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INTEGRATIVE MODELS OF EDUCATION FOR CITIZENSHIP
(HANDBOOK)

UNIVERSIDAD DE BURGOS

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INTRODUCTION

The world is becoming more diverse every day. The means of transport and communication have improved to the point that we can share our daily grind with anyone in the world in a matter of seconds, regardless their culture, traits, traditions, or beliefs are. This seems to be a great advance for human relationships, but at same time, it requires from people to be in tune with the reality we are currently living in. Developing an active citizenship is essential to reach a social participation under principles such as mutual respect and non-violence in accordance with human rights.

To achieve this goal, our society needs to train people with decisionmaking capacity and critical thinking to face common problems. That is precisely the main advantage what integrative models of education contribute with. The current situation in schools forces teachers and education professionals to create effective alternatives that enhance competencies beyond the acquisition of knowledge and the repetition of living models of previous generations.

This handbook offers a bridge between two important points that need to be considered in any school classroom anywhere in the world: on the one side, it provides readers with a global perspective about what integrative models of education are, focusing on different fields of knowledge and pointing out how they interact. On the flip side, it provides an approach to the concept of active citizenship, which includes the defence of human rights with features of inclusion and equity, and its application in the classroom. This handbook contributes to reach the starting point for developing innovative alternatives of education with traits of those skills that our society strongly demands, and with concise tips for developing a professional career in education field for the 21st century. It is therefore suitable for students and professionals in the field of Education, especially for those who develop their career at compulsory school levels.

INTEGRATIVE MODELS OF EDUCATION

Approach to current Integrative Models of Education[1]

There is a need in our society to train people with **decisionmaking capacity** to deal with the challenge of creating a sustainable future. Education must therefore commit itself to training responsible and active members of the public, capable of taking **evidence-based informed decisions**, and capable of working towards social innovation. In other words, education should help young people to become aware of how they can contribute to the eradication of poverty, protecting the planet, and assuring prosperity for all.

As Heras and Ruiz-Mallén [1] pointed out, skills are needed to achieve these objectives: **critical thinking**, **reflection on scientific process**, and the **integration of social and ethical processes**. The integrated proposals are among those that are pushing in that direction since:

> They promote the *humanisation of knowledge*, favour the students' commitment to their reality, encouraging them to participate responsibly and allowing them to tackle the social and cultural problems that really affect today's society, in short, because the school has among its most important tasks the formation of a citizenry committed to democratic culture and society (Guarro, 2001, as cited in [2, p. 39].

It is important to highlight that in the school context different levels of integration may arise as Gresnigt et al. proposed [3] in Figure 1:

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[1] This chapter contains excerpts from reference [78] with the express authors' permission.
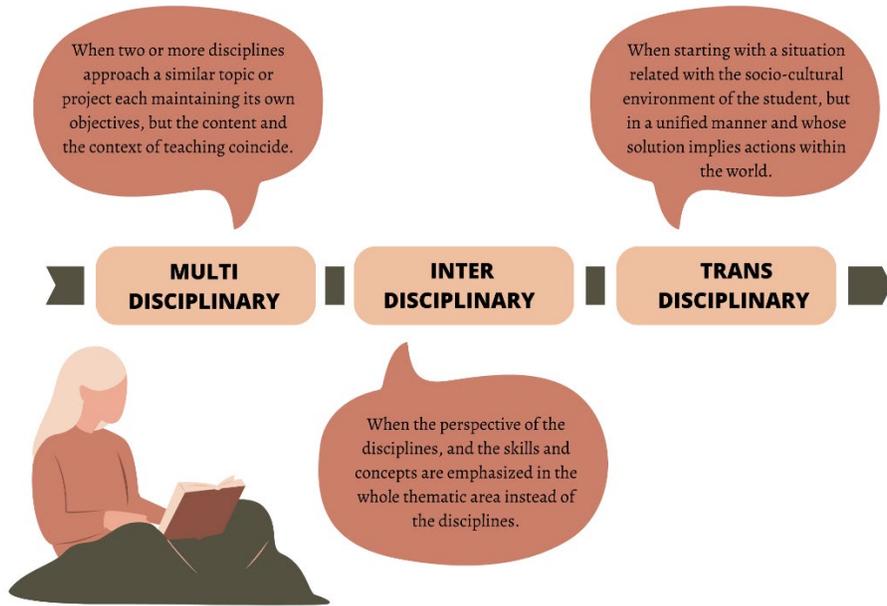
Figure 1. Levels of disciplinary integration. Authors' adaptations from Gresnigt et al. [3].

To implement these integrative proposals, four active and dynamic methodologies have been selected: **Inquiry-based Science Education**, **Engineering design**, **Design thinking** and **Socio-Scientific Inquiry-Based Learning**. These have been considered over the past few years as the most effective at achieving greater student motivation and involvement at all educational levels of compulsory education. They are all characterized by:

- A student-centered approach.

- Starting out from real problems.

- Stimulation collaborative inquiry-based learning.

- Helping the development of critical thought, creativity, cooperative skills, and independent learning, as well as other transversal skills.

INQUIRY-BASED SCIENCE EDUCATION (IBSE)

Inquiry is defined as a complex construction process of meanings and coherent conceptual models, in which students formulate questions, inquire to find out answers, understand and construct new knowledge, and communicate their learning to others, applying the knowledge [4].

From an instructional point of view, above all, in compulsory education it is useful to rely on models to help teaching staff with their lesson planning. Various models have been developed in the form of cycles, to remind us that they should not be understood in a linear manner, but that the phases or stages proposed in them can vary according to the context, in much the same way as with scientific work. Among them, we have the **5E instructional model** proposed by Bybee et al. [5] which groups the inquiry process into five phases (Figure 2).

The European Commission presented the report **Science Education for Responsible Citizenship** in 2015 [4], in which the inquiry-based learning (also known as inquiry method) was proposed as one of the most beneficial in relation to 21st century skill sets. In fact, many European projects have adopted this approach for the teaching of sciences and have designed didactic material principally for the later stages of primary and secondary courses, for example, the projects **Profiles** [6], **Fibonacci** [7], **Sails** [8], **Prismas** [9], **Parrise** [10, 11], and **Engage** [12].

ENGAGE

Awake interest among students with problematic situations, close to their experience (generated from observation of the environment, readings, videos, news, etc.) or their own concerns. Incentivize the construction of good questions or problems that can be investigated, or to which scientific-based answers can be found.

EXPLORE

Define the hypothesis, which is a provisional proposal, in the form of a model or statement, in order to explain a fact, a phenomenon, or a problem. It is not necessary for the answers of the students to be "correct", but spontaneous answers must be avoided and students must be asked to ground their answers in the evidence or the knowledge that they possess.

EXPLICATE

Propose ways of testing the hypotheses (experience, observations, investigative activities, etc.) and indicate their potential advantages and limitations. When deciding on a means of hypothesis testing, it is important to ensure that students are capable of understanding and interpreting what they are doing.

ELABORATE

Analyse the collected data to find responses to the initial questions and to arrive at conclusions. To do so, the students should be incentivized to represent the information in a specific way, separating what may be observed in the experiment from the previously structured data, assembled on the basis of that observation.

EVALUATE

Applicate the results and the explanatory models to new situations. In general, the conclusions and explanatory models that were developed correspond to very concrete situations and specific settings. These models must be transferable to other realities and situations, in order to reach their interpretative potential.

Figure 2. 5E instructional model. Authors' adaptation from Bybee et al. [5].

Depending on the independence of the students during the inquiry methodology, three types or levels of inquiry may be seen [13]:

(1) **Open inquiry**: student formulates a question, designs, leads and communicates the results of the inquiry.

(2) **Guided inquiry**: teacher helps students with inquiries in the classroom (normally, the teacher chooses a question for the inquiry and, occassionally, also designs the experiments).

(3) **Combined inquiry**: merges guided and open enquiry.

Working a particular concept, idea or template is useful with guided inquiry, because it is the teacher who selects the question that guides the research; but the type, extension and depth of these investigations will vary depending on age, competences, and topic.

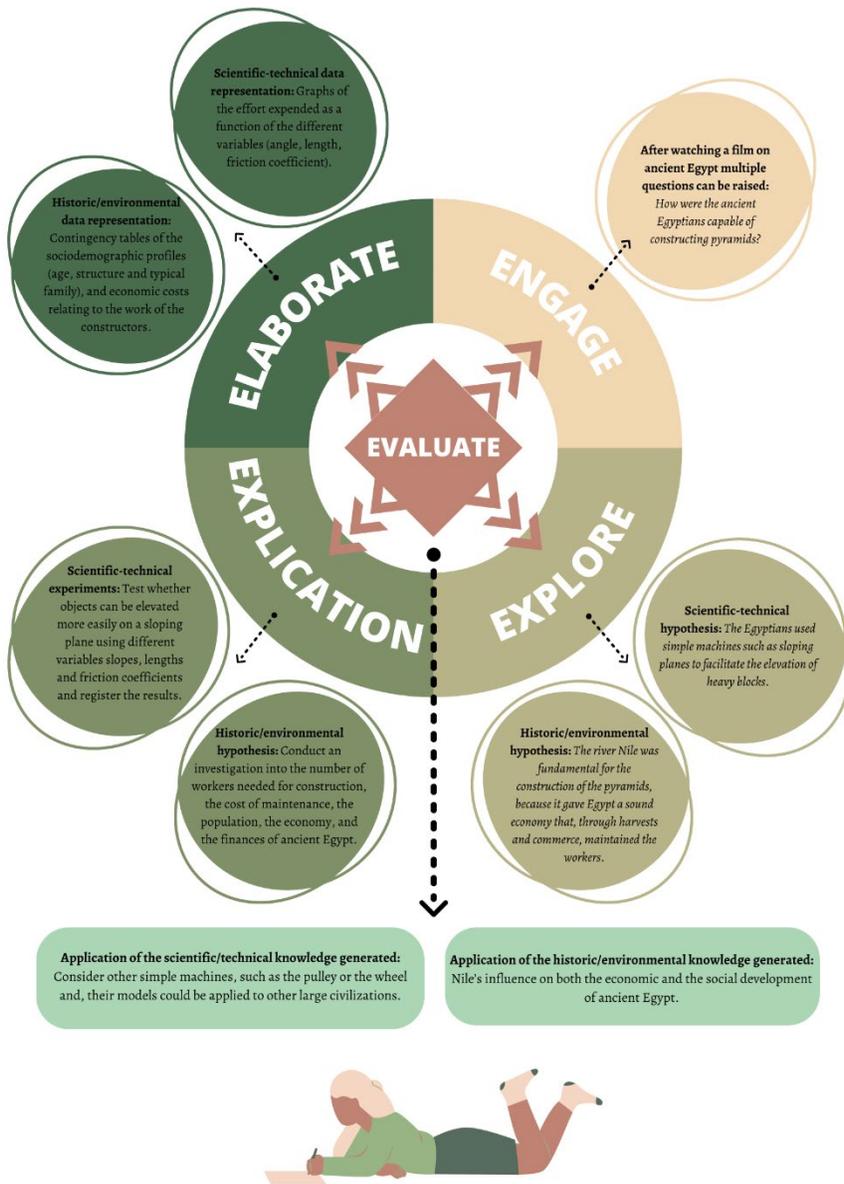The following is an example of a possible teaching sequence based on IBSE (Figure 3):

Scientific-technical data representation: Graphs of the effort expended as a function of the different variables (angle, length, friction coefficient).

