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STEAME ACADEMY TEACHING FACILITATION LEARNING & CREATIVITY PLAN (L&C PLAN) - L.2 TEACHERS Sustainable Tourism in Rodos

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1. Overview

Title	Sustainable Tourism in Rodos		
Driving Question or Topic	Rodos island relies heavily on tourism for its development and growth. The crisis in tourism in 2020 and 2021 demonstrated the importance of sustainability in tourism, as the island was hit severely by the crisis. What is the current situation in Rodos regarding the sustainability of tourism? Are there any initial actions that can be taken to that direction?		
Ages, Grades, ...	12-15	8 th -10 th grade (Gymnasium)	
Duration, Timeline, Activities	28 hours	14 sets of 2X45-50 minutes lessons	>=10 activities
Curriculum Alignment	Sciences: -ecology -climate change - sustainability Technology: -Informatics Engineering: -Technological design Mathematics: - algebra (calculations) - statistics (basic data analysis) Entrepreneurship - Tourism development - Economic development		
Contributors, Partners	<ul style="list-style-type: none"> - Municipality of Rodos - Association of hotel owners of Rodos - Dodecanesian Association for Development and Progress - Chamber of Commerce and Industry of Dodecanese - Greek National Tourism Organization 		
Abstract - Synopsis	The learning and creativity plan refers to an intervention where students, working in small groups, while developing their understanding and knowledge about sustainable tourism, develop their own proposals on how sustainability		

References,
Acknowledgements

in tourism can be achieved for the island of Rodos, focusing mainly on the sustainability dimensions of economic value, social impact and environmental impact of tourism.

<https://www.gstcouncil.org/gstc-criteria/glossary/>

<https://www.unwto.org/sustainable-development>

https://single-market-economy.ec.europa.eu/sectors/tourism/eu-funding-and-businesses/funded-projects/sustainable_en

<https://www.youtube.com/watch?v=kgAHZHkMTQU>

<https://www.youtube.com/watch?v=aYcll372Wb8>

2. STEAME ACADEMY Framework*

Teachers' Cooperation

Science teacher (T1)

- Coordination of the project
- Coordination of meetings
- Presentation of tourism sustainability concepts
- Investigation with students and other teachers the sustainability parameters of sustainability parameters

Informatics teacher (T2)

- Assistance and guidance of students in locating and extracting information
- Collaboration with the other teachers on technical matters during the project process
- Supporting the students and teachers in the use of the applications used for calculations and presentations

Mathematics Teacher (T3)

- Supporting students on the calculations and results
- Providing assistance and guidance to the students related to calculation methods
- Collaboration with the other teachers and students on the results of the proposed solutions

Economics teacher (T4)

- Presentation of tourism sustainability concepts focusing on economic impact
- Close collaboration with the science, Informatics and Mathematics teacher on calculations and evaluation of impact

T1 cooperates with T2, T3 and T4 on the measurements that will have to take place and the parameters to be investigated

T1 cooperates with T4 on the presentation of concepts and content and the format of the data and results

T1 cooperates with T2, T3 and T4 on the analysis of the sustainability data

T1 cooperates with T4 on the final details of the presentation of the students work

STEAME in Life (SiL)
Organization

- Meeting with a representative from the Greek National Tourism Organization regarding the touristic profiling of Rodos and the governmental views on sustainable tourism
- Meeting with a representative from the Dodecanesian Association for Development and Progress to get more detailed information about tourism in Rodos and to get data on tourism

Action Plan Formulation

- Meeting with representatives from the Municipality of Rodos (Department of Recycling and Waste Management, Department of Environment and Department of Tourism) to get information on the municipality's policies and to get data
- Meeting with representative from the Chamber of Commerce and Industry to get information on the tourism related commercial activities and to get data
- Meeting with the chairman of the Association of hotel owners of Rodos to discuss on sustainability activities undertaken by the association members
- Day visit to small/medium sized and large sized hotel units to get information on the management of the activities.

