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AESTHETICS OF GEOMETRY IN FOLK ART
IN PRIMARY SCHOOL EDUCATION

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Abstract

In the title of this article there are associated terms that apparently relate to various fields of interest: aesthetics, geometry, folklore and education. The concern for approaching a theme such as Aesthetics of Geometry in Folk Art in Primary School Education stems from current professional practice, from the desire to find answers where they are not sufficiently sought - in the essence of the human being.

The present paper is structured on three parts preceded by the introduction. In the first part there are synthesized some ideas regarding the presence of the elements of geometry in the folk motifs, in the songs and dances specific to the folklore of the children. The second part details some features of popular aesthetics of intrinsic and extrinsic value. The third part describes how the geometry and folk art can be intertwined in the didactic approach both in order to optimize students' school performances and to educate them as authenticity-oriented individuals.

Keywords: aesthetics of geometry; aesthetic of folk art; folk motifs; folk dance; primary school education;

1. INTRODUCTION

In a deeply-digitalised world, learning has new dimensions both in a broad and in psycho-pedagogical sense. The objective world, as an inexhaustible source of information, simultaneously fulfills the role of purpose, environment and resource for learning. One of the challenges we face in today's education is to maintain a balance between the objective universe and the inner world. We ask ourselves, therefore, what is necessary to learn, what is the purpose and by what means, so that the fundamental traits of the human being are not changed in an unwanted, irreversible way.

In the formal education, responses are synthesized in the curricula, an important vector of education. We know, for example, how many hours of mathematics are allocated weekly for the development of logic-mathematical skills, how many hours are allocated for the development of communication skills, how many hours are allocated for the study of arts, movement, etc. Even if apparently the fields of study are well delimited, the didactic process is often interdisciplinary and transdisciplinary.

2. GEOMETRY IN FOLK ART

The community of mathematicians around the world has an ever-increasing desire to popularize the beauty of mathematics, to make the study accessible, one of the proposed ways being based on the various forms of art.

From the multitude of studies conducted in this respect, we present one held in 2012 at the Department of Mathematics of the University of Southern California. It highlights the close relationship between math and the world of dance, despite the appearances that characterize the first field as a complicated and eternal source of frustration, while placing the second sphere of activity in the area of entertainment, of good mood. The authors of the study demonstrate that geometry is present in individual dance, in pairs or groups in all its forms: lines, geometric figures, in a continuous movement. In conclusion, the integrated approach of the two areas can facilitate their study, increasing both the level of knowledge and the level of satisfaction. (Wasilewska, 2012)

Without pretending to exclusively refer for the first time to the relationship between geometry, visual arts, music, dance, folk tradition and education, in this article, we invite the reader to reflect about some ideas that could generate creative approaches to the teaching. Based on the scientific researches presented in the specialty literature, on some empirical researches, based primarily on spontaneous observation, respectively on experience in working with students from our faculty and, implicitly, with primary school students, we underline some ways of intuitive learning of the basics of geometry through visual arts, music and dance specific to children's folklore.

a. Geometric motifs in folk art

An interesting starting point for the study of popular motifs in relation to geometry is the image below. Figure 1 shows that in the writing of each figure, a number of angles equal to the quantitative significance of the graph illustrated number can be used.

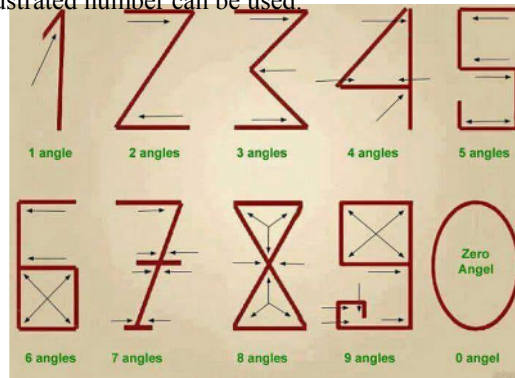


Figure no. 1, *Numbers and angles* (Hanson, 2018)

Figure 2 refers to the popular geometric motifs that we find on the various traditional art products. No matter what ethnic-folkloric area we are talking about, fabrics, ceramic vessels, wooden objects, etc. are richly ornamented with specific motifs.



