

Art-innovation: Technologies applied to education - Perspectives, practices and challenges based on project pedagogy



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ABSTRACT

In ART-INNOVATION: TECHNOLOGIES APPLIED TO EDUCATION - VISIONS, PRACTICES AND CHALLENGES BASED ON PROJECT PEDAGOGY, applying the

methodology of active project-based learning, we present a proposal in which teachers and students, through photography, are motivated to develop an interdisciplinary educational project in a virtual and face-to-face learning environment. experimenting with the constructivist possibilities of interaction, reflection, and collaborative construction of knowledge around real problems of their daily lives. The world is increasingly interconnected and the school is becoming the legitimate place of learning with the production and reconstruction of knowledge, increasingly needing to accompany the transformations of contemporary science, supporting interdisciplinary and transdisciplinary proposals. Interdisciplinarity focuses on universalizing processes in the face of globalization, as well as democratic ones, requiring an understanding between culture and education. The new methodologies are adapted to pedagogical proposals to share knowledge, contributing to training for citizenship and cultural diversity.

Keywords: Art, Innovation, Educational Technology, Education, Project Pedagogy.

1 INTRODUCTION

The current global scenario in the face of the pandemic places us as protagonists of a new visionary and irreversible behavioural stance that we, as social and professional actors, must follow, transform, adapt to a new paradigm that is essential for human relations and the use of technology.

Creation and innovation are the most important and fruitful aspects that can enhance the joint work of ways of thinking and technology is conceived as a bridge, through which content is transmitted and which becomes a territory where the interactions that make it possible take place; dialogue and shared work between educators and technologists.

Contemporary education faces an important challenge, which is to satisfy the desires of students, which often continues to function as a mode of transmission of knowledge and now hybrid education has emerged that has a lot to contribute, personalized teaching with a face-to-face part and



an online part in other applied methodologies, having the teacher as a guide and mediator of knowledge.

Analysing and discussing the different modalities of hybrid education for the meaningful learning of the learner, considering structure, organisation and practice as protagonists in today's education and, in this process, applying active methodologies, where education is synonymous with exchange, interaction, enablement that allows the construction of knowledge is a challenge. These methodologies have to support personalized objectives, involve students in increasingly complex activities, in which they have to make decisions and evaluate the results, with the support of relevant materials.

One of the models of active methodology that is now widely recognized are flipped classes where students are allowed to define "when, how and where" they learn more easily, access to videos, interactive classes and other materials; However, it is important to highlight the continuous and formative assessment of the student in the teaching-learning process.

In the parameters for a hybrid education, according to Moran (2015. pg. 25), "It is possible to transform aspects of the educational process with the use of Hybrid Teaching, where the student is the protagonist of their learning with a more participatory stance and consistent with their autonomy and the expansion of critical thinking".

Having a shared vision of a project in education is a dynamic that needs innovations for a new art of building a qualitative and motivating learning scenario. This is the important moment in the architectural visualization of the digital terrain, but knowing how to apply it is of utmost importance.

Nowadays, virtual learning environments are very useful for teachers to continuously train, with the participants experiencing, the new constructivist educational perspectives, where interaction, reflection and the construction of knowledge and collaborative reinvention are central aspects.

The role of the teacher is to create and orchestrate differentiated and engaging learning environments, involving students in activities that lead to the construction of their learning process.

Education professionals must not only master the specific didactics of the different subjects, but also a series of cross-disciplinary educational elements of qualification.

Throughout this educational universe, through the "arts and visual culture" it is necessary to consider the need to build another narrative for the school based on a comprehensive vision of the curriculum and the activity of the teacher as a facilitator of learning experiences.

Faced with the different technological tools with pedagogical application, there is a new planning that emphasizes the connections between the understanding of knowledge and technological interaction. The Internet allows for the development of new forms of expression and reworking of the world and a new pedagogical practice; and it is worth highlighting here when the renowned Spanish sociologist Castells (2015) in his book: "The Galaxy of the Internet" defines Internet culture as



technomeritocratic, as a hacker culture by incorporating norms and customs into cooperation networks focused on technological projects.

