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FACULTY OF PSYCHOLOGY AND EDUCATIONAL SCIENCES
"EDUCATION, REFLECTION, DEVELOPMENT" DOCTORAL SCHOOL

Abstract of doctoral thesis

**Developing artistic and plastic arts skills in young school-age children through
flipped classroom strategy. Applications in the context of eTwinning
international collaboration projects**

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2nd part

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KEY WORDS AND PHRASES

- **Artistic and plastic arts skills**
- **Flipped classroom**
- **eTwinning International Collaboration Projects**
- **Stages of drawing development**
- **Stage of concrete operations**

The doctoral thesis entitled **Developing artistic and plastic arts skills in young school-age children through flipped classroom strategy. Applications in the context of eTwinning international collaboration projects** is structured in two parts. The first part includes the introduction of four chapters in which the concepts: skills, flipped classroom, eTwinning, stages of cognitive development and drawing in young school-age children (7-9 years). The synthesis of these concepts is the tool of research: a grid for the evaluation of plastic compositions, adaptable and scoring systems that do not relate to qualifications. At the same time, comparative analysis of the general skills and content of the school curricula in Romania, the Republic of Moldova, Poland and Turkey are carried out.

The second part of the thesis, the presentation of the experimental research *The valences of the flipped classroom strategy in the artistic and plastic arts skills in school-age children, participants in the eTwinning programme* are made up of four chapters. In the experimental pedagogical research it is analysed the potential of the systematic use of the flipped classroom training strategy in developing specific skills in school-age children (7-9 years). The research design, stages of the psycho-pedagogical experiment, the analysis of the results obtained in each stage, the conclusions are highlighted. The thesis ends with a list of bibliographic resources and annexes.

In the *Introduction* are presented the motivation for choosing the theme, for choosing the key concepts and phrases, the experimental samples, the scientific domain within which the educational program was created and applied.

In the first chapter, we have given a review of the specialized literature (Ciolan, 2008; Dressel, 1958; Good, 1973; Jacobs, 1989), emphasizing the importance of key competences for the success of pupils in life. Key competences are highlighted in all official documents of all education systems in all European countries. We have given an example in this sense and this is the Education Development Strategy (2007-2013) in Poland that lists the eight core (basic) skills and explains how each discipline contributes to their development. The Polish document emphasizes the importance of developing key competences to help pupils choose a profession and a workplace. Through the Social Capital Development Strategy (2011-2020), Poland also emphasizes the need to develop social activities as well as active participation in social life.

As proof of concern for everything socially speaking, Poland is one of the very well represented countries in social learning environments, such as eTwinning, with 57.422 registered teachers, project developers. Romania is particularly active on this platform, with 26.461 teachers participating in projects, while the number of teachers in Turkey has reached the number of 147.006 (www.etwinning.net). The Republic of Moldova is represented by 360

active teachers, in recent years the interest in collaborative projects has been increasing due to the work of the ambassadors of the East European Foundation eTwinning Plus, PSA Moldova (<http://etwinning.md/despre-etwinning/>).

We have carried out comparative analyses of the curricula in Romania, the Republic of Moldova, Poland and Turkey for the discipline Visual Arts/Plastic Education. We have highlighted the existence of some common categories of skills and elements. We have highlighted the flexibility of the subjects in the curricula, which gives more freedom to both teachers and pupils. Pupils are offered a wide range of approachable subjects: from techniques and means of drawing/painting, from plastic language to elements of art history, artistic culture. All of these create the premises for developing pupils' creativity and capitalizing on their skills. We consider it extremely important to establish interdisciplinary connections between plastic education and other disciplines, such as ICT, in order to achieve an overall development of the children. In the process of developing our educational programme, we have always used as a reference element the curriculum, the *School Programme for Vision and Practical Skills (2013, 2014)*, as well as the curricula of the other participating countries. We used these analyses in Chapter III to create an educational programme based on the use of the flipped classroom strategy on the eTwinning international collaboration platform.

In Chapter II, we have provided a detailed description of the specificity of the flipped classroom training strategy, insisting on the typology, the differences between this and flipped learning. In order to correctly position the emergence and development of flipped classroom, through an exercise of imagination, We have achieved the theoretical course of education throughout the modern period and to today's metamodernism. The ideas of Comenius, Montessori, Dewey, Cocişiu (the experimental school of Blaj, for our country) marked important stages in the development and modernization of education. The emergence of holism, determined by evolution in the sciences, has brought novelty into the theory of education as a consideration of reality as a whole. A consequence of holism on education is the division of disciplines and the emergence of interdisciplinarity. Metamodernism focuses on making a synthesis of the most valuable concepts of modernism and postmodernism in order to recreate efficient processes by which society can be governed locally and globally. There is also a reconsideration of man's role in natural ecosystems. In a complex and varied world, there is the question of peaceful coexistence and productive collaboration between people, and special policies are needed in this regard.

The features of the flipped classroom strategy have been highlighted:

1. it is a blended-learning (or hybrid) strategy that combines online learning with face-to-face learning;

2. reverses the place of teaching with that of exercising the contents (ie home with the classroom);
3. allocates more time to exercise the content (one-to-one or in small groups);
4. motivates pupils to prepare for classes (by marking content scoring);
5. has control over the level of individual pupil education (through instant feedback generated by computerized applications);
6. allows class activities to focus on the practice of higher cognitive processes.