Historic/environmental data representation: Contingency tables of the sociodemographic profiles (age, structure and typical family), and economic costs relating to the work of the constructors.

After watching a film on ancient Egypt multiple questions can be raised: *How were the ancient Egyptians capable of constructing pyramids?*

ELABORATE

ENGAGE

EVALUATE

EXPLICATION

EXPLORE

Scientific-technical experiments: Test whether objects can be elevated more easily on a sloping plane using different variables slopes, lengths and friction coefficients and register the results.

Scientific-technical hypothesis: *The Egyptians used simple machines such as sloping planes to facilitate the elevation of heavy blocks.*

Historic/environmental hypothesis: Conduct an investigation into the number of workers needed for construction, the cost of maintenance, the population, the economy, and the finances of ancient Egypt.

Historic/environmental hypothesis: *The river Nile was fundamental for the construction of the pyramids, because it gave Egypt a sound economy that, through harvests and commerce, maintained the workers.*

Application of the scientific/technical knowledge generated: Consider other simple machines, such as the pulley or the wheel and, their models could be applied to other large civilizations.

Application of the historic/environmental knowledge generated: Nile's influence on both the economic and the social development of ancient Egypt.

Figure 3. Example of a didactic sequence based on 5E instructional model proposed by Bybee et al. [5].

ENGINEERING DESIGN

Engineering design method often approaches interdisciplinary problems of special complexity based on conflict, crisis, and disasters. Their definition and realization include aspects of human rights, with clear technological and social dimensions.

The engineering design method within citizenship education:

- Facilitates the understanding of scientific ideas from all areas when applying them to resolve engineering problems.

- Favours the understanding of how science affects life and society through engineering and technology.

- Enables the acquisition of some key concepts, such as the design process, efficiency, sustainability (economic, ethical, social, material, and knowledge-related) and limitations inherent to any technological solution.

- Sweeps away the notion of error –there is no perfect solution, as they may all be improved–.

In the school context, the engineering design method is usually organized into some stages. Once again, as in the case of the inquiry method, the process is circular, with modifiable interrelations in accordance with the context.

Phase 1: Set out the problem. It can be determined through the detection of a need or an improvement within a school context.

Phase 2: Inquiry into the problem, previously existing solutions, and limitations. Although not all models take it into account, education for citizenship is interesting to add in this phase of identifying the community perspectives, as Tan et al. [14] proposed. Whatever the example that is proposed, what do the different social groups want (people with functional diversity, neighbours, and institutions and public leaders?).

Phase 3: Develop possible solutions. It is relevant that students have the opportunity to express their ideas and to propose, in a reasoned manner, different solutions.

Phase 4: Select the best solutions according to some of the aspects under evaluation or established criteria. It is worth clarifying there is no good solution in an absolute sense and that there may be more than one that is acceptable.

Phase 5: Prototype construction.

Phase 6: Test and valuate the prototype, both from the technical (*Is it viable? Is it intuitive? Would it be aesthetically pleasing? Is it easy to update?*) and the social point of view (*To what extent does it answer the needs and demands of the different collectives? What opinions are not reflected in it?*).

Phase 7: Communicate the results – for and against the prototype and areas for improvement that have been detected.

Phase 8: Improve the prototype, whether introducing small modifications, or new solutions, which they consider improve both the technical and the social specifications of the problem.
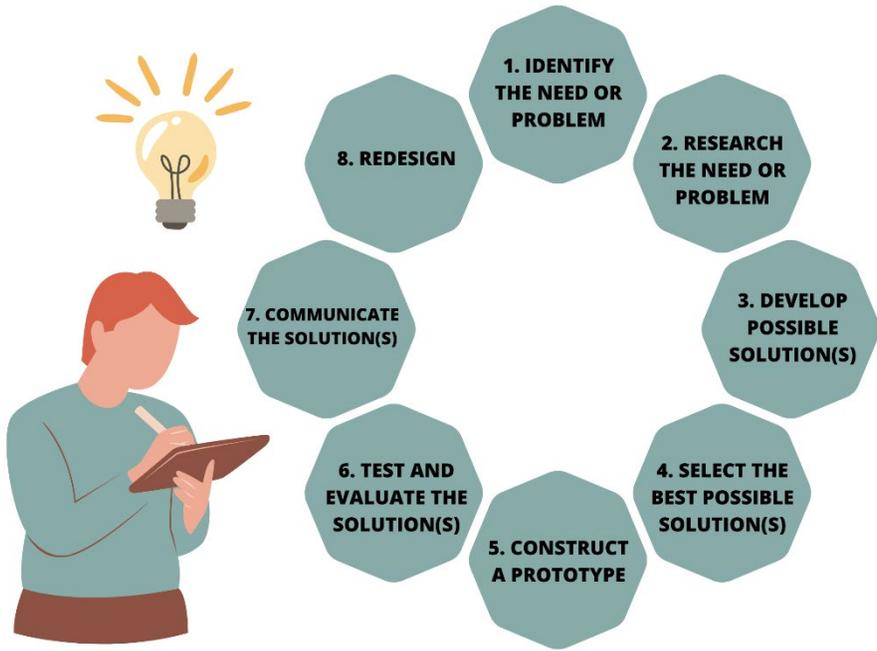
Figure 4. Phases of engineering design method.

DESIGN THINKING

Design thinking is a holistic approach for the resolution of problems that is composed of five non-linear stages; at any time, moving forwards or backwards, if convenient, or jumping to non-consecutive stages (Figure 5).
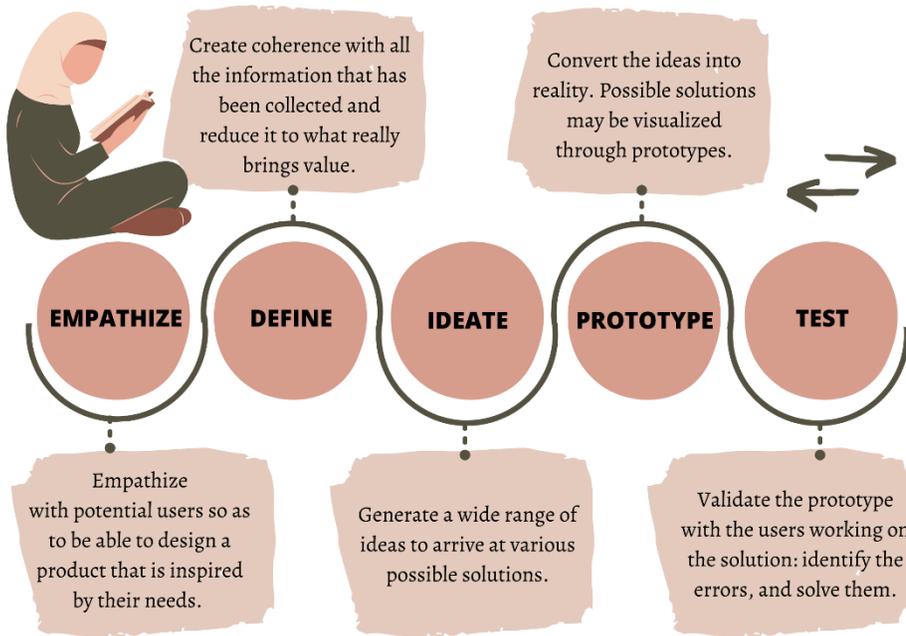
Create coherence with all the information that has been collected and reduce it to what really brings value.

Convert the ideas into reality. Possible solutions may be visualized through prototypes.

EMPATHIZE **DEFINE** **IDEATE** **PROTOTYPE** **TEST**

Empathize with potential users so as to be able to design a product that is inspired by their needs.

Generate a wide range of ideas to arrive at various possible solutions.

Validate the prototype with the users working on the solution: identify the errors, and solve them.

Figure 5. Design thinking methodology. Authors' adaptation from the Stanford Desgin School [15].

SOCIO-SCIENTIFIC INQUIRY-BASED LEARNING

- This methodology combines the educational value of socio-scientific issues, through the inquiry method and citizenship science which enables students to:

- Understand how science can be transformed and used in social and ethical contexts.

- Discuss the uncertainty associated with scientific activity.

- Distinguish between scientific, social, and ethical proposals, and recognizing the social and political context in which the decisions are taken in science and technology.

The central idea of this method is, for Levinson and the Parrise consortium [10], inquiry into a problem that leads to improvements in local and/or global

conditions, producing actions through democratic processes, and taking advantage of scientific knowledge that can be re-contextualized as part of the process.

The starting problems can have the way of a dilemma or an issue in which opposing arguments are presented by different parties, both supported by sound reasons. The type of problem can vary a lot, but it must be bear in mind that they have to be researchable (students must sustain their arguments with evidence) and have to lead to courses of action (constructing something, generating instruction materials, promoting an institutional change, creating a debating forum, a scenario of a theatrical work for an older audience that illustrates a dilemma, producing banners to promote further discussion, etc.).

The role of Social Science in Integrative Models

Social sciences can be understood as **the tool to achieve an approach the environment in which we live and develop**, both social and natural, as well as the interactions that take place in it. From this point of view, today's society needs to train people **with the ability to make decisions aimed at creating a sustainable future** [16]. Therefore, education in social sciences should be directed at the formation of critical and responsible citizens with the capacity to act in various social changes. In this sense, it is essential for students to investigate, research, discover and learn **how they can contribute to addressing the great challenges of the 21st century**: poverty, the protection of the planet and, in short, to ensure the development of a free, prosperous, and committed citizenship.

Given that the problems associated with the study of the reality in which we live are complex, dynamic, and interdependent, **the possibility of reducing them to the analysis of a single disciplinary perspective is meaningless** [17, 18]. Therefore, "quick and pertinent responses to the globalized reality" are required [17]. In other words, it is necessary to develop **critical thinking skills**, reflection on scientific processes and integration of social and ethical processes [19].

Traditionally, social sciences have been understood as a discipline antagonistic to those properly called sciences. That is, the sciences of humanistic nature as opposed to the sciences with more empirical character. However, **observation and reflection are equally necessary in the case of sciences and in the case of social sciences**. Therefore, we

*Observation and **reflection** are equally necessary in the case of both social and natural sciences.*

should not understand them as opposing but complementary disciplines. We live in a reality characterized by a great diversity of multidimensional phenomena and processes based on relationships, self-regulations, and interconnections with the environment. From this perspective, **this complementarity makes sense since the**

integration of several disciplines is necessary to favour both explanations and solutions to the different problems of society.

