

Europeana Learning Scenario

(Teachers)

Title

Learning Epidemic through Ages using Mathematics

Author(s)

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Abstract

In this learning scenario students were asked to work on statistical representation of Covid_19 across time and space mobilizing both their mathematical and historical knowledge, process data and information from primary sources, both textual and visual, study graphs and maps, combine and compare elements. Furthermore, being motivated by the interdisciplinarity of teaching mathematics based on digital cultural heritage of Europeana recourses, students are guided to create posters based on history of pandemics that expresses the progression of medicine. This learning scenario implemented using the methodology of flipped classroom in ages 14-16.

Keywords

Statistics, pandemics, history, flipped classroom

Table of summary

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Subject	Mathematics, History
Topic	<p>Mathematics: Statistics (graphical representation of statistical data)</p> <p>History of pandemics and progression of medicine in treatment of them</p> <p>Technology: Using digital tools and apps for presentation and collaboration</p> <p>Engineering: The process of design thinking in order to identify and solve problems, understand professional and ethical responsibility and communicate effectively.</p>
Age of students	14-16
Preparation time	120'
Teaching time	45'
Online teaching material	<p>Article for History of pandemics</p> <p>Video Pandemic Past, Pandemic Present with Medical Historian Mark Honigsbaum</p> <p>Video Pandemics in History: Modern Medicine in the Time of Pandemic Influenza</p>

	e-class : educational platform for students and teachers, and is used daily in schools across Greece. It is a flexible, secure and easy-to-use digital environment for learning, communication and collaboration, supporting the learning scenario.
Offline teaching material	Papers for keeping notes in order to design and solve problems
Europeana resources used	Smallpox epidemic in Cape Town Area of York affected by Cholera epidemic, 1832 Wax model of a plague scene, Europe, 1657

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Integration into the curriculum

This learning scenario can be integrated into the curriculum of subject of statistics in secondary school of all class (1st, 2nd, 3rd) and in history as extension.

Aim of the lesson

This interdisciplinary lesson aims at

- Motivating students to search for information and getting knowledge for cultural heritage by the Europeana portal
- Developing students' creativity and innovation, flexibility and adaptability and problem-solving skills
- teach tomorrow's citizens to be competent and critical users of the statistical information that overwhelms us and the conclusions that are often drawn.

Outcome of the lesson

- Students implement mathematical knowledge to learn about cultural heritage for pandemics
- Students develop positive motivation, self-confidence, focus on the positive aspects of experiences, patience and perseverance in dealing with any mathematical situation

Trends

Project-Based Learning: students get fact-based tasks, problems to solve and they work in groups.

Mobile Learning: we get access to knowledge through smartphones and tablets. It is learning anytime, anywhere.

Student Centered Learning: students and their needs are at the center of the learning process.

Peer Learning: students learn from peers and give each other feedback.

Flipped Classroom: students master basic concepts of the topic at home. Time spent in classroom is used to reflect, discuss, develop topic.

Cloud-based learning: Students will have the opportunity to reach the materials they have learned, by themselves, or in collaboration with their peers, or with the teacher, whenever they need, the lessons in Google Classroom.

Open-Source Learning: teachers copy, share, adapt, and reuse free educational materials.

BYOD: Students bring their own mobile devices to the classroom.

Key competences

- Mathematical competence and competence in science, technology and engineering;
- Digital competence;
- Personal, social and learning to learn competence;
- Cultural awareness and expression competence.

Activities

Name of activity	Procedure	Time
Introduction	<p>The teacher introduces students to study the article for History of pandemics</p> <p>And watch the Video Pandemic Past, Pandemic Present with Medical Historian Mark Honigsbaum Video Pandemics in History: Modern Medicine in the Time of Pandemic Influenza</p> <p>Students write a short report about the key messages of articles and videos.</p>	Homework 40min
Flexible Reading & learning	<p>The teacher introduces to students the cultural heritage of pandemics included in Europeana portal, items such as Smallpox epidemic in Cape Town Area of York affected by Cholera epidemic, 1832 Wax model of a plague scene, Europe, 1657</p> <p>Teachers suggest students collaborate in preparation of posters of history of pandemics and presentation to classroom.</p>	Homework 35 min
Statistics for Covid_19	<p>Through real database for Covid_19 students select the field of their interest (e.g vaccinated people, deaths of Covid_19 e.t.c), and then working on reading and making conclusions based on graphical representation (see Annex)</p>	Homework 45 min
Presentation	<p>Students present the solutions of worksheets in the classroom and posters. They discuss with their classmates and make comments on the importance of statistic in real life.</p>	45 min

Assessment

The assessment takes into account the following 5 parameters:

1.

