefore, when learning to play an instrument we broaden their horizons, we

offer them a new way of relating, we give them skills that will be very useful in meetings or presentations. If your inclination is painting, the result will also be great. It is very important that we understand that the development of these skills has the purpose of complementing their training, not that of being a second job or that they are going to become concert performers (although it is something desirable, the detail is that many of the boys with outstanding aptitudes are highly competitive).

Figure 38.

Participating with the little ones in an integral way, in their games, their activities and, naturally, in the formation of integral beings.



In addition to this, it is good that they can develop some sporting activity which can be both recreational, such as becoming part of a team and being a representative of their Institution. It's very important to note that being gifted doesn't mean you're not good at sports or other areas (that's just a bad cliché).

The above lines serve to share the importance of developing both hard and soft skills in children, considering at all times the promotion of comprehensive development.

Figure 39.

The possibilities of developing skills other than their primary activities will provide them with a sensational complement.



Note: Playing the piano in England.

One last thought on this. It is important that the little ones develop what, in the time of Sor Juana Inés de la Cruz, were known as worldly skills. Sor Juana, also known as the tenth muse or the Phoenix of America, was a really outstanding girl, she learned to read at the age of three (a situation that today would not seem interesting, only that in Sor Juana's time, women did not were precisely encouraged to dedicate themselves to study), she learned in such a prodigious way and with such vehemence that, even in her time she earned the respect of her countrymen, in this context, Sor Juana, learned by mutual own that she should dominate not only the arts and sciences, but also, in order to survive the viceregal era that fell to him, he had to master worldly knowledge, that is, the forms and communications typical of the court of his time, in such a way that he managed not only to survive, but also to stand out prodigiously in his environment (although he was not free from envy and bad intentions, he managed to navigate successfully at almost all times). Suffice it as an example that when Sor Juana was around seventeen years old when she was publicly examined by the 40 most renowned sages of New Spain and, as can be read in the testimonies of the time, little Juana got rid of who examined

her in the same way that a powerful galleon makes its way between 40 boats.

Certainly, this invites our minds to visualize a brilliant moment, an inspiring moment where a little girl with outstanding aptitudes manages not only to respond, but also to teach those who had the highest university ranks of the time. But let's take a closer look at this episode so that Sor Juana's teachings can help us face the challenges ahead.

1.- First of all, it is clear to Sor Juana that this is initially a court entertainment, so she must be very careful in the way she deals with it;

2.- She faced three contrary conditions in such an interrogation:

- a) He is very young;
- b) She was born in America and;
- c) She is a woman.

Each of these conditions turned out to be an impediment that seemed insurmountable at that time, however, Sor Juana manages to emerge victorious even against the current.

3.- Sor Juana is aware that she must answer not only with mastery and mastery

in the different subjects that are questioned, but that she must be cautious and courteous, in such a way that her answer leaves no room for doubt about her knowledge, but that it does not exhibit to those who are examining it. It is at this point that Sor Juana transcends from simple knowledge to legend, as she manages to understand that knowledge must not only be possessed, but must have the ability to be transmitted in any human sphere. Sor Juana, makes knowledge accessible, not only for the 40 gathered scholars, but also for the courtiers who witness the evaluation. In fact, the viceroy of Laguna, could not be without her favorite.

The previous lines serve to understand the importance of helping children not only to develop their hard skills, but also soft skills to help with their comprehensive development, this will allow not only for them to reach their maximum development, but also to develop in a healthy way. harmonic, empathic and coexist appropriately with others.

Figure 40.

Developing it in an integral way will allow you to create empathy for living beings.



Note: As important as mastering the skills identified as hard, is developing your soft skills and, within them, the sensitivity for living beings and their environment, in such a way that when you have the training, information and ability to change the world do it with a global vision capable of considering not only present generations, but also future ones.

Figure 41.

Those who develop love for all living things are likely to make more comprehensive decisions in the near future.



||

Paradigms and new
visions

“The impossible is only the
current frontier of our knowledge”

Aldebaran Martínez

Paradigms and new visions

An unwanted effect. Imposition of labels or charges with the "desire to seek help."

Certainly this topic was touched on previously, however, its relevance is such that we wanted to dedicate this space to it.

In Mexico there is the saying "Mama cuervo", this condition refers to the fact that parental love can cause us to have the mixture of two unfortunate effects when seeing our children.

The Pygmalion effect discussed earlier and the halo effect. The latter refers to an associated error when, due to a lack of data or methodologies to evaluate correctly, biases occur by attributing non-existent characteristics or exaggerating them both in a positive and negative sense.

An example of the above is when the desire to see our little ones rise to prominence leads us to overvalue their abilities, leading to ensure that they have characteristics that could qualify them as geniuses or virtuous.

At first glance, it might be desirable to think that this condition will help catapult their chances and that their parents' enthusiasm will lead them to seek every opportunity to ensure their path to success, however, this condition has an undesirable effect, the imposition of "labels" that although it starts with great enthusiasm, can be a very heavy burden when the expectation does not match reality, we are going to explore a little more about it.

Initially, the label is basically received in three ways:

- a) People who genuinely appreciate the little one and want them to be successful;
- b) Those who feign joy for the little one, but whose feeling is more than envy;
- c) Those who present open hostility or apathy (both undesirable conditions).

