

## Project Update: October 2018

This report presents the effectiveness of conservation education programme on Azerbaijani students' knowledge and skills on monitoring of rare vegetation and its threats within the "buffer zones" (areas between industry zone and non-industrial protected area in Gobustan National Park) and responsible environmental behaviour.

The main objectives of this research are to assess the effectiveness of conservation education program on Azerbaijani students' knowledge about and attitudes towards rare vegetation within the "buffer zones" in Gobustan State National Park and students' behaviour change.

For evaluations of the training course we used Donald Kirkpatrick's levels model: reaction, learning and behaviour (Figure 1a)).

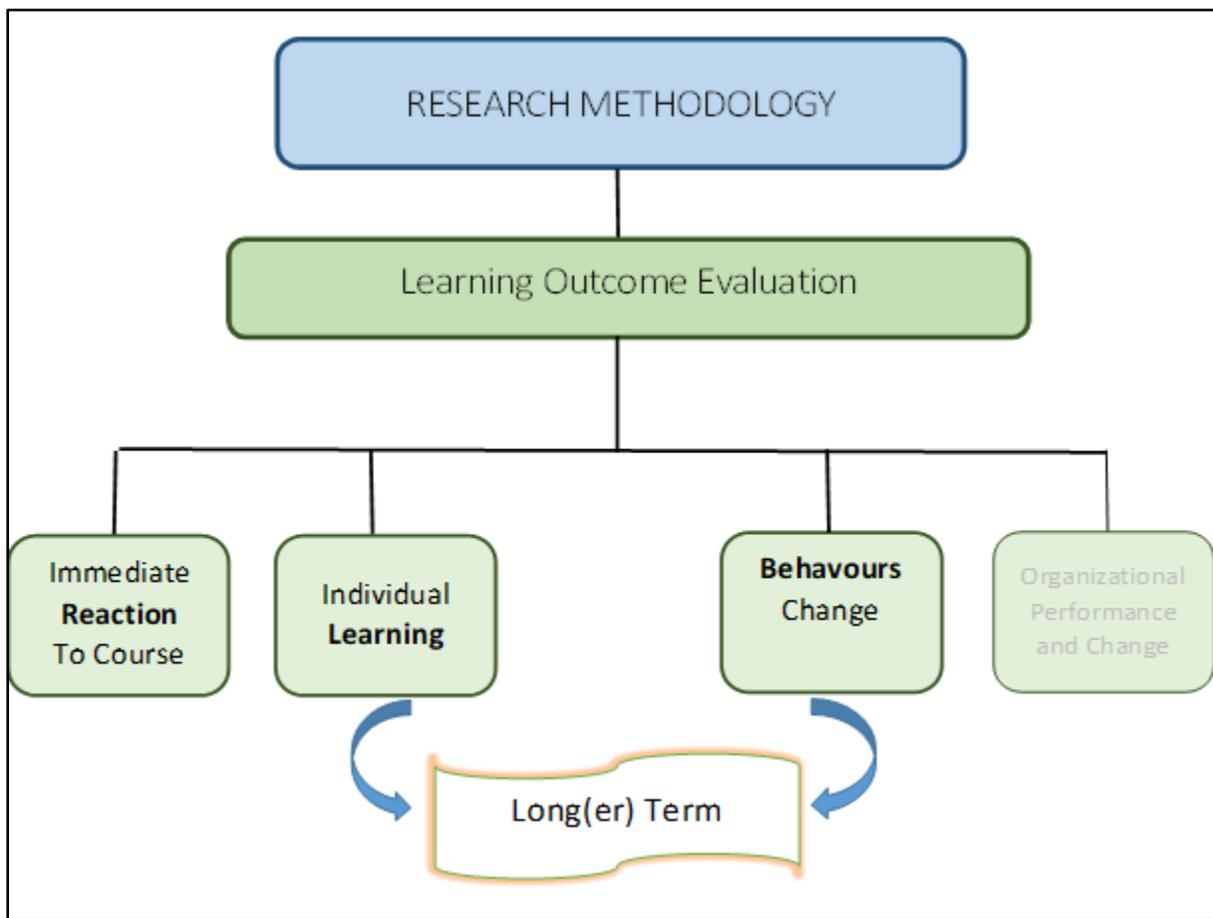


Figure 1a). Research Methodology

The first we carried out an evaluation of the students' reaction (Level 1 Kirkpatrick Model). Evaluation on this level measured how participants reacted to the training. It was important for us to get a positive reaction immediately after the training. The results presented in figure below show that the participants were pleased with the quality of the training. The level of the training course was assessed as "good".

