

“Dare to dream through STEAM and think positively for the future”



**School interdisciplinary counseling through STE(A)M
for students and teachers**

Table 1 – Summary		
1	Author(s)	ATMATZIDOY KATERINA MATH Teacher -GENIKO LYKEIO SCHIMATARIOY upper secondary school- GREECE
2	Background	<p>I'm a mathematician and elected general secretary of Hellenic Mathematical Society Viotia's Department.</p> <p>I teach for over 20 years in a public school, GENIKO LYKEIO SCHIMATARIOU, located 60 km far away from Athens and also about 10km away from Chalkida, a seaside town. The school is placed in the center of 2nd biggest industrial area in Greece and I strongly believe that my students deserve to learn through creative STEAM activities (and not only the theoretical way) because they can work here and solve topical problems. My students are 16-18 years old.</p> <p>I work on my dream: getting bigger a network of teachers (not only mathematicians) who love creativity, innovation and STEAM. As far as now this network of my colleagues uses math as cause, motive and causation for cross-disciplinary and interdisciplinary projects and recently I make systematically steps in STEAM blending learning.</p> <p>A few years ago I established the first Math Laboratory in our area called: "Dare to dream and think POSSITIVELY". I work here in Greece and share my passion about projects with my students collaborating with European schools through etwinning projects. We all need the POSSITIVE aspect of what goes on around us.</p> <p>I also support the eTeam Schimatariou, a STEAM team in my school. (see here https://getlogilearn.web.app/index.html. This our recently activity with my students. We took part in Vodafone Next Generation Competition this year with the subgroup Nano Trojans and we have been evaluated the 4th place with our STEAM project “Logilearn”.</p> <p>Recently I came through OSOS and R4Cs communities and, finally, the STEAM methodology and SALL(Science as Living Labs) methodology. I try hard for me and my students to get inspired and be part of innovative communities . I am always very interested to get involve with an innovative projects. Of course I am open-minded in any other's proposal that will make my students feel the benefits of collaboration. I run etwinning projects.</p> <p>I argue that lifelong learning is essential and that is why I seek to train through seminars every year and so I have participated in many seminars and conferences in person and at distance and I have collaborated in programs with teachers from Greece and Europe.</p>

3	Descriptive title	<p>“Dare to dream through STEAM and think positively for the future” :</p> <p>School interdisciplinary counseling through STE(A)M for students and teachers .</p>
4	Abstract	<p>The policy I propose came up in a foundational moment for Greece. Emerging from the after Covid-19 period and a severe economic and social crisis that has greatly affected its economy, society and education system has engaged in a number of important reforms to re-establish the conditions for its education system to thrive.</p> <p>Education needs to change to meet new economic, social and cultural challenges and the expanding demands. This STEAM educational purpose aims at preparing, during the school year, current students aged 16-18 for the future career path.</p> <p>The 2020 Digital Economy and Society Index (DESI) shows that 42% of Europeans do not have even basic digital skills. 54% of small and medium-sized enterprises who try to recruit digital experts experience difficulties in filling these vacancies.</p>

Table 2 – Goals		
1	General goal	<p>Knowing that today's 18-year-olds when they enter the labor market, the professions will have diversified and that they must have the knowledge to adapt we will try through this policy to excel the existing professions, to communicate with professionals and also to give them the supplies through the STE (A) M philosophy to be able to adapt to new working conditions.</p>

General goal description

The strategy is intended to “ensure clear choices and to rally the school’s support for future issues about students and teachers”

The development plan for the strategy proposed seven strategic tenets:

- build a learning society and strengthen our students and teachers towards new facts of economy and the needs of the labor market.
- increase the European and international components of the learning methods to fasten the connection to the future jobs.
- boost social mobility and further social inclusion
- design new orientation of our students to 21st-century higher education
- respond to our young people’s and their parents aspirations.
- informing young people about the demands of the labor market in the wider local industrial area in which the school is located
- creating inspirational links of current entrepreneurship with the school.

It also identified four main levers:

- define a new higher education landscape
- listen to and support the men and women who work in higher education
- listen to and connect the industries to support school’s needs
- invest in a learning society for students, ex -students, their parents and teachers .

These lead to an action plan (Béjean and Monthubert, 2015)

Studying the [Hard Trends I've outlined](#), which will help career-minded individuals predict what sorts of skills they'll need to develop and where opportunity for employment may lie. As for employers facing a talent shortage, they need to develop new recruiting methods and be willing to provide necessary additional training to new hires. From both sides, it's clear that the most important aspect of this talent and employment shortage is the pursuit of modernized knowledge.

