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# 7. INTEGRATION OF THE ARTS IN STEAM LEARNING PROJECTS

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**Absract:** *In the context of the globalization of learning, schools must become learning organizations in order to reconfigure the way of learning towards an integrated one and to value the functional dimension of education/learning through its contribution to the formation of key skills. In this article, the learning process in the subjects of the Arts curriculum area is researched in order to support and promote a learning process in accordance with the new orientations in education at the European level. The specifics of learning in Musical Education, Visual and Plastic Education are revealed by concretizing the types of learning, establishing the internal and external conditions of learning, characterizing knowledge and artistic experience, harnessing the potential values of works of art, identifying knowledge through art as an inner experience, integrating the arts through aesthetic education and extra-aesthetics, the description of the stages of awareness of the artistic experience in the learning process. Arts integration is a process that requires a multi-year commitment and requires exploring new ways of teaching and learning. The integration of arts in STEAM learning projects is conditioned by the fundamental values of art discovered and acquired through artistic activities, the integrative nature of spiritual intelligence in the act of learning through arts, the holistic approach, building connections between arts and sciences, etc. The profound benefits of integrating the arts into STEAM learning projects will come with consistent implementation over time.*
**Key words:** *art learning, learning process, arts integration, holism, spiritual intelligence, learning through STEAM projects*

## 1. Introduction

Learning the art challenges us to find life-fulfilling solutions, which can only be implemented through education and self-edification through the arts. By studying the arts, pupils study life itself. The patterns of sensory and emotional knowledge of the world are concentrated in art. The experiential and spiritual character of the artistic act, the aesthetic and extra-aesthetic potential of the arts, the integrative factor of the arts in dialogues and cultural traditions, etc. assigns an irreplaceable space to the arts in the educational process. As man is inseparable from social life, the arts, as a product of human spirituality, come from the laws of life and exist according to the same laws. Thus, education/learning through the arts directly forms translatable culture into conduct and existence.

We are currently on the brink of a revolution in learning. Talking about our incredible capacity to learn and how we can use it, the education expert Alex Beard [1] points out that learning is the soul of the human species, from the first step to the last words, we are what we learn. Learning is subordinated to education and can predict the profile of culture, how and how long we will live, how satisfied we will be, how much we will earn... But, despite its obvious importance, learning has lost the touch with human progress. The connection between *arts and life* can become the leitmotiv of integrating the arts into the learning process through STEAM projects.

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## 2. Learning in the Arts curriculum area subjects

A strategic priority of the general education system in the Republic of Moldova is the formation/development of the learning culture. "However, a culture of learning that is formed/developed in general education will be the key to success throughout life" [5]. From a didactic perspective, learning can be seen as:

- *a quantitative and qualitative product* of systematic, formal and non-formal knowledge;
- *a process of acquiring* facts, skills and methods that can be used according to needs and contexts;
- *superior ability to understand*, interpret and reinterpret perceived and processed reality in ways that vary with the personality of the learning actor;
- *behavior, product* and/or *process*.

**The learning process** is carried out through the multiple and complementary interaction *between teacher - student, teaching - learning - assessment*. It is notable that "the teaching-learning process essentially represents a knowledge process contextualized in the learning process" [4]. As C. Cucoș mentions, the "facilitating relationship" - the basic structure of education/ learning, contains an integrable element.

From the perspective of learning in the disciplines of the Arts curriculum area, it should be noted that interactions are established in the learning process multiple not only between teacher and student, but between 3 actors: *student – work of art – teacher*. The teacher chooses the teaching strategy for these interactions. In school practice, the following **types of learning** [13] are known:

- didactic learning (obtained exclusively within the school);
- social learning (accomplished within the school, as well as outside it);
- learning from own experience;
- learning from the experience of others.

From the perspective of the content of what is learned, the following **forms of learning** are attested: *perceptive* (we learn to observe, to look at a picture, to see, to notice, to listen, etc.); *verbal* (learning the differentiated use of language depending on the circumstances, characterizing the artistic language, describing the image of the work of art, etc.); conceptual (learning notions, terms, legalities, judgments, reasonings); *motor skills* (learning movements, learning through movements, concrete operations and actions, gestures, expressive behavior - musical-rhythmic movements with the arms, dance steps, plastic movements of the hands in space, pencil/brush handling techniques, etc.).

There are **internal and external conditions of learning**. Being a complex mental activity, school learning involves all mental processes and phenomena. It is conditioned by a series of internal and external factors: the *environmental conditions* in which learning takes place (facilitating or inhibiting environment), *the teacher's personality*, *the methods* used and his *teaching style*, the established *learning program*, group factors and of activity and interpersonal, intragroup interaction, etc.

From the perspective of the psychology of education, the emphasis falls, however, on the internal conditions of the learning activity, on the psychological mechanisms that intervene in the dynamics of this process. A learning sequence is presented under two solidary aspects: the procedural aspect and the stimulating and

regulatory aspect. The **procedural** aspect aims at the involvement of cognitive and intellectual processes in the act of learning (perceptions, representations, thinking, memory, imagination and language) and includes at least four moments:
a) receiving or receiving the material;
b) his understanding;
c) memorizing and storing it in the memory;
d) updating the material by recognition, reproduction or transfer of knowledge and skills.

