Identifying Landscapes and their Formation Timescales: Comparing Knowledge and Confidence of Beginner and Advanced Geoscience Undergraduate Students

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Abstract

The Landscape Identification and Formation Test (LIFT) was created in response to previous data from the Student Attitudes, Expectations and Self-esteem of Students (SAESS) [1]. In order to further investigate this, the LIFT (named after the landscape identification and formation test) was developed.

This LIFT was validated with ‘think aloud’ interviews with students and correct answers were determined from interviews with experts. The LIFT was created to test landscape identification timescales, confidence in their knowledge, and are self-aware of what they are better at gauging. A new student grouping and advanced student grouping was created, and the confidence levels were determined. The LIFT specifically probe the recognize knowledge, assessing landscapes than assessing how long they take to form and are better with extreme timescales, two critical points that should be taken into consideration in future particular studies.

Introduction

Upper level students at UBC (Vancouver) decreased in their confidence with timescales of landscape formation at the end of the term, as measured by the Student Attitudes about Earth Science Survey (SAESS) [1] in order to further investigate this data, the LIFT (landscape identification and formation test) was developed.

The LIFT combines questions assessing student knowledge in identifying landscapes from images, determining their formation timescales, and their confidence in each of these components. Finally, the student’s general knowledge in geologic time is assessed (thompson, 2009).

Methods

The LIFT is a validated test and is an iterative process, shaped by responses from both students and experts. Interviews ensure that the test is correctly identified and self-awareness for the targeted audience. Then an answer key is created based upon expert responses. Four other multiple choice answers are chosen based on student responses and the test is administered.

- **Survey UBC’s geomorphology text book** (Thielltal, 2007)
- **Search for images online**
- **Develop test questions**
- **Student interviews**
- **Expert interviews**
- **Think-aloud method**
- **Administer the LIFT to 2nd yr. (n=71) and 4th yr. class (n=26)

Results

The LIFT has provided valuable information about knowledge, confidence, and self-awareness of beginner and advanced geoscience students. It shows that students are more confident in their knowledge, and suggests a new way to evaluate a student’s level of expertise.

Evaluation of Expertise

Students in the second and fourth years classes (a) have varying degrees of geologic knowledge, which does not always align with the level of skill that they think they possess. Students are more confident than experts, students were re-grouped based on the eight question geologic time section of the LIFT.

Advanced students do not display the decrease in confidence that was previously seen in the beginner group (b), there is a larger separation in average confidence between those students are more self-aware (i.e., better at self-assessing their knowledge). Among the advanced group (b), there is a large separation in average confidence (b) from the beginner group (b: p<0.001).

Implications and Recommendations

• Students have less knowledge in formation timescales, which could be addressed in curricula and teaching.

• The middle range of timescales is particularly difficult for students, elicits the most disagreement among experts, and could be more explicitly emphasized.

• Students abilities do not necessarily correlate to courses in which they are enrolled, and should be independently measured in similar future studies.

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