

## Probative educational argument in constitutional rights of young people before neuromyths with the use of Google map and Google Earth

BY

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### Abstract

It is a project that aimed to confront the neuromyth of the misapplication and conceptualization of multiple intelligences in the educational society and to emphasize Gardner's true words. It is a descriptive and exploratory study based on a pedagogical application work for EGB and high school students from the Provincia del Carchi Technical Fiscal College, in which they were provided with the cognitive bases of Project-Based Learning in order to form an album of Photo of the virtual tour of the students through different parts of the country. A qualitative expository study is applied in which it is concluded that the PBL methodology is accompanied very well by other methods such as Design Thinking applying Google Maps and Google Earth as long as they are given the guidelines and they are preparing the observation sheets. And the albums.

**Keywords:** Project-Based Learning- Cooperative Learning. Design Thinking- Neuromyth-

## INTRODUCTION

Within the diagnosis of the Provincia del Carchi Technical Fiscal College of the city of Guayaquil in Ecuador, from 2019 to 2023, it is discovered that the Institution has associated problems: that teachers are not trained in the use of Technologies, which is why it is difficult for them the development of blogs, the development of streaming, the development of didactic material associated with the subjects, as well as crime in the area does not allow students to attend with technological implements such as tablets or phones. There is also little use of technological tools in the teaching-learning process, which is accompanied by deficient pedagogical resources that involve the academic development of schoolchildren. To this is added the family economic problems as a result of the pandemic, with a marked lack of interest in content,

### Forecast

**Society, family, and education** It is the triangle that accompanies students during the first 20 years of life, for this reason, a feasible project is elaborated so that those who are in the last year of high school face the society of the future with the knowledge of the values that allows them to exercise their right as citizens in the best way. The project consisted of making the students of the Educational Unit aware, on their first day of classes, of the

constitutional rights that assist them, from 3 perspectives; that of the subject notebooks, in which they put on the cover an article of the Constitution of the Republic of Ecuador, and then during the diagnosis week we reflected on how to apply them within the context of the family and society, respecting the rights of others.

Later, during the Civic Monday session, these values were verbally and info graphically exposed among all the members of the educational community, with the purpose of asserting those rights in a pragmatic way. It has been of great value for my general knowledge and contribution to the teaching-learning process, since it is always refreshing to know and remember the methods, models, and learning strategies, as has been the beginning of education in the society in which we live. and the changes that it has undergone implicitly within the family and social context. The objective of the research was to demonstrate the error of some neuromyths that are applied in education, developing contents from different skills with the same students, to defend Gardner's theory, confronting it for those who have misinterpreted it.

In curricular terms, the project is based on what the national authority determines from the MINEDUC OI (specific objective of the Social Sciences Area) 5.1. Analyze the various political

projects, the proposals for democratic change in an intercultural society, and its effects in different areas, based on the recognition of the characteristics of origin, expansion, and development, as well as the limitations of one's own and other cultures and their interrelationship, and the importance of its technological, economic and scientific contributions. (Ministry of Education of Ecuador, 2016); but also in other elements of the Upper Sublevel of General Basic Education and Baccalaureate Level, of thematic Axis four: Thematic Axis 4. The State and its organization Understanding the structure, components, and functions of the State, its origin

historical, evolution; differences between State, Nation, and Government; the constituent assemblies and the people as the legitimizing subject of the assemblies; the Constitutional Charters; republicanism: principles and forms; functions of the Ecuadorian State; constitutional rights and guarantees. In this way, at the beginning of the school year, it was possible to make students aware so that they direct their thinking and actions towards their cognitive structure as young people with rights and increase mutual respect among them. The project was also applied to students of Basic General Education in accordance with the provisions of the National Authority from Block 2 of human beings in space:

Location and location of the characteristics and components of the closest environment: home, school, community, neighborhood, parish, city, province, related to the country and planet Earth, appreciating the opportunities and risks of its natural and human geographic reality; spatial location of Ecuador and its fundamental characteristics: physical, demographic, territorial and human, up to the provincial level; Geographical location and description of planet Earth: continents, seas, climates, population, highlighting environmental care and contingency plans against possible natural risks. (Ministry of Education of Ecuador, 2016)

Active methodology: Within the active methodologies, PBL and cooperative learning are applied for the socialization of the constitutional rights of young people in Ecuador, and for the use of the technological tool of Google Map and Google Earth in the virtual tour of the different provinces of the country, in such a way that a single methodology is not carried out, but due to the multiple intelligences that a student has, they can be brought together in the development of citizenship and knowledge of the environment.