The variety of forms of learning causes the close articulation of cognitive and intellectual processes, so that they practically merge into one and the same learning process. The **regulatory** aspect refers to the participation of mental processes and functions that have a stimulating and regulatory role for the act of learning: motivation, affectivity, will, attention.

**Learning in the subjects of the *Arts* curriculum area** actively involves students in activities that inspire them to acquire skills and knowledge through activities of creation, reception, interpretation, artistic representation, etc. – situations of communication with the work of art. In the learning process, the student lives several experiences: the receiver of the work of art, the bearer/promoter of the values of the works of art, the creator of the work of art (in the activity of interpretation, musical improvisation or artistic-plastic representation).

Unlike other school subjects, learning in *Music Education* and *Art Education* lessons is greatly influenced by artistic experience, as there is a number of things learned only through experience that cannot be learned in any other way. When an individual learns how to receive a work of art, how to perform a piece of music, etc., not only is a whole body of knowledge and skill acquired, but a certain artistic knowledge is constructed - a very special way of one knows oneself and the world around, a knowledge through which other things can be done using one's own creativity and understanding.

We define the **artistic experience** as a unit of sensual-empirical, affective, spiritual, cognitive, behavioral acquisitions, etc., gathered in the process of the student's communication with art (practicing the artistic activities of creation, interpretation, reception, etc.), which determine the quality of the human-art relationship.

**The artistic experience** - represents the unity of sensual-empirical, affective, spiritual, cognitive, behavioral acquisitions, etc., gathered in the process of the student's communication with art (practicing artistic activities of creation, interpretation, reception, etc.), which determines the quality of the relationship between *man* and *art*. In the process of learning the pattern of the work of art or what art is, the relationship between the student (as a receiver, creator, wearer or consumer) and the actual work of art is built. When the nature of the established relationship between subject and object provokes, influences, inspires, etc., it is possible to talk about the formation of a certain degree of artistic culture as a component of the spiritual culture of students.

Even if not all the constituent elements of the artistic experience are passed through consciousness, the awareness of the data of the experience mobilizes the resources for a training/development of the student's personality in the learning

process. In the study of the arts, the dimensions of awareness of the learned subject are intensely articulated and related: emotional, physical, mental (cognitive), spiritual, social-relational awareness. Namely, these dimensions represent the **quotient of learning awareness** [12, p. 172].

Due to social pressure, learning is externally motivated, dictated by social, political and cultural interests. To eliminate the opposition between learning and knowledge, it is necessary to transpose the features of knowledge to the learning process. Thus, creating a connection between the subject- student and art as an object of knowledge will have a lively, active and challenging character. Learning the arts can be based on two types of knowledge: artistic and scientific. In the general education system, the learning of the arts is subordinated to the process of artistic education and is based on artistic knowledge.

**Artistic knowledge is totalizing and encompassing**. She is more attentive to nuances and depths. Artistic intuition can preface or appear consonant with scientific intuition. It does not destroy or negate what science does, but adds, strengthens and deepens. Being a "transversal" and somewhat transcendent horizon of reporting to reality, the art becomes a necessary framework for unification and polarization around the human. "When science goes "crazy", advancing on a too "objective" path, becoming cold, abstract, indifferent to interpretations and consequences, art can counter it with a "supplement" of soul, of value flexion, of human responsibility. It is not bad that such regulatory levers intervene in a world prone to slippages or excesses" [3, p. 10].

Based on the demands of artistic knowledge, we advance the idea of initiating the learning process from direct contact with the work of art and appealing to sensitivity, intuition and emotional re-living. Through school learning, the student acquires **two types of knowledge**: data, *factual knowledge*, related to the facts, to the studied phenomena, respectively, *procedural knowledge* related to the strategies and procedures used in learning, to the ways of using factual data, analysis-evaluation and their practical application.

For example, the content units in music education represent "the totality of the system of musical information and about music transformed into knowledge, capacities, attitudes, values, skills" [10, p. 143] and bring together three **compartments**: the laws of music, the musical repertoire, elementary musical skills for audition activities, elementary musical performance and creation.

Compared to other school subjects, the learning outcomes of *Music Education* and *Art Education* are of a spiritual nature and bear the imprint of the values and attitudes formed by the students. Hence the uniqueness and necessity of realizing the learning process through arts in the general education system. At the same time, by **harnessing the potential of the values of works of art** in the education process, the action of the process of training transdisciplinary skills can be expanded.

If beauty as a goal establishes education for art, then beauty as a means establishes education through art and aims to achieve a moral, intellectual, physical education, etc. "A person is not fully formed if he does not know and is not sensitized to the value universe specific to artistic creation, does not receive the beautiful hypostasized in other existential contexts (nature, relationships between people, community, etc.) [2, p. 87].

**The integration of ethical and aesthetic education through the arts** has as its essence the formation of the child's personality through the good and the beautiful of art, society and nature, and is part of an integrative pedagogy. Extending the learning process beyond the boundary of the field of *aesthetic education* towards *extra-aesthetic education* can ensure the formation of key skills.

