

## Supplementary S1

### SURVEY

This questionnaire is part of a research project in didactic science, which aims to identify the obstacles to the teaching of earth sciences and the teacher's conceptions related to the teaching of this discipline. We thank you very much for your valuable collaboration, which will be of great benefit to our research. We guarantee that your answers will be only used for research.

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#### Personal pieces of information

P1. Age:    years

P2. Sex:        ☐ Female        ☐ Male

P3. What is your highest level of training?

☐ Baccalaureate        ☐ Baccalaureate + 1 or 2 years in higher studies

☐ Bac + 3                ☐ 4 Bac + 5 or 6

☐ Other (please specify)

P4. BA specialty:        ☐ Biology                ☐ Geology

P5. Teaching level: Secondary middle school    Secondary qualifying high school  
P6. Seniority: years

P7. Did you have any vocational training in teaching        ☐ yes        ☐ no

P8. Your place of work (city):

N.B: You can check several boxes for multiple-choice questions, and you can answer open questions in Arabic:

Q1- What are the teaching difficulties of earth sciences that you encounter in your geology classes?

The relationships that discipline has with time and space.

☐ Strongly disagree    ☐ Somewhat disagree    ☐ Somewhat agree    ☐ Strongly agree

The limited abstraction capacity of learners

☐ Strongly disagree    ☐ Somewhat disagree    ☐ Somewhat agree    ☐ Strongly agree

The content of the geological lessons is complex and very abstract.

☐ Strongly disagree    ☐ Somewhat disagree    ☐ Somewhat agree    ☐ Strongly agree

The confusion of specialized vocabulary.

☐ Strongly disagree    ☐ Somewhat disagree    ☐ Somewhat agree    ☐ Strongly agree

Lack of prerequisites to start new concepts

☐ Strongly disagree    ☐ Somewhat disagree    ☐ Somewhat agree    ☐ Strongly agree

Non-motivating knowledge for the learner

☐ Strongly disagree   ☐ Somewhat disagree   ☐ Somewhat agree   ☐ Strongly agree

Lack of initial and/or continuous training.

☐ Strongly disagree   ☐ Somewhat disagree   ☐ Somewhat agree   ☐ Strongly agree

Lack of interest in the mineral environment

☐ Strongly disagree   ☐ Somewhat disagree   ☐ Somewhat agree   ☐ Strongly agree

Social Obstacles (Conceptions of the Family and Society on the Usefulness of this Science)

☐ Strongly disagree   ☐ Somewhat disagree   ☐ Somewhat agree   ☐ Strongly agree

Learners do not like this subject

☐ Strongly disagree   ☐ Somewhat disagree   ☐ Somewhat agree   ☐ Strongly agree

Other: specify:

Q2- In your opinion, what are the causes behind the difficulties faced by teachers in teaching Earth sciences?

Q3- What are the teaching aids/tools that you use to deliver geological knowledge?

Q4- In your opinion, what is the value of learning earth sciences for a bac student? You can check several boxes:

Develop the scientific spirit of learners

☐ Not agree   ☐ Rather not agree   ☐ Rather agree   ☐ Agree

General culture

☐ Not agree   ☐ Rather not agree   ☐ Rather agree   ☐ Agree

Environmental Education

☐ Not agree   ☐ Rather not agree   ☐ Rather agree   ☐ Agree

Know the functioning of the planet

☐ Not agree   ☐ Rather not agree   ☐ Rather agree   ☐ Agree

Train competent geologists

☐ Not agree   ☐ Rather not agree   ☐ Rather agree   ☐ Agree

Train competent teachers in earth sciences

☐ Not agree   ☐ Rather not agree   ☐ Rather agree   ☐ Agree

Train engineers in mineral engineering, hydrogeology, geomatics, ...

☐ Not agree   ☐ Rather not agree   ☐ Agree

Nothing

☐ Not agree   ☐ ☐ Rather not agree   ☐ Rather agree   ☐ Agree

Other (specify)

Q5- If learners interrupt you in class to tell you that learning earth sciences is useless for them. How would you react?

☐ You show them that you are in complete agreement with them and that you have no choice but to start these chapters.

☐ You try to motivate them by showing them the scientific and economic benefits of the earth sciences.

☐ You schedule a session or several sessions to discuss the economic benefits of the earth sciences.

☐ You ignore the question asked by the learners.

☐ You tell them it's only important for the baccalaureate.

Other reactions, please specify them

## Supplementary S2

SEMI-DIRECTIVE INTERVIEW-----

Personal information

P1.Age: Years

P2. Sex: ☐ Female ☐ Male

P3. What is your highest level of training?

☐ Baccalaureate ☐ Bac + 1 or 2 years in higher education

☐ Bac + 3 or 4 ☐ Bac + 5 or 6

☐ Other (please specify)

P4. Bachelor's option:

☐ Biology ☐ Geology

P5. Teaching level: ☐ Middle school ☐ Qualifying high school

P6. Seniority: years

P7. Did you benefit from any professional training in teaching ☐ Yes ☐ No

P8. Your place of work (city):

Q1- What are the teaching difficulties of earth sciences that you encounter in geology classes?

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Q2- In your opinion, what are the causes behind the difficulties faced by teachers in teaching Earth sciences? .....

Q3-A- Did you encounter any difficulties in teaching content related to internal geological phenomena, when you first taught them?

☐ Yes ☐ No

If so why?

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Q3-B- Thank you for telling us the solutions that allowed you to overcome them.

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Q3-C- Thank you for indicating the difficulties that persist and telling us why:

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Q4- If learners interrupt you in class to tell you that learning earth sciences is useless for them, how would you react?

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Q5- In your opinion, what is the main cause of marginalizing the discipline of earth sciences?

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Q6- Describe the experience you have had in your schooling and university education concerning learning Earth Sciences.

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