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School Inspectorate
of Călărași County

THE METHODOLOGY OF ORGANIZING AND IMPLEMENTING MICS (MaST Innovation and Creativity Study Shops) AND MICS EXHIBITIONS





Cap I. CONCEPTUAL CONSIDERATIONS

Art. 1 Purpose

Creating and developing joint Romanian-Bulgarian educational communities for the integrated study of mathematics, sciences and technologies through innovation and creativity workshops and presenting the results in the MICS exhibitions.

Art. 2 Defining concepts

2.1 MICS = MaST Innovation and Creativity Study Shops.

MaST = Mathematics, Science and Technologies

MICS function as extracurricular activities, introducing optional classes according to a schedule/timetable and a proper regulation. MICS are a way to develop students' scientific and technical abilities as well as their entrepreneurship and marketing skills.

Within the MICS, teachers and students carry out interdisciplinary MAST projects.

MICS are organized in secondary schools and high schools.

2.2. The Interdisciplinary MaST Project (see Methodological Resources)

It is a research learning project created and developed on an interdisciplinary theme by a team of teachers and students.

The research learning project will be considered interdisciplinary if at its implementation knowledge from at least 2 scientific and technical areas is used:

- ① Applied Mathematics
- ② Physics
- ③ Chemistry
- ④ Biological Sciences and Environmental Protection
- ⑤ Engineering, Robotics and Unconventional Technologies
- ⑥ Information Technology





Art. 3 Acces to gaining MaST competencies

Acquiring academic or professional skills within an institutional framework (in our case, school institutions) requires pre-requisites, which are absolutely necessary to obtain the expected results, defined by three fundamental dimensions:

- dimension „hard”: infrastructure, equipment, information resources and documentation, teaching materials and curricular auxiliaries etc.;
- dimension „organization”: access to facilities, equipment and other resources, as well as their use in the teaching process, setting the timetable, teaching strategies and methodology;
- dimension „soft” – aspects of the organizational culture - belonging to values and mentalities: the key actors' satisfaction towards education, values, attitudes and behaviours, motivation for learning etc...

Cap. II IMPLEMENTING MICS

Art. 3 Organizing MICS in schools represents an attribute of curricular and methodological committees that ask formally the governing body of the school to adopt such a non-formal learning environment during school year.

Art. 4 Each MICS will be established by an internal decision of the school and will consist of a team of 10 to 15 pupils and 2 to 4 mentor teachers. At least one mentor teacher must have attended a training course.

Where appropriate, the team can also co-operate with auxiliary staff (technician, computer engineer).

Art. 5 In a school unit, at the teachers and students' request, more independent MICS can work simultaneously.

Art.6 The entire team building process must be transparent. The school principals will make known the intention to build the MICS team through an announcement posted on the school's website. The timetable and registration conditions will be posted.

Art. 7 MICS will operate according to their own regulations and programs, approved by school boards of directors and will develop MAST interdisciplinary projects.





Art. 8 Schools that have gained experience in running MICS activities will partner with other schools to deliver know-how. Teachers accredited as part of the CBC for MaST education project will provide advice and assistance to the new teams of the program.

Art. 9 County/Regional School Inspectorates will keep record of the MICS taking place each school year, through one of the MaST inspectors.

Art 10 Activity is MICS will take place according to a program and a proper regulation, created at the school level and will be materialized through:

- a) completing a portofolio containing:
 - decision of running MICS
 - title of the project
 - Content: purpose, objectives, description, bibliography, results etc.
 - Activity results: project diary, reports, photos etc
- b) final products: magazine, devices and instruments created during activities, CDs, website, videos, photos etc.
- c) dissemination: local news articles, taking part in local/national/international exhibitions, articles published in magazines, taking part in contests.

Cap. III ORGANIZING MICS EXHIBITIONS

Art. 10 School Inspectorates can organize a MICS exhibition annually that operates within their scope of responsibility if there is a reasonable number of MICS that functioned in that school year.

Art. 11 The school units in which MICS take place will organize MICS exhibitions at the school level in order to promote activities as well as to conduct evaluation.

Art. 12. Partnerships can be created among school inspectorates, educational establishments, universities, local/regional authorities, NGOs, private companies to form consortia as to develop a superior culture of science and technology among the young generation.

These consortia will have a greater capacity to organize and promote events such as MICS exhibitions.

Art. 12 After the general school inspector has made a decision, a team consisting of three to four members will be created in order to organize the MICS exhibition.





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Art. 13 The organizing team will publish a calendar for the exhibition event as well as the procedure and the school enrollment form (Annex 1) at the event.

Art. 14 The organizer (school inspectorate, school unit, consortium) enrolls the MICS which are to participate in the exhibition based on the school enrollment form submitted within the deadline specified in the announcement and posts the list of registered MICS and the MICS exhibition program on the institution's website.

Art. 15 The organizer has the responsibility to identify a suitable venue for both the exhibition and the presentations which are to be held.

Art. 16 In accordance with the school enrollment forms (part 4), the organizer will provide all teams with basic presentation equipment (computer, videoprojector, screen etc..)

Art. 17 The organizer will select a jury consisting of three to five MaST experts.