By harnessing the imagistic, expressive, intellectual, emotional potential, etc. of works of art in the learning process can be achieved the five **dimensions of permanent learning in the learning process**: *(1) to learn to know (to know); (2) learning to do; (3) learning to live together with others; (4) learning to be; (5) to learn to transform yourself and change society*. Therefore, by expanding the learning of the arts from the aesthetic field to the extra-aesthetic field, the perspectives of integrating education through the arts into the learning process can be completed.

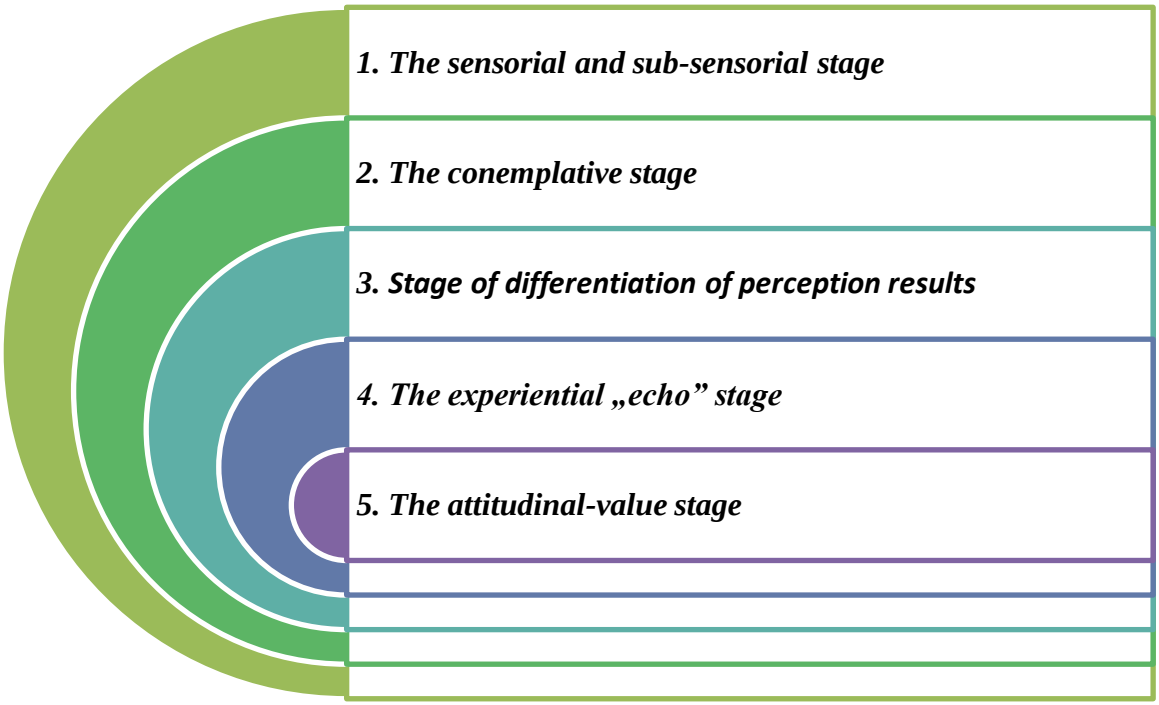



Figure 1. Stages of awareness of the artistic experience in the learning process

In order to orient the students in the learning process, **the awareness of the artistic experience** is carried out successively in five stages [16, p.14].

***1. The sensory and subsensory stage.*** The perception of the artistic phenomenon takes place (with the manifestation of emotional experience, primary appreciations and the memorization of impressive elements).

***2. The contemplative stage.*** The individual detaches, moves away in time and space from the artistic phenomenon. The most expressive moments, elements, sequences, fragments etc. are identified, being appreciated as something original, beautiful, unique. At this stage, the general perception of the content, the determination of the form and the aesthetic appreciation of the work of art take place.

***3. Stage of differentiation of perception results.*** The content of the impressions crystallizes as elements of originality and uniqueness in the artistic experience of the personality. The aesthetic appreciation of the work of art is issued, which is according to the taste and inner vision of the individual.

***4. Experiential "echo" stage.*** The individual operates creatively with the data of artistic experience, building on the results of previous experiences. Each encounter with the artwork becomes a re-creation of it.

***5. The attitudinal-value stage.*** All the artistic experience, the mechanism of aesthetic consciousness, aesthetic needs, interests, value orientations, aesthetic attitudes, etc. creatively updates itself in relation to the individual's motivation.

Learning is related to the concepts of thinking, understanding, exploration, experimentation, creativity, curiosity, education, development and growth. A student's ability to learn varies depending on various factors such as personality, intelligence level, motivation and learning style. A person becomes more interested in learning when driven by curiosity and intrinsic motivation. The culture of learning in each school discipline reveals a philosophy of action of the teaching staff, related to the specifics of the field of knowledge - art. The learning activity has its own structure, specific mechanisms and laws, it takes place in its own stages, forms and levels, under the influence of specific factors.