Figure no. 2, *Popular geometric motif* (Stănescu-Bătrînescu, 1978, p.44-2)

As can be seen in the Figure 2, there is a rhythm and a periodicity of the popular motif. The inner dynamics of the folk motif can be noticed both in its microstructure and in the overall picture of the ornamented artistic product. The microstructure of geometric popular motifs is the result of the ingenious combination of geometric figures so that the aesthetic value of the image obtained counts more than the correctness of their assembling. The chosen chromaticity certainly contributes to the achievement of the artistic image, but only to the extent that it emphasizes the popular motive joints as a result of the juxtaposition and/ or partial overlapping of geometric figures of different dimensions.

b. Morphology of songs and dances from children's folklore

Popular songs from the children's repertoire have a balanced and clear structure. Most of these are written in the simple two-step measure and have rhythmic structures made up of half-time and one-time durations (see Figure 3).

Mămăruță ruță

Cântec din folclorul copiilor

Voice

Mă - mă - ru - ță ru - ță...

Figure no. 3, *Specific rhythmic structure for children's folklore songs*

Children's songs have their specific rhythm, different from adult's folk songs. The rhythm is shaped more in relation to the idea of movement than in relation to the syllabic structures of words. Here are some characteristics of the rhythmic system specific to the songs from the folklore of the children which support the theory underlying the present work:

- there can be noticed inconsistencies between the metric accents and those of the speech (for example, the song in figure 2, where the word *mămăruță* (ladybug), acquires an emphasis on the syllable I, although in speech, the emphasis is on the 3rd syllable);
- consists of rhythmic structures grouped two by two, variables as length (verses with or without refrain);
- most frequently, the beginning of the rhythmic series is with emphasis.

These features are reflected in folk dances for children both in dance steps and choreography. The dance steps are simple and relate to the binary formulas of the songs, so they are often grouped two by two, left and right, back and forth. The specific choreography of popular folk dances for children is most often thought of in the form of a circle, alternating with one or two lines, depending on the number of dancers and the space in which they are dancing. By learning dance steps and choreography, children can understand the elementary space relations, interior-exterior, left-right etc.

3. AESTHETICS OF FOLK ART

Whether cult or popular, art has its own laws, principles, means, elements of language. The aesthetics of folk culture is complex and difficult to define in few words. The very meaning of the term *culture* has, over time, undergone a series of modifications, depending on the socio-historical context in which it was formulated. In the context of this paper, among the innumerable definitions of culture, we mention a definition by A. Bondrea, who makes the following statement: *Culture is a prolongation of nature and a new dimension of the universe.* (approx. quote) (Bondrea, 1981p. 79)

Cultural value can only exist when there is knowing too. Authentic culture is created, capitalized and transmitted from generation to generation through various means. Referring to Michelangelo's statements that *a man who does not build his own tools will not make his own sculpture*, we can point out that the folk culture preserves everything that is specific to life in an area, at a certain time.

The aesthetics of popular culture can be seen in the very dynamics of our existence. Synthetic and analytical at the same time, folk art has a special symbolism. As R. Guénon states, *Symbolism is generally based on the correspondences that exist between different orders of reality. ... This correspondence is the true foundation of symbolism, and therefore the laws of a lower domain can always be considered to symbolize superior realities where they have their profound reason that is at the same time their principle and purpose.* (approx. quote) (Guénon, 1997, p. 311) Extrapolating this idea, we can see that folk art illustrates the correspondence between the collective and individual life experience and the fundamental human values of each person.

The products of folk art preserve not only the individual and collective aesthetic experiences but also the phenomena of their understanding. Their aesthetics are defined by reference to shape, signs, ornamental, specific, chromatic, motives. According to L. Ionescu, *the dominant impression generated by Romanian folk art is one of harmony and freshness and has its source in the synthesis of the forms of objects and in the geometry, sometimes almost modern, of the traditional decoration and, obviously, in the colors chosen by the ancestral creators.* (approx. quote) (Ionescu, 2013)

Folk motifs result from the joining of flat geometric figures: lines (straight, curved, broken), circles, semicircles, diamonds, squares, etc. invested with deep aesthetic significance. The ancestral artisan does not describe his woven, embroidered motifs on objects created using geometry-specific terms, but speaks of *water waves* (curved lines), *wolf teeth* (the broken line in zigzag), *sun* (circle), *cross*, *star*, *wheel*, *rosette*, etc.