According to the same author, human relations will increasingly take place in a multimedia environment, reminding us that cultures consist of sign-based communication processes and that there is no separation between "reality" and symbolic representation, what he calls "the culture of real virtuality".

It is pointed out that the appropriate work with technologies is essential: "Learning can occur with the internal involvement of the individual, that is, the emotional, the rational, the imagination, the intuitive, the sensory in the interaction, based on the challenges of exploration, possibility, the assumption of responsibilities, creation and joint reflection". (KENSKI, 2008)

The pedagogical project that will be presented below reaffirms that photography dialogues with memories, can lead us to self-knowledge, because it is a witness of our experiences. In this contemporary world, full of meanings, the photographic image has a social focus. "To photograph is to relate to the world, to participate and experience the unfoldings of this experience by being a memoirist" (SONTAG, 2004).

The image is susceptible to interventions in which the photograph can be manipulated. It represents a construction of subjectivity and brings a new status of self-knowledge. It is understood as a document almost always linked to memory, that visual that portrays, resignifies and recontextualizes the social action of the gaze.

Sociologically, the process of visual culture brings sociability, representation and belonging; And this visual is a place for the construction of discussion of meanings, that is, a cultural and sociological phenomenon, because it reproduces the elements of certain identity formations, and becomes a way of access to values, symbols, attitudes, sensitivities, networks of sociability, languages, reconstituting their political and cultural memory. "It is a matter of understanding what is represented in order to understand the representations themselves" (SARDELICH, 2006).

Anthropologically, Roland Barthes' work, "The Clear Camera", stands out in this approach, when he establishes the famous distinction between the "studium" (objective) and the "punctum" (subjective) of photography, that is, between photography while presenting itself to my intellect as a field and object of study, as a terrain of a knowledge and a culture that I can understand, and to recognize that photography offers itself to my affection as a detail that crosses me existentially, moves me and encourages me.

The term derived from English *Art-education*, means a way of interrelating the concepts of art in educational processes, portraying a subjective, sentimental and human manifestation in the universe of intellectual and pedagogical development.



2 DEVELOPMENT OF THE PROPOSAL

In this educational moment that we are going through due to the Covid-19 Pandemic, social isolation and distance education, we have a great opportunity to develop educational technology projects with an interdisciplinary/transdisciplinary perspective. The development of projects with Art and Technology with students in basic education, in this case the secondary level - 7th, 8th and 9th grades, can contribute to the expansion of knowledge, expressions of creativity, aesthetics, imaginative, in addition to providing opportunities for skills and competencies.

The adoption of meaningful learning approaches to pedagogical methodological work in distance education classrooms has been a reality. Art can open the way to dialogue with other disciplines and areas of knowledge; and it is presented as a way to transform experiences.

A contextualized project with dialogue between the areas of knowledge promotes the involvement of students in research and the construction of knowledge. The project presented here is based on the principle of art and technological innovation applied to education. A proposal that dialogues with various areas of knowledge and languages such as: the arts; technology; oral and written language, in this case Portuguese; geography and history. Other areas may appear during the course as well interacting. The central idea is based on photography and the daily lives of the students. Based on this premise, the project will be developed and expanded.

Art as an object of study generates specific knowledge and broader knowledge that communicates with other areas. The visual, musical, performing, corporeal and multimedia arts are presented and represented through signs, symbols and codes, allowing the development of creative, artistic and aesthetic thinking through their use. Art in education is one of the fundamental languages to provide and consolidate in learning processes the construction of criticality, reflection, sensitivity, responsibility, and multifocal social visions. Art is not only something contemplative, but students and teachers are invited to make, produce, create, appreciate, observe and reinvent themselves in their artistic work.