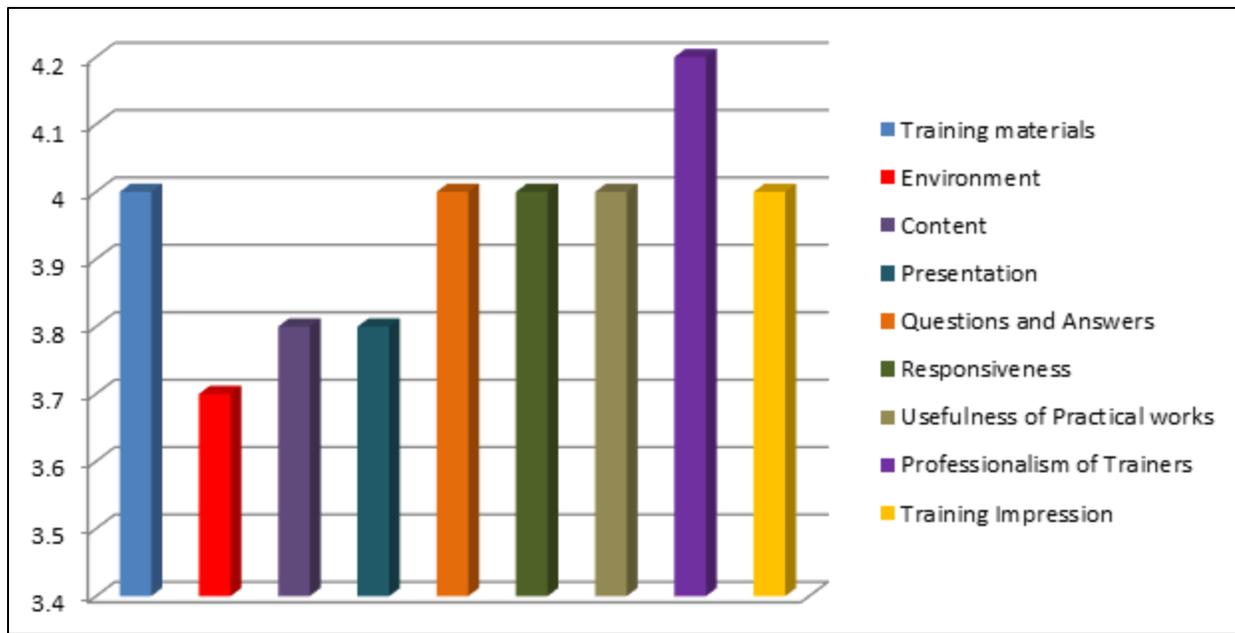


Figure 1b). Results of evaluation of the students' reaction. Kirkpatrick Model Level 1: Reaction

Evaluation of student's knowledge, experience and skills they have gained and used in practice (Level 2 Kirkpatrick Model) are presented in this report.

Assessment of students' behaviour change (Level 3 Kirkpatrick Model) also have been presented in this report. It takes one year for participant behaviours to change as a result of the education program. Given this, discerning whether or not behaviour change occurs requires long-term study.

### Methods: data collection

To evaluate the conservation education programme, we surveyed students from the university about their environmental knowledge, attitudes, skills and self-reported behaviours using a questionnaire.

The selected students were divided into two groups of which students were in experimental and remaining kept in control groups.

The "experimental group" consisted of students who participated in the conservation education programme.

The students were implemented with an innovative curriculum on environmental education for rare vegetation conservation. These students completed a questionnaire just before they participated in the conservation education programme (the 'pre-test') and about 2 years after they participated (the 'post-test').

The "control group" is given the same pre- and post-training tasks as the training participants, but they do not receive any training.

By comparing the results of the “experimental group” with the results of the “control group”, it can be established if training contributed to the learning, which can also guide future decisions on when to conduct training.

The student questionnaire which designed to measure the intended outcomes of the conservation education programme grouped into four categories:

- *Category 1:* Environmental attitudes.
- *Category 2:* Rare vegetation knowledge test (competency test used in writing to test principles, facts and other knowledge-based objectives).
- *Category 3:* GIS and remote sensing test / (GIS: knowledge base - remote sensing exercises (demonstrations of skills are particularly useful for evaluating technical skills).
- *Category 4:* Environmental behaviour. Measuring behaviour changes (1.5 year after the training)

### **Data processing and quantitative data analysis**

- *Category: 1.* Environmental attitudes

This part of the survey is designed to determine environmental attitudes.



Students showed their interest in rare vegetation conservation between pre- and post-testing phases: the questionnaire in order to test the students understanding and the relevance of biodiversity to real world issues, explore their interest in taking additional courses related to rare vegetation conservation, getting involved in environmental issues (Figures 2a),b)).