Step 1: Theoretical background knowledge (6 hours – 2 + 2 + 2)

- The science teacher and the economics teacher explain to the students the basic concepts of sustainability and sustainability in tourism.
- The science teacher provides in the second part more background information focused on the environmental issues of sustainable tourism
- The economics teacher provides in the second part more background information focused on the economic and social dimension of sustainable tourism
- In the third session both teachers work with the students on the indicators of the ETIS toolkit to be used, analyzing discussing and brainstorming on the way that it can be used in the project and the sources of information that can be used.
- Both teachers coordinate the meeting with the representatives from the external organizations involved in the project and the information that can be provided by them for the realization of the project.

Step 2: Extension of theoretical knowledge and connection with the real world (6 hours - 2 + 2 + 2)

- The science teacher together with the economics teacher coordinate the meeting with the representative of the Greek National Tourism Organization, in order to form the profile of tourism in Rodos and get information about the views of the national agency on sustainable tourism
- Both teachers coordinate the meeting with the representatives from the municipality (Department of Recycling and Waste Management, Department of Environment and Department of Tourism) to discuss on the issues of waste management on the island, the problems faced, the environmental impact of tourism and the data to be provided for the project.
- Both teachers coordinate the meeting with the representative from the Chamber of Commerce and Industry to get information on the tourism related commercial activities of the businesses of the island and to get data on the volume of activities and the activities that they undertake regarding sustainability
- Both teachers coordinate the meeting with the representative from the Dodecanesian Association for Development and Progress to get more information on the research on tourism that is carried out by the organization, their views and findings on sustainable tourism and to get the data needed for the project
- Both teachers coordinate the meeting with the representative the chairman of the Association of hotel owners of Rodos to discuss on

sustainability activities undertaken by the association members, the initiatives undertaken by the Association and to gather information on the actual activities hotel units have taken (eco-labels, specific actions/measures taken)

Step 3: Formulation and definition of the project (4 hours)

- Students work with the science and economics teacher on formulating a brief report on the views of the external actors, the problems identified by them and the actions towards sustainable tourism mentioned
- Students work in small teams with the support of the teachers to decide on the parameters to be investigated and calculated during the project
- Students and teachers agree on the parameters, the plan of data analysis and the general concept of the outcomes.
- The work teams are formed
- The scope and progress of the project are reviewed by the students and the teachers

Step 4: Application of knowledge and implementation (10 hours)

- Students, with the support of the teachers formulate the spreadsheets that they will use for data analysis in the dimension of sustainable tourism they have undertaken.
- Students, with the support of the teachers gather the data from the online sources and from the external organizations that are involved in the project.
- Students, with the support of the teachers analyze data and evaluate sustainability of tourism of the island.
- Students, with the support of the teachers, formulate proposals for improvement and form scenarios while calculating their impact.
- Different scenarios formulated by each team are presented and discussed in the classroom and the final proposals for actions are decided
- Students calculate the total impact of the proposed scenario and work in plenary for the results and reporting.
- Students supported by the science and economics teacher work on the final presentation of the project

Step 5: Results presentation and evaluation (2 hours)

- Students present their results to the teachers or other peers and evaluation of the implementation and of the results of the project is carried out.

** under development the final elements of the framework*

3. Objectives and Methodologies

Learning Goals and Objectives

Learning goals of the project:

LG#1: Introduce students to the concept of sustainable tourism

LG#2: Present and familiarize the students with methods and approaches for measuring and assessing sustainability in tourism

LG#3: Analyze the connection between sustainability and regional development

LG#4: Familiarize students with the use and evaluation of data

LG#5: Elaborate further the interconnection between the actors in a regional economy involved in the tourism sector