Thus, this diversity of multidimensional phenomena and processes, based on relationships, self-regulations and interconnections with the environment, characterize the reality and the approach to it, as well as to the phenomena and problems that develop in it, **is only possible from a multidimensional approach**, which is raised from the theoretical point of view and pedagogical practice [20], otherwise, **we will fall into the biased or partial treatment of what we want to study** and, thus, to know [21]. It is, therefore, necessary to implement a global dialectical approach that allows us to observe the **human being**, their relationships with nature and with the systems created by them, which will allow us to apprehend the reality in a more integrated and coherent way.

The practice of interdisciplinarity, thus, requires handling theoretical concepts from different disciplines, their methodology and procedures, but fundamentally having the capacity for **observation and reflection to understand the relationships and interconnections established between them** [22]. Interdisciplinarity is understood as the main way to reach the understanding of the phenomena and problems that make up the environment as a coherent whole and irreducible to a disciplinary vision [17, 20], in which the integration of knowledge is allowed under a globalizing dialectical approach in which from the disciplines cooperative relationships, contribution and permeability are established to understand and interpret the world in order to arrive from there at a solution of complex and practical problems. **The greater the degree of permeability, the greater the transfer and interrelation** and, therefore, the greater the degree of integration [17].

However, the relationship between social sciences and other disciplines, such as engineering, architecture, anatomy, philosophy, or arts can already be found in the Renaissance and the greatest exponent of this period, **Leonardo Da Vinci**. Both his curiosity and ability for observation and reflection led him to a search for knowledge from a globalized point of view, working in unison in the resolution of various problems from several disciplines. Da Vinci himself is credited with the

statement *"The most useful science is that whose fruit is the most communicable".* In this sense, **it highlights the importance established between science and Society as the origin, destination, and means through which the knowledge provided by sciences is transferred**. From this point of view, and continuing with an example of the time, understanding the genius of Michelangelo's David is not only in the appreciation of the beauty and contemplation of a work of art. **The mathematical proportions, the anatomical study, but fundamentally the socio-cultural context, the philosophical thought that underlies the work itself and the reflection or the aspirations of society also plays a fundamental role**.

Whereas the aim of social sciences is to train a critical, responsible, and active citizenry, capable of proposing and participating in social change, the **teaching of social sciences must make invisible people, groups, or identities visible**, including the concept of gender as a category of social analysis. Thus, teachers should pay attention to a series of recommendations in order to introduce certain concepts and perspectives in the classroom in a **natural way**, for which we propose the next:

> *The teaching of social sciences must make invisible people, groups, or identities visible.*

Proposal to naturally include social science in the classroom.

1. **Reflection and selection of content**, avoiding the uncritical transmission of stereotyped historical discourses and a reductionist and anachronistic vision of the historical past and of present-day society. *For instance, in the study of World War II, instead of focusing on the classic analysis of military advances, or the political strategies, we can analyse the conflict from the perspective of the people who lived in the immediate aftermath of the war.*

a. Promote **non-androcentric interpretations** of the realities studied.
b. Problematisation of **social inequalities**, deconstructing relations of domination, marked by the protagonist profile of the political or military leader.
c. Identification of **stereotypes and prejudices**.

2. **Avoiding the methods that involve memorisation or uncritical recall**, far removed from historical understanding and the construction of social knowledge. The aim would be to develop research activities, debates, role-playing, etc, using active methodologies, like PBL (problem-based learning).

3. Analysis of **social invisibilities and absent identities**. *Following the same example, we could study the work that women did during the war, how children went about their daily lives, or the reflections of these or other actors during/about the conflict.*

4. Construction of **counter-narratives** (based on social justice and Human Rights), *i.e., as an alternative to hate narratives (often directed against women and the LGBT+ community), oriented towards social action and the development of critical thinking.*

a. Recognition of the presence of groups in a **contextualised situation of vulnerability** in order to avoid hate speech.
b. Considering **emotions and feelings** as categories of social analysis.
c. Reflecting on the **limits of the right** to expression.

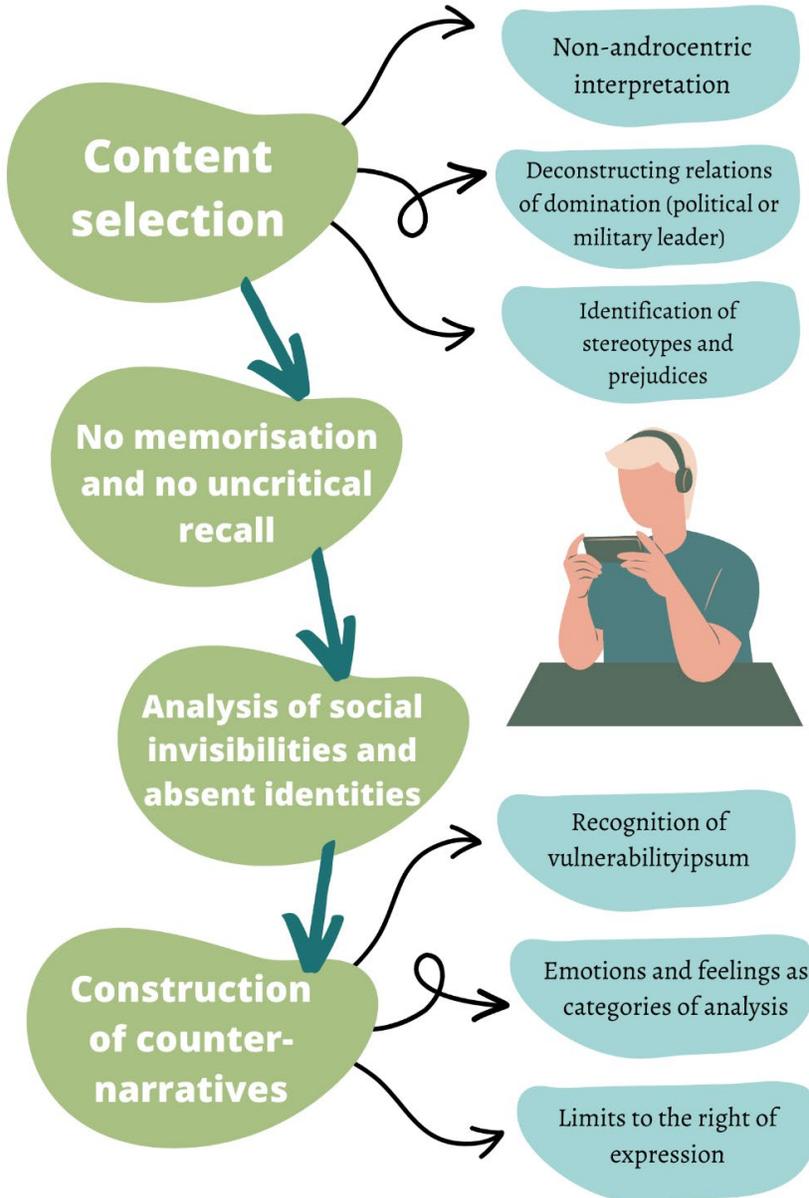**Content selection**

Non-androcentric interpretation

Deconstructing relations of domination (political or military leader)

Identification of stereotypes and prejudices

No memorisation and no uncritical recall

Analysis of social invisibilities and absent identities

Recognition of vulnerabilityipsum

Emotions and feelings as categories of analysis

Construction of counter-narratives

Limits to the right of expression

Figure 6. Work proposal for reaching the educative objective from the social science perspective.

Therefore, we consider that education in social sciences, especially in history, should be directed towards the development of historical concepts such as **historical empathy, relevance, or historical perspective**. In this sense, it is essential for students to understand how patriarchal, subjective categories have been constructed, as well as to analyse the hierarchical positioning of men over women's actions and narratives. Moving away from the margins of the reductionist vision of history, based on the public sphere, allows us to approach a vision of history based on the understanding of social relations and practices, **favouring a holistic perspective**, which develops critical thinking skills that can favour certain actions such as responsible citizenship.

The role of **Natural Science** in Integrative Models

Natural sciences have always represented an unavoidable discipline when talking about **disciplinary integration** to explain and undestand any phenomenon, event, question, or problem related to the real world; and this idea has been extrapolated to the educational field in the same way. Therefore, approaching disciplinary integration from the point of view of natural sciences leads us to go back a few decades (between the late 1970s and during the 1980s) and highlight, among others: the Science, Technology and Society (STS) movement, the Science-Technology, Society and Environment (STSE) movement, a proposal developed from the previous one, and the Public Understanding of Science (PUS) movement.

In the case of the STS movement, a more **global and holistic science education** was sought, focused on the use of interactions between social issues (considered relevant to the scientific-technological literacy of the citizenship) and scientific knowledge along with related technologies [23]. This movement was especially concerned with the well-known education for **sustainable development**, and from this vision, it evolved by adding the E for Environment to the acronym, to become known as the Science, Technology, Society and Environment movement (with the acronym STSE).

In turn, the PUS movement arose with similar objectives to STS and STSE, and it was initially promoted by scientists who were seeking more efficient scientific communication because of a concern for the difficulties and lack of understanding of scientific knowledge by citizens. Thus, the PUS movement incorporated the need to foster citizen engagement with science [24], a development that turned this movement into a field of study on the democratization of science[2].

However, given the topical orientation of this handbook, in this section we focus our attention on presenting a current view of **integrated science, technology,**

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[2] More detailed information on these movements can be found in [79] for the STS case, [76] for STSE, and [77] for the PUS movement.

engineering and mathematics (STEM) education and its **STEAM** evolution (with the addition of arts as well as the other humanistic disciplines when we adopt a more sophisticated view). These are the most powerful and relevant integrated approaches (both in relation to students and teachers' effects) that currently involve the integration of Natural Sciences. However, it should be noted that, although the STEM acronym does not include an S pertaining to society and its ideological and educational roots are different and distant from the aforementioned movements, integrated STEM and STEAM education are also addressing **sociocultural issues** [25].

After delving into the necessary epistemological discussion of integrated STEM education [26], we have developed a theoretical framework for integrated STEM education (also valid for STEAM) aimed at the competency development of students from a **humanistic vision** [27]. To this end, we propose the need to address three interrelated levels of commitment (theories, methods, and goals) that are coherent, justify and support an integrated, inclusive and humanistic STE(A)M education.

Furthermore, we have recently identified and reviewed the main theoretical models on integrated STEAM education published in the literature [28]. For this handbook, we highlight below those models that go beyond disciplinary integration by explicitly including some issue related to citizenship education, such as the models proposed by Quigley et al. [29], Chu et al. [30], and Trott et al. [31]:

- The **Quigley et al. model** [29] proposes a conceptual model for STEAM that provides educators with a pathway to understanding and implementing effective STEAM instruction. Their model is organized into two domains: instructional content and learning context which encompass a total of six essential dimensions:

  (1) **Instructional content** includes the dimensions of source material, disciplinary integration, and problem-solving skills.

  (2) **Learning context** includes the dimensions of pedagogical approaches, assessment practices and equitable participation. This third dimension,

that covers how the classroom facilitates access to knowledge and participation of student in the learning process with specific attention to abilities and resources, addresses task relevance, diversity, accountability, and student choice.