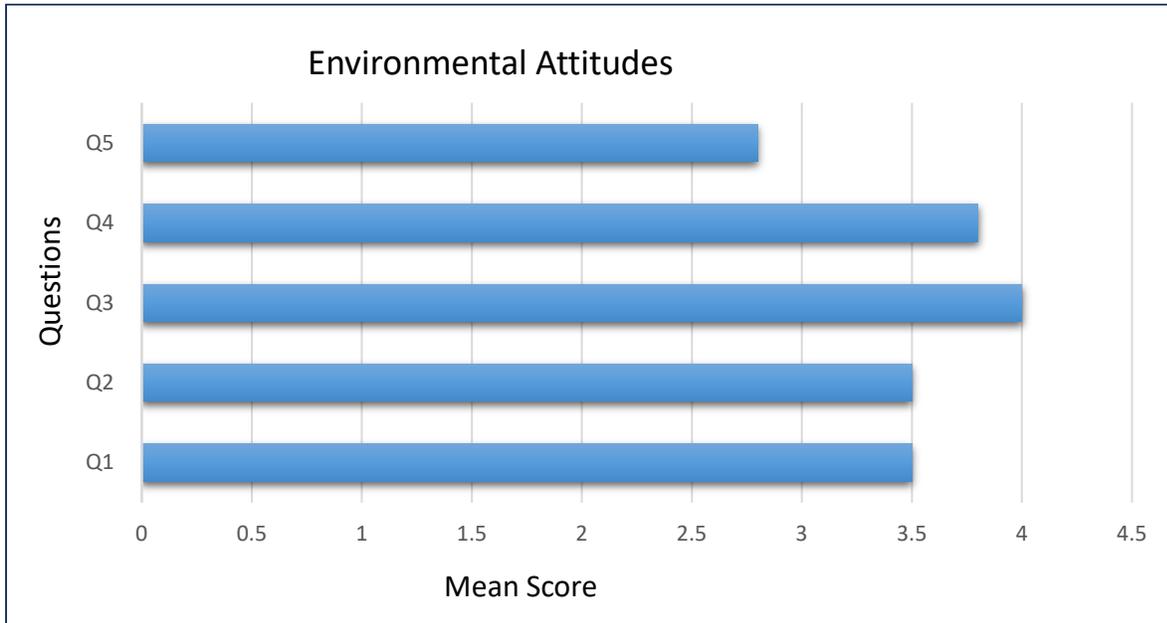


Figure 2a). Assessment of student's interest in biodiversity conservation

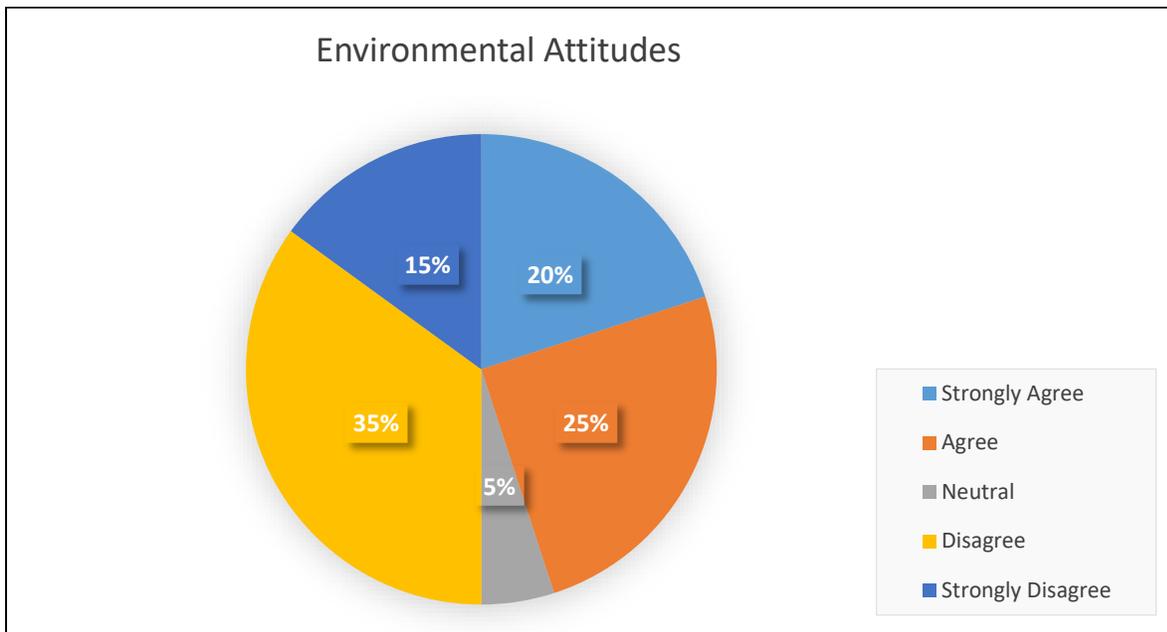


Figure 2b). Assessment of student's interest in biodiversity conservation

- *Category: 2. Rare vegetation knowledge test (competency test used in writing to test principles, facts and other knowledge-based objectives)*

Competency test used a written rare vegetation knowledge test, consisting of 10 multiple-choice, to measure changes in students' knowledge of rare vegetation.



Students in the post test phase significantly increased their confidence in rare vegetation knowledge: defining type of habitat for rare species of vegetation post- testing and type of soil and the degree of salinity for rare vegetation, identifying principal threats, providing examples of which rare types of plant communities have been degraded. Assessment of rare vegetation knowledge presented in Figures 3a), 3b).