Learning objectives

	<p>LO#1: Students will understand the concept of sustainable tourism and sustainability of tourism</p> <p>LO#2: Students will know about the approaches for assessing and evaluating information on sustainability of tourism</p> <p>LO#3: Students will know how to use tools to measure tourism sustainability</p> <p>LO#4: Students will conceptualize ways to improve tourism sustainability in a regional level</p>
<p>Learning Outcomes and expected Results</p>	<p>After completing the project students should:</p> <p>Knowledge</p> <ul style="list-style-type: none"> • Know the main dimensions of tourism sustainability • Understand the main ways tourism in a region can be sustainable • Mention criteria for evaluating the sustainability of tourism • Understand the interrelation between the tourism related economic activities and sustainability <p>Skills</p> <ul style="list-style-type: none"> • Locate information sources and extract data • Perform mathematical calculations using spreadsheet software • Make assessments by comparing data • Use tools and criteria to assess sustainability • Use presentation software to create presentations <p>Attitudes</p> <ul style="list-style-type: none"> • Develop interest on sustainable tourism • Raise awareness on sustainable development of a region • Develop a more respectful towards the environment attitude • Develop interest on actual economy and sustainable economy
<p>Prior Knowledge and Prerequisites</p>	<p>Prior knowledge-skills:</p> <ul style="list-style-type: none"> • Basic use of spreadsheet software for calculations • Basic mathematical calculations • Basic use of office applications suite • Communication and cooperation skills • Basic use of the internet for information search • Teamwork skills <p>Prerequisites:</p> <ul style="list-style-type: none"> • Laboratory with access to the internet • Teleconference platforms • Access to office suite applications • Presentation equipment
<p>Motivation, Methodology, Strategies, Scaffolds</p>	<p>Motivation</p> <ul style="list-style-type: none"> • Preservation of the environment • Regional development and progress • Connection of the project with the real world of the students • Entrepreneurship <p>Methodology</p> <p>Project based approach that involves the collaboration between teachers of Science, Mathematics, Informatics and Economics and the collaboration of groups of students working in small teams of 4-5 students</p>

Strategies

Project based learning
 Autonomous work
 Teamwork
 Guided discovery
 Brainstorming
 Scenario building
 Simulations – mathematical model building

Scaffolds

Guidance and consultancy from teachers
 Additional information from experts
 Support during lab work from teachers

4. Preparation and Means

Preparation, Space
 Setting, *Troubleshooting*
Tips

Preparation

The teacher in charge of the project is the science teacher, assisted by the economics teacher. Initially he/she discusses with the other teachers the goals of the project and the actions to be taken for its implementation. Both teachers together initially review the basic sources of information and the resources and tools to be used during the project and discuss with the informatics teacher and the mathematics teacher on the digital information and the calculations that will be required. All the teachers formulate an initial document for the presentation of the concept of the project to the students. All the teachers take care to identify what will be needed for their part of the intervention in terms of materials, resources and infrastructures.

The science and economics teachers make a preliminary contact with the external actors involved in the project to identify their availability and schedule the meetings and visits. The informatics teacher checks on the availability of the computer laboratory and all the needed applications and platforms.

The science teacher together with the economics teacher take care of all the documentation and paperwork needed for the approval of the on-site visit to the hotel units and the safety measures to be followed during the visit.

Space setting

The implementation of the project requires the following settings:

Computer laboratory with internet access where students can work at least in pairs on data analysis, presentation software and spreadsheet software.

Classroom, where students can work collaboratively in small teams of 4-5 students. The classroom must be equipped also with presentation equipment (computer, projector and office applications) and have a connection to the internet for the online meetings with the external actors.

Troubleshooting/tips

Special care must be taken regarding the field trip of the students in order all the necessary permits to be taken and the safety of the students while visiting the hotel units.

Resources, Tools,
 Material, Attachments,
 Equipment

Educational resources and materials

Teachers can use the resources mentioned in the references section supplemented by additional custom developed materials focusing on sustainability and tourism.