With the passage of time, events begin to occur that allow us to confirm the certainty of the "label" or its erroneousness. In the first case, those who genuinely appreciate the little boy are happy and continue with their support, however, in case of negative signs, those who presented a profile contrary to the little boy exacerbate their comments and even those who were neutral in Many times they end up showing contrary attitudes towards the little ones.

Figure 42.

A vision of human evolution.



That is why it is extremely important that we can be discreet at first regarding the potential that we see in our little ones, that we accompany them and be able to look for places or groups where they can interact with people who share their same interests, where they can develop activities and talk. Although the subject

will be discussed in greater detail later, it is important to point out that being in contact with these groups will allow us to have a comparison of our little ones and perhaps discover that, although he is not a "super genius", in short, has the potential to be someone with great enthusiasm and dedication to an area of science or the arts and that is a great step forward to support their development.

Figure 43.

Getting together with people who share the same interest will promote the development of the little ones.



Note: Visit to the National Museum of Anthropology. Mexico City.

**Approach to environments
where the
activities of your interest.**

It is, at this point, that we return to the importance of looking for groups where you can live and interact with people who have the same interest and passion, in addition to this, this interaction will give parents the opportunity to talk with people who could guide them on more activities and ways to promote the development of our little ones.

Figure 44.

With the Director of CENIBiot. Costa Rica.



At this point it is when already immersed in the environment that our little ones like, we begin to look for the opportunity for them to meet entities that can give them a vision of what their professional life would be like in the selected career, having within them:

- a) The visit to Universities and Institutes. In the case of Mexico, its Maximum House of Studies, the National Autonomous University of Mexico turns out to be an extremely friendly institution, where its researchers are very often enthusiastic about sharing their activities and guiding those who have an inclination for the sciences and the arts. It is possible to find that under their wings they shelter many and diverse programs such as the so-called "open doors", where those who are part of the institutes, schools and universities give their time to share their research and allow them access to laboratories and places where they carry out research. their works;

Figure 45.

Visit to Ciudad Universitaria of the National Autonomous University of Mexico (UNAM), recognized as the Maximum House of Studies in Mexico.



- b) Science summers, not only Universities and Institutes participate in these, but there are also organizations that organize and carry out activities of approach to science;
- c) Training programs for young researchers, which, under the auspices of the federal and state governments, non-governmental entities, associations, foundations,

science clubs and others, create well-structured and oriented programs to be a link that allows them to see how the professionals in their area of work;

Figure 46.

Consolidated and structured science programs that bear fruit as contributions to the body of knowledge.



Note: Patch of the COLPARMEX tardigrade mission, which has been successful at an international level and has borne fruit as articles in indexed journals.

d) Chairs for young researchers. There are well-structured programs with first-rate intellectual capital that allow young recipients to be trained with the highest quality standards in their research area, being a crucible to promote and contribute to the development of young people who have a high profile for the research;

e) Support program for young promises. Solidly structured programs that aim to assist and encourage those who, up to the age of 30, have a strong inclination towards science in any of its areas and who have had proven merits according to the parameters established by each program.

Figure 47.

Galileo International Chair.

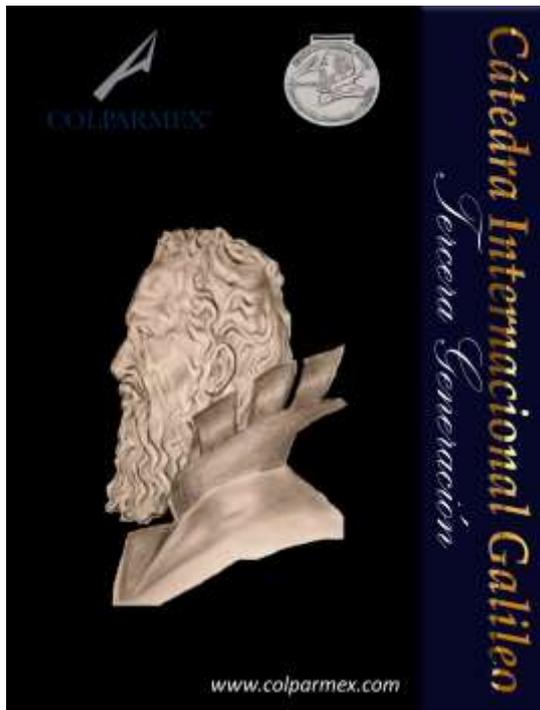
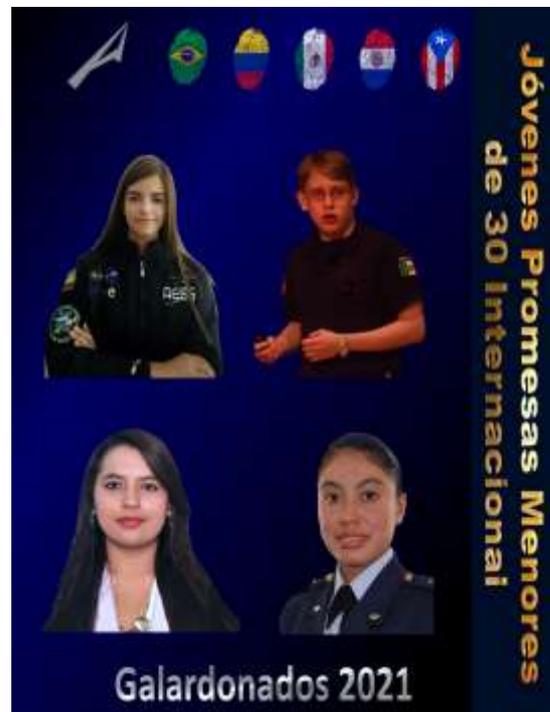


Figure 48.

