



## Geography in the Physics Classroom - An Interdisciplinary Approach

Mónica Alexandra Rodrigues (1,2), Maria Helena Pina (1), Ana Monteiro (1,3), and Alina-Mihaela Luchian (4)

(1) Geography Department, Faculdade de Letras University of Porto; FLUP, Via Panorâmica, s/n, 4150-564 Porto, Portugal (monica.a.rodrigues@hotmail.com ; mpina@letras.up.pt ; anamonteirosousa@gmail.com), (2) Physics Department, University of Aveiro; Campus Universitário de Santiago, 3810-193 Aveiro, Portugal (monica.a.rodrigues@ua.pt) , (3) ISPUP- Institute of Public Health, University of Porto; Rua das Taipas nº 135, 4050-600 Porto, Portugal, (4) Asklepios-Klinik, Schwalmstadt Hospital; 34613 Schwalmstadt, Germany (luchian\_alinutza@yahoo.co.uk)

The delimited Region in Douro (NE of Portugal) is a privileged area and it stretches along 250000 hectares of land from which around 45000 are occupied by a continuous vineyard (IVDP, 2009). Placed in the hydrographic bay of Douro in schistose soil it displays a microclimate with Mediterranean characteristics from which is noticeable an exceptional landscape with narrow ledges full with gravepines. It is in this scenery partly classified by Unesco as a Mankind Patrimony that recurring to selected regional stocks the most excellent wines are produced. However it is worth noticing the Port Wine. Really this wine is unique all over the world owing its special characteristics not only to the territorial area where it is produced but also to the selected regional grapes and the very special method of production. In fact in the vintage time when the new wine is leavened in the exact moment technically determined according to the type of wine to be produced is added to that new wine around 20% of vinic brandy interrupting its leavening. This way the natural sugar of the grapes is preserved getting a sweet and strong wine (with 18 to 22 grades of alcohol). To complete its organoleptic frame, this wine rests for a minimal period of two years within wooden barrels, varying this period of time according to the desired type of wine. But many other points of interest justify the importance of the Douro region. Really although the vineyards are the economic support of the region other hypothesis of development are arising now specially connected with tourism (Pina, 2010). Therefore potentialities such as the landscape and atmosphere, the architecture, the social, cultural and economic features together with enology and gastronomy of this Douro space are highly valued. In this context this study has as its most important goal the aim to develop a teaching strategy showing the importance of daily contexts goal the aim to develop a teaching strategy showing the importance of daily contexts to motivate the students. The insertion in the classroom of a didactic approach in a multi instruction perspective may be seen worthy both for the teachers as they can innovate and perfect their professional practice and for the involved students, because this way we hope to have contributed for the development of their competences, attitudes and values according to the present tendencies in order to create future autonomous citizens active and conscientious, partakers in the solution of problems which must be faced day after day.

As a sample we have selected a class of the 10th grade whose students' age ranges between fifteen and sixteen years. Through different moments the students have worked in team. In a first phase, it was offered to the group of students the possibility of making an investigation on the patrimonial value of Port Wine to our country ( having in consideration its historical and geographical origin), of the way of producing it and the techniques used. In a second phase it was proposed a practical Lab activity where the students were asked about the following question / problem. As it is known the alcoholometry studies and determines the amount of alcohol within the leavened beverages and the hydro alcoholic solutions. The problem goes back to very ancient times and it was studied by the first physicians. According to Salleron, "Aristóteles and Teofrasto 370 years ago had already stated that the heady strong wine produced a flame when thrown into the fire". However only at the end of the XVII century after the works done by Baumé with the appearance of the "oenometer" or "wine alcoholmeter" this turns to obtain a practical meaning. Having in mind this information the students will have to determine the alcoholic level and the density of a Port Wine, age 30 years, showing the techniques used, the procedure taken and the material used during the working period.

### Reference:

PINA, Helena (2010). Quality tourism and its impact on the sustainability of Rural Areas - the case of Aquapura Douro Valley (Lamego, Northen Portugal). *Horizons in Geography*, Haifa University Press.