Considering that each type of learning has advantages and limitations, we have made a comparison between traditional education (through its strategies) and reversed learning as a blended learning strategy that highlighted differences in content, support/coordination, time, feedback/evaluation, cost and results.

At the end of the chapter, we have analyzed the tutorial learning that fills the online flipped classroom strategy component using training platforms, Web 2.0 tools, and software applications.

Chapter III describes the eTwinning programme, insisting on the motivation of choosing it as a framework for the implementation of the proposed educational program. The ways in which these collaborative projects can be integrated into the curricula have been explained: the teacher can opt for fully integrated curriculum projects, partly integrated or extracurricular. Integrated projects in the curriculum can cover the whole set of skills in the curriculum for a discipline (and a few skills in other disciplines) or just specific skills (eg only for a thematic unit).

eTwinning (including eTwinning Plus) is an official action, part of the Erasmus + Program, implemented with the agreement and support of the Ministries of Education in the member countries. eTwinning, through the eTwinning Plus program, has been addressed to teachers, librarians from Armenia, Azerbaijan, Georgia, Republic of Moldova, Tunisia and Ukraine since 2013, and since 2018 has included Jordan and Lebanon, crossing the borders of the European Union. The national support centers of this program are nominated by the ministries of education. In Romania, for the period 2014-2020, the Institute of Educational Sciences was designated to coordinate the implementation of eTwinning (Crişan, 2015). eTwinning was created following the recommendations of the European Council of Barcelona in March 2002 on the implementation of twinning schools. The aims of these school partnerships are to provide the opportunity to learn by collaborating, practicing and improving ICT skills.

The main objectives of eTwinning are:

- Collaboration between partners from European schools or eTwinning members based on treaties, conventions;
- Developing a strong professional community through the offered courses, the working groups created;
- Developing friendly ties between pupils, teachers from different countries;
- Improving the use of technology (ICT) skills by developing projects on the platform;
- Promoting curricular integration within project activities.

The common goal of the efforts of all the factors involved in this initiative is to achieve a unitary, quality European education to raise the level of education in Europe through collaboration and exchange of ideas. All this through ICT. At the same time, the eTwinning program is a means of promoting the newest directions in education drafted by the European Commission with the help of everything it offers through its platforms (courses, groups, experience exchanges - mobility, campaigns, etc.).

All program components are addressed to:

- school managers and school inspectors;
- teachers with little experience in eTwinning;
- learning communities in the virtual environment/professional communities (teachers, librarians);
- pupils (from pre-university education) and parents;
- local community.

We continued to offer a curricular integration model for a project, using the steps outlined in *Curriculum Theory. Conceptual and Methodological Elements* (Bocoş, 2008). We have customized the description of these stages for Visual Arts and Practical Skills, as part of the eTwinning international collaboration project ARTmania, for the Romanian curriculum. This model can also be easily adapted to the curriculum of the other European countries participating in the projects.

Chapter IV contains the specific elements of a plastic work and their peculiarities at the age of 7-9 years. At the same time, an analysis of the specific competences of the school curricula for visual arts and practical skills/aesthetic education in Romania, Moldova, Poland and Turkey was carried out. In the curricula of the countries involved in the ARTmania/AVAP/Magic of Color project, specific competencies appear to have been formulated differently.

In Romania, specific skills are derived from general skills and formed through Learning Activities (learning activities only appear as suggestions in the curriculum, the teacher having the freedom to organize learning experiences by choosing the relevant activities). Since the discipline of Visual Arts and Practical Skills is an already integrated discipline, created by joining plastic education and technological education, the skills specific to the visual and plastic fields were considered for this study.

In the Republic of Moldova, specific skills are included in the curriculum as end-of-education procurements, with sub-skills corresponding to procurements at the end of the school year.

In Poland, procurements at the end of the school year are formulated in terms of abilities, knowledge and skills.

In Turkey, learning areas are detailed, for each school year, in knowledge, skills and competences. Examples of learning activities that favor the achievement of skills are provided.

This chapter explains how the plastic arts skills of pupils are shaped by the organization of the plastic arts space, in accordance with Piaget's theory of cognitive development and the theory of Vygotsky's proximity development, using the flipped classroom training strategy, within the eTwinning project.

For this study, the stage of concrete operations (the age of the children involved in the eTwinning project which formed the basis of this research ranging from 7 to 9 years) has been taken into account, and will be customized for the plastic art field as compared to the stages and interpretations of the described drawing by Luquet (as was Piaget himself) and Szuman in 1927, Lowenfeld (1947), Read (1956), Widlöcher (1965), Osterrieth (1976), Edwards (1979) and Royer (1995).

The second part of the thesis included the experimental pedagogical research *"The valences of the flipped classroom strategy in developing artistic and plastic arts skills in young school-age children, participants in the eTwinning program"*.

The aim of our research was to investigate the flipped classroom valences in the artistic and plastic arts skills in young school-age children (7-9 years old), participants in the eTwinning program (skills being corroborated with the criteria of the research tool: plastic message and compositional organization).