Young Promises Under 30 International.



Note: It is an international program developed with a solid methodology.

Certainly each person can have their own measure of success and recognize their progress, however, this leaves us in a great void, which is why we want to share the parameters that have been used with great success by COLPARMEX, to evaluate those who participate in the Young International Promises Under 30 program. Until the close of this edition, this successful program was in its third edition, which has not only been a success, but also transcends borders and currently files are received from 5 countries and the number of them exceeded four hundred in their last call.

Another great advantage of sharing information about this program is that it will help parents or guardians to select solid programs and have a parameter of comparison regarding what type of activities are considered relevant in areas of youth science. A relevant fact that is always important to consider is that, as far as the authors know, this type of program is free, that is, no type of payment is requested to participate in it.

Name of the program: Young Promises Under 30 International.

Type of call. International.

Periodicity: Annual.

The data related to the fourth call is shared, which is the one in force at the time of the edition of this book.

Figure 49.

Young Promises Under 30 International.



International Call

Young promises under 30. Fourth edition

The College of Postgraduates in Administration of the Mexican Republic AC, invites those interested in proposing candidates to participate in the "Young Promises under 30" Recognition.

Objective:

Grant recognition in order to disseminate, encourage and assist in the development of promising young people in all areas of science.

Recognition:

- a) It will be part of the special edition of the electronic magazine In Memoria in its October 22 issue and will be disseminated through the electronic and physical media designated by COLPARMEX;
- b) You will receive electronic recognition for being part of the selection "Young promises under 30".

Figures 50, 51, 52.

Young Promises Under 30 International.



Requirements for registration of candidates:

1. Explanatory letter of motives (free format);
2. Signed letter requesting participation (attached to the call);
3. Candidate's Curriculum Vitae (maximum of two pages);
4. fill in the semblance (attached format) with the data and photographs that they wish to be used in case of being selected for the special edition(it is important to send it in word since that allows us to edit it for the magazine);
5. It is possible to attach extra photographs that you consider may be useful for dissemination;
6. Attach relevant supporting documents;
7. Birth certificate or INE or the national identity document that proves your age.

Categories:

They will be divided into four categories:

- a) Administrative Sciences;
- b) Biological Sciences;
- c) Exact Sciences;
- d) Social Sciences.

In turn, each of these categories will be subdivided depending on the ages (considering the age that the participants have at the closing date of the call):

- 1.- Minors under 19 years of age;
- 2.- From 20 to 24 years old;
- 3.- From 25 to 30 years old.

Process

1. Proposals will be received accompanied by the indicated documentation, from the publication of this call and until August 30, 2022, at the electronic address congresscolpamex@hotmail.com
2. Based on the proposals sent, the committee will decide who will be included in the special edition;
3. Those who have participated in the previous edition and are still 30 years old or younger at the close of this call will be able to participate again by updating their data.
4. The decision of the committee will be final.

“Research and Development for the Progress of Mexico”

Master Francisco Moyado Bahena
National President of COLPARMEX, AC

Figure 53.

Cover of the magazine 19 In Memoria.



Suggestions are attached to verify that the file was sent complete and the parameters that will be considered.

We suggest that before sending your documents you have the opportunity to check the following list that is intended to guide you to achieve a successful process and that we have your information in full.

Explanatory letter of motives	free format
Signed letter requesting participation	Form annexed to the call
Candidate's Curriculum Vitae	Maximum of two pages
fill in the semblance	Attached format with the data and photographs that you wish to be used in case of being selected for the special edition, it is possible to attach extra photographs that you consider may be useful for dissemination. (it is important to send it in word since that allows us to edit it for the magazine). We suggest that for the semblance you consider one or more photographs where your face is visible, preferably only you and with a background that you like or with a background as clear as possible.
Birth certificate or INE or the national identity document that proves your age.	Which must be perfectly legible.
<p style="text-align: center;">Attach relevant supporting documents.</p> <p>It is very important to highlight that the intention of COLPARMEX is to promote young promises, therefore, If you do not have one or many of the items mentioned, do not worry, these are only to guide the filling of your profile and that you can consider carrying out these activities in the near future. As you can see, the most important thing is that your current activities and interests bring you closer to the field of science and these documents only serve the committee to be able to more adequately evaluate the participants.</p>	