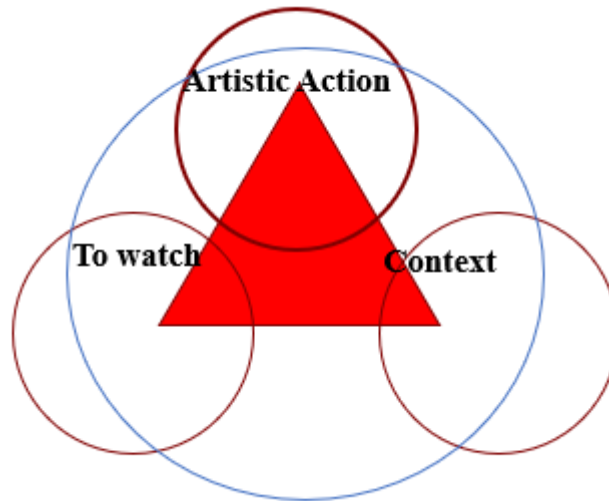
Barbosa (2010) proposes that the study of art encompasses the following aspects: Knowing art - contextualization; Appreciating art – appreciating and making art – production. It is a proposal with a triangular approach in the teaching of art, dialogic and that offers many paths for teaching practice. It is not a closed method, teachers can make their choices, adjustments, changes and so on. It is an opportunity for transformations to take place.

According to Novaes (2005):

The Triangular Approach points out that it is important to think, to question what the image is, the use of the image, the image of everyday life of the history of art and culture in the classroom. It is necessary to make a critical reading of the production of images of things and of ourselves. It's not just up to the subject how an image looks. It also needs to be interpreted. The visible image awaits an invisible reading that is revealed with each scroll it makes (pg. 11).



Figure 1 - Graphical representation of the dimensions of the Barbosa Triangular Approach.



Source in Portuguese: Barbosa (2014)

According to Barbosa:

The production of art makes the child aware of the creation of visual images, but the production alone is not enough to read and judge the quality of the images produced by artists or the everyday worlds around us. It is necessary to be literate in order to read the image. Through the reading of works of visual art, we will prepare the child for the decoding of the visual grammar of the still image and, through the reading of cinema and television, the preparation to learn the grammar of the moving image (2006, p. 26).

Nowadays, it can be said that active methodologies have been transforming education, taking into account the numerous benefits implemented within the classroom, whether physical or virtual. The main transformation is in the way of conceiving learning, based on the student's concern to think "outside the box", solve problems, as well as connect ideas and people. The main intention is for the student to be involved in complex activities that require decision-making and that it is possible to evaluate the results obtained, with the support of the relevant materials, in order to become creative people.

The main objective of the active teaching methodology is to stimulate in students a teaching-learning process in which, in an autonomous and participatory way, based on real problems or situations, they can develop competencies and skills. Thus, the student will be at the center, actively participating in the construction of knowledge.

Currently, technology is capable of integrating spaces, times and knowledge, providing the teaching and learning process with a constant interconnection between the physical and digital worlds.

The term project-based learning is the translation of the English term *Project Based Learning*, where for the development of a project it is necessary to solve a problem. In general, the terminology "project-based learning" is applied to modalities in which there is a real product as an outcome - final product.



Project-Based Learning (PBL) has been widely used in schools in all its educational segments - preschool, primary 1, primary 2 and secondary; as it provides opportunities for the implementation of innovative projects, where students end up becoming the protagonists in the construction of their knowledge. However, as teachers in the context of activating students' problem-solving, we need to take them out of the role of viewers of content, as in the traditional system. With the application of this methodology, the goal of teaching is to achieve a high degree of learning through research and hands-on activities.

In this work, the adoption of Project-Based Learning (PBL) suggests the use of individual and group activities focused on capturing the attention of students through factual problems that can seek solutions to improve the personal and social context.

Teachers should guide students to delve into various areas of knowledge in accordance with the project proposal established for the study. The approach can be interdisciplinary and also transdisciplinary, with the participation of the respective professors of the disciplines and areas working as a team together with the students. During this approach, the student must develop commitment and independence, characteristics necessary for the construction of knowledge.

The project will involve art (photography - use in everyday life), history (construction of memory/collective and individual effects), geography (location, climate and vegetation) and information and communication technologies (virtual learning environments, smartphones and applications). As a suggestion for a study of the environment, students can investigate whether the neighborhood where they live is forested and if there are Ipês and of what type. The project is quarterly from August, so it will be possible to follow the flowering of the Ipês, which begins in July and lasts until spring. Why choose Ipês? Because it is a very typical tree of the southeast region and the city of São Paulo. The Ipê-yellow, purple, and white species are very common.