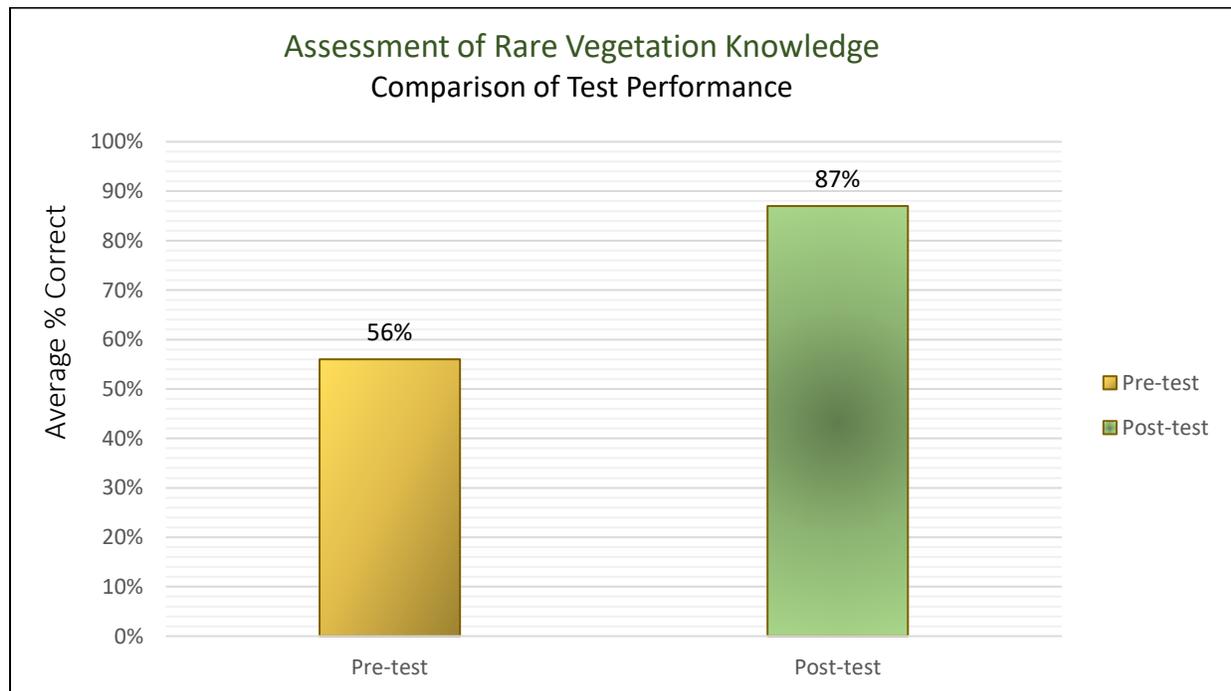


Figure 3a). Assessment of rare vegetation knowledge before and after ("experimental group")

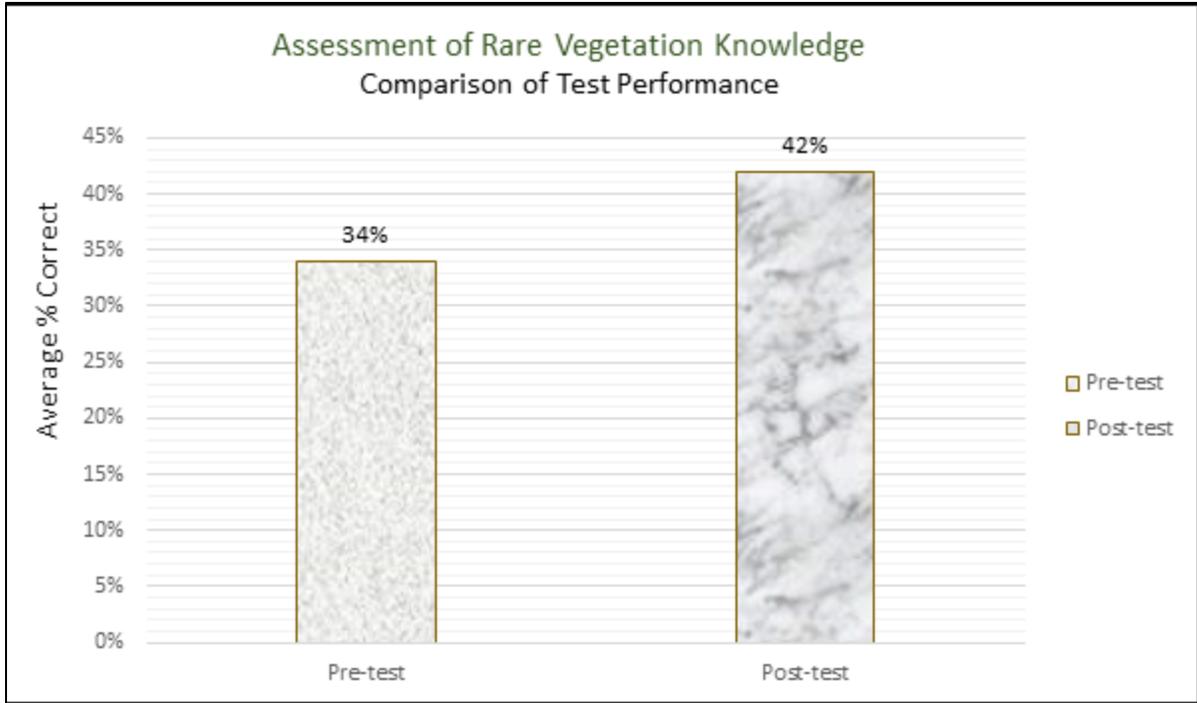


Figure 3b). Assessment of rare vegetation knowledge before and after ("control group")

