Article

Assessment of Literacy to Biotechnological Solutions for Environmental Sustainability in Portugal

Margarida Figueiredo [1,2], Alexandre Dias [3], José Neves [4,5] and Henrique Vicente [1,5,6,*]

1 Departamento de Química e Bioquímica, Escola de Ciências e Tecnologia, Universidade de Évora, Rua Romão Ramalho, 59, 7000-671 Évora, Portugal; mtf@uevora.pt
2 Centro de Investigação em Educação e Psicologia, Universidade de Évora, Rua da Barba Rala, 1, Edifício B, 7005-345 Évora, Portugal
3 Itf Healthvita, Rua D. António Ribeiro, 9, 1495-049 Algés, Portugal; alexandre_d29@hotmail.com
4 Cooperativa de Ensino Superior Politécnico e Universitário—CESPU, Instituto Universitário de Ciências da Saúde, Rua José António Vidal, 81, 4760-409 Famalicão, Portugal; jneves@di.uminho.pt
5 Centro Algoritmi/LASI, Universidade do Minho, Campus de Gualtar, Rua da Universidade, 4710-057 Braga, Portugal
6 Rede de Química e Tecnologia/Laboratório Associado para a Química Verde—REQUIMTE/LAQV, Universidade de Évora, Rua Romão Ramalho, 59, 7000-671 Évora, Portugal
* Correspondence: hvicente@uevora.pt

Abstract: In today's world, the importance of preserving the environment has become increasingly evident. As a result, more sustainable solutions and techniques are being developed to combat environmental destruction. Higher education institutions are now including environmental themes in their technological courses to promote sustainable behavior and indirectly enhance environmental literacy among the population. This study aims to evaluate the level of literacy to biotechnological solutions for environmental sustainability in four areas, namely Air Pollution, Aquatic Pollution, Global Warming, and Energy Resources. A questionnaire was developed and distributed to a sample consisting of 471 individuals of both genders, age range between 15 and 78 years old, to collect data characterizing the sample and assess their literacy in environmental issues. The questionnaire was distributed in Portugal, and the participants were asked to indicate their level of agreement with several statements related to the aforementioned environmental themes. The findings suggest that literacy regarding biotechnological solutions for environmental sustainability is influenced by age group and academic qualifications. The age group above 65 years old is the one with the lowest levels of literacy, exhibiting frequencies of response I don't know exceeding 50% in 10 out of the 22 issues present in the questionnaire. The findings also suggest that the levels of literacy are higher in the thematic areas of Global Warming and Aquatic Pollution and lower in the thematic areas of Air Pollution and Energy Resources, with lower levels of literacy in the issues that have not been widely disseminated by the media. Additionally, a model based on Artificial Neural Networks was presented to predict literacy to biotechnological solutions for environmental sustainability. The proposed model performs well, achieving accuracy rates of 90.8% for the training set and 86.6% for the test set.

Keywords: environmental literacy; sustainability; biotechnology; artificial neural networks