In the case of music, in order to determine the authenticity and aesthetic value of folk creation, we are referring to the preservation or alteration of the axiological criteria along the temporal evolution, namely the consonance between form and content, the role in a certain context and expressiveness. In this regard, we bring to attention A. Leahu's assertion that *The admirable "opening" of some of the folkloric structures whose stylistic matrix, made for centuries to perpetual recreation of the variants, offers exactly the fully-fledged model of collective sensitivity and its multiple possibilities for development.* (approx. quote) (Leahu, in Coord. Rădulescu, 2007, p. 35)

The transposition of the above-mentioned ideas in education ensures the perpetuation of these aesthetic values, keeping them eternal through a common, clever and ingenious action of all.

4. THE AESTHETICS OF FOLK ART GEOMETRY IN THE EDUCATION OF PRIMARY SCHOOL STUDENTS

According to the school curriculum for Mathematics and Environmental Exploration, the children learn intuitively the basic geometric figures in the readiness, first and second grades, while, in the third and fourth grade, they learn how to operate with these notions. In school textbooks for the study of mathematics and in classroom practice, the universe for the intuition of basic geometry elements is reduced to images and objects in the proximity of students (table, closet, chair, table, shelf, etc.). Without minimizing this way of working, we propose that planar geometry elements be approached with children through the art or folk art.

A first argument in this respect is the theoretical material outlined in the first two parts of this article.

A second consideration that causes us to opt for the study of mathematics through arts is the special relationship between children and all forms of art. Expression of children through image, sound, movement happens beyond words, unconstrained. When children enjoy what they do, they develop an open attitude towards learning. That is why the study of any field, so of mathematics, more precisely of geometry through arts, is not only more pleasant but also more efficient. Didactic activities based on the intuition of plane geometric figures and the solving of some creative assembling operations by exploiting

folk motifs and/ or popular dances contribute to a better understanding of mathematical notions in order to develop children's logical and spatial thinking.

The third reason underlying the idea of studying planar geometry in the primary cycle in relation to folk art is that, thus, popular creation can be understood and valued by students from a different perspective. The folk motifs, songs and dances from children's folklore remain not only popular folk art items with which children sometimes come into contact exclusively with artistic education, but acquire the quality of inherent legacies that are defining the shaping of national identity.

As a result, we propose a guiding model of mathematical activity through arts that has as main purpose the understanding and deepening of basic geometric figures.

- Read and analyze the folk fairy tale *The magic shirt* written by P. Crăciun (Crăciun, 2013, p. 5-14). In this fairy tale, the romanian traditional shirt sewn by a poor girl for three years, is the magical element that leads the emperor's son to find the choice of his heart.

- The class is divided into groups of four children (both boys and girls);
- It is stated that the boys will be initiated in geometry, and the girls will create the folk motifs for the *magic shirts*;

- Boys, helped by teammates, will identify in the classroom, in the given time, as many known geometry figures as possible;

- Valorizing the geometric figures gathered by the boys in the team, the girls will create the most beautiful popular motifs to be embroidered on the *magic shirt*;

- Every team is asked to think about an appropriate choreography for the children's folklore song *Drag mi-e jocul românesc*, to illustrate the story;

- The artistic activity of the children is assessed;

- Fix the theoretical notions.

Such activity cannot be limited to 50 minutes, so it falls into the category of inter-transdisciplinary workshops. We believe that such an approach to the study of mathematics can be characterized as dynamic, flexible, attractive and efficient.

5. CONCLUSION

The mirroring of the syncretism of folk arts in didactic art is not only an exigency of contemporary education, but also a goal of it.

Applying geometry in the creation and ornamentation of artisan objects, as well as in traditional music and folk dance, helps students understand that math can be an appropriate tool for organizing and embellishing the space we live in.

Folk art is the product of individual and collective ideas, experiences and values that reflect the national identity of each individual.

At present, education is truly effective when it succeeds in transgressing any field in complete freedom, without altering its specificity and diminishing its intrinsic value.

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