In the execution of this project, the student must make decisions about the best place, the best angle and the light for the photographs, as well as technological resources, illustrative texts, interviews, research on the history of photography, types of photography, important photographers, among other resources to complete their research. All this dynamic will lead to the presentation of an effective result of the topic explored with the individual and collective presentation of the final product. The education of the gaze and sensibility are present in the use of photography as an object of study.

Registration is often the commonplace made in everyday life by students, but the proposal of a sensitive and aesthetic gaze will be necessary so that photography also has reflexive aspects of recording reality and life. Students will be invited to investigate the history of photography from its origin to the present day, in order to understand the language they will use in practice.

It is also important to highlight the types of photographs and how photographers use language to make their representations of readings of the world. Important photographers from the history of



photography will also be part of the research context. We can mention here the famous Brazilian photographer Sebastião Salgado and his works. He is a contemporary photographer who stands out in the panorama of documentary photography and photojournalism, as well as an activist and founder of the Terra Institute, which develops projects for the recovery of the Atlantic Forest in Minas Gerais and other Brazilian states.

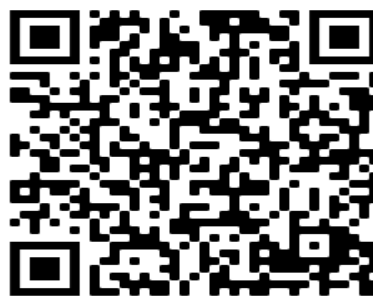
{...} Photography can be recognized as a mirror of the real where it is produced thanks to the similarity between the object and the real image, then it is seen as a transformation of the real that can be deconstructed, and finally photography is seen as a conception of symbols, which is a set of codes (DUBOIS 1993. P.48).

The practical activity consists of an action, as it is based on the taking of the photograph. The empirical and practical content of this research encourages students to develop skills that they will be able to apply in the future in personal life and in the social world. In addition to photographing, in the process of developing the project, studies will be proposed for the re-reading of photographs and their production and also the use of applications (appropriate to the age group chosen here, from 12/13 years old) for the manipulation and editing of photographs and development of short videos about the research and the individual final product.

For the re-readings, Naïf Art will be presented as a source of research in the field of popular art, the reading of the social environment and personal and original expression. It will be one more option for students to work with the photographs, their reinterpretations and artistic presentations. Within the Art Naïf scenario, popular artists portray landscapes, everyday life, life in the countryside, trees, flowers and others, including the Ipês, trees typical of some regions of Brazil.

Learn a little more about Naïf Art in Brazil by checking out the QRcode below and a video about the Brazilian Museum of Naïf Art located in Rio de Janeiro. The museum has been closed since 2016 for funding reasons.

Figure 2 – Museo de Art Naïf de Brasil



<https://memoria.ebc.com.br/cultura/galeria/videos/2012/08/conheca-o-museu-internacional-de-arte-naif>



The form used to instigate students will be guiding questions, a topic that encourages them to seek answers on the topic through prior knowledge/affective memory. Some of these questions might be: Are your street and neighborhood tree-lined? Do you know a Yellow Ipê tree? Are there any such trees in your neighborhood or near a family member's or friend's house? These and other questions will awaken the way of thinking (individually and in groups, both in the virtual environment and in face-to-face meetings) and/or run the project.

PBL needs the learner to delve into the content of what they are going to learn. It is very important to guide the research with reliable sources, to offer them guidance so that they can not only access them but also know how to look for them on the internet. It is necessary to work on critical thinking with students so that they know how to discern a reliable source and false information. The seriousness in the process will awaken in them a sense of responsibility and commitment to your project. Learning how to research is very important for the process and development of the project.

The PBL proposal aims to transform the mentality of the student, stimulating logical thinking and creativity, based on the development of skills and abilities, and other knowledge for personal and social maturity.

The final objective of the work will be the presentation of the result (or product) of the project, a point of motivation for the students, giving meaning to the search for knowledge and the selection of information, in order to make a relationship between what they find and what they have, so that they can share ideas with classmates and teachers. act and interact with them to be sure that they have achieved their goals.