- The **Chu et al. model** [30] proposes a theoretical framework for teachers to develop a STEAM program aimed at improving science teaching and learning in a cross-cultural context, from epistemological, psychological, and methodological perspectives. In coherence with their intercultural objective, they are based on socio-constructivism, assuming that subjects collectively construct knowledge, interacting collaboratively with others and with the environment. This aspect is reinforced by their adoption of situated learning as a psychological posture, which places learning as a product of the activity, the context, and the culture in which it is developed. From the methodological point of view, they adopt the 5E cyclical model of instruction applied to inquiry-based teaching, a cyclical learning approach that guides students through activities that contemplate five stages: participate, explore, explain, elaborate, and evaluate (see chapter *Approach to current Integrative Models of Education*).

- The **Trott et al. model** [31] seeks to engage young people to imagine a better future and act collaboratively in favour of sustainability. According to the authors, although many of the proposals that include art are more focused on competitiveness, it can go much further, and the integration of art and acience is an essential element to deepen understanding and commitment to the challenges of sustainability. On the one hand, it offers a way to overcome some constructed and institutionalized divisions (e.g., emotion-reason and art-science), which seem to hinder sustainable transformation. On the other hand, it enables ideas and methods, which could give rise to new answers to our old sustainability problems. To this end, they present a methodological framework that integrates arts and sciences by combining three elements:

(1) **Transdisciplinary learning**, which organizes teaching and learning around meaning-making in the context of real-world problems or issues and focused on understanding sustainability challenges.

(2) **Participatory process**, a collaborative approach that brings together researchers and participants to identify, study and address problems in community settings, focused on critical engagement with current unsustainable realities and planning for social change.

(3) **Collaborative action**, a community action approach that involves working together for societal transformation toward sustainability, focused on actively generating sustainable alternatives at the local level.

Other models [32, 33] mention empathy (from the point of view of art and design pedagogy) or critical thinking (from the scientific-technological point of view) that could be deepened and taken up again from the interests of this handbook.

We would like to end this section by clarifying that, because of their flexible (but no less rigorous) nature, STEM and STEAM approaches are particularly powerful in the search for inclusion, equity and, ultimately, in the creation of an active, committed, and respectful citizenship in society.

The role of **Arts** in Integrative Models

Within recent didactic foundations and cognitive or process approaches to teaching, there is an increasing impetus to create integrated lessons. A growing trend is precisely the integration of art education into other subjects, as educational institutions realize the important role that art plays in shaping the overall knowledge and perspective of the learner. Even though art education is taught as a separate subject in many countries, there are infiltrations into the others. **Visual stimuli, graphic elements or organisers** are an integral part of almost every textbook. This has to do with storing information in long-term memory and making cognitive connections that are simpler and easier to understand through images.

The integration of art education is therefore closely related to **visual literacy**, which is now an essential condition for the functioning and application of the individual in society. The integration of the arts:

- Provides pupils with a well-rounded education.

- Helps them to see the connections between objects and information and to understand the world more comprehensively.

- Shapes their emotional intelligence and fosters creativity, imagination, and innovation [34, 35].

VISUAL LITERACY

Visual literacy is a multidisciplinary field nourished by different areas such as graphic design, psychology, education and communication studies and it is considered a key skill in today's world where visual information is ubiquitous. In many industries such as advertising, journalism, and information design, visual literacy is essential for professionals to effectively communicate information to their audiences [36].

Visual literacy refers to the ability to understand and interpret visual images and media such as photographs, pictures, illustrations, graphs, maps and diagrams as well as the ability to create visual information for the purpose of effective communication [36, 37, 38].

In education, visual literacy is considered an important aspect of media literacy, which is the **ability to critically analyze, evaluate, and produce media messages**. By developing visual literacy skills, students can be better prepared to understand and interpret the visual messages they encounter in everyday life, as well as to effectively communicate their own ideas and information through visual means [39]. Integrating art education into other subjects such as science, home science, language, mathematics, and music can enable students:

- To better understand complex ideas and communicate their own ideas effectively.
- To develop critical thinking and problem-solving skills.
- To foster pupils' creativity.

CREATION PROCESS

In developing the integrative model, we will draw on a **process approach** that has been gradually formulated within progressive educational movements and has proven to be very effective. It promotes an individual approach, respects the specific requirements of students, and leads them to develop their own cognitive strategies that help them to store information more effectively and to integrate it into the structure of the knowledge they have acquired so far.

The process approach in education refers to a method of teaching that focuses on the steps or stages that students go through to complete a task, understand a concept, or achieve a goal. In this approach, the focus is on the **process of learning** rather than just the outcome, and the teacher acts as a facilitator to guide and

support students as they work through different steps. Using the procces approach in education is beneficial for several reasons:

(1) It is based on a **student-centered learning approach** which allows them to take responsibility for their learning and deepen their understanding of the material.

(2) It develops **critical thinking skills** by taking incremental steps to solve a problem or understand a concept.

(3) It uses **hands-on, experiential learning** that helps students engage meaningfully with the material and retain information more effectively.

(4) It encourages **creativity and innovation** by providing opportunities for students to explore and experiment with new ideas.

(5) It supports **social and emotional development** by working in groups, collaborating, and learning to communicate effectively.

The process approach is used in a variety of educational settings including primary and secondary schools, colleges, and universities. It is also used in many subject areas such as art, music, science, and technology. The approach can be adapted to a wide range of teaching styles and can be used in both formal and informal learning environments [40].

It is important to point out that the different steps of the creation process are intertwined and do not occur in isolation (Figure 7). They influence each other and condition the next steps in the pupil's creative process [41, 42].
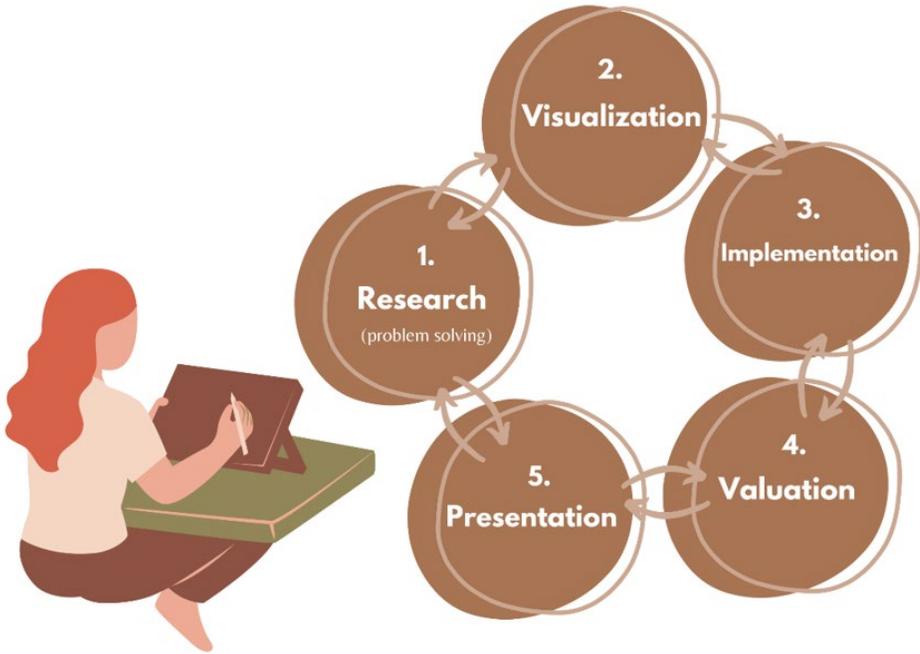
Figure 7. The creative process in art education.

MODEL OF INTEGRATION OF ART EDUCATION IN EDUCATION

Based on the above design process we have created a graphic organizer to facilitate the teacher's preparation of an educational unit aimed at integrating art education and art activities into other subjects. This tool is based on the process approach and can guide a teacher to learn the steps and apply the correct procedures and methods. Thus, a teacher can be inspired by these suggestions and use a similar principle when creating graphic organisers for his/her pupils.

Thus, we suggest a procedure that a teacher should follow to properly integrate art activities into the selected educational units (Figure 8):

(1) **Determine the topic and the learning objectives**, bearing in mind that the integration of art should not be a mere embellishment, but that discipline-specific objectives should be set.

(2) **Plan the activity**, decide on its form, think about what content is needed to best address the topic and integrate as many subjects as you need.

(3) **Select appropriate art techniques and methods** for the activity based on the subject matter and learning objectives.

(4) **Gather materials and resources** needed for the activity, such as art supplies, books, and videos.

(5) **Introduce the activity to the students** and explain the topic area, the learning objectives, and the art techniques that will be used.

(6) **Guide the students** through the process of creating the artwork, helping them to research, plan, create and reflect on their work.

(7) **Encourage discussion and reflection**.

(8) **Assess students' work** taking into account their artistic skills and techniques, critical thinking and problem-solving skills and understanding of the subject area.

(9) **Recognize students' work** either by displaying it in the classroom or by presenting it to a wider audience.
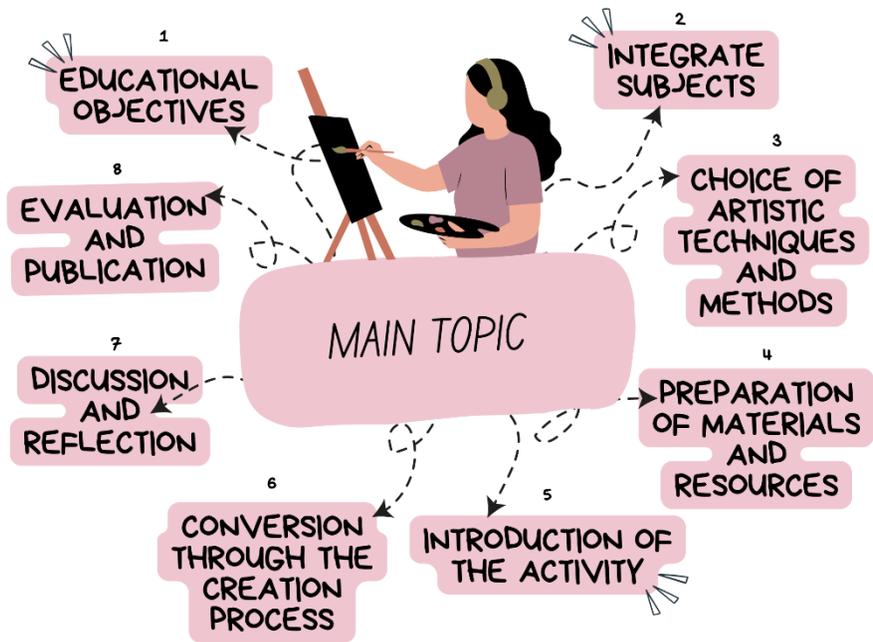
Figure 8. Graphic organizer to create an integrated sequence.

For students who have not worked with similar graphic organizers before, it may be more difficult at first to understand the different contexts. We have therefore decided to discuss the different phases in more detail and to simplify the use of the graphic organizer by means of help questions.