Tools and equipment

	<p>The implementation of the project requires basic equipment and software namely</p> <ul style="list-style-type: none"> • Computer laboratory with access to the internet • Office suite applications (word, excel, PowerPoint) • Presentation equipment in classroom • Teleconference platform • Classroom where teleconferences can be held
Health and Safety	<p>Provisions must be made for assuring the health and safety of students during the visit to the hotel units, regarding code of conduct during the visit and personal and other people's safety (pools, machinery, appliances, surrounding space, other infrastructures)</p>

5. Implementation

Instructional Activities, Procedures, Reflections	<p>The project is implemented extending to 28 study hours separated in 14 lesson/activities blocks of 2 study hours each. Classes are held once a week in the context of additional activities in secondary education. The leading teacher (Teacher 1 – T1 - Science Teacher) and the teacher of economics (T4 – Economics teacher) participates in all the activities and the other teachers (Teacher 2 – T2 - Informatics teacher), (Teacher 3 – T3 – Mathematics teacher), are involved in specific parts of the project where their participation has been scheduled.</p> <p>Lesson block 1</p> <p>T1</p> <p>25 minutes, presentation of the project to students</p> <ul style="list-style-type: none"> -motivation of students -presentation of goals and concept of the project <p>T1, T2, T3, T4</p> <p>25 minutes, presentation of participation to the project especially for T4</p> <ul style="list-style-type: none"> -motivation of students - brief presentation of the activities that can take place during the project <p>T1, T4</p> <p>20 minutes, evaluation process agreement</p> <ul style="list-style-type: none"> -Discussion with students and agreement on the project evaluation methods and discussion on the final outcomes <p>30 minutes, introduction to sustainability</p> <ul style="list-style-type: none"> - Introduction of the students to the general concepts of sustainability <p>Lesson block 2</p> <p>T1, T4</p> <p>25 minutes, presentation of the concepts related to sustainability and sustainable development</p> <p>T1, T4</p> <p>25 minutes, introduction to sustainable tourism</p> <ul style="list-style-type: none"> -definitions -importance <p>T1, T4</p> <p>50 minutes, presentation of the main dimensions of sustainable tourism and discussion with students</p> <p>Lesson block 3</p> <p>T1, T4</p> <p>50 minutes, analysis of the ETIS approach to sustainable tourism and the ETIS toolkit</p> <ul style="list-style-type: none"> - development of the instrument
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- dimensions of sustainability
- criteria

T1, T2, T3, T4

50 minutes, toolkit analysis

- discussion with the students and brainstorming on the sources and ways to get and analyze data
- primary decision on the handling of the information during the project
- student's teams formation

Lesson block 4

T1, T4

50 minutes, meeting with representative of the Greek National Tourism Organization

- touristic profile of the island
- governmental views and actions towards sustainable tourism
- actions for sustainability taken that include Rodos
- data that can be provided for the project

50 minutes, meeting with the representative from the Chamber of Commerce and Industry

- views on sustainable tourism of the organization
- economic activities related to tourism
- volume and interrelation of activities
- implications on employment and regional development
- actions for sustainability undertaken by other commercial businesses
- data to be provided for the project

Lesson block 5

T1, T4

50 minutes, meeting with the representative from the Dodecanesian Association for Development and Progress

- views on sustainable tourism of the organization
- Tourism data from the survey on tourism that is carried out by the organization
- activities for sustainable tourism undertaken

50 minutes, Meeting with representatives from the Municipality of Rodos (Department of Recycling and Waste Management, Department of Environment and Department of Tourism)

- views on sustainable tourism of the municipality
- environmental impact of tourism
- problems related to their work
- data on waste and waste management for the project
- actions undertaken by the municipality
- environmental data needed for the project

Lesson block 6

T1, T4

50 minutes, meeting with chairman of the Association of hotel owners of Rodos

- views of the Association on sustainable tourism
- actions undertaken by members
- problems faced by hotel units
- data needed for the project

T1, T4

30 minutes, sum up of the information from the meetings

20 minutes, preparation for the report from the meetings (views, actions, expected data)