In summary, the guidance offered to students with this methodology is:

1. Students are given one or more guiding questions;
2. Students should try to answer these questions;
3. Knowing the question and its origin, students must define the tactics of the real answers;
4. Once the work plan has been established, it is time to implement it.

The idea is that students can interact with their reality, establish what is wrong, and suggest solutions and preventions.

The advantages of PBL are: the improvement of class attendance rates, student participation and commitment in the teaching-learning process, leveraged by higher performance in activities related to the arts, computer science and education, geography, history, oral and written language, with the participation of photographs, internet, connection, networked society, natural sciences, among others.

One of the expected results is that, based on this methodology, students can be motivated and improve interactions within their school, family and social groups. Allow teachers other ways to promote the formative assessment of each student, observing: logic, critical vision, empathy, synergy, leadership and trust.



We also hope that during the development of the project, new ideas will emerge and real and concrete actions will be developed thanks to the involvement of students, families, teachers and the educational community. Exhibitions, saraus, social and civic actions are also planned, as well as other possibilities for the final product suggested by the students.

Project Studies and Development Guide - "Art-Innovation: Technologies Applied to Education - Perspectives, Practices and Challenges based on Project Pedagogy."

The Proposal: Based on the approach of photography in the classroom, develop a transdisciplinary project in the field of Arts and Educational Technological Innovations promoting research, action, reflection, production, presentation and contributions of social actions in the community.

Disciplines involved: Arts, oral and written language - Portuguese, geography, history and educational technology.

Suggested period for the project: Quarterly - August to October (due to the spring season and the flowering of the Ipês trees). Divide the activities and development of the project into classes during the term - 24 classes for the development of the project and additional hours for the presentation of the final product and the deployment of the project into real social actions in the community. Each area of knowledge, subject (curricular space) and teacher will develop the project in their classes and in parallel in conjunction with other areas, since the proposal is transdisciplinary. It will be up to the teachers to plan the actions in class, the division of tasks, the contents, the themes, the research relevant to their areas and also the correlations between them. Students will be invited to help plan the development of the project and within the topics that can be addressed, researched and discussed in each area of knowledge/discipline. It will be necessary to plan moments of transdisciplinary teamwork. Grades involved: 7th, 8th, and 9th grades.

Challenges for students: use of information technologies in education; based on guiding questions, develop the process of individual and group research and production; presentation of the process and final product in a virtual learning and face-to-face environment; use of technological tools; use of virtual learning environments; Suggestions and concrete actions to have an impact on the community based on the result and presentation of the final product of the project.

How to move forward with the project:

- Contextualize the Project to the students. All the disciplines involved and the teachers will discuss the proposal with the students and the corresponding grades;
- To study the history of photography and the contextualization of its use in our daily lives, and to propose an investigation and a presentation in class groups. Suggestion: use the virtual learning environment, *padlet* and *sharing* for the presentation of texts and images (see the information about photography in the Mind Map available in attached text);



- Starting from the question: are your street and neighborhood tree-lined? Invite students to use their smartphones to record the response in pictures. Present in class and talk about the topic;
- Ask students to find and investigate the typical trees of the city where they live, their flowers and images. In the research you will find as a reference the Ipés and their different colors of flowers. Students can research their neighborhood and other places in the city. Take photos with smartphones and present them in class. Stimulate research on Ipés and present the results along with the photographs. They can use the resources of the virtual learning environment and also applications to prepare their presentations (see information about Ipés in the attached text *Los Ipés de Brasil*);
- During the research and development process of the project, encourage students to exchange ideas in groups using the chats in the virtual learning environment. Between the professors and with the professors, the use of the virtual environment is also encouraged and even a forum for debate, exchange of ideas and research materials is created;
- Research with family members old photographs that show the neighborhood, city, and place where they live or lived and their trees. Work to rescue memories, stories and affections. Compare the photos of yesterday and today, talk and discuss the afforestation of cities. Discuss the types of photographs and present examples. Present your research in class and tell the stories in the photographs. Analysing the images of yesterday and today, questioning the tree-planting of the street, the neighbourhood and the city and the relationships that this implies in the daily life of the community;
- To present the biography and work of photographer Sebastião Salgado: documentary photography, photojournalism and also the development of his work as an environmental activist. Present the Terra Institute project (see information in the attached text on *Mind Map*);
- Work of re-reading the photographs: introducing students to Naïve Art and its characteristics, artists, styles, works and others. Ask the students to research the topic and produce their own interpretation of the photographs of the Ipês, based on the works of Art Naïf (see information on *Art Naïf* in the attached text). The material for the development of the re-reading will be free and is based on previous research and knowledge about colors, collage, painting and drawings;
- Individual final product: Make an individual presentation of your photographic research of the street, neighborhood or city; images rescued from families, images of trees - Ipés found, your production of a re-reading using an image editing application (own and