The project is applied experimentally from 2021 to 2023, although the diagnosis starts from 2020, in the pandemic and in the post-pandemic, measuring the misinterpretation of the neuromyth of many teachers that intelligence can only be developed in children. students with a misinterpretation of Gardner's theory, who in the video [https://www.youtube.com/watch?v=OPaKQ7MF\\_RU](https://www.youtube.com/watch?v=OPaKQ7MF_RU) It supports the true theory of multiple intelligences, in which it stands out to include talents within intelligences.

## Development

(National Assembly of Ecuador (LOEI), 2021) considers in article 2.3.q that: "q. Universal Design of Learning: Offers flexibility to the curriculum, in terms of the ways in which all students access learning, according to their strengths and needs. ( p. 11)

(Vidal, 2023) expressed from the University of Concepción in Chile "the constitutive distinction between force and content is the idea that there is nothing inherently affirmative or assertorial in the propositional content of a judgment or assertion" (p. 41); in such a way that in education the same thing happens to measure the performance indicators of the students, although it is considered as immediate, the learning processes are not immediate, they are mediate. Within the observation of students in Higher Basic Education, those students who put more effort into learning the contents of the curriculum do not always demonstrate greater learning but do show greater immediate knowledge; that is to say, immediate knowledge is not always complete learning, because the demonstration must be increased to that theoretical knowledge, avoiding the teacher the speed for knowledge, but what the teacher must sow in the classroom, are structures, and what characteristics do these structures contain? First of all, in this innovation project, cognitive and operational structures will be called. The first ones are perceptive, they belong to a posteriori, and they are linked with the previous knowledge of the students.

For the development of cognitive structures, they were presented with two different scenarios.

Students were allowed to work from their homes in the midst of the pandemic, and they had to first measure the distance from Guayaquil to different places in Ecuador, and they could leave the perimeter of the province. It was striking that 60% of the students chose the areas close to their grandparents' place of origin: Province of Santa Elena, Manabí, Esmeraldas, and cities such as Playas, and Cuenca.

They were given an observation form that they could observe from virtuality and complete it manually and then they had to type it and send it in pdf. They were directed to the use of Impr Pant Pet Sis; with which they had to demonstrate the routes. In high school, 3 articles of the Constitution of the Republic of Ecuador were delivered, related to the rights of young people, taking into account the criteria of (Vidal, 2023) that "Certainly a judgment consists in the affirmation of a proposition, but the point would be that the proposition itself is neutral with respect to the affirmative force"; Therefore, this criterion was compared with the contents of Gardner's statements, remembering that in 2011 Howard Gardner won the "Prince of Asturias" award in Spain for his intellectual revolution about multiple intelligences, and in 2017 he was interviewed by the neuro educator Eduard Punset.

Let's read what Gardner says in a video cited in the bibliography to find out for sure how humanity biasedly applies the excellent theory of the psychologist but which has been misinterpreted. (Gardner, 2016)

Among the multiple premises with which Gardner answers the interrogation is to affirm:

"I am sure that I was not the first to recognize the multiplicity of talents"; "My mistake is that I used the word intelligence instead of talent"; that is to say that Gardner already suspects in 2016 that his ideas were already preceded, but he affirms: "I would not have received the Prince of Asturias award if I had written that there

were different human talents and I wanted to take the word intelligence associated with IQ, and I decided to call intelligence what others called talent, and I don't agree that because you are a musician you are talented and not intelligent" "Nobody has given me an answer to that question yet.

Therefore, during the development of the experimentation, an attempt was made to unite the traditional of talent with the novelty of what some teachers call "intelligent students" both in high school and in EGB. In such a way that from the PBL (Project-Based Learning) and cooperative learning, it is provoked not to unite the students in a single work method, but to combine them. And although there are different types of intelligence, it is about developing interpersonal intelligence and giving way through effort to linguistic intelligence.

That is the origin of the neuromyth that was confronted in the project, disprove the belief that Gardner separates intelligence from talent, no. Gardner unifies them, and those who separate talent from intelligence create the neuromyth. "He is intelligent in mathematics and talented in music, therefore he has only one type of intelligence, no. For (Gardner, 2016) "There is no reason that everyone has to learn in the same way"; Gardner continues and refers to multiple intelligences to the way of learning.

