The public's knowledge of earth sciences

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Formal education can lay important learning foundations but lifelong learning involves a commitment of adults to take advantage of informal learning environments such as geoparks that offer programmes, exhibits, and more. This project examined trends in geological knowledge and specifically compared knowledge of university students and Stonehammer geopark visitors who learned through formal and informal educational opportunities. We developed the 28 question Earth Science Literacy Survey (ESLS) to measure knowledge of concepts central to the nine Big Ideas (BI) outlined by the Earth Science Literacy Initiative, (BI-1 - Earth scientists use repeatable observations and testable ideas to understand and explain our planet; BI-2 - Earth is 4.6 billion years old; BI-3 - Earth is a complex system of interacting rock, water, air, and life; BI-4 - Earth is continuously changing; BI-5 - Earth is the water planet; BI-6 - Life evolves on a dynamic Earth and continuously modifies Earth; BI-7 - Humans depend on Earth for resources; BI-8 - Natural hazards pose risks to humans; and, BI-9 - Humans significantly alter the Earth). Overall, participants (N = 343) who had taken a geology course had higher ESLS scores (Mean YES = 87.4% vs. Mean NO = 84.16%; $p = 0.013$) due to their significantly higher scores on Big Ideas 6 ($p = 0.015$), 8 ($p = 0.006$), and 9 ($p = 0.039$). We also compared the ESLS scores of people with an interest in geology with those who were not interested. Overall, those who were interested in geology had higher ESLS scores than those with no interest (87.16% vs. 83.16%; $p = 0.001$). In this comparison, there were statistically significant differences on Big Ideas 1 ($p = 0.023$), 4 ($p = 0.005$), 7 ($p = 0.006$), 8 ($p = 0.014$), and 9 ($p = 0.014$). Thus, it appears that both formal (had a course) and informal (had an interest) educational opportunities increase awareness of topics central to earth science literacy.

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