Rare Vegetation Knowledge Test Results presented in Figures 3c)

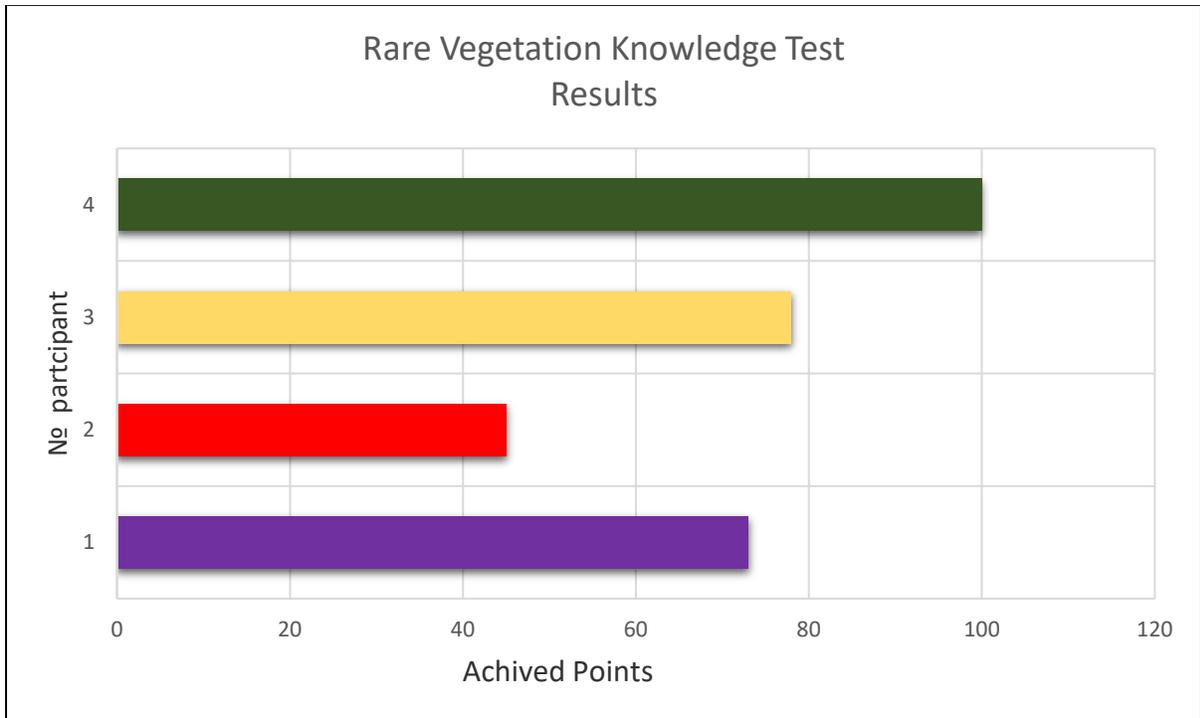
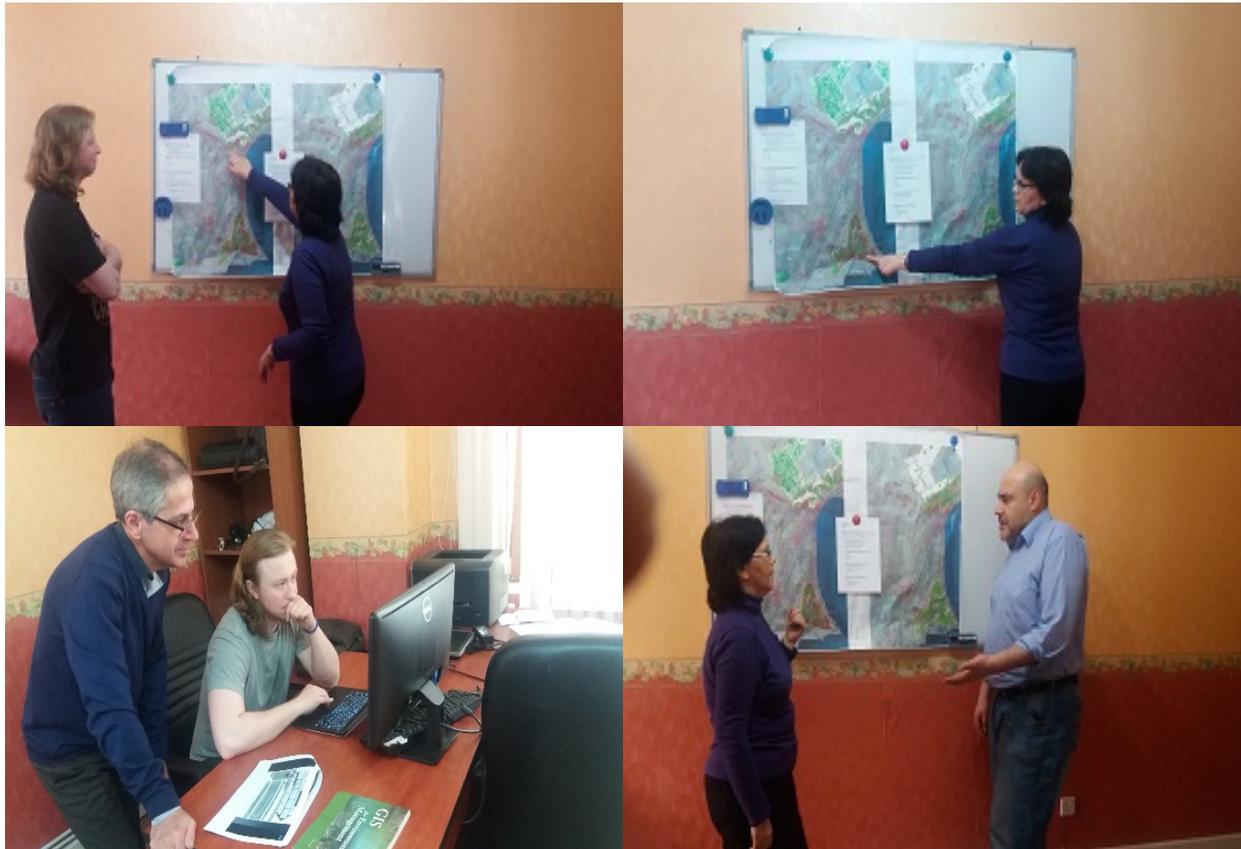