[2942 επαγγέλματα](#)

[STEM workers receive a significant earnings premium over other workers with the same level of education](#)

[Why Coding Is Still The Most Important Job Skill Of The Future
Computer programming jobs may be declining, but coding is becoming the most in-demand skill across industries.](#)

[The Future of Jobs: Anticipate Job Needs in an Increasingly Tech-focused Economy](#)

[schools to enhance STEM proficiency](#)

Table 3 – Targets		
1	Beneficiaries	<p>Through this policy</p> <ul style="list-style-type: none"> • Firstly, we focus in 16-18 years old students who are preparing to take the national exams to obtain their entrance to national public universities and design their future through this choice. We will help them to discover their skills and focus on their development in order to choose the profession that is most suitable for their profile. • Secondly, teachers will benefit in their pedagogical and professional aspect of their job. This will turn back to students as meta-beneficiaries.
2	Recipients	<p>Recipients will be first of all our students but from result will be all society, because we will educate the future workforce to respond innovatively to real-world problems.</p> <p>Also recipient will be the whole Greek educational system as individual steps of teachers of all subjects to STEAM make a right tense for the future of Greek education.</p>
3	Special needs	<p>Because of the model of policy we propose all students and teachers may be included. Actually because of the restriction of pandemic some of them have to study from home and watch synchronously or asynchronously their class, the policy took consideration of them and reformed the typical classroom for them in order to participate to the school class activities.</p> <p>A refugee crisis for example during 2015-17 resulted in at least 12 000 school-age children joining the education system, adding challenges to a system already struggling with resource limits.</p> <p>While many refugees intended to transit to other European countries, a number of them have begun to leave their refugee camps for more permanent accommodation in Greece, and their children are being integrated into local schools.</p> <p>As there are groups of students with special needs we must admit that the effect of attending a STEM school was stronger for girls, economically disadvantaged, and underrepresented minority group students.</p>

Table 4 – Value Proposal		
1	Value proposal	<p>Students be connected to their future</p> <p>Teacher be more professionals and re-educated about the trends of the labor market which makes their influence to their students more affected.</p> <p>Local community be connected to school.</p> <p>Local industries contribute to prepare the local students to existed work places.</p> <p>No brain drain from Greece.</p>
2	Results	<p>Our students will gain exploratory thinking and a greater interest in the learning process.</p> <p>70% -80% of students will be able to decide their professional future.</p>
3	Impact	<p>The impact of School Counseling through STE(A)M on students' social and emotional well-being growth, including incentive gains, perseverance, commitment, empathy and emotional regulation. Students learn to adapt their actions in relation to the actions of others - enhancing their self-efficacy and social perceptiveness. unique ability to help students understand new perspectives and participation in social and creating emotional skills.</p>