**Learning the art** comes with several challenges related to finding life-fulfilling solutions that can only be implemented through education and self-edification through the arts. At the same time, there are known express references to what can never be taught - artistic creation. This idea is also valid in the case of learning art. If there are books about the ways of learning art, it is difficult to find in them scholarly forays, pedagogical rules that guarantee learning art, but only suggestions to avoid mistakes in the artistic-didactic act. The learning process in the subjects of the Arts curricular area is a "state of openness" of each student to the world of the imaginary, the world of art. As M. Mănescu [7, p. 32], points out, "the art of learning art" means prescriptions of freedom and self-discovery and not an ossified system of rules.

In the dialogue between teacher and student, in music education/art education lessons, V. Medușevski [15, p. 76-79] includes the spiritual "I" - the "logos" (order) of being. Thus, as a result of the contact/communication/knowledge of art, **the intuitive-intellectual vision of life awareness** is formed and manifested. Artistic-didactic activities always have a creative, intellectual and processual character, making full use of emotional experiences.

In the context of artistic thinking, emotional experience is considered judgement/opinion, and based on the comparison of opinions, the inferences are expressed with which the logic of the image of works of art is discovered. In the artistic-didactic act, the student, as receiver/creator, discovers for himself a new reality/world produced by the artist: imitative, expressive, imagined, etc.

"The cause from which the movement of appearance in art begins is the form that is in the spirit," Aristotle [8] wrote. Through art "those things appear whose form is in the spirit". If art is spirit in the sense that spirit dominates its emergence, then the artistic-didactic act cannot be separated from spirit and is essentially a spiritual process. Therefore, any learning technology in Music Education/Art Education lessons must be subordinated to the emotional and spiritual atmosphere of the act of artistic creation/ reception [17, p. 29].

Despite the different definitions and content differences of artistic education, in one form or another, **artistic activities are part of educational policies in**

**almost all countries of the world.** If we accept the fact that artistic education is achieved through artistic activities, the destination of artistic activities can be deduced from this, valid for all fields (theatre, choreography, literature, music, visual arts, etc.). A work of art is an object that embodies a meaning. Through the variety of artistic activities, students discover the meanings of works of art, either through reception, through creation, or through thinking/meditation/appreciation. If artistic activities represent external manifestations of the arts, forms of making art, then the artistic act is an inner experience, a communication as a specific, deeply spiritual experience.

**The fundamental value of art can be discovered and appropriated through artistic activities** [11, p. 47] expressed by: reproducing, producing original forms, expressing an inner world. At the foundation of the learning methods are the activities of exploration, discovery, action, creation, and the content of the learning activities is conditioned by the type and theme of the lesson. It is a difference between the concept of artistic activities and artistic-didactic activities. In the methodological literature, references are made to learning activities and not, in particular, to artistic, artistic-didactic activities.

**The conditions of learning** are those events that must occur for a certain type of learning to appear. The subordination of didactic technologies to the patterns of art is the condition without which the learning process cannot be conceived in the lessons of Music Education and Plastic Education. In conclusion, learning in the subjects of Music Education and Plastic Education in general education institutions is conditioned by:

- ***the meanings embodied in the work of art*** (philosophical, ethical, aesthetic, spiritual, psychological, etc.);
- ***the values of the work of art*** (image, language, form, genre, etc.);
- ***the pattern of the work of art*** (sound, spatial, temporal, imagistic, expressive character, etc.);
- ***respecting the specificity of artistic knowledge in the didactic act;***
- ***the characteristics of the individual involved in the artistic-didactic act*** (auditory/visual/motor sensations, sensitivity, attention, memory, imagination, thinking, etc.);
- ***the methodology of artistic-didactic activities*** (reception, interpretation/artistic representation, artistic creation).

## 3. Integrating the arts into STEAM learning projects

Any STEAM lesson is based on inquiry, problem solving and process-based learning [19]. In fact, this is one of the distinguishing features between Arts Integration and STEAM. So when you want to make STEAM education happen in the classroom, pay close attention to the essential question and the process around its exploration. Whenever a STEAM lesson is used, it is imperative that the arts content be intentionally selected and taught with integrity and not in service of the other content. Making meaningful connections isn't just a bonus. Making connections provides career opportunities and useful real-life applications. Thus, STEAM learning is a way for students to understand that what they do in the classroom matters—what they learn, create, and apply has real possibilities and

opportunities.

For a true STEAM learning, students must have direct instruction in artistic skills and processes. STEAM education cannot happen if students do not explore artistic techniques, the creations of artists and composers, the skills to create, respond, perform/present, and connect through art to knowledge/learning. STEAM lessons can take place in the art or music classroom, but they can also take place in the math or science classroom. STEAM learning is a process of application, enabling students to create meaning for themselves and others. As Susan Riley points out, "School should not be a place, but rather a state of mind that uses the arts as a lever for explosive growth, social-emotional connections, and the foundation for tomorrow's innovators...today!" [19].

Georgette Yakman defined this learning model in 2006 as STEAM [21]. It is significant that each field/discipline promotes the need for students to develop the skills that make them sufficiently literate in the discipline to be able to continue to adapt and demonstrate the ability to transfer knowledge from one field to another, in the basis of a functional literacy. Another interdisciplinary learning perspective is constructivism, a theory of problem- and project-based learning, inquiry learning, authentic, contextual and experiential learning, collaborative and community learning, etc. The tipping point in the STEAM learning pyramid is the holistic approach.