Figure 3c). Assessment of rare vegetation knowledge ("experimental group")

- *Category: 3.* GIS and remote sensing test (demonstrations of skills are particularly useful for evaluating physical (technical) skills)

The trainees were asked to demonstrate their skills using GIS: knowledge base and remote sensing technologies by producing rare vegetation map using the software (special computer programme).



In terms of demonstrations of skills on rare vegetation identification, students reported significant gains between pre- and post- testing phase in data recording, rare vegetation classification and rare vegetation change detection (Figures 4a),4b)).

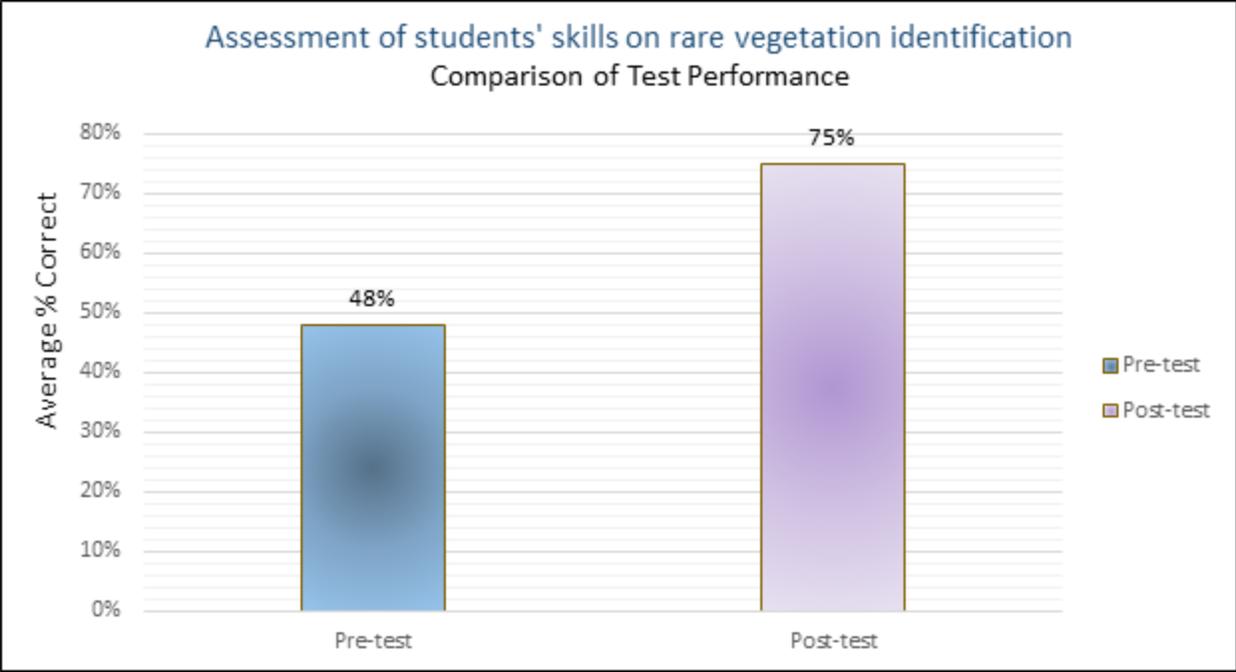


Figure 4a). Assessment of rare vegetation identification skills in confidence before and after (" experimental group")