The applications are sufficient to support student activation and participation, understanding graphical representation

2.

The teacher organizes the material in a collaborative digital environment, which can monitor the individual progress of the student, but also the communication with him through the discussion in plenary.

3. Student-student interaction

4. Student-trainer interaction

***** AFTER IMPLEMENTATION *****

Student feedback

After the implementation of the learning scenario students highlight according discussions through presentations:

- the importance of learning cultural heritage and mention that they have never been familiar with Europeana recourses
- The starting point of history of pandemics was very interesting for the combination of history and statistics
- Statistics based on real data is a great way of understanding the importance of mathematical knowledge

Teacher's remarks

Based on the methodology of flipped classroom most of the teaching takes place outside the classroom (video and articles are assigned as homework), while practice takes place in the classroom (problem solving on statistical representation of covid_19). This mean that classroom time is used to engage in meaningful discussion, apply learning concepts, and collaborate with peers. Students learn new concepts on their own and then test their comprehension by doing problem-solving exercises in the classroom under the guidance of the teacher.

This learning implemented to educational platform [e-class](#) (see Annex) that

Educational Content Management includes:

- Documents: organize, store and distribute educational materials.
- Multimedia: organize, store and embed video and audio files.
- Links: add and organize resources from the web.

Information, Communication and Collaboration Tools

- Messages: Message exchange between students and instructors.
- Notifications: Alerts for course updates.
- Forum: Unlimited asynchronous conversations.
- Wiki: Collaborative writing

Assessment and feedback tools

- Exercises: create assessment quizzes and online tests (multiple choice, true-false, cloze text and matching).
- Assignments: Create, manage and grade online assignments.
- Questionnaires: Create polls and surveys and receive feedback.
- Statistics: View course and user statistics, track learners' participation and progress and create reports

About the Europeana DSI-4 project

[Europeana](#) is Europe's digital platform for cultural heritage, providing free online access to over 53 million digitised items drawn from Europe's museums, archives, libraries and galleries. The Europeana DSI-4 project continues the work of the previous three Europeana Digital Service Infrastructures (DSIs). It is the fourth iteration with a proven record of accomplishment in creating

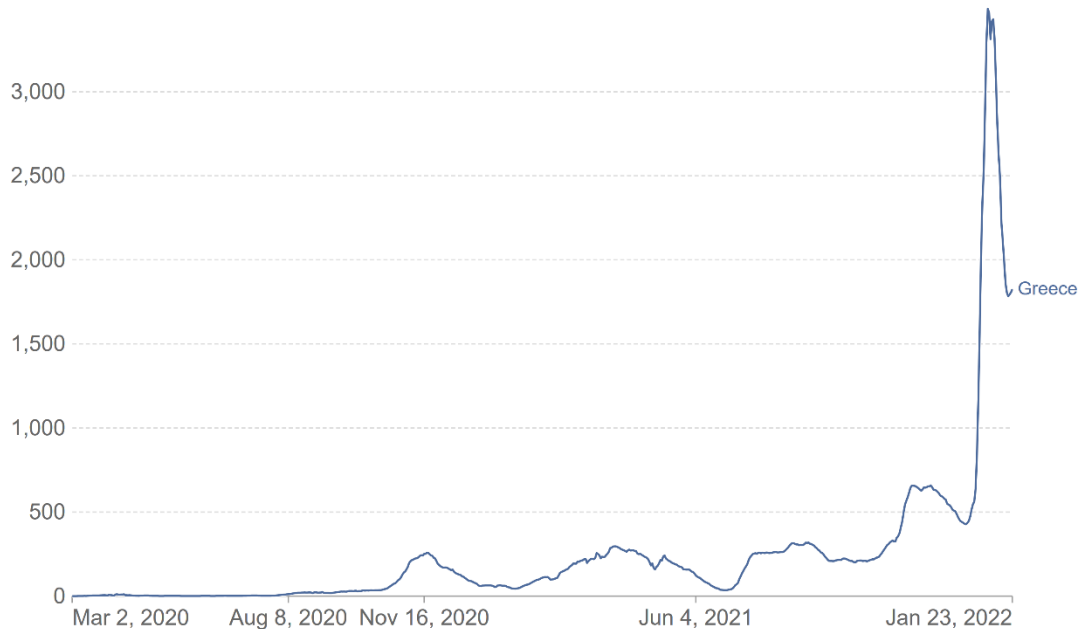
access, interoperability, visibility and use of European cultural heritage in the five target markets outlined: European Citizens, Education, Research, Creative Industries and Cultural Heritage Institutions.