How to distribute the tasks in project-based learning or PBL in the area of Social Sciences? In the face of the pandemic, WhatsApp groups were allowed to exchange information, to guide themselves. In the PBL, the guidelines for the activities to be carried out were given and the students were discovering how they should do it. The orders were:

For EGB: 1. Take a tour from point A or B choosing the Google Maps or Google Earth applications

2. Take a tour of 4 stages whose code by artificial intelligence were:

A1, A2, A3, A4

3. Select 3 images in stages with artificial intelligence, which would be A1a, A1b, A1c, A1d, and so on.

4. Comment on the routes according to the objectives of the area or the performance indicator:

Location and location of the characteristics and components of the closest environment: home, school, community, neighborhood, parish, city, province, related to the country and planet Earth, appreciating the opportunities and risks of its natural and human geographic reality.(Ministry of Education of Ecuador, 2016)

5. At least 2 comments are needed with the codes: C1 and C2 of at least 4 to 8 lines each.

6. Groups can work for multiple intelligences.

Mathematical or numerical intelligence: the codes

Linguistic intelligence: writing

Naturalistic intelligence: the journey.

For the development of the teacher learning criterion, the criterion prevailed that almost two decades have passed since the birth of what has been called the social neurosciences, understood as the

application of procedures from the neuroscientific field to complement the study of the human and social sciences (Adolphs, 2010). The itineraries began individually with Google maps to obtain the distances, and the results were the following:

After they located point A and point B, they began to voluntarily choose the routes. Some of them came up with the idea of setting the start time of the virtual itinerary and dividing the segments into heights numbered A1a, and the rest.

The latter, neuroeducation, has been gradually introduced into the teaching-learning process, especially from various perspectives. In other words, not only showing how we learn but reviewing other basic assumptions that were considered valid during this process and that now, due to greater knowledge of the human brain, can be questioned based on the empirical evidence available. Validating these advances began to banish the neuromyth that students only have one or two multiple intelligences.

The students on their own initiative created the WhatsApp group: Tourism in Social Sciences EGB.

So, the students were virtually arriving at Chongón, and going through:

**Illustration 1 Parque Lago sector, aerial observation of the color of the flora**



Capture by EGB students

In this sector, the virtual visit was exceeded with: Cerro Blanco Protected Forest lake park

Lake of the Chongón Dam, of which they obtained images like these from the observation of Parque Lago in 3D. From the observation, it was possible to visualize and distinguish if the area had sedimentary or igneous rocks. Evidence-informed teaching involved monitoring to generate more knowledge from their own actions in the virtual classroom, theories, research, and educational practice.

What began as potential applications of how we reason and feel in reference to economic operations, political decisions, purchasing patterns, moral dilemmas, or learning procedures, has been forged in the form of disciplines with their own field of study, such as neuroeconomics, neuropolitics, neuromarketing, neuroethics, and neuroeducation. (Pallares Dominguez, 2018)

This is how the objective of the area will be structured in a real way:

(...) appreciating the opportunities and risks of its natural and human geographic reality.(Ministry of Education of Ecuador, 2016)

(Santiago Rivera, 2022, p.2)About learning knowing the geographical reality, the author expresses that:

The purpose is to analyze the geographic reality of the community as an object of study of school geography. The local community is the geographical setting where the circumstances originated by the relationship between society and nature are experienced. It is about the immediate territory where it is necessary to promote the formation of geographic awareness with reasoned explanations, when addressing their daily themes and problems from feasible proposals of significant citizen achievements. Methodologically, a bibliographical review was carried out to structure an approach on the scenario of the time, the community and school geography, and the local community as an object of school geography. It is concluded that given the demand for a geographical teaching with a more social and human accent, in daily school practice,

For what prevails most in this PBL learning process is induction, inquiry, observation, because the student does not know what awaits him, but through observation, differentiating that already at that point of leaving the city of Guayaquil, the flora is different, you can associate the appearance of the flora with the structure of the soil and the type of climate. In this process of inquiry, everyone began to develop their naturalistic intelligence, to give life to the development of the human brain.

(Ramirez Castro, 2017)

Naturalist Intelligence allowed strengthening the relationship between the human being and the environment, based on thinking skills that were aimed at approaching the natural world to recognize it as part of human life. Due to the environmental problems that the planet presents, it was pertinent to propose Naturalist Intelligence as a possibility to raise awareness and promote care for the environment.

Given the weaknesses found within the administration of the classes during the pandemic and in review of the curricular elements that had to continue adapted to connectivism, the PCI was reviewed to schedule computer study circles, and the use of these two technological tools as applications, It was a great help, between teachers and mothers, better strategies should be carefully analyzed that led to developing better learning in the different fields of action, both those who were at a disadvantage so that they are supported by the students with the highest or highest performance performance, allowing the socialization of learning and reaching a moderate constructivism.

With respect to evidence-informed teaching, teachers have an understanding of research approaches and methods and the strengths and limitations of each, as well as knowledge of associated core aspects of the research process such as sampling, analysis, validity, and reliability measurements, among others, which serves to measure if the PBL became a clear and beneficial option when joining it to Cooperative Learning.