authorized for children from 12/13 years old) of up to two minutes. In addition to the researched images, you can add soundtrack, text, and effects;

- Collective final product: Create a digital portfolio with the work of all the students together with all those who have participated in the project. Provide an opening text, project presentation, video narrating the development of the project, and individual student presentations. Make the portfolio available on the school's digital platform so that other classes, families, and the educational community can appreciate the work;
- Hold a virtual exhibition of the work: photos, rereadings and a face-to-face exhibition;

Social action based on the project: Based on the results found on the afforestation of the environment where the school is located, the students and their families live and also from the research on the Terra Institute Project, propose real afforestation actions in the city/neighborhood/street where I live, involving students, teachers, educational community and civil society.

Evaluation: continuous process of evaluation of individual and group learning; Participation and performance in the development of the project, final product and new proposals.

3 BRAZIL'S IPÉS

Ipé is a very representative tree in Brazil, mainly in the Midwest and Southeast regions. It is a tree that differs from most because when it blooms its leaves fall off. A blooming ipé is a sign of the arrival of spring. Most ipé tree species bloom in late winter or early spring (Southern Hemisphere).

Its flowers are lush and colorful as well. The best-known species are the yellow-ipe, also called pau-d'arco, common in Minas Gerais, Espírito Santo, Rio de Janeiro, São Paulo and Paraná; the ipé-violet, with pink flowers, common in the Midwest, Southeast, and South; and ipé-branco, which is widely found in Rio de Janeiro and Minas Gerais.

The purple ipé is the first to bloom: from June to August in warm regions, a little earlier in colder places. The yellow ipé blooms between August and September and the white ipé from September to October. In Brazil, there are twelve types of ipé with flowers in shades of yellow.

It is a species that grows slowly and up to 30 meters tall, but most are from 7 to 15 meters. It belongs to the genus *Tabebuia*, which in Tupi-Guarani means "tree with thick bark".

Ipé wood has a lot of quality, it is a hard and resistant wood. It is widely used in civil construction, shipbuilding, beams, wheel axles, and joinery and flooring parts. Its reforestation is very indicated and important so that the species does not become extinct, due to the great demand.