Through art "those things appear whose form is in the spirit", Aristotle pointed out. The arts in STEAM learning build connections through spiritual intelligence, shaping the inner world of students' personalities and building bridges between the inner and outer worlds. There is a synchronization of multiple intelligences in the act of learning There is a series of reasons by which is argued the need to integrate the arts into the learning process through STEAM projects: (1) knowledge of art can only be an act of internalization; (2) artistic experiences of inner life can shape/edify the human person; (3) for the conception of a positive impact of the arts in the learning process, it is important to practice *reflection in-actu* (which exists in the process of the act of creation/reception) and *post-actum* (which exists after its production), because not only the artistic act , but also artistic reflection contributes to learning; (4) spiritual intelligence (SQ) is an integrative element in the act of artistic knowing, which brings together, mobilizes and transforms all the types of intelligence we have; (5) the metacognitive nature of artistic skills circumscribes the application of successful strategies [9, p. 201-219].

The integration of the arts in the STEAM learning process is not done for external effects, but, more importantly, to transform **knowledge through art into an inner experience**, because: knowledge and discovery represent the successive stages of understanding; the human interior asks questions, seeks explanations, relates, identifies itself (it is always being constructed, shaped, edified); manifests sensory-affective comprehension and soulful meditation/reflection; it constructs judgment from the intellect in relation to the scale of its own spiritual values.

In the same sense, M.S. Kagan [14, p. 204] points out that the need for music, which embodies all the richness of human feelings, inspires and elevates natural emotional reactions and forms a subtle soul of a person, which - the further, the more - will be necessary for culture, because it becomes more and more clearly that

the logical type of personality is not a "reasonable", enlightened person and not a person with romantic feelings, but a holistic person, who harmoniously combines these great abilities of the spirit, developed throughout the entire history of the world and, at the same time, endowed with a developed ability of "productive imagination" (Kant), which can also be called "projective imagination", since it directs all the practical actions of people and thus connects the present and the future.

According to the holistic character, the organization of the curriculum ensures a training-learning process, in which the child progresses from the "periphery of behaviors" to the "center of intimate and deep experiences". The systemic-holistic perspective *values the articulation in a systemic manner, from the perspective of achieving educational goals, of the multitude of components of the educational process. The starting point in the circular-systemic approach proposed by this perspective is the goals of education.* Teaching and learning are seen from a holistic perspective, reflecting the real world, which is interactive" [6, p. 32].

**The holistic purpose** of learning is the more complete development of human capacities in all the spheres of life. In defining **holistic education** we identify the priority of the spiritual, through its eternal character, over the material. The personality of the learner is, above all, a soul that has its own objective and the objectives that contribute to the realization of this fact. The holistic education consists of the ability to respond to the diverse learning styles and developmental needs of the human being.