Table 5 – Costs		

1	Cost structure	<p>Plan A: With the study that will follow, we will proceed on a theoretical basis to review the concept of educational costs or otherwise a general approach without numbers and exact amounts. We will refer to the empirical issue of the type, amount and performance of educational expenses. At the same time, we emphasize the need for the proper management of financial educational resources, as it is known, especially in the scientific field, that the proper distribution and use of financial resources can increase the efficiency of a program, an educational organization, without the need for upward change in their height.</p> <p>The cost approximation of the hypothetical program that we will attempt aims at a sample calculation of all forms of costs involved in the educational process of a lifelong learning program in school vocational guidance. Expenditure management will be informed by the suggestions and experiences of education economists and here we will see a budget approach that will analyze the cost of such a hypothetical lifelong learning program.</p> <p>Let us first clarify the two concepts: cost and costing.</p> <p>Cost is an economic quantity that represents an investment in the acquisition of goods or services that will be used to generate Revenue. In our case, the cost of the training program with the characteristics described above is a size that represents the amount that the program implementer will spend to provide all the required services and goods to be able to execute the program. Suppose the Agency is a non-profit organization (eg a public education structure or an Erasmus + collaborative program).</p> <p>Costing is the process followed to determine costs.</p> <p>The content of the costing is determined by the purposes or objectives pursued by it. So to determine the cost of the program we are called to determine we will follow costing under the following assumptions:</p> <ul style="list-style-type: none"> • with costing we want to achieve the goal which is to cover only the costs of implementation of the program So we calculate revenues and costs of the program, the cost, under this reasoning. • the body that implements the training wants to achieve its purpose which is in-service training of teachers from all over Greece in matters of vocational guidance. aims to determine the cost, operation, activity, project, liability or product and service as a whole or in phase and stage of its formation. <p>To achieve these, cost principles, methods and techniques are applied within the various cost systems.</p> <p>For this process, technological progress remains ineffective without the reliable information of the managers of a company regarding the cost which is one of the two variables that shape the result.</p> <p>Since the second variable - the selling price - is shaped by the market in the context of free competition, cost is the determining factor for making the right decisions and for effective management.</p> <p>To make a business decision the cost must be expensive. The activity-based costing system was developed precisely to meet this need for accurate costing.</p> <p>In general, the first categorization / distinction used in the cost analysis of educational programs is between direct or persistent and indirect or capital costs. The direct cost includes the costs that are frequently incurred and are related to costs for materials and services that bring immediate and short-term results. Indirect costs relate to the purchase of buildings and capital equipment whose results are expected and enjoyed for a longer period of time (usually over one year).</p> <p>The educational costs related to teaching are direct and indirect and are presented mainly at the school level. For this, the necessary information is collected from documents (eg financial report from similar programs that have already been implemented) and interviews with experienced colleagues in similar programs. The cost categories were formed in proportion to the categories used in international practice in institutional cost analyzes of educational programs (H. Thomas, 1990, M. Stone, 1992, J. Mace, 1990, E. Karadjia, 1997).</p> <p>Indirect cost is that which is generated through the usual activities and, therefore, cannot be determined specifically for a specific Project. The most typical example of indirect costs is the overheads of the Implementing Agency (eg in general: electricity, water, heating, telecommunications, office rental and maintenance, administrative support).</p> <p>The indirect cost of the program we plan is included</p> <ul style="list-style-type: none"> • the lease of space in a central hotel in Athens, • the cost of the additional telecommunications we may need in addition to the hotel facilities provided; and • the administrative support of the project. <p>The general direct cost categories (costs that can be determined specifically for a specific Project) are the rest.</p> <p>Gathering all the significant cost elements, the Project Planners will prepare a provisional Project Budget, including estimates and forecasts for the most relevant expected costs. In addition, they should identify the sources from which the Project will be funded and the contribution of each source to this funding. Attention should be paid to cases of EU co-financed projects, where ineligible costs (eg salaries and salaries of civil servants) should be excluded from the Project budget.</p> <p>An interesting tool for calculating costs is listed below.</p> <p>ΑΝΑΛΥΣΗ ΚΟΣΤΟΥΣ ΜΟΝΑΔΕΣ ΚΟΣΤΟΣ/ΜΟΝΑΔΑ (€)</p> <p>1. Κόστος Έναρξης Έργου</p> <p>1.1 Προσωπικό (που συμμετέχει στο σχεδιασμό Έργου, δηλαδή στην παραγωγή Τεχνικού Δελτίου Έργου, Τεχνικών Σχεδίων, Ανάλυσης Κόστους- Οφέλους, Μελετών Σκοπιμότητας κλπ.)</p> <p>1.2 Υλικά & Εξοπλισμός (π.χ. γραφική ύλη, άλλα αναλώσιμα) 1.3 Ταξίδια (π.χ. για έρευνα αγοράς, συνεντεύξεις, επιτόπιες επισκέψεις) 1.4 Εξωτερικοί σύμβουλοι/ εταιρείες συμβούλων (π.χ. για Τεχνικό Δελτίο Έργου, Τεχνικά Σχέδια, Ανάλυση Κόστους-Οφέλους, Μελέτες Σκοπιμότητας κλπ.) 1.5 Κάλυψη εκτάκτων αναγκών 1.6 Γενικά/ Διοικητικά έξοδα</p> <p>1.7 Άλλα (π.χ. έρευνες, πιλοτικά έργα, πρωτότυπα κλπ.) ΥΠΟΣΥΝΟΛΟ 1:</p> <p>2. Κόστος Σύναψης Δημοσίων Συμβάσεων</p> <p>2.1 Προσωπικό (που συμμετέχει στη διαδικασία σύναψης δημοσίων συμβάσεων, π.χ. σύνταξη Εγγράφων Διαγωνισμού, συμμετοχή σε Επιτροπές Αξιολόγησης κλπ.)</p> <p>2.2 Υλικά & Εξοπλισμός (π.χ. γραφική ύλη, άλλα αναλώσιμα) 2.3 Ταξίδια (π.χ. για έρευνα αγοράς, συνεντεύξεις, επιτόπιες επισκέψεις) 2.4 Εξωτερικοί σύμβουλοι/ εταιρείες συμβούλων (π.χ. Εκπόνηση Εγγράφων Διαγωνισμού, νομικές συμβουλές κλπ.) 2.5 Κάλυψη εκτάκτων αναγκών 2.6 Γενικά/ Διοικητικά έξοδα 2.7 Άλλα (π.χ. έξοδα δημοσιεύσεων) ΥΠΟΣΥΝΟΛΟ 2:</p> <p>3. Εκτέλεση & Έλεγχος Έργου 3.1 Δραστηριότητα/ Ομάδα Δραστηριοτήτων 1 3.1.1 Προσωπικό (που συμμετέχει στη διαχείριση Έργου & διαχείριση σύμβασης ή/και στην παραγωγή παραδοτέων) 3.1.2 Υλικά & Εξοπλισμός (π.χ. οικοδομικά υλικά, χρήση μηχανημάτων, αναλώσιμα, άδειες χρήσης λογισμικού κλπ.) 3.1.3 Ταξίδια (π.χ. επιτόπιες επισκέψεις & επιθεωρήσεις, συναντήσεις εργασίας κλπ.) 3.1.4 Εξωτερικοί σύμβουλοι/ εταιρείες συμβούλων (που συμμετέχουν στη διαχείριση Έργου & διαχείριση σύμβασης ή/και στην παραγωγή παραδοτέων κλπ.) 3.1.5 Κάλυψη εκτάκτων αναγκών 3.1.6 Γενικά/ Διοικητικά έξοδα 3.1.7 Άλλες δαπάνες (π.χ. επικοινωνίες, ενέργειες δημοσιότητας, κόστος κεφαλαίου, φόροι κλπ.) 3.2 Δραστηριότητα/ Ομάδα Δραστηριοτήτων 2 3.2.1 Προσωπικό 3.2.2 Υλικά & Εξοπλισμός 3.2.3 Ταξίδια 3.2.4 Εξωτερικοί σύμβουλοι/ εταιρείες συμβούλων 3.2.5 Κάλυψη εκτάκτων αναγκών 3.2.6 Γενικά/ Διοικητικά έξοδα 3.2.7 Άλλες δαπάνες 3.3 Δραστηριότητα/ Ομάδα Δραστηριοτήτων 3 3.3.1 Προσωπικό 3.3.2 Υλικά & Εξοπλισμός 3.3.3 Ταξίδια 3.3.4 Εξωτερικοί σύμβουλοι/ εταιρείες συμβούλων 3.3.5 Κάλυψη εκτάκτων αναγκών 3.3.6 Γενικά/ Διοικητικά έξοδα 3.3.7 Άλλες δαπάνες 3.4 Δραστηριότητα/ Ομάδα Δραστηριοτήτων x..... ΥΠΟΣΥΝΟΛΟ 3:</p> <p>4. Τέλος Έργου</p>
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2	Funding opportunities	<ul style="list-style-type: none"> ✓ We will use volunteers and agencies to provide free advice and cooperation. (e.g. Tipping Point) ✓ Funds can come from school budget expenses, municipal or state grants, and from the PTA. ✓ Local industries already are looking positively to a collaboration with school. They have asked us for a plan of activities ✓ Funds can come from a school activities (parties, handmade constructions, fairies, parties...) as we do with other events. ✓ Funds can come from university collaboration in Erasmus+ projects.
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Table 6 – Action Plan