Gradually, the student or teacher can use simpler aids in the creation of an integrated educational unit, until they have mastered the different phases of the process to the point where they are able to use and transform them for the integration of other subjects. Next you can see a more detailed graphic organizer (Figure 9) for creating well thoughtout and structured integrated learning.
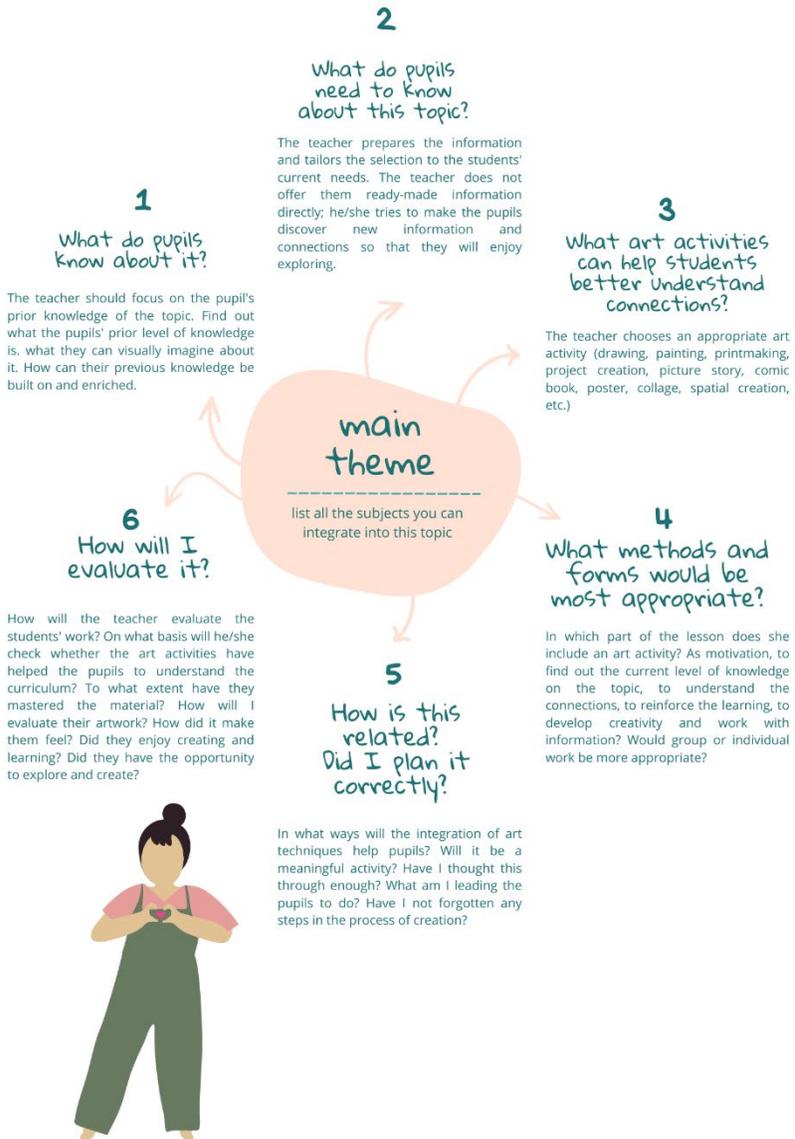
2

What do pupils need to know about this topic?

The teacher prepares the information and tailors the selection to the students' current needs. The teacher does not offer them ready-made information directly; he/she tries to make the pupils discover new information and connections so that they will enjoy exploring.

1

What do pupils know about it?

The teacher should focus on the pupil's prior knowledge of the topic. Find out what the pupils' prior level of knowledge is. what they can visually imagine about it. How can their previous knowledge be built on and enriched.

3

What art activities can help students better understand connections?

The teacher chooses an appropriate art activity (drawing, painting, printmaking, project creation, picture story, comic book, poster, collage, spatial creation, etc.)

main theme
_____
list all the subjects you can integrate into this topic

6

How will I evaluate it?

How will the teacher evaluate the students' work? On what basis will he/she check whether the art activities have helped the pupils to understand the curriculum? To what extent have they mastered the material? How will I evaluate their artwork? How did it make them feel? Did they enjoy creating and learning? Did they have the opportunity to explore and create?

4

What methods and forms would be most appropriate?

In which part of the lesson does she include an art activity? As motivation, to find out the current level of knowledge on the topic, to understand the connections, to reinforce the learning, to develop creativity and work with information? Would group or individual work be more appropriate?

5

How is this related? Did I plan it correctly?

In what ways will the integration of art techniques help pupils? Will it be a meaningful activity? Have I thought this through enough? What am I leading the pupils to do? Have I not forgotten any steps in the process of creation?

Figure 9. Detailed graphic organiser to create an integrated sequence.

TOPICS AND EXAMPLES OF INTEGRATION OF ART ACTIVITIES

In this section we offer some examples of some topics that can be addressed in an integrative way, including art:

Sustainability and environmental issues	**Eco-printing**: creation of eco-prints by pressing leaves, flowers, or other natural materials onto paper, fabric, or other surfaces. **Nature collages**: creation of nature collages by collecting and arranging natural materials, such as leaves, twigs, and stones into an artistic composition.
Social and cultural issues	**Cultural storytelling:** creation and performance of stories that reflect the traditions, values, and beliefs of different cultures. **Portrait drawing**: creation of portraits that reflect their own identity and the identities of others.
Globalization and interdependence	**Mapmaking**: creation of maps that demonstrate the interconnectedness of the world and the impact of globalization on local communities. **Collage of cultures**: creation of collages that reflect the cultural diversity of the world.
Economic and financial literacy	**Money collage**: creation of collages that reflect their attitudes and beliefs about money. **Budgeting simulation**: participation in a budgeting simulation where they make decisions about how to allocate a limited amount of money.
Health and wellness	**Mindful coloring**: mindful coloring, where they focus on the present moment. **Yoga**: Physical practice that promotes physical and mental wellness.
Civic engagement and social responsibility	**Community service project**: participation in a community service projectwhere they contribute to the well-being of their local community. **Social justice collage**: creation of collages that reflect their attitudes and beliefs about social justice issues.

Also, there are many art techniques that are interesting and suitable for students in the integrative model of education. Here are a few examples:

TRADITIONAL TECHNIQUES	NON-TRADITIONAL TECHNIQUES
Painting	Performance art
Collage	Street art
Photography	Video art
Printmaking	Sound art
Sculpture	Social media art
Fiber arts (weaving, knitting, and felting)	Participatory art
Digital art	

The role of **Math** in Integrative Models

Mathematics is a **language that describes the world quantitatively**. Besides the number of items, mathematics can also interpret patterns, objects and their features, processes and many more. Thus, mathematics relates to various disciplines, including those studying nature, society, art, etc. **The transversion of mathematics into many disciplines can be demonstrated by mathematical concepts taking place elsewhere**. For example, the Fibonacci sequence can be found in fauna; the golden ratio describes human body parts' proportion; number systems and logic are fundamental for computer science; vector algebra is used in visual effects; prime numbers secure personal information, etc. These and many more mathematical concepts should relate to real-life examples when teaching mathematics. Otherwise, pupils would learn isolated facts that could not be practically used. Furthermore, **teaching facts separated from real-life experience and not showing signs of future use decreases students' motivation to learn**. There are several ways how mathematics can contribute to integrative models.

INTEGRATING MATHEMATICS THROUGH STUDENTS' EXPERIENCES

Students may find mathematics disconnected from the real world. This misconception is often built from the earliest years by formulating unrealistic problems, such as *"Steve bought 24 cartons of milk for $3,49 each. How much does Steve need to pay for his purchase?"* Despite the appropriate function of the problem, that is practising multiplication, it may not make sense to people thinking about the situation. The issue with this maths problem is that we do not know the broader context and why anyone would buy that many milk cartons.

There are two ways of fixing this issue. The first requires **adapting the problem to correspond with students' real-life experiences**. In our case, it could be done by changing the number of cartons to a more appropriate number. There are two numerical data in the problem, and we should ensure both are similar to what students can experience.

The second way **asks to include further details about the situation**. If Steve were a leader of a cooking class with 23 apprentices, and they would learn how to make, e.g., pancakes, having bought 24 cartons of milk makes sense. Therefore, the problem should include information about **why numbers and situations are relevant and meaningful**. It should inform solvers about what is happening and why it is done this way. Besides that, caution should be applied to the meaning of the problem. In other words, solving such a problem must give someone information that can be used for some purpose. **The information must be valuable to someone**. In this case, the total price tells Steve how much money he needs to carry in his wallet.

We could argue further: today we use card payments more often than cash – moving toward a cashless society; therefore, counting bills is not relevant anymore. Therefore, we should mention that, for example, the place Steve goes to is a local farm where you can pay cash only.

Going through the given problem, we can conclude that **maths problems are integrated with students' experiences** when they answer additional questions about **real-life correspondence** (e.g., *Are prices appropriate?*), **contextual relevance** (e.g., *Why someone needs that many items?*), and purpose of solving the problem (e.g., *How could someone use the obtained solution?*).

INTEGRATING MATHEMATICS INTO SUBJECTS WHERE MATHEMATICS IS USED AS A TOOL

One way of integrating mathematics within the curriculum is to show how **it contributes to other disciplines**. The compulsory curriculum of primary schools consists of multiple subjects. OECD [43] classifies them into *reading, writing, and literature*; *Mathematics*; *Natural Science*; *Social Science*; *Modern foreign languages*; *Arts*; *Physical Education*; *Religion*; *Technology*; *practical and vocational skills*; and others. As mathematics deals with quantity, **we must employ it when determining**

any number-related topic. Working in schools with separate subjects, you may integrate maths during both no-mathematics and mathematics classes. In both cases, mathematics is a tool for **solving a problem about a specific content**, and the content helps us shed some light on the important role of

Maths is a tool for solving a problem about a specific content.

mathematics in the world. The following table presents some of the many topics and areas where mathematics is present and possibly integrated into other subjects, for example:

SOCIAL SCIENCES	NATURAL SCIENCES	ARTS
Finance	Motion	Drawing
Population	Temperature	Dancing
Politics	Fauna and Flora	Music
…	…	…

Example 1

The problem of a **rising population is relevant to many regions**. While discussing this topic with students, you may refer to the problem in terms of population density that can be **addressed using area and proportion concepts from maths**.

Example 2

It is essential to teach children to **spend time outdoors**. Fostering them to do so, you may address **the concept of time from maths**. Besides, measuring the time they spend outdoors, it can be interpreted using different types of graphs.

Example 3

Water is an **essential element for life to bloom** and it should be protected. Producing goods requires water (*e.g., it takes about 450 gallons of water to make a 100 g bar of chocolate*). **To demonstrate the importance of saving water**, it can be compared to their daily water consumption.