[European Schoolnet](#) (EUN) is the network of 32 European Ministries of Education, based in Brussels. As a not-for-profit organisation, EUN aims to bring innovation in teaching and learning to its key stakeholders: Ministries of Education, schools, teachers, researchers, and industry partners. European Schoolnet's task in the Europeana DSI-4 project is to continue and expand the Europeana Education Community.

Work sheet

Daily new confirmed COVID-19 cases per million people

7-day rolling average. Due to limited testing, the number of confirmed cases is lower than the true number of infections.



Source: Johns Hopkins University CSSE COVID-19 Data

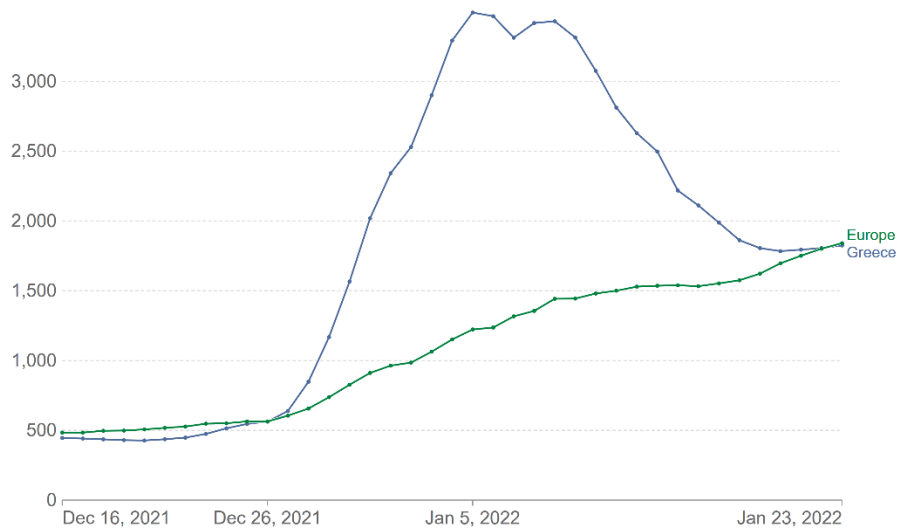
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[Daily new confirmed COVID-19 cases per million people](#)

1. What information does the above chronogram provide? (*Reading the data*)
2. Select at least two time points and record the number of daily cases (*read data*)
3. Describe what changes you notice in the daily cases? (*Reading between the data*)
4. At what times were the daily cases at the same levels? (*Reading between data*)
5. Is the information on the Greek schedule capable of providing you with information on the general situation of the pandemic in Europe? (*Read over data*)

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Source: Johns Hopkins University CSSE COVID-19 Data