He has participated as a book author	Considering the concept of UNESCO (2019) "A book is understood as a non-periodic printed publication consisting of at least 49 pages, not counting the cover pages, published in the country and made available to the public.", (in all cases, reports of congresses or editorials that publish the master's or doctoral theses as a book are excluded).
He has participated as co-author of books	
He has participated as an author of indexed journals	Considering EcuRed (2019) we have that "An indexed journal is a periodical research publication that denotes high quality and has been listed in a worldwide consultation database, which usually means that the journal has a high impact factor." It is important that the candidate appears as the first author or corresponding author to be considered as an author, in case there is no specific mention in the article, he will be considered as a co-author.
He has participated as co-author of indexed journals	
He has participated as an author of broadcast magazines	This category includes articles published in journals that, although they are not included in an index, do have an editorial committee and solid publication rules and that have national or international circulation, discounting gazettes or magazines with limited circulation. to a particular institution. It is important that the candidate appears as the first author or corresponding author to be considered as an author, in case there is no specific mention in the article, he will be considered as a co-author.
He has participated as co-author of diffusion magazines	
He has participated as author / co-author of popular magazines	Articles published in journals whose objective is to disseminate science and that have an editorial committee and solid publication rules are considered in this category. The aforementioned rules apply to be considered an author.
He has participated in: stays of research in your country	Considering the concept of the General Directorate of Cooperation and Internationalization of the UNAM (DGEI, 2018), the Research Stay is conceptualized as: "It is a period during which research activities are carried out in an institution other than the one of origin."
He has participated in: stays of research abroad	
He has participated in: science summers	For this call, the summer of science is conceptualized as the one that aims to promote the interest of the participants in scientific activity in any of its areas, considering that the participant is allowed to enter prestigious research centers and institutions under the supervision and guidance of researchers for a previously agreed time.

Has given: Lectures in your country	This item will include dissertations on scientific topics (in any field) at prestigious institutions within the framework of educational, scientific, and business events (dissertations at educational institutions to which the candidate belongs are not considered). It is important that the candidate is the one who gave the conference.
Has provided: Conferences abroad	
Has provided: Workshops and/or courses in your country	This item will include the courses or workshops held on scientific topics (in any field) in prestigious institutions within the framework of educational, scientific, or business events (those held in the educational institutions to which the candidate belongs are not considered). It is important that the candidate is the one who has given the course or workshop or is part of the team that carried it out.
Has provided: Workshops and/or courses abroad	
Has received awards: International	Having received an award or recognition from prestigious institutions. Acknowledgments of the institution in which you work are not considered.
Has received awards: National	
Has received awards: State	
He has been part of research teams	For this call, a research team is considered as the unit made up of research personnel with established lines of work (whether disciplinary, interdisciplinary or multidisciplinary) and common interests, where research, development and innovation activities are carried out. In the case of having directed research teams, documentation is requested that specifies it or in the case of having been part, documentation that mentions that he was part of the group.
He has led research teams	
Master two or more languages	For this item, it is considered that they master a language in addition to their mother tongue to an advanced degree.
It has patents	For this item, patents that at the date of the application already have the documentation that accredits the same are considered.
Has professional experience	It is required to have written evidence of the experience referred by the candidate on letterhead and signed by the person in charge of the unit where he works.
It has been cited by other researchers	Evidence of having been cited is required.
Has participated in the organization of congresses or academic events	Evidence that you have participated in the organization of congresses or academic events in prestigious institutions is required.

III

Pitfalls, Pitfalls, and
Managing Success

"The conviction of one man can
change the destiny of a nation."

Aldebaran Martínez

Pitfalls, and Managing Success

Avoid falling into the hands of people who profit from expectations.

Although it might seem out of the question that there are people who can profit from the expectations of parents, this is extremely common. Their disguises can range from supposed "experts" who only "inflate" expectations around the little ones using all kinds of gadgets such as "psychological tests" created by them to identify geniuses, tests that lack any methodology, to classes and "trainings". specials” to “develop your intellect.” It would be almost implausible to identify the large number of people and "institutions" that obtain resources from those who pay for these "special courses" in the hope that their children will obtain some kind of competitive advantage. The problem is that, like all deception,

will-o'-the-wisps, in Mexico they are also called “petate flares”, due to their fleeting presence. In this area, the question arises, how can we differentiate between those who offer solid programs and those who only appear to be so? This is a question that requires a great deal of time and space for its development, however, in order to keep the reading as concrete as possible, we wish to provide some initial ideas that will greatly help those who seek to use their resources more efficiently. both financial and time

1.- Visit the place physically, knowing the facilities in real form will give you a clearer idea of who you are dealing with. Unless your economic capabilities allow you to opt for high-cost tutors, the suggestion is that when you visit places, pay more attention to details such as:

- a) Hygiene (an institution that seeks to promote talent will always have impeccable facilities);
- b) The treatment of the directors with the operative personnel;

- c) The equipment, depending on the institution visited, may include recreational material, library, computer equipment, laboratories, equipment to project or teach classes, furniture to take the lessons, depending on the weather, to see if the activities can be carried out comfortably;
- d) The food that is provided or the possibility of acquiring the same within or near the facilities;
- e) The type of security within the facilities (remember that we are going to entrust them with our most precious treasure);
- f) Being able to attend a class shows;
- g) Talking about experiences with users (not only with the parents of those who attend the institution, but also with the students);
- h) Some extra conditions to consider more for comfort issues than for quality of service refer to the

possibility of parking or getting to the facilities comfortably (for example, nearby metro or bus stations).