INTEGRATING MATHEMATICS WITHIN THE WHOLE CURRICULUM AS A GENERAL PROBLEM-SOLVING TECHNIQUE

Learning mathematics is often incorrectly understood as learning facts and procedures. Although knowledge of facts is essential for performing logical operations with them, **learning mathematics should lean toward mathematical practices that are steppingstones of any mathematical work**. The mathematical practices include *problem-solving*, *sense-making*, *persevering*, *reasoning*, *drawing analogies*, *calculating*, and others. In mathematics, these practices are often critical to reaching solutions and suitable for being applied to other subjects or project-based learning. This premise also corresponds with Bruner [44], who believes that **education must be aimed at facilitating pupils' thinking and problem-solving skills**, which can be used in various situations.

Another author, Boaler [45], argues for working on long and complicated problems because they encourage **persistence which is a critical trait to develop**. Solving complex problems may be a challenge, though. Thus, it is essential to teach students ways of approaching problems. Related to this, Polya [46] lists a few steps necessary to cope with problems:

a) Understanding the problem

To make your students understand the problem, you may use **different strategies**. One of them is representing the problem by various means. Drawing from Bruner's modes of representation [47], students should be guided to use action-based, image-based, and language-based representations of the problem. These may include working with **manipulatives, problem dramatization, drawing**

schemes and pictures, discussing the problem, and so on. Working with the above-mentioned representations helps students to form a mental picture of the situation created by the problem.

b)   Devising a plan

After compreheding what the problem is and what concepts relate to it, one must ask themselves what methods may be used to solve it. **This phase is crucial for applying general problem-solving techniques**. Several general approaches can be employed when devising a plan. You may ask yourself:

> **Before starting, you may ask yourself:**
> ✓Have I encountered a **similar problem** before?
> ✓Having the given details, **what can I find out**?
> ✓Can I create a **similar but more accessible** problem?
> ✓What **details do I need** to arrive at the problem's solution?

In creating a plan, one may alter problem conditions and the given data to attain a simplified version and, thus, better insight into the adequate solution. **The process of devising a plan is intertwined with understanding the problem**; hence, methods from the previous paragraph may also help to develop a plan. It is also typical to use analogies.

c)   Carrying out the plan

This is done by correctly following learned computational procedures. To ensure you avoid mistakes, **it is worth estimating a result before computing and checking each step of the solution**. At the very end, you should check obtained result to see whether it satisfies the problem's conditions (checking your work is important not only in mathematics!). Finally, mathematics teaches arriving at the solution, presenting what has been done to get there, and arguing why it is like this.

d) Looking back

It is always useful to look back at the problem and ponder whether it could have been solved by different means or whether your method can be generalised for more problems.

The problem-solving process helps one develop strategies for solving mathematical problems and **fosters cognitive abilities such as persistence, visualisation techniques, communication skills, and executive functions**. These abilities are essential for mathematicians but also for modern citizens of the 21st century, so that maths means an indispensable part of integrative models of education.

The role of **Languages** in Integrative Models

Bilingual education has become more and more important because of the demands of the current and future society [48]. This is why, for the last twenty years, European institutions have been recommending measures to support the revision and adaptation of the national language policies with a view to improving the language skills of their citizens and, in particular, to developing the **Content and Language Integrated Learning (CLIL) approach** in their education systems. Therefore, the implementation of CLIL as one approach to bilingual education is an emerging movement of growing interest in the education systems of European Union countries that calls for the need to rethink, create and implement an approach to bilingual education based on the coordination and integration of language and content through a cross-disciplinary dialogue [49].

According to Coyle, Hood, and Marsh [50, p. 1] CLIL "is a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language".

This is why CLIL pursues a dual objective**: learning the content of specific curricular subjects** and **learning an additional language in an integrated way**, through learning situations where a whole subject or a single lesson of the curriculum content is taught through another language [50, 51, 52, 53]. Even though the *L* in CLIL does not stand for a certain language, English is the most frequently used language in Europe [54]. In general, CLIL can be used in many subjects, even connecting more than one curricular subject with a language, and it can be applied to all educational levels.

Usually, CLIL consists of four components (Figure 10) that altogether form the 4Cs framework [55, 56] and which should be included in every CLIL lesson plan or material:

- **Content**: The first C refers to the curricular content of the specific subject(s) selected, such as, for instance, science, maths, arts and craft, music, etc. According to Coyle, Hood, and Marsh [50, p. 41] effective learning takes place through "progression in knowledge, skills and understanding of the content".

- **Communication**: Communication refers, in general, to the language learning and using, both orally and in writing. Therefore, it is crucial that the learners interact with each other in the communicative context and thus create their knowledge about the content. This component also addresses the need for the development of appropriate language knowledge and skills, such as vocabulary or grammar.

- **Cognition**: Content implies the development of the students' cognitive skills. Students need support to develop these skills in the additional language. They also must be involved in thinking and engaged in higher order thinking skills. Through reasoning, creative thinking and evaluation, among others, CLIL allows students to create their own knowledge and understanding [57].

- **Culture**: According to Coyle [58] "Culture is at the core of CLIL", that is why intercultural learning and therefore, understanding our own and also other cultures, is a crucial part of CLIL. By getting in contact with other cultural contexts, learners can acquire a deep intercultural awareness and *"become aware of the responsibilities of global as well as local citizenship"* [57, p. 7].

Of course, these four components cannot be seen separated from each other but rather creating a symbiosis within specific contexts whichthen, leads to effective CLIL. These four components already suggest some of the aims CLIL has which are closely linked to its' benefits for learning.
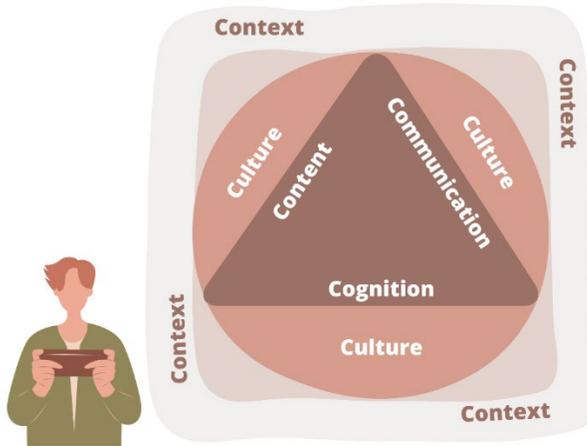
Figure 10. The 4Cs Framework. Authors' adaptation from Coyle et al. [50, p. 41].

In the above sense, the curricular contents and the additional language learning are dealt with in an **interdisciplinary way**, which implies greater motivation on the part of the students and the development of critical thinking. This approach thus creates an authentic learning environment that resembles the real world, in which different areas of knowledge are often intertwined. CLIL allows students to learn language in a meaningful context focusing both on language and the curricular subjects. Moreover, CLIL offers students the opportunity to develop their **intercultural competences** with the aim of improving the plurilingual and pluricultural competence of citizens [49, 50, 59].

When talking about the positive effects that CLIL can have on learning, one has to keep in mind that **CLIL is a broad and flexible approach** and that there are many different modalities according to the focus on, for example, the different components of the 4Cs framework, but they all follow the common principle that in some way content and language are integrated [56]. Some possibilities to implement CLIL into the teaching can be the following [60]:

- Learners study a curricular subject or part of it for a certain time through an additional language developing both content learning goals and language skills.

- In (pre-)primary education parts of an area such as, for example, science, arts, etc. are taught in an additional language, but, in contrast to the first example, just for a short and regular period of time.

- Cross-curricular projects in a foreign language, possibly planned together in a co-teaching setting by teachers with different subjects.

- Foreign language teachers plan a lesson with a more content type approach.

As these different possibilities for the implementation of CLIL are quite general, we will finish with a good **CLIL practice example** among European institutions coordinated by the Universidad de Burgos (Spain). It has been created in the context of the ERASMUS+ project STEAM Educational Approach and Foreign Language Learning in Europe, shortly, the SeLFiE-project (2020-1-ES01-KA201-081850).

The project has two main goals:

(1) To improve the CLIL Primary teachers' and their trainers' competencies (considering English, Spanish, and French as additional languages).

(2) To advance the integrated learning in science, technology, engineering, arts, and mathematics (STEAM) as well as linguistic competences of primary students.

Some of the specific objectives of the project are to research how teachers can **integrate CLIL and STEAM**, using current methodologies such as Inquiry-Based Science Education **(IBSE),** Engineering Design Process **(EDP)** and Story-Based Approach **(SBA)** in Primary Education [61]. Out team of academics have created a handbook that develops the theoretical approach of the pedagogies included in the SeLFiE model for CLIL and six ScienceL2 booklets that include brief comments on methodology and the complete teaching plan (including resources, rubrics, evaluation guidelines, complementary reading, etc.) for primary CLIL teachers.

All the ScienceL2 booklets use the narrative of a picture book to link all the STEAM and language areas, creating a topic-based work. They have been

implemented and validated in the associated schools in Europe. If you want to find out more, scan this QR and visit the SeLFiE web page:

CITIZENSHIP IN INTEGRATIVE MODELS OF EDUCATION

Approach to current concept of **Democratic Citizenship**

The central concept of citizenship education is called **active citizenship**, understood as social participation based on **mutual respect and non-violence**, in accordance with **human rights** and **democratic principles** [62]. More than two decades have passed since the Council of Europe included, within the framework of the well-known Lisbon Strategy, the promotion of this concept, and of learning values and democratic participation as transversal educational objectives. Talking about education for **civic participation** or for the exercise of active citizenship implies reflecting on how to teach in order to intervene, from the point of view of **commitment and responsibility**, in **relevant social problems**, **socially live issues** or **controversial topics**.

We find ourselves in a world with growing economic, political, environmental, and social problems, which justify the educational need to teach controversial issues and social problems from a transdisciplinary and integrated perspective. The **teaching of controversial issues**, defined as opposing viewpoints that generate rational disagreements, aims to **increase critical awareness of social problems** and to develop the civic competences necessary to address them. Indeed, curricular problematization or the didactic treatment of social problems favours the **comprehensive deepening of social reality**, the contrast of argued perspectives in the critical analysis of sources, elective rationality for decision-making in problematic contexts and social commitment as an inherent part of the democratic process.

This educational problematization or controversial 'thematisation' of the curriculum incorporates conflict in its definition, refers to **social problems of diverse nature and interest for society as a whole**, and is constructed through the confrontation of opposing beliefs, values or interests. It is therefore an indispensable element for anticipating, intervening, and solving social problems **peacefully**. From this perspective, Penner [63] agreed on the need for intentional integration teacher education, in which social problems can be proposed as the **main content of education for democratic citizenship**. The absence of research findings on

integrated teaching in initial social studies teacher education motivates the need to design, implement and evaluate programmes specifically aimed at integrated teaching.