We proposed in this research the following objectives:

1. Identification of concrete ways of capitalizing on the flipped classroom training strategy in order to train specific young school-age children, at the subject Visual arts and

- practical skills;
2. identification of the role of eTwinning projects in developing specific skills in the curriculum for visual arts and practical skills at primary education level;
 3. identification of the artistic and plastic training needs of primary school teachers in the eTwinning community;
 4. providing a tool for eTwinning community members to evaluate the plastic work of young school-age children (7-9 years);
 5. providing a model for integrating eTwinning projects into the curriculum of Visual Arts / Plastic Education, adaptable to the curriculum at European level;
 6. providing curriculum materials to teachers, psychologists, parents for formative influencing by art, young school-age children (7-9 years).

Through the didactic experiment we aimed to control the general hypothesis, changing the conditions in which the didactic process takes place (the systematic use of the flipped classroom strategy), in order to reach the result (the plastic skills specific to the school curriculum). We applied the didactic experiment with parallel samples, in which the experimental design intersubjects (Bocoş, 2003) comprises the stages:

- preexperimental stage (in which we apply the pretesting)
- experimental stage (where we introduce the independent variable)
- post-experimental stage (in which we check the effectiveness of our experimental approach)
- retesting stage (where we check the results of the experiment remotely).

We present the stages and timing of experimental research:

Table no.1.

Stage	Planned activities	Time resources
Preexperimental stage	<ul style="list-style-type: none"> - Selection and analysis of reference bibliographic resources and curricular documents relevant to the educational program based on the systematic use of the flipped classroom training strategy in eTwinning projects; - collecting initial data (building research tools): <ul style="list-style-type: none"> a). needs analysis of teachers in primary 	School year 2016-2017 (1 st term) 2017-2018 (1 st term)

	<p>education;</p> <p>b). piloting the program on a small sample of participants.</p> <p>- validation of research tools;</p> <p>-the creation of experimental and control samples;</p> <p>- applying the pretesting;</p>	
Experimental stage	- Implementation of the educational program	School year 2016-2017 (1 st and 2 nd terms) 2017-2018 (1 st and 2 nd terms)
Postexperimental stage	- quantitative and qualitative analyses of data obtained from the implementation of the educational program (test results);	School year 2016- 2017 (1 st term) 2016-2017 (2 nd term) 2017-2018 (2 nd term)
Retesting stage	- quantitative and qualitative analyses of the data obtained from the retesting.	School year 2016-2017 (1 st term) 2017-2018 (1 st term) 2018-2019 (1 st term)

The overall hypothesis of this study referred to:

The systematic use of the flipped classroom strategy in the eTwinning International Collaboration projects contributes to the specific skills of the school curriculum in visual arts and practical skills in young school-age children (7-9 years old), related to the topic plastic, plastic message and compositional organization. (We mention that the school curriculum was: School curriculum for Visual Arts and Practical Skills, 2013, 2014-for Romania, School Curriculum, I-IV, 2010-for Moldova, Stolarczyk, Graw Kolory, Nauczania Edukacji Wczesnoszkolnej Program, 2009-for Poland and İLKOKUL've Ortaokul Görsel Sanatlar Dersi Öğretim Program, 2013-for Turkey.)

Depending on the overall hypothesis, we have formulated the following specific assumptions:

- I. There is a causal relationship between the systematic use of the flipped classroom strategy and the formation of pupils' specific skills in the visual arts discipline and practical skills related to the framing of the plastic works.

- II. There is a causal relationship between the systematic use of the flipped classroom strategy and the development of pupils' specific skills in the visual arts and practical skills/plastic education, related to the plastic message of the works.
- III. There is a causal relationship between the systematic use of the flipped classroom strategy and the development of pupils' specific skills in the subject of visual arts and practical skills/plastic education related to the compositional organization of the works.
- IV. The application of the flipped classroom strategy, within the eTwinning International Program, ensures the formation of specific skills of pupils, participants in collaborative projects, visual arts and practical skills/plastic education.

The following research variables have been taken into consideration:

A. Independent variable:

- The systematic use of the flipped classroom training strategy for young school-age children within the eTwinning International Collaboration projects, having as main subject Visual Arts and Practical Skills/Plastic Education

B. Dependent variables:

- the specific skills of the pupils, the visual arts discipline and practical skills/plastic education, related to the plastic themes. These skills, brought together under the criterion of the Plasticity Criterion (in the evaluation grid which constitutes the research tool), refer to: respecting the artistic current, the chosen technique, the type of chosen instruments and materials, the diversity and the expressiveness of the lines, the diversity and complexity of the forms, chromatic harmony, texture (color surface) and ornamentation of the composition. Pupils will acquire skills with plastic language elements: point, line, spot, shape, colour; (the ability to combine them, the accuracy of the forms' reproduction, the ability to work with the materials and tools specific to the visual and plastic arts education, the selection of instruments and materials in relation to the theme, the ability to combine them, the ability to work with artistic and plastic education- the correct use of a technique or several artistic and plastic techniques, their reporting to the theme, etc.).