2.- In the case of services provided electronically, it is important to go through and get to know the electronic site, immerse ourselves as far as they allow us in the existing material, which gives us the opportunity to verify that the resources mentioned exist and If possible, attending sample classes.

3.- In both cases, it is essential to be able to verify the solidity of the program to be considered, this can be done in various ways, considering the rule that the more verification points we have, the better, counting within them:

- a) Review the background and, if applicable, the authorizations by the corresponding authorities (at this point it is very important that we are not satisfied with receiving the information, but that, using electronic means, we enter the official pages to verify not only that the corresponding information and permits exist, but also that they are valid);
- b) Request and review the programs in which you are likely to participate. Reading carefully and asking questions about them will not only provide insight into the program under consideration, but will most likely encourage and excite those who offer strong programs and, conversely, make them seem nervous or hesitant. to those who know that their programs are more of the "coaching" type unable to survive scrutiny;
- c) Ask and verify if possible the trajectory of former participants (this simple fact can provide a complementary view of the possibilities of the program).

Avoid the false prestige trap

The most important recommendation for a good selection could be to keep the ego out of the equation. In other words, we must keep in mind that what you want is to provide the best environment and possibilities so that the little ones can develop their full potential. It is important to stay away from false promises, attractive brochures, "society" events, possible medals and prizes awarded within said institution to its most outstanding members, etc. Suffice it as an example that there are institutions where they boast of their excellent averages, however, when examining these averages a little more closely it is easy to realize that they are rather mirages, an example of them is that in a "high performance" school, When applying the exams, they took the student who obtained the best grade and considered it as the basis of qualification for the others, in such a way that whoever obtained a seven in that group automatically becomes a 10 (considering that the qualification is based on 10) and to the others, they apply a rule of three in such a way that the grades are always high. The ego

of the parents is compensated, the little ones fall into a false perception of success and everything turns out great until they go out to face other students who were prepared with more real criteria. The result is catastrophic both for the parents who look for someone to blame, and for the little ones who in an instant realize that their preparation is very far from other institutions.

This part can be extremely hard for those who have linked the price with the expected results, however, it is better to face that reality as soon as possible to avoid continuing to divert resources where the desired results will not be obtained.

It is important to stop along the way to remember that the ego must be out of the equation and institutions must be evaluated correctly, in such a way that, beyond the price, the "fame" or the prestige that many times is published by these institutions, the result obtained by its former members can be assessed. It is interesting to observe that there are some institutions that create their own rankings, placing themselves prominently above their competition (in some cases they

publish magazines that seem to offer a neutral opinion, however, a little observation is enough to see that said institution is always placed itself in the first places).

As parents and guardians, we must have the vision to see beyond the uniforms and the fleeting belief that the school will take charge of the formation of the little ones, in reality, this task falls on the shoulders of the family, in such a way that evidence has been found to support that parents who are adequately involved in their children's education correlate with the success achieved by them, in such a way that, if at the end of the analysis it is seen that the school, group or entity selected is the right one is only part of the challenge to achieve success, the other part will undoubtedly depend on the involvement of parents in its development and continuity.

There are two conditions that deserve particular attention.

- 1.- Events focused only on collecting resources;
- 2.- Predatory magazines.

Let's look at these in more detail.

Events focused only on collecting resources.

We definitely declare ourselves in favor of creating spaces where science can be disseminated and disseminated in all its spheres, however, it is important to place each event in its proper dimension, that is, "events" are often created, where to the participants with the promise of participating in a world-class event, however, when participating in it it is possible to observe two or more conditions such as:

- a) The judges lack training both in the matter and in how to evaluate projects assertively (it should not be forgotten that this book is aimed at young people interested in science);
- b) There are no clear evaluation parameters;
- c) Participants are locked up by prohibiting them from seeing other speakers in such a way that they cannot compare their project and by declaring the winner, they believe that no one notices their manipulation;
- d) Participants are forced to stay in hotels that have special agreements with the organizers of

the event and the conditions of these hotels are far from the minimum standards of hygiene and comfort;

- e) The food is far from the standards considered healthy and hygienic;
- f) Participants are used as “presentation currency”, for political or other non-scientific purposes;
- g) Teams that are absent or clearly do not meet the basic requirements are rewarded;
- h) When they report their results it is possible to see that they are clearly exaggerating the facts;
- i) It is possible to observe that their main interest is to obtain economic resources;
- j) Favorites are identified throughout the event for specific groups who, by chance, happen to be the winners of the event.

The predatory magazines.

Without wishing to be reductionist, we can conceptualize these journals as those that use a business model based on charging publication rights to authors, that do not apply what are known as good scientific publishing practices, they claim to be indexed without this being real. and they mention having impact factors that are not registered in SJR (Scimago Journal & Country Rank) or JCR (Journal Citation Reports).

It is very important that the parents or guardians of the little ones be very careful not to fall into the temptation of supporting their children to achieve their first publications by paying for it. Although, at first glance, it seems like a good idea, they will be disenchanted when, when presenting their resumes in serious institutions, they see that these publications are discarded because they lack academic or research value. A similar issue occurs when some publishers offer to publish dissertations or papers presented at a conference without any methodological rigor. The temptation to have a book published can be very high, however, they are disappointed when they realize that their book is discarded when it is presented as part of the curriculum to

access scholarships or high-level research programs.