I already said(Gardner, 2016)that "The claim of multiple intelligences is that we have some independent computers (to refer metaphorically to the brain) (min.6)

“Without a doubt, if you go to business or training (studying) or politics, it is recognized that perhaps you have a much higher than average IQ, but if you don't know how to understand others, if you don't understand yourself, If you don't know how to make your way on the street, in the television studio, in the sports field or in the artistic field, even if you have the highest IQ ever observed, you will never be intelligent in other areas.

That is to say, the author affirms that the results do not always reflect the level of intelligence. (Gardner, 2016)

“When people use the word intelligence without thinking, it usually refers to intelligence in school, if you are good in language or math, you will do well in school, and while you are in school you will think you are intelligent, and it is the test intelligence the one that confuses us, if you were good in the test you were good in everything, if you were regular in the intelligence test you were regular in everything, and if you were bad in the intelligence test you were bad in everything. (min.7- 9)

The photos that can be qualified and then quantified already at the level of the referential affirmation of the elements that are presented in the audit of the activities that are carried out outside the classroom, which are continuously questioned, range from the analysis of a problem that is he wants to focus and the application of the ways of carrying out the processes, to later arrive at a demonstration of the activity carried out in the visits.

Figure 2 Innovative methodologies



Prepared by María Eufemia Villao Ordoñez

At another level in which the development of observation is essential, is to increase while using Google Eath, the hierarchy of logical formal research. What does this consist of? Well, it is the union of 2 multiple intelligences, the naturalist and the linguistic. Among them, this facility was given to achieve it, when an observation sheet was designed for them and the formation of image catalogs. And it is a way of valuing despite the fact that(Hargraeves, 2018 p.244)the knowledge society is really a learning society.

Which means that these societies generate a large amount of information and knowledge that enhances inventiveness and



creativity, which makes them competitive and adaptive to modern changing economic systems. They rely on both collective and individual intelligence and allow their members numerous opportunities for upskilling and retraining. However, the work of teachers, in many moments, is not easy or rewarding.

"If you think you have only one intelligence, you think you have only one computer in your skull. If that computer is efficient and fast, you don't make many mistakes, you're good at everything (And Gardner frowns), on the other hand, if it works in fits and starts, it's within average, and if you're slow and make many mistakes, you're stupid. The claim of multiple intelligences is that we have several independent computers, one is in charge of spatial generation, another is in charge of musical generation, and another is in charge of bodily information; Of course it's not a small computer, we don't have an empty can in here, but brains are different, but thinking that they do only one thing is not correct" (m.7-m.9).

In this statement from minute 7 to minute 9 of the aforementioned video, lies the neuromyth, because teachers or parents justify the strength of a student, ruling out that they can make an effort in other areas and achieve learning.

### Scientific observation in PBL and EGB

Observation is vital for the student to become a researcher. The level of curiosity of students between the ages of 13 and 15, was very natural and allowed the observation of the facts, flora, fauna, elements that are part of the economy was rescued by the students.

Illustration 3 Molinuco sector, near Quito



Captured by: EGB student

When formalizing a scientific observation, they were left free to design the observation sheet. Teaching improved, knowing how the human mind and brain works, learning mechanisms, how the environment positively or negatively affects the acquisition of knowledge, and how to optimize effort. Lto norm a culture of using research, fostering an effective learning environment, and having supporting structures and processes.

Cooperative learning allowed students to give others the opportunity to think about their interests and personal goals and use self-regulation strategies that help them motivate, monitor, and control their own learning.

In the emic analysis of reality, the empirical and the phenomenal shows that we live in a functionalist society, where everyone has chosen to do what they have achieved socially, and only from that can they survive. From this analysis of reality, the students innovated through and with the help of the parents with the

preparation of the typical dishes of the area and the productive analysis of it.

Positivism makes a great contribution to the history of science with the continuous use of a method that is characterized by believing in the evidence and leaving assumptions only from the point of view of science, in which the researcher must seek the truth. that is demonstrable.

**Final ABP Artifact:** Students at the end of the tours must deliver an album of:

- 1.- Points that were visited virtually
- 2.- Personal comment on the characteristics: to. geographic (naturalistic intelligence)
- b. distance between tourist towns using Google Maps
- c. commercial (mathematical logical intelligence)

Although the work was for personal development to avoid contamination during the pandemic, the virtual cooperative learning methodology was applied, in which among themselves, in addition to the images, they created an album, at a group level.