- pupils' specific skills related to the plastic message. These skills, brought together under the criterion of The Plastic Message (in the Critical Evaluation Grid that constitutes the research tool), refers to: plastic expression and ideaistic content. Pupils will acquire the skills to transmit plastic messages through plastic language elements.

-the specific skills of the pupils regarding the compositional organization. These skills, brought together under the Composite Organic Criterion (in the Critical Evaluation Grid that

constitutes the research tool), refer to: spatial vision, originality and creativity, unity and balance of the plastic work. Pupils will acquire skills to organize the elements in plastic using original techniques and ideas.

The content sample was selected according to the specific age raking considered in our study (7-9 years).

The content sample included:

- the content elements present in the *School Programs for Visual Arts and Practical Skills/Plastic Education* for I, II and III Grades, Design and Painting fields, from the four countries participating in our research are the point, the line, regular and irregular shapes, flat spot and vibrating paw (colours).

- examples of activities in the *School Programs for Visual Arts and Practical Skills/Plastic Education* for I, II and III grades of the four countries participating in the research: understanding the suggestive effects of a colour used in reproduction, by comparison with adjacent areas, coloured differently; exploring the cultural and artistic environment to identify shapes, colours, materials, techniques, artistic objects; browsing art albums; initiating class projects for making painting albums; making plastic compositions after different thematic suggestions.

Place and time of research

The experiment was conducted on the eTwinning international collaboration platform in the online section of the Twinspace project section for two years (between 2016-2018). We took into account the *e(Twin) -ARTmania* project, which took place in the school year 2016-2017, which became a reference for *AVAP projects - Art, Joy, Harmony, Friendship* (2016-2017) and *Magic colours* (2017-2018). We have chosen to conduct the experiment in three projects based on the following observations:

- a) the number of members of an eTwinning project, in which the working language is different from the mother tongue, varies from 2 to 4. Thus, communication and collaboration can be better managed. The issue of curricular integration of the project is also easier to approach.
- b) the pilot project was implemented in the first project. After processing the experiment data, we expanded our research, including the other countries.

The project activities have been staggered for each project during a whole school year. The projects were attended by schools from Romania, Poland, Turkey and the Republic of Moldova. The communication and product exchanges made by pupils in the projects were

also done through social networks (Facebook groups), through Google email, Yahoo, or the WeTransfer application.

Sample of subjects. Initially, the piloting of the educational program aimed at studying the flipped classroom effect on a sample of 20 2nd grade pupils, the class coordinated by us. The results of our research have led us to choose the age range of 7-9 years, the interval corresponding to the stage of the concrete operations, as optimal for the implementation of our program.

The sample of participants comprised the experimental sample and the control sample. The experimental sample (Table no.2) consisted of 328 pupils, aged 7-9 years, as follows:

- a) 226 pupils from 10 schools from Cluj, Arad, Mureş, Botoşani, Bacău, Galaţi, Suceava, Dolj were involved in Romania.
- b) 10 pupils from a single school were involved in Poland.
- c) 20 pupils from a single school were involved in Turkey.
- d) 72 pupils from 2 schools were involved in the Republic of Moldova.

Table no.2.

Country of origin	School of origin	No. of the pupils involved
Romania	"Avram Iancu" Secondary School of Turda, Cluj	27
	"Teodor Murişanu" Secondary School of Turda, Cluj	25
	"Horea, Closca and Crişan" Secondary School of Turda, Cluj	21
	"Preparandia - Dimitrie Ţichindeal" National College of Arad	27
	"Ştefan cel Mare" Secondary School of Botoşani, Botoşani	22
	"Mihail Sadoveanu" Secondary School of Galaţi, Galaţi	29
	"Augustin Maior" Secondary School of Reghin, Mureş	19
	"Bosanci" Secondary School of Suceava	16
	"Ghita Mocanu" Secondary School of Oneşti, Bacău	16
	"Mircea Eliade" Secondary School of Craiova, Dolj	24
Poland	Szkoła Podstawowa w Dworszowicach Pakoszowych	10
Turkey	Kozayağı İlkokulu, Akyurt	20
Republic of Moldova	"Mihai Eminescu" Theoretical High School of Floreşti	58
	"Ştefăneşti" High School of Floreşti,	14

The control sample (Table no. 3) consisted of 322 pupils, aged 7-9 years, as follows:

- a) 322 pupils from 10 schools from Cluj, Prahova, Braşov, Constanţa, Timiş, Vaslui, Argeş were involved in Romania.

Tabel nr.3.