Accompany during disappointments.

So far, we have talked about conditions that in some way we have the possibility to control or choose, however, along the way, we will find others where we lack control over them, some of them are:

- a) **Discrimination.** This can be due to a wide variety of factors that range from skin color, ethnic origin, economic condition, some physical limitation, to situations such as last name, being part of a particular club or simply being from another region. As an example, a teacher tried her best to block the attempts of a student who was clearly the best in the group, however, he always found himself in second position behind a female student. This situation was repeated throughout the semester, until, in an exam in which the abuse by the teacher was clearly seen, the student was encouraged to ask the reason for that attitude, the teacher's response was as short as it was incredible. ,

“because you are a man”. The teacher described herself as a social reformer and, to the best of her ability,

- b) **Corruption.** Which can permeate all areas that range from the well-known "consent" of the group to frank attempts to limit and block the advance of those who are not part of the favored group. As an example, there was a director who, instead of serving as an example of ethics and love for education, exercised her function in a manner closer to a feudal lord where the destinies of her

vassals depend on her grace, in such a way that, having an exceptional student in her group, she did everything possible to block him and seek to relegate him, however, despite her efforts, the boy continued forward since, fortunately, he was properly guided. According to his parents, this condition was frankly aberrant, however, due to the environment, any attempt to correct this condition would have worsened the situation, so they only finished their studies at the school where this director had influence and the boy continued on his way. free and with a hard but

important teaching to face new adversities;

c) **Lack of clear criteria.** One of the most complex and hard experiences for a child is to attend events where they present their initial projects or research and, after completing the entire process, see that a team is rewarded that, without entering into controversy regarding which project is better, does not understand why he won, if he did not show up on time on opening day (when the first evaluation was given), did not bring presentation material, did not comply

with the requested requirements, when listening to the explanation they gave to the visitors to their stand it was easy to see that they did not know the subject or, at least, they could not explain it and, when the judges pass by to evaluate the project, they are not there because they went shopping at a shopping mall and are ultimately named winners. This can be very hard when someone who clearly does not even qualify to be in the place is rewarded, however, that is the moment when we must embrace the little ones and emphasize that the

most important thing is the experience acquired to be able to fly. higher and, although people are not always fair in their evaluations, the purpose is to contribute to the body of knowledge, that the most important thing is science and that this should encourage them so that in the future, when they participate in this type of events,

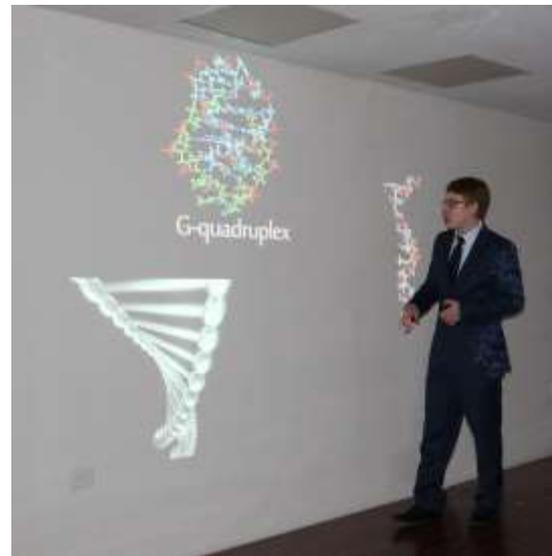
**Knowing how to accompany them
in their moments of triumph
without losing ground.**

Now, as important as being in the difficult moments is being in the moments of success, you have to accompany them, celebrate them, let them savor the moment and, at the right moment, tell them, "You really liked it", this is the fruit of the work and vision of you and the group of people that accompanies you, to live it again it is important to return to work in a solid way and with a vision of the future. We hug them and ask them "What is the next project to undertake?"

Having contact with more people with outstanding abilities will allow them to share experiences, successes and lessons. One of the most enriching experiences of being part of these groups is that they will be able to set higher goals, identify new opportunities and generate networks of contacts that from the beginning provide the benefit of being related to people who share the same interests and over time increase and consolidate.

Figure 54.

Giving a lecture at an international event.



Note: Giving lectures in a technically correct way, using a friendly didactics, supported by carefully developed audiovisual resources, allows knowledge to be brought to those who are interested in science topics.

Figure 55.

Receiving the hug of the participant of an activity in the same international of the previous photograph.



Start planning

in such a way that it seeks to accompany instead of imposing, teach instead of indoctrinate, teach to question instead of accepting dogmas without asking. This is part of the essence of this type of education, which is detailed in the same document Educational Model

from the college of sciences and humanities (s/f, p. 3), where it is mentioned:

The personal dimension is aimed at training students capable of acquiring a basic, general and propaedeutic culture, which allows them to continue with higher education or continue preparing themselves throughout their lives. Regarding the social dimension, it is proposed that students be able to influence the transformation of their country based on a personal and social commitment, an analytical, critical and

participatory attitude. In a complex and growing environment of technological development, the School has the challenge of training young people aware of the importance and consequences of their actions; of the value they have in the development of their country as agents of change, capable of interacting at different levels of social organization, with respect and tolerance. Training that will allow them to contribute to the construction of a democratic society,

As can be seen, this model not only has great virtues in terms of intellectual development, but also transcends by seeking to generate agents of change with a social conscience. The School's model departs from the paradigm where memory and the encyclopedic are privileged and focuses its attention on the new paradigm "learning to learn", where students must generate processes of self-regulation, self-esteem, metacognitive aspects and complex thinking skills that enable them to achieve self-learning (like that of Sor

Juana), in such a way that they become the forger of their destiny.

