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Cross-Curricular Link in Primary School

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Abstract: *As educators and connoisseurs of the school system, we often wonder about the meaningfulness of the goals set within an individual formal education. Are these goals, which are related to individual learning content, really the essence and the main guide of the learning process? In any case, for their realization, it is necessary to present and explain the learning content in a quality way by the person who also leads this learning process. The fact is that the presentation of content in individual subject areas has lately not been so rigid and limited anymore. Learning contents are intertwined between individual subjects, as in the world, at different levels, there is a growing tendency towards the interdisciplinarity of different areas. This is all the more pronounced in careers where employers seek the breadth of knowledge and versatility of future employees. Therefore, in primary school education as well, there should be increasing interdisciplinary connections and the search for a breadth of knowledge among students as well. Better than setting high and almost unrealistic goals within the standards of knowledge of an individual subject, it would be necessary to find ways to know the basic knowledge acquired in a particular subject, connect with another subject area and thus further strengthen the understanding of the learning content. In this paper, I present some interdisciplinary links with the subject of fine arts and other subject areas in primary education.*

Keywords— cross-curricular link, curriculum, case studies, learning objectives, standards of knowledge, Fine arts, Chemistry, Physics, Mathematics

1. INTRODUCTION

The fact is that the presentation of content in individual subject areas has lately not been so rigid and limited anymore. The intertwining of learning contents between individual subjects is growing from year to year, as the world, at different levels, is showing a growing tendency towards the interdisciplinarity of different fields. This versatility is also expected from future employees by the employers, who are looking for breadth of knowledge and flexibility of future employees. Also in primary education, we need to work on increasing interdisciplinary connections and finding a breadth of knowledge among students themselves. Better than setting high and almost unrealistic goals within the standards of knowledge of an individual subject, it would be necessary to find ways to know the basic knowledge acquired in a particular subject, connect with another subject area and thus further strengthen the understanding of the learning content. The following are some interdisciplinary links with the subject of fine arts in primary education and other subjects, such as. Chemistry, Mathematics and Physics.

2. CROSS-CURRICULUM RELATIONSHIP FINE ARTS AND MATHEMATICS

Fine arts and Mathematics have been linked as fields since prehistoric times. If we mention different artistic periods throughout history, we can quickly find connections within these areas. Already during the first civilizations, in the period of Egyptian art, as well as within later artistic periods (Greek and Roman art, then the later Renaissance and other periods), we find many architectural excesses in the artistic sense, which without the natural sciences themselves, such as Mathematics, would definitely not be realized. Proportions, golden cut, geometry, etc., are just some of the Mathematical challenges that most great artists have had to face. This is also a kind of proof that it is also sensible to connect these two subject areas with each other, in some learning contents.

One of the goals of fine arts, as a subject area, is to develop a spatial representation, which must also be understood in Mathematics. One of the tasks of the students (9th grade of primary education) was to draw geometric bodies (a cube, a square and bodies composed of these shapes) and to show them, within an interesting composition, as an illusion on a surface. They drew all this in a linear perspective and with drawing tools (ruler, technical pencil), as they are also used in Mathematics. The figures below (Figures 1 and 2) show an example of such cross-curricular integration.

Fig. 1

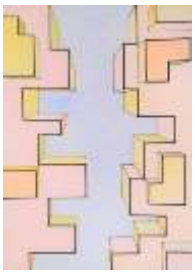

Fig. 2

Fig. 1 and 2 *Examples of student products*

With 8th graders, however, we connected to other geometric shapes and bodies that we still know. From an equilateral triangle (made of wooden building blocks), they had to create an architecture (model) in groups, which will consist of these figures and from which they built other

geometric bodies. In doing so, they had to pay attention to the stability, variety, originality and all other laws of construction of such a model of architecture. The challenge was to show as many characters and bodies as possible, of course within the meaningful layout of the composition. The figures below (Figures 3 and 4) show this construction method.