Art. 18 The Expo MICS activity consists of two phases:

- a) The jury and the public will visit the exhibition;
- b) The team members will present the project.

Art. 19 The Jury will evaluate:

- The interdisciplinary MaST project's portfolio
- The project's products
- Presentation of the project

Art. 20 The organizer will establish award criteria and will offer diplomas and prizes consisting of objects/money.





METHODOLOGICAL RESOURCES

Project Method: learning/research method

The CBC for MaST education project aims to develop key competencies in mathematics, science and technology by delivering high-quality MaST (STEM) education.

The role of MICS is to initiate, promote and support school-level projects that enable students to acquire MaST skills.

What is the MaST project method?

It is an active-participative research method of learning, which promotes the development of the students' dynamic skills and abilities in MaST education.

What is the learning process of the MaST project method?

It is a student-centered training model based on the project method that develops broad-based knowledge and abilities, promoting, at the same time, scientific research by linking the students' performance standards (points of reference) and students' top-level thinking abilities, having, as a result, authentic products in the MaST field.

The main stages of learning through the MaST project method:

1. Identifying the theme

The learning units or theme / themes that are approached through the project method focus on the needs and interests of students in science and technology. Students are involved in making decisions about the content, process and the product of learning. The projects allow students to address the topics of interest to them, to develop new skills, to work on the abilities they already possess and to create original products.

2. Formulation of Objectives

By formulating objectives, different interests are identified, subordinate topics are discussed and the results to be obtained are determined.

The objectives of the project must be correlated with specific competencies, such as MaST abilities and the reference objectives, respectively.

Objectives must be clear, measurable, achievable, realistic and they must be accomplished within a defined time-frame (SMART objectives: S= specific, M = measurable, A = achievable, R = realistic, T = time-bound).





3.Planning and preparation

Planning involves establishing the project activities, each member's responsibilities and the time schedule.

Preparation involves organization, information/documentation, consultation. For information/ documentation, documentary research tools will be used.

These two components, planning and preparation, must answer the following questions:

- how can we reach our objectives?
- what tools will we use to check if and to what extent the proposed objectives have been achieved?
- what do we need? (information, materials and equipment, experts/consultants, space, time)

4. Implementation

It is the stage of concrete implementation of the activities proposed in the project in order to achieve objectives. Activities can be run individually or in groups of students in accordance to the planning of activities (Ganntt chart). These activities are coordinated by the teachers involved in the project. MaST projects involve the use of specific scientific research tools.

Learning through projects engage students in active roles such as:

- solving complex problems
- making decisions
- investigation
- documentation
- collaboration

5. Presentation

The presentation part is the stage of the project where students present the results of their activities, the products, either in a working group, in a class or in front of an audience.

Depending on the project objectives and the age of the pupils involved, one or more of the following presentation products can be made:

- written presentation
- oral presentation
- newsletter, newspaper, brochure
- posters
- resource based on web (wiki, blog)





6. Evaluation

Within the learning process based on the project method, a complete assessment of all activities and products is carried out.

Just as the method itself, the evaluation is student-centered and focused on both the content and the skills, defining the abilities to be achieved in the context of the project.

Students should also be involved in the evaluation, which will lead to developing a greater sense of control over the learning process. As a result, they will consider themselves capable and performant.

Evaluation methods should be established from the very planning stage so as the following will be assured:

- continuity of evaluation throughout the project
- diverse forms of assessment (formative or summative)
- improving evaluation methods
- evaluation of the project objectives
- involving students in their evaluation

An efficient form of evaluation supposes the following:

- tools and clear criteria established from the beginning of the project
- providing examples so as to obtain quality activities and products
- offering students the opportunity to monitor their own progress
- offering a specific amount of time to improve activities and products

Teacher-student relationship

Perhaps the most important gain of the learning-research project method is the new relationship established among teachers and students who are part of the MICS team.

Through the working method itself which has a democratic character and through which traditional barriers among teachers and students disappear, a partnership relationship is established over time to achieve common objectives. The teacher becomes both a mentor and a learning facilitator, which means he or she is no longer just an information provider.



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Annex 1

REGISTRATION FORM FOR PARTICIPATION IN THE MICS EXHIBITION

Year _____

Part 1. General Information

Institution	
Postal Address	City: Street: Nr. Postal Code: County:
Telephone no. (with area code) of the school	
Fax no. (with area code)	
E-mail	

Part 2 Information about the MICS team

2.01 CA decision to set up MICS	
2.02 Number of participants:	Students: Teachers:
2.03. Contact person: First and Last name, address, mobile phone no, email	





Part 3. Project Details

Title/topic of the project	
Justify the importance of your work (max. 200 words)	
If the project has already been presented, please specify:	Where: When: How:

Part 4 Presentation details

For the presentation, I need:	Equipment: Programs: Other:
The project portofolio consists of:	

Part 5 Certification

We declare under our sole responsibility that this owrk is the intellectual property of the authors mentioned above. In the case of plagiarism, the authors will face the consequences provided by the Intellectual Property Law.

Last and First name of the author/authors and signature	1. _____ 2. _____ 3. _____ 4. _____
Last and first name of the school's principal, signature and stamp	