Country of origin	School of origin	No. of the pupils involved
Romania	"Ioan Opris" Secondary School of Turda, Cluj	46
	"Mihai-Voda" Secondary School, Mihai Viteazul, Cluj	51
	"Avram Iancu" Secondary School of Turda, Cluj	50
	National Pedagogical College "Constantin Brăescu", Constanţa	30
	"Episcop Jacob Antonovici" Secondary School of Bârlad, Vaslui	30
	Secondary School of Balinţ, Timiş	38
	"Tudor Arghezi" Secondary School of Piteşti, Argeş	19
	Secondary School no.30, Braşov	23
	"Alexandru Bohăţiel" Secondary School of Vultureni, Cluj	13
	"Înv. Radu Ion" Secondary School of Vadu Părului, Prahova	22

The methods (Table no. 4) used in the research are:

- analysis of legislative and curricular documents
- questionnaire based on survey
- the method of psycho-pedagogical experiment
- method of analysing the products of the activity (pupils' plastic works)
- statistical methods of collecting/interpreting data

Table no.4

Methods of research	Research Tools
Analysis of legislative and curricular documents	Grid of comparative analysis of the content of the curriculum of primary school education in Romania, Moldova, Turkey and Poland; Comparative analysis grid of specific skills in plastic education curricula in primary education, from Romania, Republic of Moldova, Turkey and Poland.

Survey based on questionnaire	Questionnaire addressed to the teaching staff on the didactic approach of the plastic field
The psycho-pedagogical experiment	The research project
Systematic observation	Pupils' works, posts on eTwinning platform
Analysis of the products of the activity	Critical evaluation grid for plastic compositions
Statistical methods for collecting/interpreting data	IBM SPSS Statistics Program 25.0

We used the Cronbach's Alpha Index (Table no. 5) to determine the internal consistency of

The research tools as follows:

Table no.5.

The Research Tool	the Cronbach's Alpha index	Number of items
1. Questionnaire on the flipped classroom and eTwinning projects to change teachers' perceptions about the organization of learning experiences in the field of aesthetic education	.711	20
2. Critical evaluation grid for plastic compositions	.962	13

Cronbach's Alpha coefficient values have shown very good levels of internal consistency, accuracy of measurement and fidelity of the instruments used.

The pre-experimental stage comprises:

1. analyses of the curriculum documents of the States participating in the experiment. Based on the data obtained from the comparative analysis of the curriculum, the specific skills and common content elements that were used during the formative experiment were selected.
2. applying the educational program (piloting) to a small sample of pupils and processing the data obtained for the validation of the research tool: the grid for the evaluation of the plastic compositions. The educational program was initially applied to a sample of 20 C-grade pupils from "Avram Iancu" Secondary School of Turda, participants in the eTwinning project ARTmania, aged 8-9. The experiment consisted of two evaluation steps: initial and summative, making comparisons between the results. Between the two evaluation sessions were the stages of familiarization with the impressionist, cubist and abstract expressionist manners. All the plastic works, practicing the artistic and plastic manners, were made in the

classroom, insisting on giving feedback from the teacher. Following the application of the Criteria we found some limitations. We faced difficulties in judging certain criteria, reorganizing them, and detailing the sub-criteria to provide greater precision to the evaluation. Thus, we reorganized the criteria by keeping only three and re-naming them as follows:

- Framing in the plastic theme
- Plastic message
- Compositional organization

The sub-criteria of the original grid were also renamed and reorganized.

3. to carry out needs analysis by creating and applying a questionnaire addressed to primary school teachers participating in eTwinning. In order to create an effective educational program that meets the needs of the European education system, we have audited the views of 110 teachers from the eTwinning community about the effects of the eTwinning program on the quality of the teaching process and the relationship with the local community and the other factors of the educational process. Most of the interviewed teachers agreed that participation in international collaborative projects brings many benefits related to the creative approach of the didactic approach through the rapid circulation of the latest practices and ideas in the field (98%), the motivation of the pupils (%), attracting local community support (81%). We also wanted to draw up an inventory of the main difficulties faced by teachers in the European education system in organizing learning experiences in Visual Arts and Practical Skills. According to the answers received, the most serious difficulties are the loaded school curriculum (78%), insufficient initial training in artistic and plastic (79%), insufficient funds (75%) and lack of updated good practice models (74%).

The opinion of teachers about the use of flipped classroom in primary education, according to the same questionnaire, ranges from optimism to restraint. The main objections to the use of flipped classroom in small classes were the lack of time for video training and the need to educate parents to understand the specifics of this training strategy. The results obtained by analyzing the answers received contributed, together with the results of piloting, to the creation of the final educational program.

4. expanding the experiment by setting experimental and control samples, the 650 pupils of state/mass education, from heterogeneous classes. The experiment did not include pupils in vocational or special education.

5. applying the pretesting to both the experimental and the control sample to determine the level of plasticity of each group, the degree of mastery of the painting techniques, the familiarization with the tools and materials belonging to the plastic field. Drawings of pupils

in the experimental sample were posted in eTwinning project space, pupils in the sample were either photographed and sent online via email or chat, or handed in personally (in the case of nearby schools as a distance). The drawings were labeled, specifying the initials and ages of the pupils. Following the pretesting we made the following remarks:

Predominant were the Sufficient for all criteria, both in the control and the experimental samples (in over 40% of the works)

- Pupils encountered difficulties in plastic expression especially due to the faulty choice of techniques and specific materials
- The high frequency of positional errors in the composition space of the elements that composed the theme (perhaps due to the coherent rendering difficulty of a subject).

The experimental stage consisted in the implementation of the educational program for the pupils in the experimental sample.

Example of activity planning

Table no.6.