To land this in our little ones we must find a way that:

- a) Learn to fail successfully. Whenever we present this concept it is complex, but it is important to focus our minds in the following way, when we do something, we win or learn, but we never lose, that is, we must be able to recognize when for some reason things do not go as expected, but that shows us part of the way, this will help them later, when they develop hypotheses, to understand that a rejected hypothesis provides information (it shows us a path that is not the right one to achieve what we want), therefore, the fact that our hypotheses are not always accepted does not diminish the importance of the investigation;

Figure 56.

The search for tardigrades does not always have the desired success.



Note: Collection of samples in a cenote.

b) That they learn to become aware of what processes led them to the formulation of new knowledge. In this situation, depending on the age of the children, this can be from a basic process to a much more elaborate one, in such a way that the research process is as natural to them as breathing, that being curious is part of their nature. and remember that not knowing something is only the first step to start searching;

c) Understand how knowledge is linked to each other to provide comprehensive answers. This is a fundamental point to ensure that the knowledge obtained is not limited to just one discipline, area or application, but rather allows them to open up a much broader and more generous spectrum of options, thus achieving the possibility of seeing what no one else he has noticed, although all have seen it;

Figure 57.

As important as the result is the understanding of the process that led to it.



Note: The importance of discipline and systematic work to obtain the result, in the investigation of photography, 141 samples were taken and 1,410 observations were made.

Figure 58.

The visit to museums that integrate different cultures allows us to contrast and broaden the visions of different human groups.



Note: Visit to the British Museum.

d) Being able to identify objectives and establish efficient processes to achieve them (at this point, the kind reader has surely noticed that we have used the word efficient instead of logical, since it is sought precisely to encourage those who manage to propose new ways to solve problems or achieve goals);

Figure 59.

Participating in stays in centers of excellence such as CENIBiot, allows not only to get to know frontier equipment and facilities, but more importantly, to meet and be in contact with high-level researchers and human quality.



Note: Stay at the National Center for Biotechnological Innovations (CENIBiot). Costa Rica.

e) That they have the possibility of developing their metacognition, considering this as the self-regulating process where they can evaluate their strengths and weaknesses, their successes and failures, finding the procedures that allow them to reach their objectives in the most efficient way and regulate their self-learning to achieve what you wish;

Figure 60.

You must be able to go out and find the evidence and then take it to the laboratory.



Note: Ascent made to 4460 masl. Looking for samples for analysis. Toulca's snowy.

- f) Being able to identify their learning sources and learn how to consult them, whether in physical form, electronically or by any means that allows them to obtain the information they require;

Figure 61.

Being able to consult the sources can take us not only to libraries or the internet, but it can be extremely enriching to access museums and obtain a more complete vision.



Note: Louvre Museum, Paris.

- g) Develop the ability to efficiently communicate your ideas, thoughts, projects, etc. In such a way that it achieves an efficient and meaningful communication process;

Figure 62.

Transform a possible interruption into an event in favor



Note: During the pandemic, electronic media were used extensively to disseminate and disseminate science topics and sometimes, the small cohabitants of the house appeared on the scene unexpectedly, in this case, the appearance of the little kitten was integrated into the presentation achieving a pleasing effect on the audience.

- h) Be highly creative while always maintaining a methodological rigor that allows you to transform your findings into knowledge;

Figure 63.

Sometimes obtaining samples can be complicated.



Note: Sometimes obtaining samples presents difficulties that seem insurmountable, however, this is when creativity must arise to achieve the objective while maintaining methodological rigor.

- i) Always keep in mind that you are part of a community where you have responsibilities and obligations, thinking long-term, so that you can assess today's gains against tomorrow's repercussions.

Learning to do implies developing the hard skills that we mentioned before, in the case of the little ones they could be considered:

- a) Being able to understand what they read;
- b) Development of diagrams, graphs, charts and other tools to communicate your ideas;
- c) Have excellent oral communication;
- d) Handle laboratory material;
- e) Design and control experiments;
- f) Develop sports or artistic skills.

Within the soft skills you can consider:

- a) The power to work as a team;
- b) Learn to negotiate;
- c) Learn to lead teams;
- d) Develop prospecting;
- e) Develop a proactive attitude;
- f) Develop autonomy.

Figure 63.

In this sense, we refer to prospecting as the ability to anticipate possible future scenarios and, for this, it is essential to know the border of the subject in question.



Note: Visiting a car showroom in Paris.

Figure 64.

With regard to the proactive attitude, we refer to the ability to act in the face of future conditions and not only react to events. For example, if you want to develop a vehicle for space, you are not content to watch the related reports or videos, but look for the simulators of those vehicles that have already been in space.