Lesson block 7

T1, T4

50 minutes, teachers support students working in small teams to summarize and report on the meetings with the external actors

- Report on views, policies and actions regarding the economic dimension of sustainable tourism

- Report on views, policies and actions regarding the social dimension of sustainable tourism
- Report on views, policies and actions regarding the environmental dimension of sustainable tourism

T1, T2, T3, T4

30 minutes, discussion of reports

- Each team presents their report to the teachers and the other teams and discuss the findings

20 minutes, compilation of joint report

- Students work with the support of the teachers to formulate the format of the final joint report for the project

Lesson block 8

T1, T4, T3

50 minutes, formulation of the measurement model

- Students with the support of the teachers work in teams to decide on the model of sustainability and the criteria they will use for tourism sustainability assessment based on the ETIS toolkit and the data that can be found online and the data discussed with the external actors

T1, T2, T3, T4

50 minutes, model decision and formulation of calculation tools

- Students work in teams and decide on the final model and the development of the spreadsheet that will be used for data analysis, with the support of the mathematics and informatics teacher

- The spreadsheet is tested and explained to all the students

Lesson block 9

T1, T2, T3, T4

50 minutes, data collection and handling from online sources

- students together with the informatics, science and economic teachers work on the collection of data from the online databases
- when needed indices are calculated and then registered to the spreadsheet

T1, T2, T3, T4

50 minutes, data collection and handling of data sent from organizations

- students work with in teams with the support of their teachers on identifying the needed data from the datasets sent and on calculating the indices needed.

Lesson block 10

T1,T2,T3,T4

50 minutes, sustainability assessment

- Students work with the support of their teachers on the evaluation of sustainability as a whole for Rodos in terms of each dimension individually and as a whole and assess the results

50 minutes, sustainability assessment

- Students work with the support of their teachers on comparing their findings with the findings from another touristic destination or island

Lesson block 11

T1, T2, T3, T4

50 minutes, proposal formulation

- Students discuss between them and with the teachers the results of their evaluation and brainstorm on different proposals that could improve the sustainability of tourism

T1, T2, T3, T4

20 minutes, alternative proposal discussion

- Students discuss with their teachers the different solutions proposed

30 minutes, scenario assessment

- students re-assess the sustainability based on the proposals they have made
- students discuss between them and with the teachers the result of the alternative solutions

Lesson block 12

T1, T2, T3, T4

50 minutes, calculation of results

-Students with the support of their teachers calculate the results of the final model for the sustainability of tourism

T1, T2, T3, T4

30 minutes, results finalization

- Students finalize the results to be presented

20 minutes, project presentation

- Students discuss with their teachers and between them to decide on the set of results to be included in the project presentation

Lesson block 13

T1,T2, T3, T4

50 minutes validation of results and presentation format

- all the teachers work together with the students on the validation of the results achieved, perform small adjustment if needed and discuss and decide the format of the final presentation.

T1, T2, T3, T4

50 minutes, project presentation

-Students work in teams and then in plenary session on the preparation of the final presentation

Lesson block 14

T1,T4

30 minutes finalization of project results and presentation and team preparation

60 minutes presentation of results and final evaluation of the students and of the project and discussion.

Assessment - Evaluation

Evaluation of the project and its results is performed mainly in two different contexts.

a) the level of participation, involvement and contribution of each student is evaluated. This evaluation is based in direct observation by the teachers where a rubric can be used or a journal of observations

b) the final result is evaluated judging by the presentation and the arguments with which they supported their decisions and their final outcome. In the evaluation participate all the teachers that were involved.

**Presentation - Reporting
- Sharing**

The final expected results of the project are

1. A report in word format the analyses conducted by the students
2. A presentation of the proposals for sustainable tourism in Rodos formulated by the teams of students
3. A final summary of the results of the project and the proposed actions formulated by the whole class

**Extensions - Other
Information**

The project can be extended and generalized to address regional sustainable tourism in different regions.