MAIN INTERACTIONS WITH OTHER FIELDS AND IMPLEMENTATION

Educating to intervene in local and global social problems requires a **transdisciplinary didactic approach**. In this sense, integrative models of education favour the **development and acquisition of competences** for the intervention and resolution of contemporary problems (Figure 11). Indeed, despite integrative model like STEAM can *"offer some solutions,* **it is the** **critical thinking, problem-solving, and** **socially** **conscious based approaches that make these solutions a reality***. Social studies, and the goals of social studies education, can bridge the gap between the technical aspects and the human requirements"* [63]. From an integrated science education perspective, Meral et al. [64, p. 143] consider that:

> *Science plays a major role in finding solutions to many issues that are considered controversial in all societies. Regarding the solution process, despite the clear impact of controversial issues in the field of social sciences and socio-scientific issues including both scientific and social issues in the field of science, they are often avoided while teaching.*
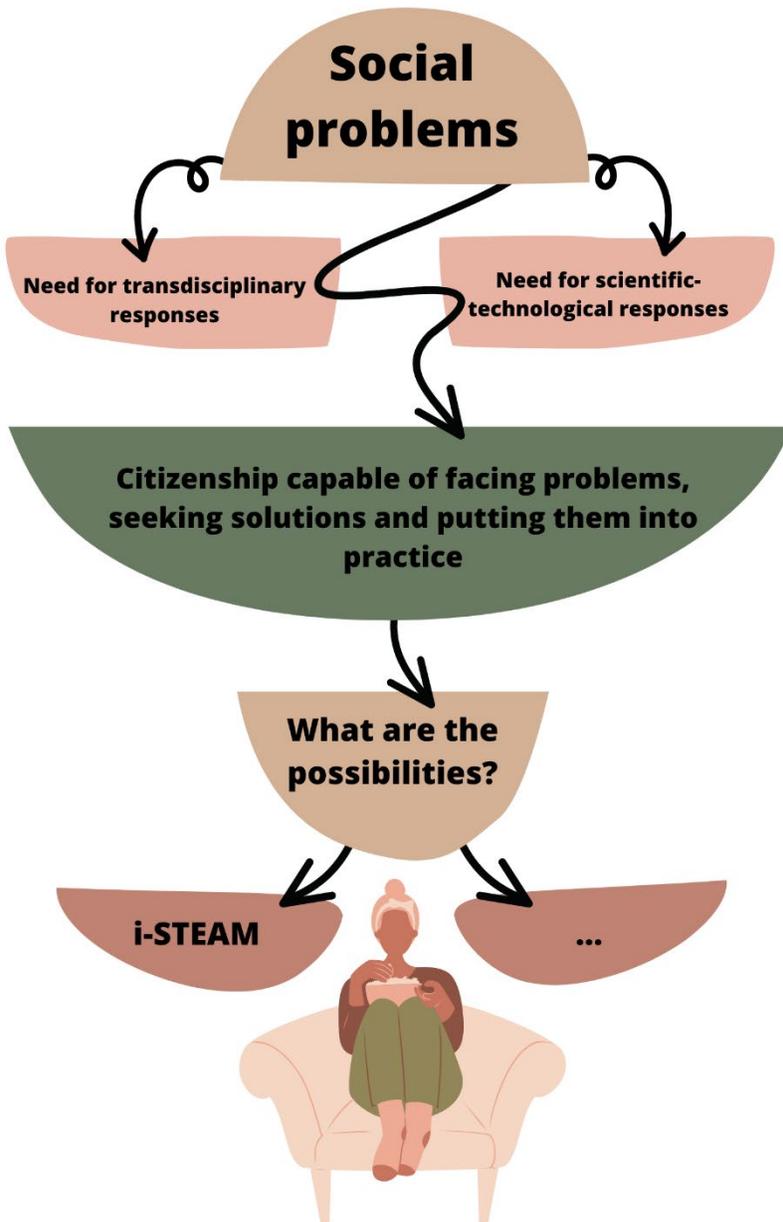
Figure 11. Education for democratic citizenship from an integrated transdisciplinary perspective. Authors' adaptation from Ortega-Sánchez [27].

From this approach, and in order to guide the teaching of controversial topics, Pace [65] has proposed a **framework for action for the design of curricula and the promotion of reflective practice**. Underlying this catalogue of guidelines for the teaching of controversial topics is argumentation as a basic didactic procedure from a necessarily transdisciplinary and integrated approach:

Framework for action.

1. Cultivate a **supportive environment** through community building, norms, openness to dissent, individual affirmation, and humour.

2. Prepare **thoroughly** with attention to student identity and development, teaching contexts, subject matter, purposes, and methods.

3. Think **through teacher stance** including pedagogical roles, positions on issues, and pros and cons of disclosing teacher views.

4. Communicate **proactively with students, parents, colleagues, and administrators** about issues that will be studied.

5. Select **authentic issues and frame questions** to promote student engagement and inquiry, progressing from cooler to hotter issues.

6. Choose **resources and pedagogies that challenge assumptions**, include diverse voices and perspectives, and foster participation.

7. Guide **discussion with tools** for analysing sources, exchanging ideas, moving from small groups to whole group, and attending to equity.

8. Address **emotions by creating space for processing them**, using de-escalation moves as needed, and developing self-awareness.

Considering the linkage of integrative models of education with the foundations of problem-based learning and the promotion of critical thinking skills, Ortega-Sánchez's [28] research revealed the **educational potential of this integrated approach to citizenship education** (the main purpose of social science education) and approached the perceptions and self-efficacy of prospective secondary school teachers to implement integrated education in this scientific field.

In line with the purposes of social studies education, this study assessed the degree and strength of agreement on the **usefulness of integrated education** for teaching to understand and intervene in **contemporary social problems**. The results obtained reported a **lack of confidence and understanding of the benefits** of integrated education in social studies. While affirming the curricular relevance of this approach, there is a general perception of its **difficulties** in implementation and its anecdotal nature regardless of the gender of the prospective

> *There is still an urgent need to design integrated educational programmes from an active citizenship approach.*

teacher. This finding points to **the need to continue to make progress** in the education of a non-compartmentalised, transdisciplinary, and oriented citizenship, which enables intervention in contemporary social problems and controversial issues in an integrated way. Despite the progress made, there is still an **urgent need to design integrated educational programmes and practices specifically aimed at addressing social problems** and intervening in the community from an active citizenship approach.

Inclusion in Educative Context

Just like society, an ordinary classroom in primary or secondary school is composed by different people with different abilities, traits, and expectations. We could say that the group is a representation of the society itself. Indeed, **they are the society of the present and future**. So, the primary and secondary school experience means the perfect trial field for the students to find themselves within the group, **taking advantage of the whole group and contributing to its development** in the best way possible.

KEY CONCEPTS

Human behaviour can be tricky. There have been repeated episodes throughout history in which groups of people have been excluded or ignored, a fact that has also been present in education. Even though the decisions made by previous generations **may not be understood from the perspective at the current time**, they tried to give solutions to different recognizable problems. Facing diversity in education is not new and we can observe how educational systems have tried to meet students' needs from different approaches:

Exclusion

The focus is on a **particular group** and the rest are excluded by not fitting with concise features. It is used for elites or groups with a very accurate objective. **It has no place in regular education**.

Segregation

A place for **special attention** is created outside the main group. It can make sense when features of the segregated group are strongly **different** than the main group. It can be as useful as the previous **phase** in an adaptative process, and **the objective must be reaching the next levels** (integration and inclusion).

Integration

The place for special attention is created **inside the main group**. It is usually used when differences between target group and main group are **evident but able to coexist together**. It must be considered a **previous phase to inclusion** and the objective will be to reach the level to step up to the inclusion level.

Inclusion

The group works together, **offering opportunities to the whole group, but also individually**, to develop themselves tothe extent that their capabilities and interests allow.
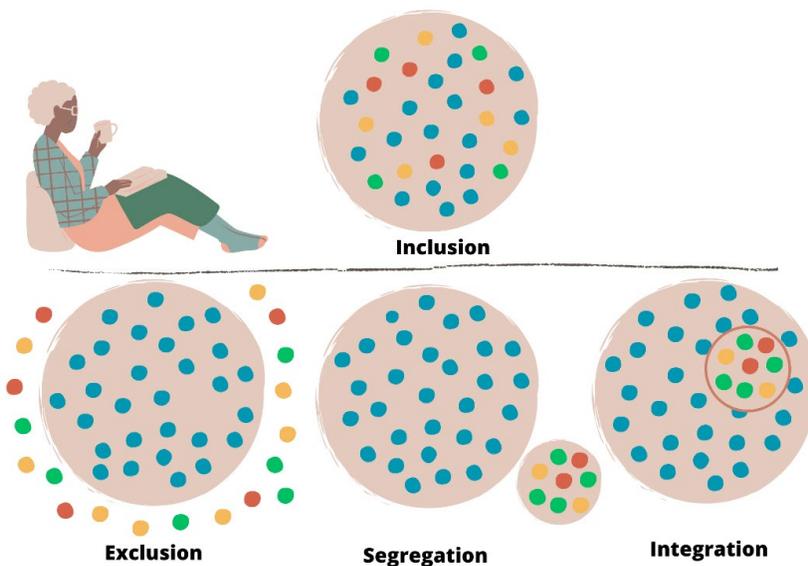
Figure 12. Visual concepts of inclusion, exclusion, segregation, and integration.
Authors' adaptation from MCIE Think Inclusive [66].

Although none of these proposals can be considered right or wrong without studying the context, **inclusion is the most desirable situation**. The term 'inclusion'

in education has been traditionally used referring to disability. There have been huge efforts for the inclusion of people with intellectual, sensory, or physical disability in educational systems, but **current trends in education tend to widen the concept to address other realities** as well. That makes sense if we try to meet the needs that every single person shows in a classroom, which may be related to gender, sexual orientation, socio-economic status, identity construction[3], physical diversity[4], gifted, etc. Far from the consideration to randomize the learning process, the challenge is to **develop it accordingly with the reality of the whole group**.

Education must ensure equal opportunities for all students to develop themselves within the group. The **participation of all students** in equal conditions is the challenge the teachers must face. Mandatory education should show the students the way to reach their full potential, but **always considering it within a group** which should also reach their own level.

Thus, the real work of the teacher is not only to help students in reaching their full potential without damaging the rest of the group, but also to **make this achievement an advantage for the whole group**. Every person in the classroom has something to offer to the rest, no matter if it is huge or tiny. The main goal of the teacher is to identify **what they can contribute with and make the perfect environment to make it happen**. This way every single student becomes an educational support for the rest of the classmates, so all of them provide significant value to the educational context.

OBJECTIVES

It is quite usual to think it is impossible when trying to address all needs in 25-students-classroom, what can lead us to **demotivation**, **frustration** and, consequently, **to give up trying**. It is crucial to understand that the objective in a

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[3] Identity construction is really related to and influence by the rest of the risk mentioned in this handbook. This term refers the risk emerged from beliefs and feelings, like religion, national identity, fanatism, etc.

[4] Officially there is just one race, human race, but different physical features are clear among peoples. That is the reason why we have referred the risk of exclusion usually named "racism" as "physical diversity" in this handbook.

classroom **is not inclusion, but it is still education**. Inclusive methods are just the way to get the best results in education.