Figure 3 – Yellow ipé in filigree

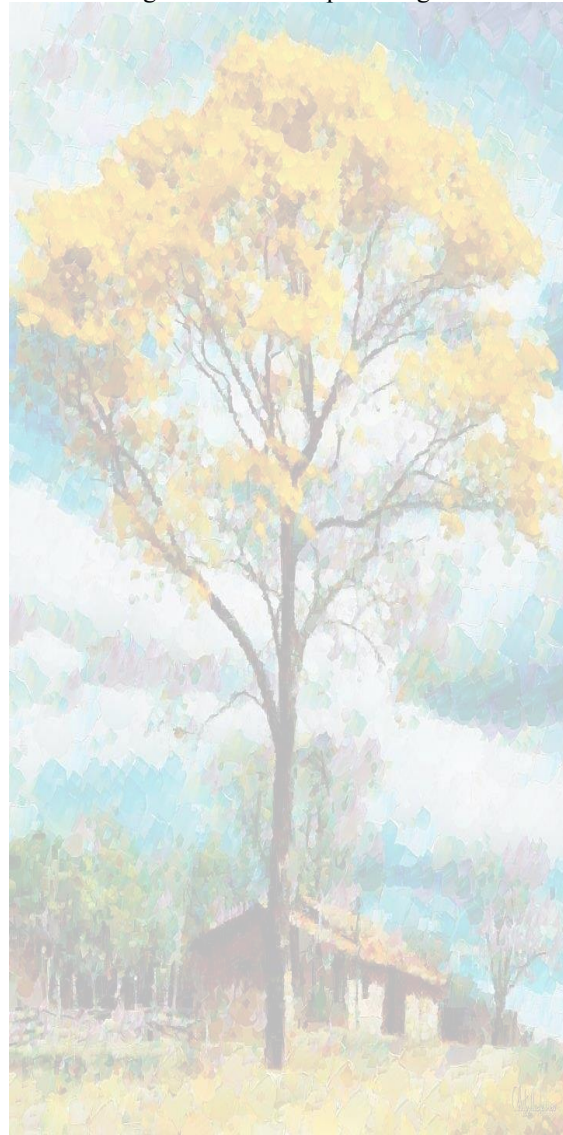


Imagem disponível em <https://santhatela.com.br/celito-medeiros/celito-medeiros-grande-ipe-amarelo/>

3.1 ART NAÏF

Art Naïf is a term adopted to exemplify a type of folk art. The word Naïf is French and means naïve or innocent.

It depicts everyday themes and cultural manifestations of people in a simple way and highly values the use of a large number of colors. This artistic freedom can be seen in the way colours are used in the compositions and in the dreamlike dimension that is projected in many works. Some characteristics are common in this style, such as: two-dimensionality; vibrant colors; spontaneity; preferably lighthearted themes; figurative features; symmetry; idealization of nature.

Artists are generally popular and self-taught, with no academic artistic and technical studies, but with great authenticity, creativity and personality. It originated in the 19th century and is closely associated with painting.



Outstanding artists of Naïve Art: Henri Rosseau (1844-1910), Camille Bombois (1883-1970), Séraphine Louis (1864-1942), also called Séraphine de Senlis, Pilar Sala, Djanira da Motta e Silva (1914-1979), Maria Auxiliadora (1935-1974), Mestre Vitalino (1909 - 1963), Heitor dos Prazeres (1898 - 1966).