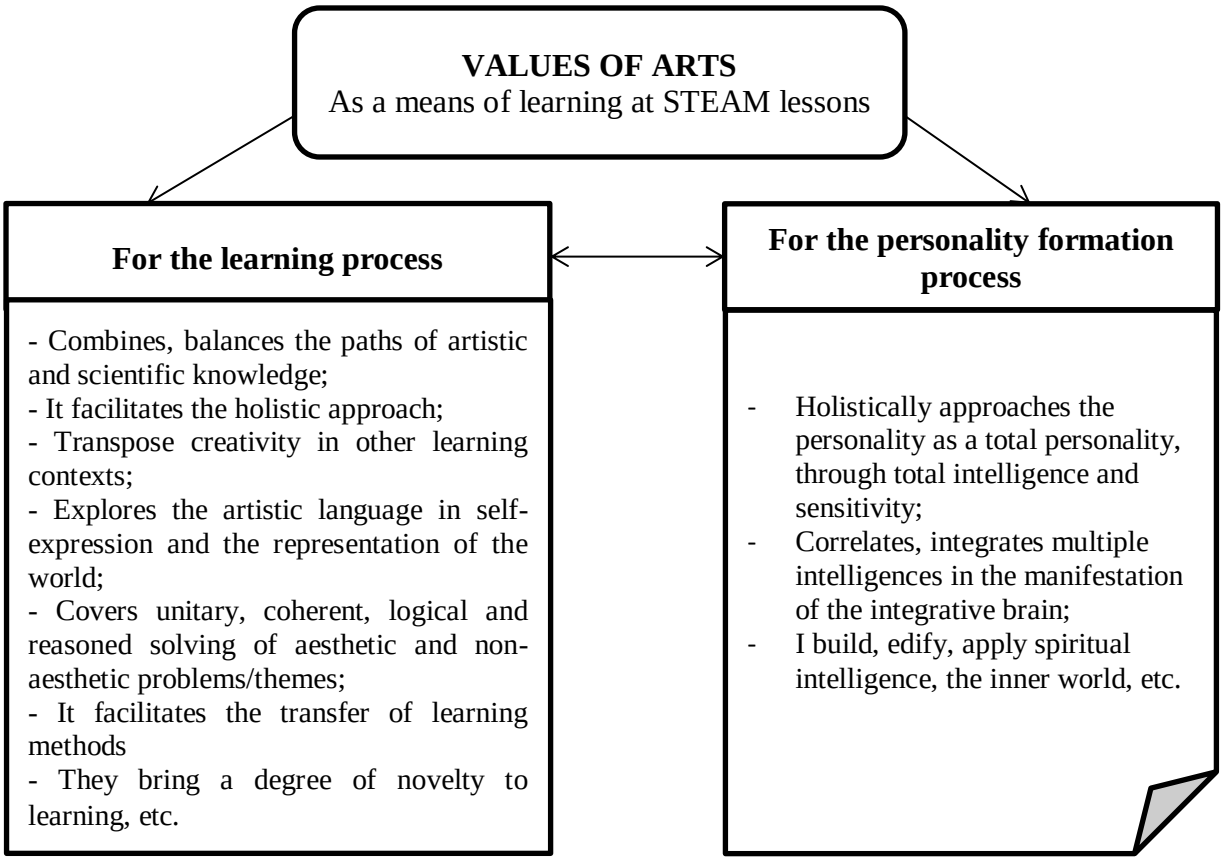



Figure 2. Arts values as a means of learning in STEAM lessons

In the praxeology of education, we identify the following aspects regarding the integration of music in STEAM education:

— addressing all the needs of the learner from an emotional, physical, intellectual, spiritual point of view and relationships with others;

— building positive relationships with oneself, with others and with the environment;
— more complete development of human capacities, abilities in all spheres of life;
— establishing learning partnerships between children, families and communities;
— putting into operation effective ways of correlating different types of contents of formal education in the area of non-formal and informal education;
— collaboration, mutual respect of all actors of the educational process.

Georgette Yakman [21] proposed an interesting approach to the implementation of STEAM, which can be schematically represented by a multi-level pyramid:

**1) Holistic.** The top level, the top of the pyramid. It is the universal level. The holistic approach will apply throughout life (long life learning). It aims to train people capable of using and generating knowledge (Knowledgeable People), to have initiatives and freedom of action in the face of economic and political pressures. There are at least two models from the holistic approach that have been successfully applied: Montessori and Waldorf.

**2) Integrative.** The integrative approach must be reflected both in curriculum development and in its connection to the realities of life. It is the specific level for STEAM application. The implementation of STEAM starts with the primary school cycle.

**3) Multidisciplinary.** It is the level where the focus is on the two components: STEM and Art - being a transition stage from STEM to STEAM. Facilitates the transition from the primary to the secondary cycle.

**4) Specific disciplines.** It refers to a "silo" approach. It applies starting with the secondary training cycle. It comprises 5 components: Science, Technology, Engineering, Art and Mathematics, with a more or less separate (independent) approach.

**5) Specific content.** It refers to the in-depth approach to a field of interest – specialization in that field. It applies to post-secondary education and higher education

All these new practices and approaches are in the phase of continuous improvement and integration into a new high-performing educational system, for which standards will be developed both globally and regionally or locally. The expected result, taking into account the application of a holistic approach, will be much greater than a simple sum of the results of the implementation of the components.

At the *STEAM Institute of Arts and Education* in Westminster (UK) 6 steps have been developed to create a **STEAM-centred classroom**. Each step works on both content and arts-specific learning strategies to address a central issue or essential question. The process of making a STEAM Project brings together the following six steps, with suggestions:

**1. Focus.** Selecting a key question/problem to be answered. It is important to clearly focus on how this question or problem relates to each of the STEAM domains. Hints for students: identify/formulate the essential problem or question.

**2. Detail.** During the detailing phase, look for elements that contribute to solving the problem or question. When you notice correlations with other areas or why the problem exists, you begin to discover a lot of key/fundamental information, skills,

or processes that students already have to address the question. Hints for students: note carefully the elements that contribute to solving the problem/generate solutions to answer the question, document your observations.

**3. Discovery.** Discovery is about active inquiry and intentional teaching. Current and possible solutions are sought. In this step, students look for current solutions as well as what doesn't work based on solutions that already exist. As a teacher, you can use this stage to both analyze gaps students may have in a skill or process, and to teach those skills or processes explicitly.

This is where the skills are learned, formed and the specific processes related to solving the problem/question take place. Actively seeks connections and ways to use skills, processes and knowledge to address the problem/question. Suggestions for students: Look for current and possible solutions, learn specific skills and processes related to the problem/question, actively look for connections and ways to use skills, processes and knowledge in addressing the problem.

**4. Application.** This is where the fun happens! After students have taken a deep dive into a problem or question and analyzed current solutions as well as what still needs to be addressed, they can begin to create their own solution or solution to the problem. Here students apply their skills, get involved in various knowledge/learning processes. The knowledge that was taught in the discovery stage is applied, new solutions are found. Suggestions for students: Use your skills, explore processes and knowledge to create a new solution/problem solution.

**5. Presentation.** Once students have created their solution or path to solving the problem, it's time to share it. It is important that the work is presented for feedback and that various ways of expressing the student's perspectives around the question or issue are presented. This is also an important opportunity to facilitate feedback and help students learn how to give and receive knowledge. Suggestions for students: share ideas/solutions with others, facilitate opportunities for feedback.

**6. Link.** It is this step that closes the learning loop. Students are given the chance to reflect on the feedback that has been shared and on their own learning and skill building process. Based on this reflection, students are able to revise their work as needed and produce an even better solution. Suggestions for students: consider the suggestions of others, reflect on your own learning process, revise solutions as necessary.