When discussing inclusion, most people bring up the idea related to the fact of tolerating diversity. However, it is more proper to focus the efforts on the fact of **accepting diversity**. The difference between both terms is essential to develop a real inclusive attitude. While **tolerance** can be exercised from a fictitious superior status **without a real involvement**

The objective in a classroom is not inclusion, but it is still education.

with the others, **acceptance entails the coexistence with diversity itself**. As occurs with every single field of knowledge, the way to increase the domain on inclusion is the experience acquired by practicing. On all these grounds, the main objective a teacher must pursue is to provide their students with enough **experience** to know and understand diversity. That is, the more diversity we have in classroom, the more opportunities to educate our students about inclusion. That is why **integrative models of education are a perfect option** to develop an inclusive attitude.

Having said that, notice that **it is not possible to be inclusive with some groups at risk of exclusion and not with others**. The final objective is to develop an **inclusive attitude** in the students rather than to provide them with some tips to look like inclusive. Despite the fact that it may seem difficult, the teacher must consider inclusion as a process that takes time.

TIPS FOR DEVELOPING AN INCLUSIVE ATTITUDE

Firstly, it must be made clear that **there are no magical tricks** to reach the objective of inclusion because every instance must be studied particularly, but the main key points can be summarized as: **enhancing participation through experience**; **including diverse stimuli to reach all needs in the classroom**; and **developing critical thinking to let knowledge and feelings sink in**. Some concise tips related to different collectives at risk of exclusion are shown in the next charts.

Disability

Main objective: **Assure participation.**
- ✓Consider **adaptations.**
- ✓Promote activities with different **roles**.
- ✓Apply **cooperative** work (the result depends on the work of the whole group).
- ✓**Involve** all students (all students take care of each other).

Gifted

Main objective: **Enhance motivation and cover soft skills.**
- ✓Use a **wide range of stimuli**.
- ✓Include **creativity**, imagination, and intellectual challenge.
- ✓Include emotions and **self-esteem**.
- ✓Allow **autonomy** and freedom to do the tasks.

Physical diversity

Main objective: **Let students know about people with other physical features.**
- ✓Break **stereotypes** and **symbols**.
  - o **Avoid fixed rules** about colours (varying good or bad attributions to different colours)
  - o **Avoid racial and other prejudices** related to physical traits.
- ✓Create **mixed and changeable** working groups.

Identity construction

Main objective: **Make students know each other and themselves.**

✓Work on **self-concept**, **self-image**, **self-esteem,** and **self-exigence**.
✓Allow **autonomy**, **roles,** and **critical thinking**.

Women

Main objective: **Enhance equal level of opportunities.**

✓Break **gender stereotypes**.
✓Let students develop themselves **out of a social-biased** perspective.
✓Include roles where **different skills** are needed.
✓Let students know about **female pioneers and achievements**.

Sexuality

Main objective: **Let students know diversity related to sexuality from a not-biased point of view.**

✓Propose activities with **variety of succeeded ends**.
✓Break **stereotypes**.
✓Enhance and show **positive view of differences**.

Family structure

Main objective: **Let students know their own value.**

✓Use **cooperative activities** that contain individual and global success.
✓Make students feel **valued**.
✓Enhance **communication** through several ways.
✓Include **self-esteem** and **self-concept**.

Equity in Educative Context

Equity, understood as a **broad concept of fairness and justice executed within societies in order to achieve individual and common welfare**, has long been interpreted and discussed by researchers in different fields of studies, bringing much contention and little consensus when it comes to its meaning and practical application. Its main understanding as the just and fair treatment of individuals and/or groups of people forming societies has never lost its undeniable importance, although the focal point might have been shifting through centuries and across **geographical and demographical backgrounds**, focusing on various aspects of fairness and pertaining to different minority groups and/or underprivileged individuals.

Let us begin with the lexicographic definition of the concept. The Merriam Webster dictionary definition emphasises **natural rights of every individual to be treated fairly**, without favouritism:

Equity is justice according to natural law or right; specifically: freedom from bias or favoritism.

The derivative root of the noun, which gained stability in the English language during the 1300s, is Latin aequus, meaning "even," "fair," or "equal"; however, to be fair, it was introduced to English by the French, whose adaptation of the Latin was 'equité'. The French word has clear legal connotations; it means "justice" or "rightness," and those meanings, plus a splash of "fairness," carried over to the English word equity [67].

Similarly, Cambridge Dictionary entry focuses on equal treatment of people according to their needs, where **no particular group receives special treatment** [68].

According to Julian le Grand defining equity in a way that satisfies both economists and philosophers is hardly attainable and thus he chooses to use the term in a similar way as its common usage, treating the term as the synonym of justice and fairness. What is made clear, though, is the lack of semantic **sameness of the terms equity and equality**, which are oftentimes used interchangeably in everyday situations. In fact, **"equality does not necessarily imply equity, or equity equality"** and what follows *"equitable outcomes may be quite inegalitarian"* [69].

> **Equality** *does not necessarily imply* **equity**, *or equity equality.*

What is considered to be either equitable or not is based on many factors, yet the one which is the most profound is **the factor of choice**: namely whether the choice is or is not within the scope of one's control. What follows, when an individual is not granted certain distributions as an outcome of factors beyond their control, it is generally considered **inequitable**, whereas **when the distributions are the outcome of the choices within the control of an individual, they are perceived as equitable**. We may consider the situation (see Figure 13) where a child and a disabled person do not receive the same opportunities of seeing what is above the fence as an adult man does (and the discrepancy of the initial opportunities is beyond their control as they lack the resources, the former being too short, the latter sitting in a wheelchair). Thus, the factors beyond one's control i.e., **constraints limit the number of possibilities to the 'choice set'**. Only in the situation where **the constrains are defined and the set of choices is equal to all individuals involved** can we talk about **equitable distribution** [69].

Figure 13. Visual interpretation of equality vs. equity. Authors' adaptation from EquityTool [70].

Whether or not we are to **compensate for the inequality of choices** available to a given individual or a group of people at any cost is a matter of dispute. If we make it an overriding principle, **we may end up infringing on other values**. That is why, oftentimes a trade-off or compromise is needed to achieve a satisfactory result in a society.

> *A society with less inequality in choice sets will be one with*
> *less inequality; the challenge for policy is to move in the direction*
> *of greater equality of choices, and hence greater equity, without*
> *too serious a compromise of other values [69].*

An attempt at redressing past inequalities with the concept of positive discrimination or affirmative action in US colleges admissions and job applications has been a contentious issue since its introduction under Kennedy Administration in 1960s. Racial quotas were declared unconstitutional after 1978 but affirmative programmes also called diversity programmes have become essential in an attempt to arrive at a racially diverse workplace or educational institution [71]. It is argued that **anti-bias training alone has no real, long-lasting effect on women's or minorities' careers if it is not followed by a profound change in the mindset, habits, and practices**. The biases stemming from life-long media exposure and experiencing life in certain circumstances seem to be too deeply ingrained to change

solely through a training programme; on the contrary, trying to supress stereotypes may even lead to a counterproductive effect of reinforcing them. **Changing unconscious bias alone would not necessarily entail reducing discrimination unless it is a part of a broader programme of change, tackling both bias and structural discrimination** [71].

Without doubt, multiculturalism requires addressing equity as much as the predicament of other minority and/ or historically underprivileged groups, the biggest of them (which cannot be due to its size be called a minority group) being **women**. The historical subjugation and inequality of treatment and choices available for women have been long represented in the language itself, it being gender unneutral. Seeking gender equity, first of all, **requires the use of appropriate vocabulary**, both in everyday usage and in legal discourse, at the base of which we can find the language of constitutions, which need to address **equity**, **equality** and **justice** for all the people they concern. Language should be seen not only as a powerful tool of representation of reality but also as having the power to shape it and as such must show inclusion as *"the use or even the order of words may convey privilege or priority"* [72]. The choice of words is followed by their interpretation and has both legal and symbolic impact on **whether women have been included or excluded from the full participation in citizenship**.

Radical feminism, which in the early 1970s perceived men and women as 'homogenized' groups living in patriarchal societies in which the existing order and power relations had to be challenged, has been replaced by more specified and particular approaches, only some of which still find gender issues as structural and institutionalised [73]. Social relations approach emphasises that women

> **Intersectionality** *is an ethical approach which addresses all marginalised voices.*

historically have been seen as child bearers economically dependent on male bread-winners, which determined their 'choice set' and resulted in our **underrepresentation and inequitable treatment in public space** (marginal role in politics, in high-status, well-paid jobs, facing insecurity of employment). In

contemporary, postcolonial feminist thought gender is rarely considered as an isolated discriminatory factor as identity is seen as **multi-faceted concept**, resulting from race, ethnicity, sexuality, social class, and age. **Intersectionality is an ethical approach which addresses all marginalised voices** and makes sure that we move beyond the divisions of the past [73]. In this approach, LGBT+ communities, which open more space for **identity identification**, have an important place and **require more accurated language to address the needs of all individuals** who do not identify with any of the two traditionally viewed genders. The most recent developments at the UN have seen much progress in promoting gay rights, yet neither the appropriate discourse nor the application of gay rights all other the world has been evenly implemented [73].

Finally, **achieving equity and at the same time excellence in education should be the aim of all education systems and curricula** and access to at least primary level must be assured (stated in article 26 of the Universal Declaration of Human Rights) since education *"is believed to function as springboard for human beings"* [74].

In order for education at school to be equitable (and ideally bring excellent results) **schools have to make sure that fair competition is possible**, allowing for some degree of 'fair inequalities' by allotting more resources to some individuals to provide the same opportunities, 'resources' referring to **money, time, contents and pedagogical assistance, etc**. [75].

Takeaway points to assure equity in education.

✓Adapting teaching methods, tools, and evaluation **to pupils of different backgrounds** (including students with special needs).

✓Avoiding using **stereotyping and pigeonholing** different realities.

✓Applying **appropriate language** which encompasses the needs of women and all LGBT+ communities.

✓Seeing **diversity as an advantage** and making sure everyone feels included.

✓Considering the constraints related to particular individuals and/or groups and trying to **compensate by creating equal opportunities** at the outset.

✓Adopting **empathetic perspective** especially in the treatment of vulnerable individuals and/or groups.

CHECKLIST

When considering carrying out an action under the perspective of any kind of integrative model of education for citizenship, turns out useful to meet some important considerations. At least, next questions must be positively answered:

INTEGRATIVE MODELS ITEMS

- ✓ Do we start from a question that solves a real problem?
- ✓ Do we include contents from all the subjects?
- ✓ Is the schedule realistic?

CITIZENSHIP ITEMS

- ✓ Have we complied with the defense of the Universal Declaration of Human Rights?
- ✓ Does the plan offer equal opportunities of participation to all students?
- ✓ Do we know the collective/s at risk of exclusion?
- ✓ Is the plan related to the needs of the collective/s at risk of exclusion?
- ✓ Does the plan do some good to the whole group?

GENERAL ITEMS

- ✓ Can we count on the human and material resources needed?
- ✓ Are we able to control the group and meet the objectives?

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