Fig. 3

Fig. 4

Fig. 3 and 4 *Examples of skeletal construction of a model from geometric figures*

One of the possibilities would be a good connection between the constructions of architecture from Platonic bodies. In this class, they were learning about these bodies in the subject of Mathematics [6] and precisely because of this, these bodies could also be used within the models themselves. It would make sense to choose one Platonic body in groups and use it as the main form of architecture and add even smaller forms of the same bodies, which would represent other parts of architecture (windows, doors, etc.). Of course, several of these Platonic bodies could also be combined (Figure 5). In all the previously mentioned projects, in connection with architecture, in addition to the understanding of Fine arts, the subject of Fine arts also developed an understanding of the skeletal way of building a building.

Fig. 5 *Example of skeletal construction of a model from Platonic bodies*

3. CROSS-CURRICULUM RELATIONSHIP FINE ARTS AND PHYSICS

Correlations with the subject of Fine arts were also found in the subject of Physics, as a natural science subject. In the 9th grade, students learn about various visual media in the subject of Fine arts, including photography. With the help of photography and taking into account all artistic laws (composition, colour contrasts, sharpening, etc.), students had to capture with the help of a smartphone, a physical phenomenon, which is also discussed in Physics [5]. Various examples have emerged, through the lens of captured moments in nature. I give one in the example below (Figure 6).

Fig. 6 *Example of speed display*

We learned about relationships and proportions in the subject of fine arts with the 8th grade students, through the sizes of the planets of our solar system, which planets are also considered in the subject of Physics [5]. In addition to the Earth, the students had to find a few other planets and place them in space within their own composition in an appropriate relationship with the planet Earth. All the data on the sizes of the planets were previously provided to them and from which they had to set the appropriate ratio, round it off mathematically and place it within the painting technique (Figures 8 and 9). In this case, it was a simplified representation of the shapes of the planets, through some chosen colour. The individual works of the students could then be assembled into a larger composition and thus a joint class product could be created.

Fig. 7 *Example of showing the relationships between the sizes of the selected planets*

Here, too (Figure 7), it is a matter of using mathematical aids, as in the case of the task (Figure 1 and Figure 2), as students can gain additional experience in the use of appropriate tools in such art tasks. In the example above (Figure 8), a compass was used to draw the circles. In other artistic expression, the tendency is to create without technical aids, but in this context of interdisciplinary connection, the use of the aforementioned tools seems reasonable.

4. CROSS-CURRICULUM RELATIONSHIP FINE ARTS AND CHEMISTRY

Chemical compounds are discussed by 9th grade students. There can be a lot of ambiguity if the student does not imagine things in three dimensions, and that is why we have made these compounds with them (in groups). Each group chose a particular compound they wanted to display and then made the appropriate model using the appropriate material (Styrofoam beads representing atoms and wooden sticks representing bonds) (Figures 9 and 10).

Fig. 8

Example of a compound model (Cyclohexane)

Fig. 9

Example of a compound model (Acetone / Propanone)

Only the chemical compound, which students discuss in the 9th grade of primary education in the subject of Chemistry and which is evident from the curriculum [1], was somehow connected to the curriculum in the subject of Fine arts [2], where we learn about kinetic sculpture or mobiles, which usually contains optical lightness, airiness and movement. The latter could also be realized by hanging the joint over the string from the ceiling and making it movable.

According to the methods described in the book by A. Papotnik [3], all these learning contents could also be linked to the project method of work and the possible connection of the previously listed subjects with the subject of Technique and Technology. Definitely, the possibilities of working on such creative projects are also open, within the optional subject of Art design [4], which I also teach.

5. CONCLUSION

The article presents only a few interdisciplinary connections between Fine arts and other subject areas. In all respects, the products were successfully realized and gave some added value to the learning content of the subjects themselves. The students were very motivated to work, as they found additional usefulness of the products made in the subject of Fine arts, in connection with other subjects. This usefulness was shown in the evaluation of the product itself, as the grade obtained in the subject of Fine arts could be transferred in a certain form (as part of the grade or in the form of percentages) to the grade in other subjects, of course where possible and in accordance with the learning content. The usefulness of the products was also shown in the fact that the learning content with such an upgrade and the connection between the subjects was also better understood. We equipped not only the Fine arts classroom with products, but also all other subject classrooms with which we had a cross-curricular connection. Thus, the classrooms themselves gained in their equipment, in terms of teaching aids.

6. REFERENCES

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