At the core of STEAM project learning are inquiry, critical thinking, and process-based learning. This is extremely important. The whole idea surrounding STEAM education is that it is based on inquiry - deep inquiry. Interest, curiosity, the ability to find solutions to a problem and to be creative in finding solutions from different perspectives (areas of knowledge, school subjects, fields of activity) are at the heart of this approach. This means that the arts and humanities are woven into STEAM education.

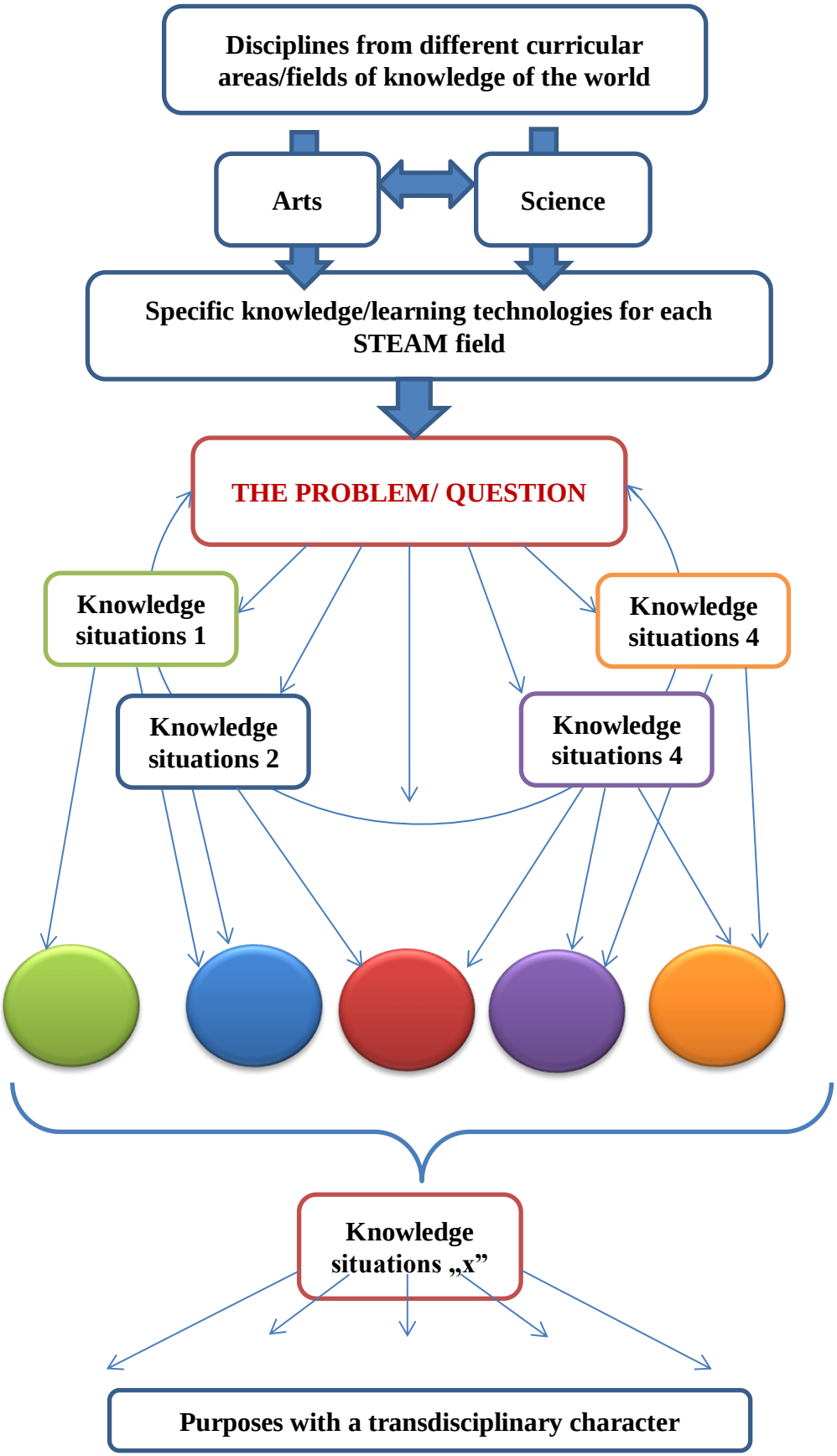



Figure 3. Integrating the arts into STEAM learning projects

In international practice, several factors have been identified that condition learning through STEAM projects [20]: collaborative planning, including some transversal contents, with teachers from each curricular area; adjusting didactic projects to adapt to a new way of teaching and learning; professional development for all staff in STEAM practices and principles; STEAM mapping scheme for

curriculum and assessment design process; aligning the learning process through STEAM projects to learning efficiency standards; implementing learning through STEAM projects without interrupting the educational process as a whole. Examples of the development of a STEAM lesson can be initiated from integrative topics, from which questions can be formulated for different fields of knowledge or school subjects from different curricular areas:

MODEL 1. Identifying connections between the arts and other fields of knowledge

Topic: ***Figures and shapes in everyday life***

Problem: How are form and content related?