Time/Period	Description of activities - tools used	Responsible
October- November	<ul style="list-style-type: none"> ● Partner presentation * ● Organization of the project space ● Impressionism (tutorials) ● presenting examples of good practices from partners; ● application of design elements: monotype; <p>tools: sharalike, padlet, kizoa</p>	All partners

* Includes the pretesting

The post-experimental stage was carried out after the completion of the formative experiment and aimed at verifying the achievement of the research objectives and the confirmation or not of the hypothesis. At this stage, we checked the evolution of the pupils from the selected samples and made comparisons. At the end of the training we applied the post-testing of the pupils from both the control and the experimental samples. The post-testing (post-experimental) stage was carried out under the same conditions as the pretesting. For the

post-experimental stage, the aim was to identify the extent to which the educational program, based on the systematic use of the flipped classroom training strategy within an eTwinning project, is functional in the development of specific artistic and plastic skills. The results of the pupils in the control and experimental samples were quantified in the qualifying categories, Very Good (FB), Good (B), Sufficient (S) and Insufficient (I).

The proposed objectives were:

- applying techniques and instruments to measure pupils' artistic and plastic skills
- studying the effects of the implementation of the educational program on pupils in the experimental sample
- making comparative analyses between the results of the pupils in the two samples.

The retesting stage aimed at establishing the durability of the procurements acquired during the formative experiment over time, to what extent these acquisitions remain/develop after the end of the educational program implementation. At this stage comparative analyses were carried out within the experimental sample (the results of post-experimental and retesting stages). The objectives were:

- To verify the level of artistic and plastic skills of pupils in the experimental sample
- To establish the link between the implemented educational program and the durability of pupils' acquisitions in time, in terms of specific artistic and plastic skills.

After retesting the pupils from the experimental sample we made the following observations compared to the post-testing stage:

1. the number of Very Good grades increased substantially, also decreasing the number of Insufficient qualifiers, especially the latter two criteria;
2. the number of Sufficient and Good grades has fallen;
3. to the Plastic Report criterion, the Insufficient Enhancement Medium was 0 and close to 0 (0.33) to the Component Organization criterion;
4. the retesting stage revealed profound changes in the pupils' artistic and plastic expression skills, in the Plastic Structure and Compositional Structure criteria.

The final results (Table no. 7) for the control and experimental groups in the retesting step were expressed quantitatively as follows:

Table no.7.

Final results	Very good	Good	Sufficient	Insufficient
Pretesting control group	580	1234	2103	269
Retesting experimental group	2284	1044	915	21

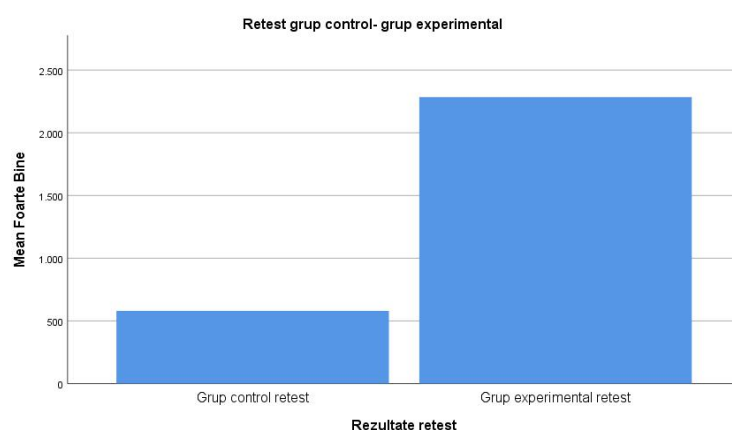


Fig.no. 1. Comparison of control group results/experimental group in the retesting step,
Very Good rating

Analyzing the graphical representation (Fig. 1), we noticed a significant increase of the Very Good grades in the experimental group pupils (2284) compared with the pupils in the control group (580) in the retesting stage.

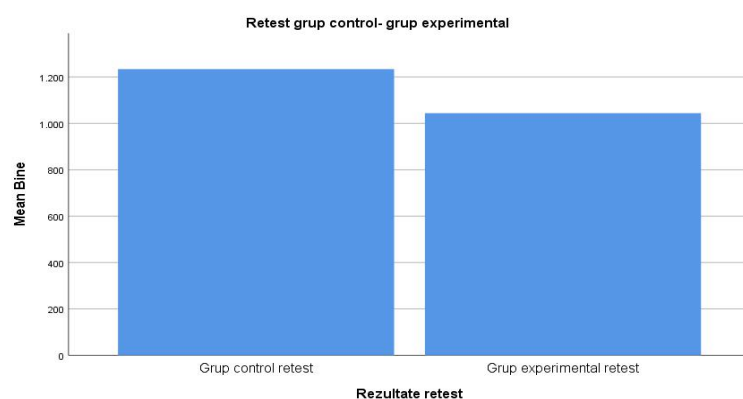


Fig.no. 2. Comparison of control group results/experimental group in the retesting step,
Good rating

From the point of view of the graphical representation (Fig. 2), we observed a slight decrease of the Good grades in the experimental group in the retesting step (1044) compared to the control group (1234).