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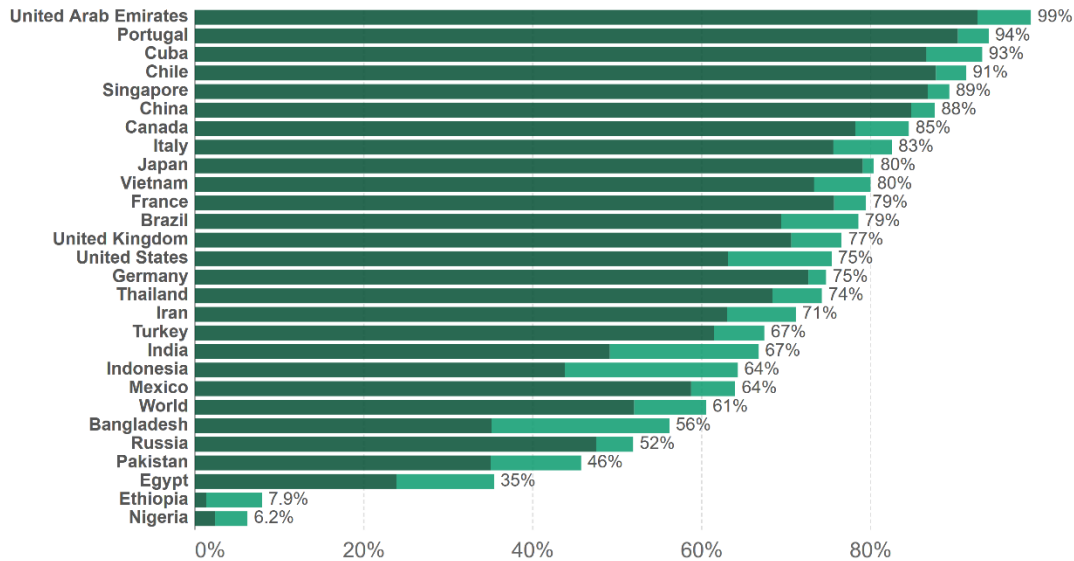
[Daily new confirmed COVID-19 cases per million people](#)

1. What additional information does the above chronogram provide? (*Read the data*)
2. Can you compare the prices of daily cases in Greece and in Europe? (*Reading between data*)
3. What is the rate of change in daily cases from 26/12/2021 to 05/01/2022 i) in Greece ii) in Europe. What is your conclusion (*reading between data*)
4. Ask your classmates a question to ask for information about the above schedule (*read between data*)

Share of people vaccinated against COVID-19, Jan 23, 2022

Our World
in Data

■ Share of people fully vaccinated against COVID-19 ■ Share of people only partly vaccinated against COVID-19



Source: Official data collated by Our World in Data

Note: Alternative definitions of a full vaccination, e.g. having been infected with SARS-CoV-2 and having 1 dose of a 2-dose protocol, are ignored to maximize comparability between countries.

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[Share of people vaccinated against COVID-19, Feb 19, 2022](#)

1. What information does the above bar chart provide? (*read the data*)
2. Identify the variables? (*read the data*)
3. Define the type of the variable? (*read the data*)
4. Which countries have the highest vaccination rates? (*reading between data*)
5. What percentage of the population has been fully and partially vaccinated in Indonesia? (*reading between data*)
6. What additional statistical information would you ask for to convince your classmates that vaccination is a powerful weapon against the pandemic? (*read over data*)

Learning environment of e-class

← → ↻ 🏠 <https://eclass.sch.gr/modules/work/?course=0551004277> ☆

👤 Δημιουργία Εργασίας 📊 Βαθμολογικές Κλίμακες 🗑️ Ρουμπρίκες

Εμφάνισε 10 που διαθέτουν συνολικά Αναζήτηση...

Τίτλος	Υποβλ.	Μη βαθμ.	Προθεσμία υποβολής	🔧
Στατιστική στα σχολικά σας βιβλία Ατομική εργασία	0	-	Χωρίς προθεσμία	🔧
Διδακτική Ενότητα 2.2 : Παρουσίαση στατιστικών δεδομένων-Δραστηριότητα-1η Ατομική εργασία	8	8	27-01-2022 14:00:00 Έχει λήξει	🔧
Διδακτική Ενότητα 2.2 : Παρουσίαση στατιστικών δεδομένων-Δραστηριότητα-2η Ατομική εργασία	2	2	27-01-2022 14:00:00 Έχει λήξει	🔧
Διδακτική Ενότητα 2.2 : Παρουσίαση στατιστικών δεδομένων-Δραστηριότητα-4η Ατομική εργασία	3	3	27-01-2022 14:00:00 Έχει λήξει	🔧
Διδακτική Ενότητα 2.2 : Παρουσίαση στατιστικών δεδομένων-Δραστηριότητα-3η Ατομική εργασία	2	2	27-01-2022 13:00:00 Έχει λήξει	🔧
Πανδημίες στο χώρο και στο χρόνο Ατομική εργασία	3	3	18-01-2022 15:00:00 Έχει λήξει	🔧
Μαθηματικό πρόβλημα στατιστικής Ατομική εργασία	8	8	18-01-2022 14:00:00 Έχει λήξει	🔧

Εμφανίζονται 1 έως 7 από 7 συνολικά αποτελέσματα

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