Note: Visit to the Space Hall of the Ontario Science Centre.

To achieve the above, the example of parents and guardians is not important, it is essential. In this sense, both parents and guardians should ensure that children receive through example values such as:

- a) Respect;
- b) The value of freedom and responsibility;
- c) Justice;
- d) The Solidarity;
- e) The honesty;
- f) The tolerance. On this last point, it is important to teach the little ones a little phrase from Karl Popper, "If we extend unlimited tolerance even to those who are intolerant, if we are not prepared to defend a society against the outrages of the intolerant, the result it will be the destruction of the tolerant and, along with them, of tolerance". This paradox leads us to understand that we should not allow those who demand respect to violate the rights of others should not be tolerated under the false pretense of being tolerant. This is a fundamental characteristic for the development of children, as they must be able to identify extremes

that can be harmful and avoid falling into manipulation.

In this model, teachers act more as facilitators, moderators who help the student to achieve the process of learning to learn, where they provide guidance, tools, support and, above all, be an inspiring example.

Figure 65.

Living together, collaborating and understanding the reality in which people live in other environments or countries contribute to the development of empathy and tolerance.



Note: Shot of the Selarón Staircase in Rio de Janeiro. Brazil.

Considering the above lines, parents and guardians will surely have a very complete idea of how they should interact with their little ones. Some additional helpful ideas are:

- a) Favor social interactions in such a way that they can develop their social skills;

Figure 66.

The fact that the whole family participates in fostering the curiosity of the little ones will not only provide intellectual fruits, but will also give something equally important, the creation of affective bonds.



Note: With the grandparents in a bird show in the Ehecatl park, State of Mexico.

- b) Create environments that favor the process of learning to learn for students;

- c) You must understand that education must be student-centered;
- d) Make it easier for children to understand why their actions benefit or harm both themselves and others;
- e) Seek that learning is meaningful;
- f) Find the way in which knowledge can be visualized or understood in a more comprehensive way (for example, if we talk about cells, use a microscope or other strategies that allow us to approach the vision of cells);
- g) Encourage in-depth investigation of topics and understanding of possible links with other topics that may seem unrelated;
- h) To be the creator of shared knowledge spaces, where the sharing of ideas and points of view in a well-founded and respectful manner is encouraged.

Figure 67.

These spaces of shared knowledge are not limited in any way to the classroom or laboratories, but can occur anywhere and at any time, such as at lunch, dinner, talks, etc.



The previous lines serve to provide some ideas and suggestions on how to guide the formation of the little ones.

Certainly the question that arises now is where to get this type of education? Well, we can start by mentioning that, for some reason, the CCH has changed its educational model, therefore, our search is a bit complicated, however, Fortunately, the spirit of the above lines prevails in many spaces of the National Autonomous University of Mexico (UNAM), so visiting open house events or guided tours of its institutes and faculties will be of great benefit. utility and benefit, both for the big ones and for the small ones.

Now, if it is not easy to find options that allow developing the appropriate studies for the little ones, they can be considered an option that has become relevant since the pandemic, we refer to home education, also known as Homeschool. In this order of ideas, two paths can be considered, using this model partially, in such a way

that only some complementary subjects be studied that will help them develop their aptitudes or, to consider this model to complete their training in an integral way. Before making this second decision, it is important to consider the legal aspects, since although in Mexico there are options to accredit knowledge through exams, these may have prerequisites to their presentation.

Schools, organizations or advisors have also emerged, who ensure that when studying in their classrooms the studies will be validated before the SEP, but it is important to highlight that in Mexico the Homeschool modality from the basic level is not endorsed by our official institutions, however there is a "legal loophole", which has allowed many children to be able to accredit basic education through official institutions such as INEA or CEDEX, which are originally aimed at young people or adults who wish to obtain their certificate of studies at the primary level or secondary. So it is important for parents if they decide to opt for this modality that they be very aware of these schools that promise an official certificate that they cannot grant, rather, they guide parents on how to process it by submitting knowledge tests at Official Institutions, a

situation that parents can carry out without the intermediary of this supposed "official Homeschool school". The situation is more fortunate at the higher level where the educational offer in many areas is broader and it is possible to take it online or with a hybrid model (that is, where subjects are taken face-to-face and distance). Regardless of the option selected, it is important to properly accompany the little ones, verifying the contents and dynamics. An advantage of distance education is that you can opt for more advanced and diverse materials depending on the interests of the children.

Now, when identifying suitable curricula for the little ones, we must remember what we have seen in previous chapters, in such a way that we avoid falling into traps and easy ways out that will only end in disappointment.

In conclusion, we wish to share with the kind reader that each child with outstanding skills is, above all, a child, who requires love, care, understanding, accompaniment and, in his case, in a very special way, support to try to understand the world around you. It is about making them happy, integrated into their community (which can vary in size, since some children prefer to socialize in small groups) and with the promise that their dreams, whatever they may be, can be realized, from reaching the bottom of the Mariana trenches to identify the tardigrades that live in its depths or walk in the spaces of the international space station, because for a child with outstanding skills, the sky is not the limit.

Figure 68.

Meaningful travel can be a wonderful way to allow children to interact with other cultures by opening windows that would otherwise remain closed.



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