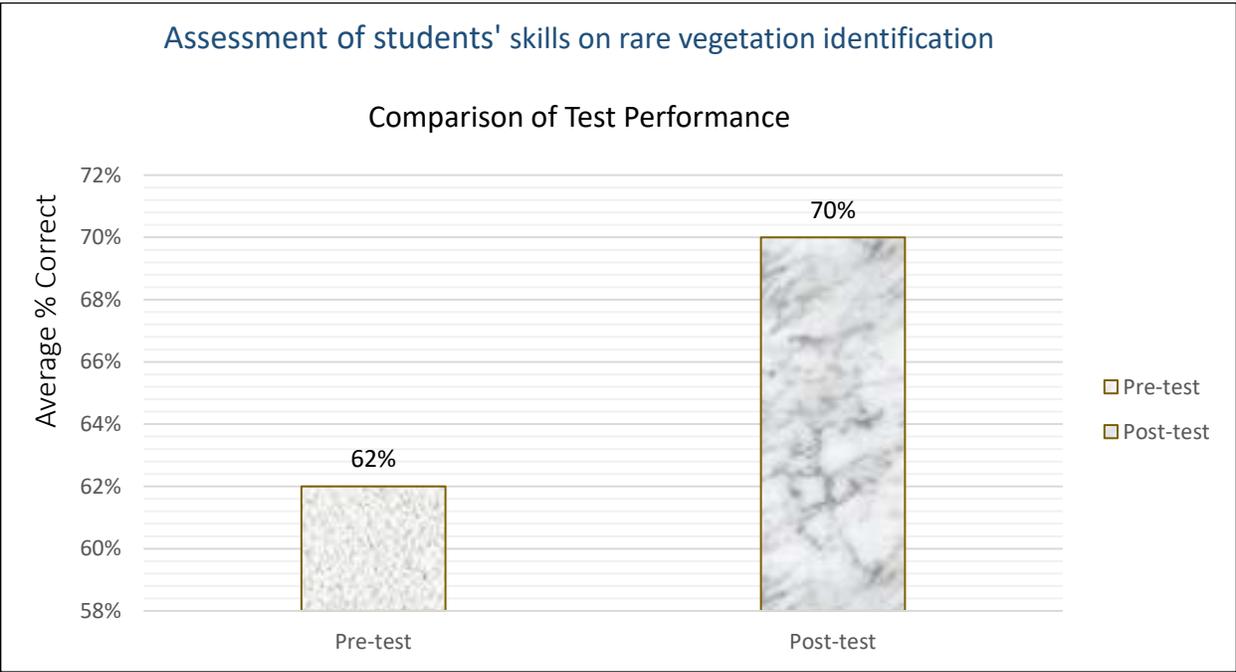


Figure 4b). Assessment of rare vegetation identification skills in confidence - before and after ("control group")

- *Category: 4.* Environmental behaviour measuring behaviour changes (1.5 year after training)

### Kirkpatrick Level 3: Behaviour

Evaluation on this level measures whether the knowledge and skills that the training participants have learned in the training are applied to their work.

#### 4.1 Environmental Behaviours

This section of the survey is designed to find out what things students do about the environment.



The trainer asked to mark the answer that is closest to the right answer for the student

Assessment of student's interest in biodiversity conservation presented in Figure 5a)



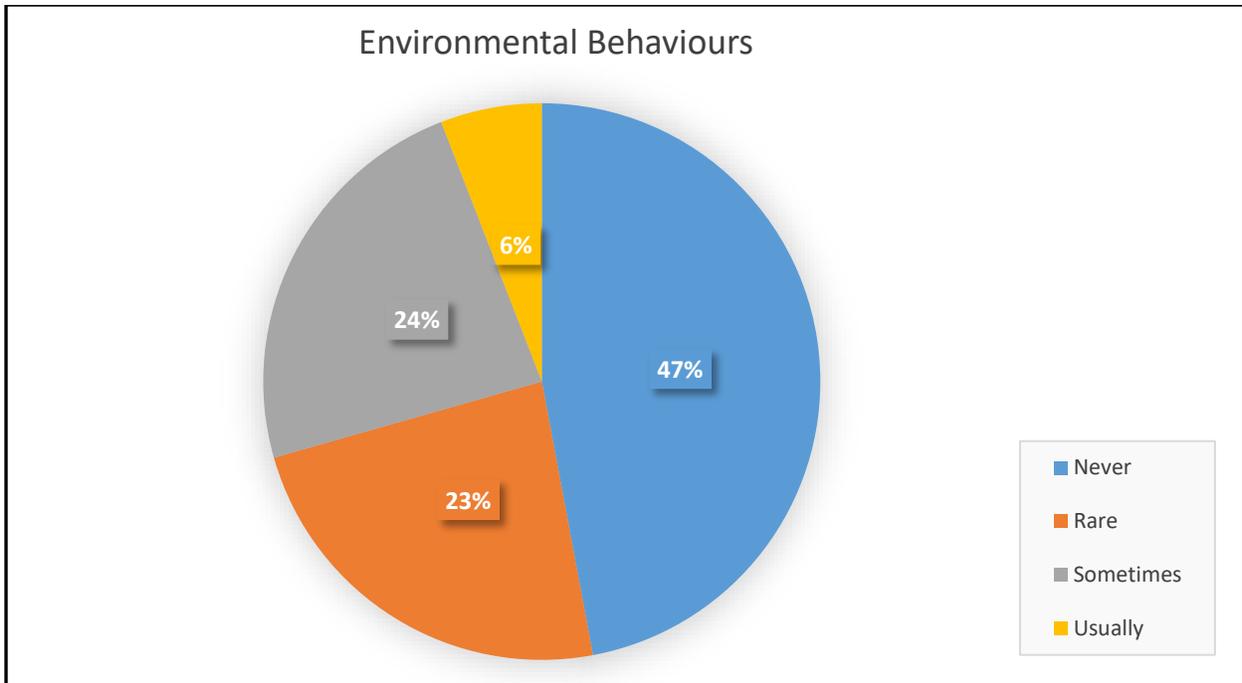


Figure 5a). Assessment of student's interest in biodiversity conservation

#### 4.2 Measuring behaviour changes (1.5 year after training)

Assessment of student's interest in biodiversity conservation presented in Figure 5b)