For(Hargravaes, 2018 p.244)

The knowledge society school should not limit itself to being a mere transmitter of knowledge but should try to compensate for inequalities, foster a critical spirit, the ability to process and structure information, creativity, and inventiveness. For this we must change the conception of teaching practice: forget about closed and highly demanding curricula, about the "compulsive obsession with standardization"

And the best way to predict whether a student will do well or not is the grades from the previous course. The problem with measurements is not the measurements, but the people who attach too much importance to them. Believing in the unique intelligence that we were born with is very Western. In Asia, they believe in the importance of effort. Therefore, Gardner recognizes the student's effort as a way to awaken another type of intelligence that the student or person has.

### Methodology

Cooperative learning and problem-solving were applied with that of Project-based Learning, in order to develop different multiple intelligences and discover the harmful effects of neuromyth.

### Results

1. The students developed critical thinking by reasoning in a concrete way from taking photos of the areas and the meals of the population projected in the in-focus tool.
2. Interpersonal relationships could be fostered with scientific connectivist phases, with peers and the community supported in collaborative work.
3. It was possible to characterize the pedagogical innovation with processes of discovery of cultural wealth.
4. By relating the development of creativity to that of logical thinking, project-based learning was related to the Design Thinking methodology, which consists of innovation based on creativity.

5. To manage the computer technical knowledge applied to the different subjects motivated by the cultural richness of Chanduy, modernization, and connectivism, they allowed the necessary visual motivation that made Google Maps and Google Earth useful tools for the analysis of the natural environment.
6. By sharing the ideas of capturing scenes from different places in Ecuador, with classmates based on everyday examples, the creation of albums was possible.
7. Cooperative learning allows active participation for the development of language and problem solving with the frequent use of information technologies, but also in the formation of groups for expositions of constitutional values.
8. Only by organizing the micro curricular contents from the pedagogical processes with emotional intelligence, freedom within rationality and creativity become values of enormous constructivist value.
9. It was not easy to guide the achievement of the desired learning from the reproduction of ancestral knowledge, due to the pandemic.
10. By considering the appreciation of nature and sustainability in the development of emotional thinking, the development of several multiple intelligences in some students allowed to banish the neuromyth.

### Discussion of results

In other pre-operational development activities of Piaget's stages, students approach their own history, that of Chanduy, valuing its historical background, rescuing its good customs, and constructively criticizing its peninsular essence, which in the words of (Rivera Olgún & Sánchez Espinoza, 2021) it allows the active development of a citizenship from the reflection of its roots towards social skills. (González González, 2020) He considers that the Science or science, technology or technology, engineering or engineering Stem project allows him, along with mathematics or mathematics, to reach Piaget's pre-operational, operational, and concrete phase, if it is done from the objects of the natural environment in which the student develops.

With this type of activity, the student is brought closer to the development of language in an organized way according to the approaches of Vigotsky and Piaget, making possible an approximation to the zone of proximal development. Pedagogical processes depend on methodological strategies because there are different types of learning, which makes it difficult to find good results with a single teaching method.

The researcher student approaches the teacher, with his leadership and graduation as a professional, to be helped in his investigative doubts, fulfill his function in society and the gaps are reduced, it must not be forgotten then that the symbol of the good stereotype researcher or bad researcher is given by the sequence of processes, the records observed and the correct use of resources, within a change in the constructivist paradigms in which the student is structuring his own deductions in the manner of the discursive and rationalist system of Popper in which the way to get to the truth is

often by establishing a system of falsification, that the investigation will take you to the different phases that the truth entails.

The observation sheet establishes the contents that have been given, in addition to rationalism, its psychological identification, when the student reasons from what he sees in the different realities, and what he will be able to write using his critical reasoning, but all accompanied by the pragmatism.

### Conclusions and recommendations

In the formation of reasoning, the graphic representations can be studied as segments of the investigation so that in the formation of the psychological we are stored as virtual libraries, how each student sees the human being, the others, and how they can develop logical dialogues. from the knowledge of the other. By applying an external procedural linguistic content from the directly observable, the narrative of the adolescent with Google is of enormous procedural advantage.

Since teachers are researchers, they are forced to be research teachers of processes in the publication of videos, indexed magazines and it would prevent students from buying very expensive books, when documents can be assembled from those virtual trips.

This neuromyth has generated the unification of the intelligence of many children in only one of them and does not give motivation for the development of others. In addition, it claims that part of the student's brain cannot be developed based on other characteristics at the time of learning, as is the case when applying cooperative learning we realize that students improve despite having the highest multiple intelligence at a different one from the one diagnosed in a test.

Another of the consequences generated by this neuromyth is that it affects both on a personal level since many times teachers take courses or try to get more training in programs on "different types of learning" with the intention of improving their methodology.

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