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Online competition and serious games to stimulate student's interest on ecological issues

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WHAT IS THE FUTURE OF OUR BIOSPHERE



Have you ever thought how this future will be in reality?

ECOLOGY and SOCIETIES



Figura 1.2 Esempio delle componenti e delle relazioni che definiscono un eco dell'ecosistema, che includono il clima (a) e il suolo (b), influenzano direttamente gi nutrono delle chiome, mentre i predatori (d), come questo uccello canoro, si ciban la luce, modificando la sua disponibilità per le piante del sottobosco. (f) Varie speci della materia organica morta accumulata sul suolo forestale rendendo disponibili i crescita delle piante.



Figura 27.1 Variazioni decennali (°C) delle temperature medie annuali della superficie della Terra nel periodo 1970-2010. I cambiamenti (anomalie) rappresentano la differenza tra la temperatura annuale media globale dell'anno considerato e il valore medio della temperatura in superficie nel periodo di riferimento 1951-1980 (un arco di tempo in cui le temperature sono state relativamente stabili; si veda la Figura 2.26). I valori indicati in alto a destra di ciascuna cartina si riferiscono alla variazione della temperatura globale media nel decennio considerato.

(Da Hansen et al., 2010.)

Over the last years ecological issues have become increasingly important for our life and this has had a big impact in our educational system, orientating our education towards the environment and sustainability

DIRECT AND INDIRECT ACTIONS

- 14 vita sott'acqua
- Prevent and reduce all forms of marine pollution
- Sustainable management and protection of the marine and coastal ecosystems
- Minimize the effects of ocean acidification
- Preserve at least 10% of coastal areas
- Enhance the conservation and sustainable use of the oceans and their resources





- Conservation, restoration and sustainable use of ecosystems
- Promote sustainable management of all types of forests
- Stop the destruction of biodiversity
- Finance sustainable forest
 management and improve
 management and conservation



EDUCATION ... AT SCHOOL



E-learning is becoming a very active field in the educational technology research and it could be the next revolutionary change in education

GAMES and SERIOUS GAMES

Video games aim to have fun and entertain and Serious games aim at learning

(Connolly et al., 2012)

Serious games were developed for purposes of training in business, government, healthcare as well as in education

(Sawyer & Smith, 2008)

Recently, serious games are used to promote student's learning because they capture student's interest and bring up their motivation

(Bergin & Reilly, 2005)

Serious games allow learners to know and experience situations that are impossible to live in the real world; they promote active participation and interaction as the center of the experience (Bergin & Reilly, 2005)

Games and competitions have been already used to promote the desire to improve ourselves

(Becker, 2001)

3.0 - EXPLORING ECOLOGY ON WEB PLATFORM



Practice on web platform





ENVRI plus Scientific gaming **ENVRI MEDCIS Scientific game** MEDCIS **ECOPOTENTIAL 4Schools 2018**

Learning by doing *Play Serious game*

Compete on line



ScirelT, Vol. 7(2) 2017 http://caspur-ciberpublishing.it/index.php/scires-it/article/view/12822





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Cicli bio-geochimici	Nicchia ecologica
Coopero o competo	Rifiuti
Dimensione e Vita	Sviluppo sostenibile
Ecosistema e sua evoluzione	Uso dello spazio e del territorio





EcoLogicaCup - Awarding



MEDCIS Scientific game - Rationale



Carry out a research project: students run a scientific project in their schools, following the scientific method

1st phase





ARE THE COTTON BUDS A POLLUTANT OF OUR BEACHES?

SEA DEFENDERS ISTITUTO COMPRENSIVO LEONARDO DA VINCI Via P. Togliatti, 1 – 73020 Cavallino (LE) Italia



INTRODUCTION

-Cotton buds are common sticks for ears cleaning. After using them, people usually have the bad habit to throw them into the toilet from which they end up in the sea, because the water treatment system is not always efficient.

-All the plastics that end up in the sea can be eaten by fish and then can come back to our table as food.

-According to Legambiente association 9% of waste from Italian beaches are represented by ears cleaning sticks. Between 2016 and 2017, during an analysis and monitoring of environment, about 7000 cleaning sticks have been found on 46 Italian beaches, precisely 79 pieces every 100 meters of beach (Fig. 1).

-A very serious problem, so that Italian Parliament has banned not biodegradable cotton buds since January 2019.



Fig. 1 : Cotton buds on Italian beach Fig 2: Measurement of the sampling site



Fig. 3 : Sampling

PURPOSE OF THE PROJECT

1. Question: the question we asked ourselves is if the beach, where we usually go during our summer holidays, is polluted by cotton buds too.

2. Null hypothesis: our beach is not polluted by cotton buds.

3. Objective: to consider the presence and the seriousness of pollution of our beach in order to compare the number of cotton buds found with those sampled by the Legambiente association in 46 different Italian beaches.

METHOD

We decided to analyze the beach of San Cataldo which is the closest to our town and very crowed in summer time. To evaluate the cotton bud pollution in San Cataldo's beach we considered 4 different sampling sites.

Site number 1: we checked 680 meters of beach (Fig. 2); Site number 2: we checked 648 meters of beach; Site number 3: we checked 612 meters of beach. Site number 4: we checked 1152 meters of beach. For each site we have collected (Fig 3) and council (Fig. 4) all the conton hulds in the sand



In the 4 sampling sites we totally controlled 3092 meters of beach and we found 2389 cotion buds (Fig. 5). We calculated the number of cotion buds present in 100 m of beach to compare this value with that found by Legambiente association.

We have observed that:

In three of the 4 sampled sites the number of cotton buds found is higher than the national value (79 cotton buds per 100 meters).

In only one site we found less than 79 cotton buds (Fig. 6) The average of the data from the 4 sites is higher than the national

average (Fig. 7).



Fig. 4 : count of the number of sticks



CONCLUSIONS

In our beaches the number of cotton bads collected is greater than those found by Legambiente association during the monitoring of 46 Italian beaches.

Although we found less than 79 sticks at site number 4, the total average is still higher than the national value.

Based on the data collected, we cannot say that our beaches are not affected by cotton bud pollution. Therefore, the null starting hypothesis can be rejected.





MEDCIS Scientific game http://medcis.scientificgame.unisalento.it/









General comments	Average*
Did you like the first phase?	3
Did you like the second phase?	3
Do you think the work of phase 1 help you to understand better the scientific method?	4
How did you like the online quiz in general?	4
How would you evaluate the questions?	3
How did you like the design?	3
How did you like the game rules	3





General comments		
What did you like most of all?	Planning phase 1	
	Communication with external students	
	Collaborative spirit and teamwork	
	Understanding of the scientific method	
	Interactive online quiz	
	Technological tools	
	Competition	
	Planning experimental design	
	Direct participation of students to the work	





General comments		
What did you dislike most of all?	A bit of confusion in the rules	
	Short time to organise the work in phase 1	
	Short time for phase 1 and unbalanced score	
	Short time for the research project, teachers are already very busy	
	Confused rules	
	Short time for phase 1	
	English, even if it is useful	





Suggestions			
Would you play the Game again next year?	Yes: 92% No: 8%		
Do you have any suggestions for future editions of the Game?	More clear rules and more time to organise the activities		
	More time to organise the phase 1 and more balanced score between phases		
	Improve the design		
	More time for experimental work		
	Beginning at the start of school		



"Education is the most powerful weapon which you can use to change the world."

Nelson Mandela

GRAZIE PER L'ATTENZIONE