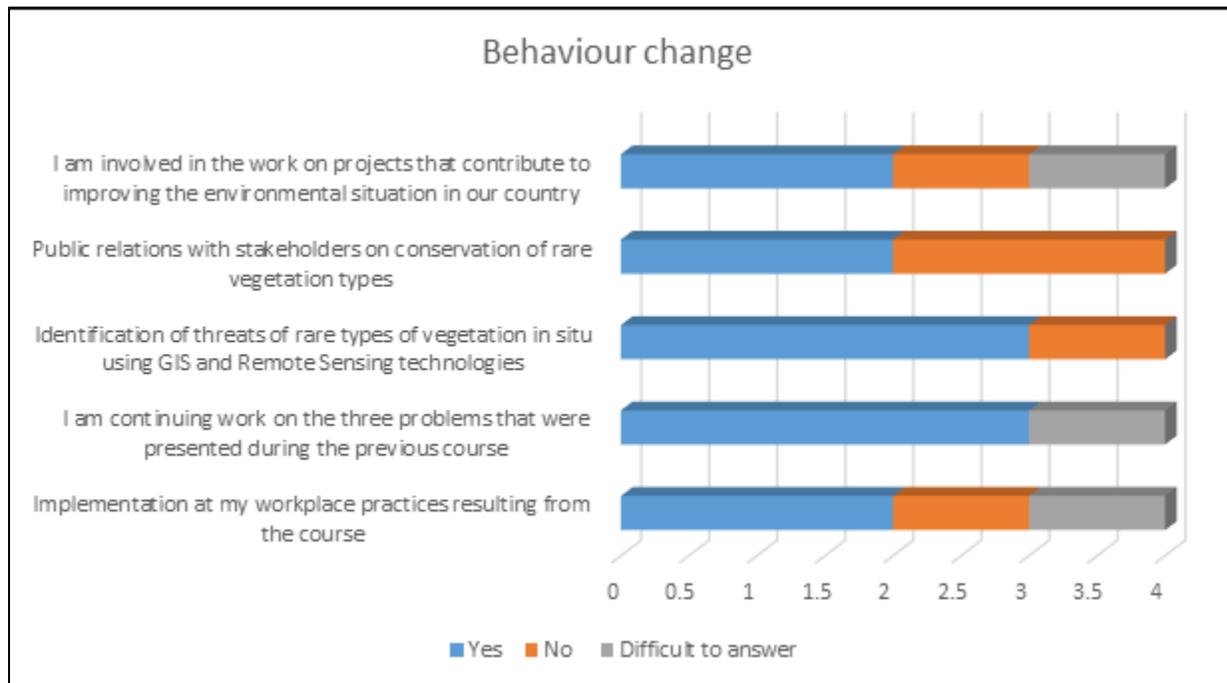


Figure 5b. Assessment of behaviour change (1.5 year after training)

We examined the effectiveness of the conservation education programme ("Rare vegetation conservation in Gobustan National Park") in changing students' knowledge and behaviour by (1) comparing responses of before and after the educational programme and (2) comparing responses of the "control group" and "experimental group" after the educational programme.

Participants in the educational programme significantly increased their rare vegetation knowledge and demonstrations of skills on rare vegetation identification became significantly more pro-environmental. The average student who participated in the program answered one more question correctly on the post-test compared to the pre-test, increasing the percent correct by 31% (rare vegetation knowledge test) and by 27% (demonstrations of skills on identification of rare vegetation) (Table 2). Attitude and behavioural changes increased in case of "experimental group".

Comparing the post-test results from the two groups, "experimental" and "control" groups, experimental had significantly greater rare vegetation knowledge (87% vs. 42%) while their demonstrations of skills changed slightly (75% vs.70%) (Table 3).

Table 2. Tests comparing paired pre- and post-test average scores ("experimental group").

Variable	Mean score pre-test	Mean score post-test	Change in score
Average % Correct Rare Vegetation Knowledge	56%	87%	31%
Average % Correct Demonstrations of skills	48%	75%	27%
Average Attitude	3.5	4.2	0.8
Average Behaviour	3.2	4.0	0.8

Table 3. Comparison between experimental and control post-tests.

Variable	Post-test score (experimental vs. control)
Average % Correct Rare Vegetation Knowledge	87% vs. 42%
Average % Correct Demonstrations of skills	75% vs.70%
Average Attitude	4.2 vs. 3.2
Average Behaviour	4.0 vs. 3.2