Prospects for research and learning through the arts:

→ Figures and shapes in fashion design: models, meaning, style/ useful;

→ Figures and shapes in the ornaments of the Moldavian iia, the Moldavian carpet, in the pavement, etc.;

→ Fractal figures in art and nature;

→ Organization of the artistic image in different forms of musical art;

→ Figures and shapes in dance composition.

MODEL 2. Building connections based on essential questions

Topic***: Looking through the window: how the world is changing.***

List of questions:

→ What does the Earth sing about?;

→ How do we understand/distinguish the expressions "nature music" and "nature music"?;

→ What does it sound like? Where does it ring? how does it sound Why does it ring in nature and urban environments?;

→ What do my feelings (auditory, visual, olfactory, etc.) communicate when receiving the world around me?

→ What is the secret message of works of art regarding the world we live in?

MODEL 3. Building the STEAM lesson based on research groups

Topic: ***The magic of sound***

**Steps:** 1. Divide into groups and choose a field you like. 2. Study the topic "The Magic of Sound" from the perspective of the chosen field, consulting different information sources. 3. Create a poster with the chosen information: texts, images, tables, figures, etc. 4. Organize an exhibition of the works made, like in an art gallery. 5. Choose a group representative to present the topic using the poster. 6. Members of the groups visit the gallery, examine each poster, ask questions and can make observations and other proposals that they record at the bottom of the sheet. 7. Appreciate each other's completed projects.

As a result of the implementation of learning models through STEAM projects, we formulate some conclusions about their importance:

→ The need to achieve cooperation between different disciplines, respecting the legalities of each;

→ Involvement of a certain degree of integration (connection) between different fields of knowledge;

→ Use of a common language for different disciplines (terminology, methods, etc.);

→ Requiring integrated learning, when the emphasis is not on the learning content, but on certain skills;
→ Transfer of teaching/learning/evaluation methods from one discipline to another;
→ Going beyond the limits of a discipline;
→ Achieving inter- and transdisciplinary goals related to the profile of the graduate.

**4. Conclusions**

The learning process in the disciplines of the *Arts* curricular area represents, in essence, *education through the arts* and is based on the student's experiences in experiencing art, the intentional act of consciousness and the revelation of the state of consciousness of the Self.

*The formative effects of integrating the arts* and building *connections between the arts and sciences* require a deep understanding of learning contents, increasing interest in knowledge and active participation in the processes of exploring and affirming students' talent, individuality and personal expressiveness, increasing confidence and feeling of self-efficacy. As a result of contact/communication/knowledge of art, the *intuitive-intellectual vision of life awareness* is formed and manifested. In the study of the arts, the dimensions of awareness of the learned matter are intensely articulated and related: emotional, physical, mental (cognitive), spiritual, social-relational awareness - dimensions that represent the quotient of learning awareness.

*The division of the arts does not exclude their synthesis*, therefore, the symbiosis of the arts becomes a condition of the civilization of the age, it implies their mutual influence and cooperation, the active coexistence in the sphere of convergence of art with science and philosophy. The deep essence of art reveals the *dialectic unity between the sensible (material) and the intelligible (spiritual)* element, which unifies artistic experiences into one of synthesis and distinguishes it from other types of learning/knowledge. In the organization of learning in an artistic experience, the continuity and connection between the elements of the artistic experience and the events/activities/experiences that constitute the general content of the individual's life experience is defining.

Extending the learning process beyond the limit of *artistic-aesthetic education* towards *extra-aesthetic education* can ensure the formation of key and transdisciplinary skills. By harnessing the imagistic, expressive, intellectual, emotional potential, etc. of works of art in the learning process, the five dimensions of lifelong learning can be achieved. In the process of training teachers about learning based on STEAM lessons/projects, it is useful to consider the answer to the following questions:
- Distinctly defining STEM, STEAM and integrated learning, including the differences and similarities of each strategy;
- Selection of competence units in Science, Technology, Arts, Mathematics, which are aligned and mutually improve learning through student involvement;
- Building authentic and rigorous STEAM lesson series in terms of individual cognitive engagement of students;
- Elaboration of technology sheets, projects, learning paths, in which a wide variety

of paths are outlined that students could explore in STEAM lessons (see Appendix 2);
- Designing the assessment that fairly measures mastery of content units for each designed purpose;
- Creating data facilitation resources that engage teachers and students in reflections of a STEAM learning experience and outline next steps in student growth;
- Exploring design principles and providing examples of ways in which didactic projects can be successfully implemented for the STEAM lesson.

In the learning process, the students are value oriented for the awareness of the artistic experience in five successive stages: 1. Sensory and subsensory stage. 2. The contemplative stage. 3. Stage of differentiation of perception results. 4. The experiential "echo" stage. 5. Attitudinal-valuative stage.

*The interdisciplinary approach of Music Education and Art Education* aligns students' natural tendencies to make sense of their experience and integrate what they know into a pattern of action or big picture of the world. The powerful influence of music and the visual arts on life is seen more holistically when students can discover the coherence of the arts with other aspects of their school experience and, at the same time, discover *the connection of the arts to life*. Acquiring knowledge and skills unrelated to life is pointless.

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