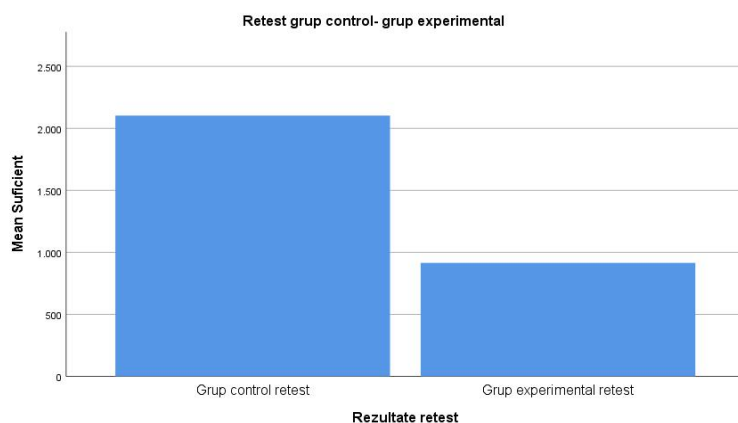


Fig. no. 3. Comparison of control group results/experimental group in the retesting step,
Sufficient rate

Unlike the distribution of the Very Good grades, the graphical representation of the qualities of the experimental group (Figure 3) revealed a decrease in their frequency in the retesting stage (915) compared to the control group (2103).

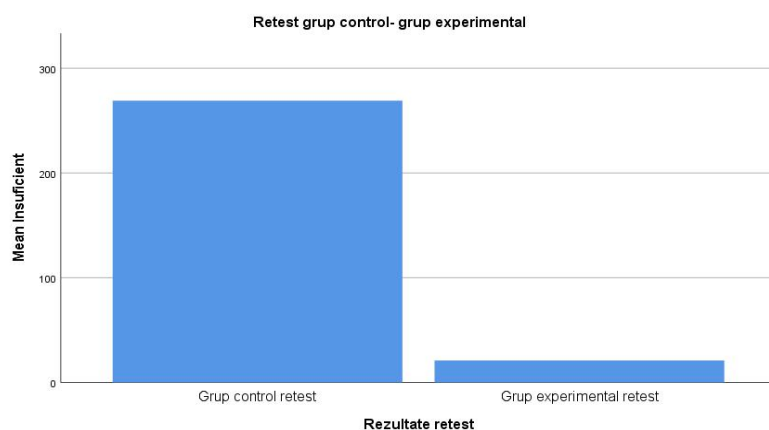


Fig. no. 4. Comparison of control group results/experimental group in the retesting step,
Insufficient rating

From the graphical representation of the results (Fig. no.4) obtained in the retesting stage of the pupils in the control and experimental samples, it was revealed that the number of Insufficient rates decreases significantly in the experimental group (21), compared to the control group (269) . The Levene and t applied tests revealed the same significant difference between the average of the results obtained by the two samples.

From the analysis of the obtained results, we have found out that the experiment has sustainability over time and that there is a link between the activities carried out within our educational program and the artistic and plastic skills of the pupils. Thus, *we considered the overall hypothesis of research to be valid.*

Conclusions:

Conclusions Concerning the Specific Hypothesis I. The results obtained, by criteria, by the pupils in the experimental sample, revealed significant increases of the Very Good grades in the retesting stage compared to the pretesting stage. Under the Plastic Ranking criterion, the number of Very Good grades increased by 37.4%, while the rest of the ratings declined: Good by 6.3%, Sufficient by 21.5% and Insufficient by 9.6%. As a result of the implementation of our educational program, the criterion of Plasticity Ranking, the number of Very Good triggers has tripled compared to the pretesting stage and has dropped below 1% to the Insufficient rating (Table no. 8).

Table no. 8.

Final Criteria Results	Very good	Good	Sufficient	Insufficient
Framing into the plastic theme				
Experimental group pretesting	384 14,6%	826 31,5%	1142 43,5%	272 10,4%
Experimental group retesting	1365 52%	662 25,2%	577 22%	20 0,8%

Corroborating the results obtained with the Plastic Fit criterion and its specific competences we concluded that there is a causal relationship between the systematic use of the flipped classroom strategy and the formation of the specific competences of the pupils in the discipline of visual arts and practical skills related to the framing of the plastic works .

Conclusions on the Specific Hypothesis II

Under the Plastic Message criterion, the number of Very Good grades increased by 43.5%, while the rest of the ratings decreased: Good by 10.1%, Sufficient by 28.5% and Insufficient by 4.9%. As a result of the implementation of our educational program, the Plastic Message criterion has the number of Very Good grades increased about five times than in the pretesting stage. To this criterion, in the retesting stage, no Insufficient grade was recorded (Table no. 9).

Table no. 9.

Final Criteria Results	Very good	Good	Sufficient	Insufficient
The plastic message				
Pretesting experimental group	77 11,7%	221 33,7%	326 49,7%	32 4,9%

Retesting experimental group	362 55,2%	155 23,6%	139 21,2%	0 0%
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Corroborating the results obtained under the Plastic message and its specific skills, we concluded that there is a causal relationship between the systematic use of the flipped classroom strategy and the formation of pupils' specific skills in the subject Visual Arts and Practical Skills/Plastic Education, referring to the Plastic Message of the Works.