Figure 4 – Naïve Art



<http://enciclopedia.itaucultural.org.br/termo5357/arte-naif>

Figure 5 – Purple Ipé in Filigree

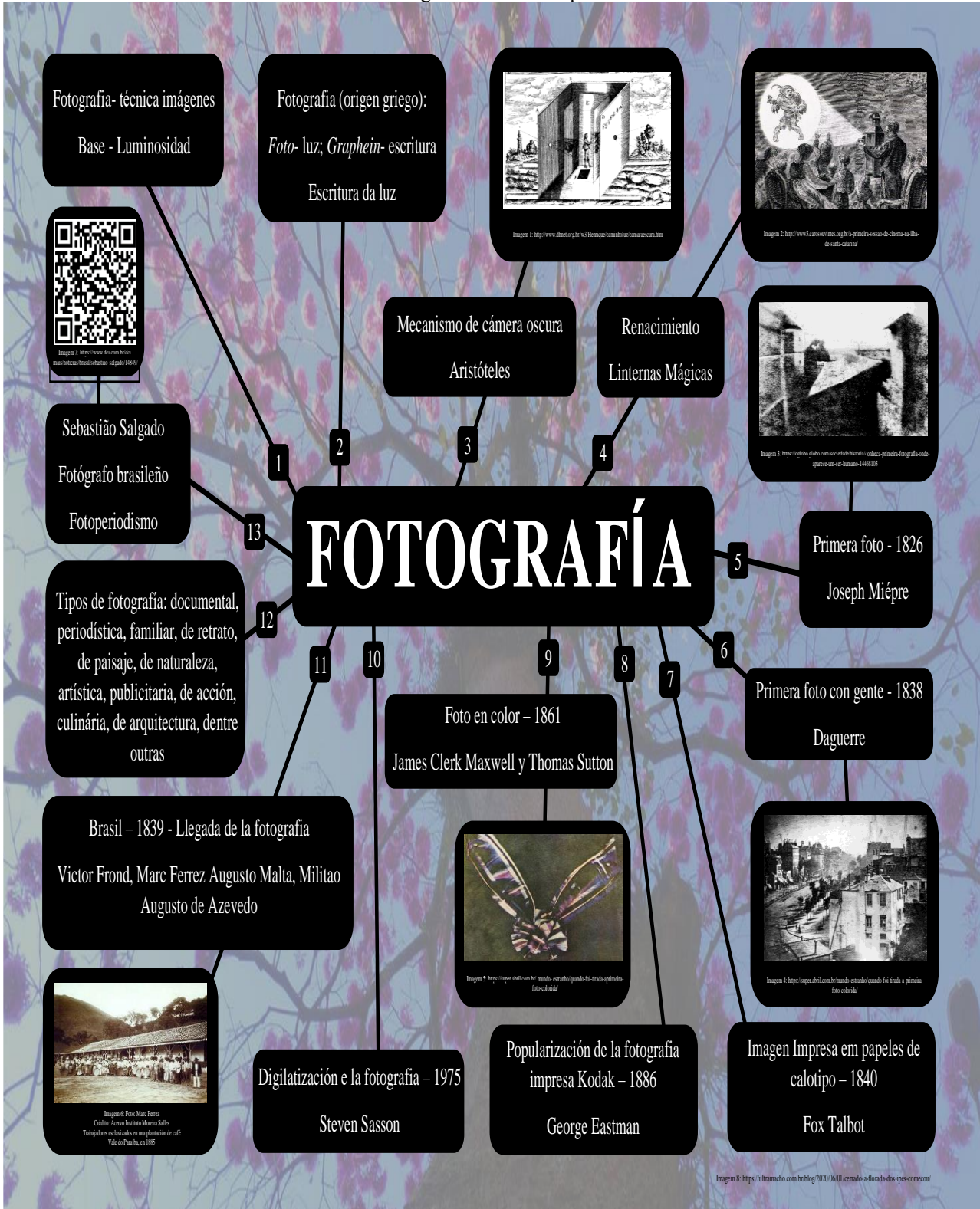


Image available on <https://www.globaltree.com.br/ipe-rosa.html>

3.2 MIND MAP PHOTOGRAPHY



Figure 6 – Mind Map



4 FINAL THOUGHTS

Throughout the project, with the bibliographic research and shared studies on the main issue promoted by the Degree: Art-Education and Technology, where the experience with Photography as memory and historical record and the importance of images in the media are portrayed, the grandiose



exploratory universe for the process of construction of the image and the influence of external factors for its composition are observed.

It is possible to understand the dimension of Art-Education and Technology in a classroom practice using "Photography" as a resource of great value, and to follow the dynamics of memory work and make explicit a field of possibilities of meanings elaborated by the subjects in that specific cultural context.

Photography, therefore, is one of the most modern forms that best expresses a certain prolongation of the arts of memory and in it we point out irreplaceable moments that build a life for ourselves and for others.

For the process of teaching and learning, the individual constructs himself, socialization occurs in the act of sharing, objectification and criticality to his life story occurs in his social and historical environment.

The importance of the applicability of this project opens the doors for self-knowledge, autonomy and above all for the awareness of memory, and that through the assimilated and constructed cultural codes can contribute to the processes of formation of the individual.

Technological culture is important in our reflections and in our educational practices because it implies thinking about intervention in the sciences, about the change of language and customs, and not only about the manipulation of Information and Communication Technologies (ICT).

Innovations and the appropriation of technology cannot be the responsibility of a few teachers, there must be greater leadership by management teams, the inclusion of technology cannot be something that depends on the will of the teacher, it must be a goal to be achieved by schools as a collective. It should be noted that it is necessary to generate technological resources, educational content, and the dissemination of innovative practices, which requires a student-centered teaching model with a greater variety of materials. In this process, it is essential to think about the training of teachers and prepare them for new critical pathways for their classes in view of the teaching of the visual arts.

It is important to consider that the dialogues established by art and technology give rise to human interactivity, and with them the fusion to a new approach to education. Multifunctionality, the mobility of technology and integration with art become human expression and communication.



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