1	Activities	<ul style="list-style-type: none"> • During the year students with the help of their teachers through their lessons to develop the STEAM philosophy and create small assignments. • Once a week to discuss different professions and each student to make a presentation of a profession. (100mentors platform and OEPEC) • Once a month to communicate for one to two hours either live or remotely with various professionals and career guidance counselors. (TTP) • Prepare students to take part in competition in Greece, Europe, international. .(VODAFONE GENERATION NEXT) • A sub-team of our students will be training during the whole year. We have already had a special place for the students in the school to work, collaborate and prepare their constructions • During the year students will have the opportunity to post in a blog about STEAM and inform their friends about STEAM, science, technology etc • At the end of the school year they can organize a local fair, “STEAM week” • Work on SHELFIE tool for the school and help teachers to benefit.
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Table 7.1 – Risks/Competition		
1	Risk description	<p>Due to the pandemic there may be weaknesses for face-to-face lessons and career information labs so there is a need for remote virtual workshops.</p> <p>Delaying the approval of speakers.</p> <p>The lack of an IT specialist who will help the organization.</p> <p>As public schools the lack of material and technical infrastructure that will support the organization's event.</p> <p>Small number of offers, difficult selection, high workload for each member of the group, low quality results</p>
2	Probability	1-2
3	Severity	3
4	Mitigation strategy	Redefining goals and reprogramming with flexibility.

Table 7.2.a – Risks/Opposition		
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1	Risk description	<ul style="list-style-type: none"> ✓ Teachers to refuse to cooperate ✓ Industries change mind about funds ✓ Universities reject collaboration
2	Probability	1
3	Severity	2
4	Mitigation strategy	<p>We will expose them to the advantages that exist and we will tell them that they will not change their course but the way they teach it.</p> <p>Parents are the greater partner to school efforts. Parents council are local voters in the municipality so they can press for funds.</p>

Table 7.3.a – Risks/External Menace		
1	Risk description	<ul style="list-style-type: none"> ✓ There is no willingness to cooperate on the part of the institutions ✓ Because of the pandemic or other factors the lessons are held at a distance and the students and teachers do not have the necessary equipment
2	Probability	2
3	Severity	3
4	Mitigation strategy	<p>We have designed plan B and C which are ready to implement if necessary.</p> <p>Reconsidering and redesigning</p>