Conclusions on the Specific Hypothesis III

Under the Composition Organization criterion, the number of Very Good grades increased by 40.3%, while the remainder of the grades decreased: Good by 15.2%, Sufficient by 19.2% and Insufficient by 5.9%. As a result of the implementation of our educational program, according to the Plasticity Ranking criterion, the number of Very Good triggers tripled compared to the Pretesting stage and decreased to 0.1% for the Insufficient Score (Table No. 10).

Table no. 10.

Final Criteria Results	Very good	Good	Sufficient	Insufficient
Compositional organization				
Pretesting experimental group	160 16,3%	377 38,3%	388 39,4%	59 6%
Retesting experimental group	557 56,6%	227 23,1%	199 20,2%	1 0,1%

Corroborating the results obtained with the Compositional Organization and its specific skills we concluded that there is a causal relationship between the systematic use of the flipped classroom strategy and the formation of the specific skills of the pupils in the discipline Visual Arts and Practical Skills/Plastic Education, referring to the Compositional Structure of Works.

Conclusions on the Specific Hypothesis IV

To confirm the specific hypothesis IV, we compared the experimental sample with a control sample of 322 pupils within the same age range (7-9 years). Taking into account the particularities of the stage of the concrete operations and of the ideoplastic phase of the drawing to the child, we started from the belief that, regardless of whether an educational program is applied or not, there is a qualitative increase in the specific skills in the curriculum. This increase in the control sample is due precisely to the stages/steps mentioned above and is natural. What we have proposed in this thesis is an educational program, developed on the eTwinning international collaboration platform, which accelerates the development of artistic and plastic arts skills, motivating pupils. In Table no. 11 the results of the control sample were

recorded in the pretesting/retesting stages, the progress due to the stage of cognitive development and the drawing at the child.

Table no. 11.

Final Criteria Results	Very good	Good	Sufficient	Insufficient
Pretesting control group	460	1281	2009	436
Retesting control group	580	1234	2103	269

Analyzing the data obtained from the control sample, we noticed that there was a slow increase in the Very Good grades (from 460 to 580) and the Sufficient (from 2009 to 2103), while the Good grades (from 1281 to 1234) and Insufficient (from 436 to 269).

In the retesting stage, the weight of the Very Good grades was 13.9% in the control group compared to 53.3% in the experimental group, the Good grades of 29.5% in the control group versus 24.5% in the experimental group , 50.2% in the control group versus 21.5% in the experimental group, and 6.4% in the control group versus 0.5% in the experimental group. Corroborating the results of the two samples and the specific skills proposed to be formed, we concluded that the application of the flipped classroom strategy within the eTwinning international program ensures the development of the specific skills of the pupils, participants in the collaborative projects, visual arts and practical skills/Plastic education.

Overall, the created educational program has ensured an increase of about 40% in the skills training specific to Visual Arts and Practical Skills/Plastic Education.

Difficulties encountered, however, were multiple:

1. limited access to relevant, relevant bibliographic resources
2. problems with the translation of materials, especially from Polish and Turkish
3. meeting deadlines by some of the partners
4. proper implementation of the flipped classroom
5. the refusal of some teachers to ask for specialist support
6. loss of important qualitative data due to omission of pupil observation during the creative process
7. lack of data on pupils with CES (ADHD, autism, etc.) that could have led to relevant conclusions for this category of pupils through the proposed educational program
8. unequal sampling in the participating countries (most pupils belonging to the Romanian schools)
9. the control sample composed only of pupils from Romanian schools

10. insufficient time to observe the influence of the tutorial on pupils' works, especially with regard to compositions in cubism and abstract expressionism
11. irrelevant works for our study due to the intervention of the teacher in their realization
12. insufficient time to prepare more video to increase the effectiveness of the flipped classroom strategy.

Future research directions. Taking into account the difficulties encountered in conceiving and implementing the educational program based on the systematic use of the flipped classroom training strategy, in the context of eTwinning international collaboration projects, we have proposed the following research directions:

1. creating a video resource for the flipped classroom
2. diversifying artistic trends and adapting them to classes
3. qualitative analysis of the plastic production process
4. studying the characteristics of the stage of the concrete operations and the stage of the formal operations in the drawings of the pupils aged 7-9
5. applying the educational program to pupils from other countries than those included in our study
6. inclusion of other criteria in the plastic composition evaluation grid
7. extending the educational program to pupils with ESCs
8. program implementation and comparative analysis between European and non-European countries participating in the eTwinning program
9. the use of electronic support (tablet) for making plastics compositions.

Following the implementation of the proposed educational program, we have formulated the following recommendations:

- 1) the development of teaching aids for the visual arts discipline and practical skills/plastic education, in which the content elements are used through the artistic currents
- 2) the development of integrated didactic aids, including the activities specific to visual arts in STEAM (Science, Technology, Engineering, Arts, Mathematics) assemblies;
- 3) the inclusion of the eTwinning International Collaboration Program in the curriculum of universities, CAT (Computer Assisted Training)
- 4) familiarizing primary school pupils with computer-based and Internet-based activities as a source of information.

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