The results and methodology followed can be exploited in different economic activities in the context of another project.

Resources for the development of the STEAME ACADEMY Learning and Creativity Plan Template

In the case of learning through project-based activity

STEAME ACADEMY Prototype/Guide for Learning & Creativity Approach Action Plan Formulation

Major steps in the STEAME learning approach:

STAGE I: Preparation by one or more teachers

1. Formulating initial thoughts on the thematic sectors/areas to be covered
2. Engaging the world of the wider environment / work / business / parents / society / environment/ ethics
3. Target Age Group of Students - Associating with the Official Curriculum - Setting Goals and Objectives
4. Organization of the tasks of the parties involved - Designation of Coordinator - Workplaces etc.

STAGE II: Action Plan Formulation (Steps 1-18)

Preparation (by teachers)

1. Relation to the Real World – Reflection
2. Incentive – Motivation
3. Formulation of a problem (possibly in stages or phases) resulting from the above

Development (by students) – Guidance & Evaluation (in 9-11, by teachers)

4. Background Creation - Search / Gather Information
5. Simplify the issue - Configure the problem with a limited number of requirements
6. Case Making - Designing - identifying materials for building / development / creation
7. Construction - Workflow - Implementation of projects
8. Observation-Experimentation - Initial Conclusions
9. Documentation - Searching Thematic Areas (AI fields) related to the subject under study – Explanation based on Existing Theories and / or Empirical Results
10. Gathering of results / information based on points 7, 8, 9
11. First group presentation by students

Configuration & Results (by students) – Guidance & Evaluation (by teachers)

12. Configure STEAME models to describe / represent / illustrate the results
13. Studying the results in 9 and drawing conclusions, using 12
14. Applications in Everyday Life - Suggestions for Developing 9 (Entrepreneurship - SIL Days)

Review (by teachers)

15. Review the problem and review it under more demanding conditions

Project Completion (by students) – Guidance & Evaluation (by teachers)

16. Repeat steps 5 through 11 with additional or new requirements as formulated in 15
17. Investigation - Case Studies - Expansion - New Theories - Testing New Conclusions

STAGE III: STEAME ACADEMY Actions and Cooperation in Creative Projects for school students

Title of Project: Eco-Innovation: Designing a Sustainable Product using Chat GPT

Brief Description/Outline of Organizational Arrangements / Responsibilities for Action

STAGE	Activities/Steps Teacher 1(T1) Cooperation with other teachers and student guidance	Activities /Steps By Students Age Group: 12-15	Activities /Steps Teacher 2 (T2) Cooperation with other teachers and student guidance	Activities /Steps Teacher 3 (T3) Cooperation with other teachers and student guidance	Activities /Steps Teacher 4 (T3) Cooperation with other teachers and student guidance
A	Preparation of steps 1,2,3	-	Cooperation in step 3	Cooperation in step 3	Cooperation in step 3
B	Guidance in step 9	4,5,6,7,8,9,10	Support guidance in step 9	Support guidance in step 9	Support guidance in step 9
C	Creative Evaluation	11	Creative Evaluation	Creative Evaluation	Creative Evaluation
D	Guidance	12	Guidance	Guidance	Guidance
E	Guidance	13 (9+12)	Guidance	Guidance	Guidance
F	Organization (SIL) STEAME in Life	14 Meeting with representatives + visit a manufacturing plant	Organization (SIL) STEAME in Life	Organization (SIL) STEAME in Life	Organization (SIL) STEAME in Life
G	Preparation of step 15		Cooperation in step 15	Cooperation in step 15	Cooperation in step 15
H	Guidance	16 (repetition 5-11)	Support Guidance	Support Guidance	Support Guidance
I	Guidance	17	Support Guidance	Support Guidance	Support Guidance
K	Creative Evaluation	18	Creative Evaluation	Creative Evaluation	Creative Evaluation