

Appendix S6

This appendix presents the qualitative results, which have been disaggregated into units of meaning for further examination. If an opinion fits into two categories, the relevant part is underlined.

Appendix S6.1. Students' answers (from units of meaning), within the categories established for the questions of the control group.

Table S1 Students' answers (from units of meaning), within the categories established for the first question of the control group.

Q1. Did you find the class interesting?	
Category	Units of meaning
Interested	E03- "Yes, I am very interested in the subject, I have learned a lot."
	E04- "Yes, quite a lot. I would have liked to dedicate more sessions; it has been interesting."
	E05- "It has been interesting, I would have liked it to last more sessions, to be able to investigate more specific issues."
	E11- "Yes, very much."
	E06- "Yes, very interesting."
	E07- "I think the history of the Earth is interesting."
	E12- "Yes, I found it interesting."
	E13- "Yes, it has been entertaining."
	E14- "Yes."
	E15- "Yes, I found it interesting."
	E16- "Yes, I found it interesting."
	E17- "I found it interesting to learn about the history of the Earth."
	E18- "I found it an interesting class, told as a story."
	E19- "The syllabus is interesting."
	E20- "Honestly, I found it very interesting, because I realized how many things I didn't know about the history of our planet."
	E21- "The theory is very interesting; I would have liked to do more sessions and go even deeper."
	E22- "Yes, I found it interesting."
	E23- "Yes, it's a very interesting topic, really."
	E24- "A lot, it's the first time I've been told the History of the Earth with that emotion."
	E25- "It has been great, told as if it were a story, but real."
Not interested	E01- "Not too much, I would have liked something more dynamic."
	E02- "I would make a more interactive class than usual."
	E08- "-."
	E09- "I don't think I can retain that much information."
	E10- "-."

Table S2 Students' answers (from units of meaning), within the categories established for the second question of the control group.

Q2. What do you value most about a traditional lecture?	
Category	Units of meaning
Teacher motivation and enthusiastic transmission	E03- "The motivation of the teacher and the enthusiasm she shows in the explanation."
	E08- "The preparation of the teacher and the support for the explanation (digital presentation, blackboard). <u>The passion shown by the teacher to convey the subject matter.</u> "
	E12- "The explanation and <u>motivation of the teacher when giving the class.</u> "
	E24- "That the teacher transmits it with enthusiasm, you can tell that she likes the subject."
Take notes	E04- "That it is much more visual during the class and captures attention better, in addition, <u>you can take notes "on your own" while listening.</u> "
	E25- "Being in a "class" environment I think I concentrate more and can take notes more comfortably."

Teacher-student interaction (reviews, feedback, participation, doubts)	E02- "I like that you can ask questions." E05- "I like it because it is enjoyable and entertaining, I appreciate that there are reviews during the explanation." E07- "I appreciate that you can participate." E13- "That the teacher gets our attention, with an eye-catching and entertaining class." E14- "Be dynamic to maintain attention, because if we don't we start thinking about other things without realizing it." E16- "What I value most is that <u>the teacher answers all doubts with patience</u> and that she always gives examples or mnemonic rules that help me remember the most important aspects of the subject." E18- "I like the teacher to do reviews because there is a lot of content." E21- "That the teacher knows how to explain the syllabus in an active way, propose activities and motivate us to participate in the class."
Quality in the teaching staff's explanation	E06- "I appreciate that <u>the content is explained well, calmly and not complicated to understand</u>, and if it is, that there are resources to facilitate the level of difficulty." E08- "<u>The preparation of the teacher</u> and the support for the explanation (digital presentation, blackboard). The passion shown by the teacher to convey the subject matter." E09- "What I value most is how the teacher explains." E12- "<u>The explanation</u> and motivation of the teacher when giving the class." E15- "I like it when the teacher gives examples to understand things better." E16- "What I appreciate most is that the teacher answers all doubts with patience and that she always gives <u>examples or mnemonic rules that help me remember the most important aspects of the subject</u>." E19- "<u>If the teacher explains well and highlights the most important things, most of the syllabus stays, and when it comes to studying it becomes easier</u>. If the methodology when explaining is more visual, with examples, images or activities, the class is less heavy, and attention is not lost." E20- "I think PowerPoint helps a lot, since it allows us to see things with images, and it is better understood. And without a doubt, <u>what I value most is the teacher, because she has explained it very well</u>." E22- "<u>That examples are given during the explanation; this always helps to retain more information. I also like images to be put in</u>."
Resources used	E01- "I appreciate that the notes or presentation that is used to explain, is later shared with the students to facilitate the study." E06- "I appreciate that the content is explained well, calmly and not complicated to understand, and if it is, <u>that there are resources to facilitate the level of difficulty</u>." E08- "The preparation of the teacher and <u>the support for the explanation (digital presentation, blackboard)</u>. The passion shown by the teacher to convey the subject matter." E10- "That it is visual, using presentations, images, etc." E11- "That it be explained in detail, with a <i>PowerPoint</i> and supporting photographs." E17- "The visual aid of the <i>PowerPoint</i>, the timeline and photos of the fossils and drawings of what the animals were like." E19- "If the teacher explains well and highlights the most important things, most of the syllabus stays, and when it comes to studying it becomes easier. <u>If the methodology when explaining is more visual, with examples, images or activities, the class is less heavy, and attention is not lost</u>." E20- "<u>I think PowerPoint helps a lot, since it allows us to see things with images, and it is better understood</u>. And without a doubt, what I value most is the teacher, because she has explained it very well." E22- "That examples are given during the explanation; this always helps to retain more information. <u>I also like images to be put in</u>." E23- "I like to use images, because it's more visual. I also value that they are concrete presentations with schematic information and the teacher's explanation. I liked it a lot, thank you!"

Table S3 Students' answers (from units of meaning), within the categories established for the third question of the control group.

Q3. What kind of activities would you propose to make it more motivating?	
Category	Units of meaning
Not change, or the proposed changes are within the "master class" methodology	E03- "Yes, I am very interested in the subject, I would have liked it to be explained with more sessions, although for the few classes we have done, I have learned a lot."
	E04- "Yes, quite a lot. I would have liked to dedicate more sessions; it has been interesting. I would add to begin with an axis with the Ages, without further explanation, to locate us."
	E05- "It has been interesting, I would have liked it to last more sessions, to be able to investigate more specific issues."
	E11- "Yes, a lot. I think that in addition to explaining with a presentation, it would be good, and it would help us to have everything clearer, a summarized timeline of each Era, to have a clearer idea of what is happening together."
	E22- "Yes, I found it interesting. Before starting the next class, I would do a more in-depth review of the previous class."
Add some motivating activity	E01- "I would make it more dynamic, I would remove part of the explanation, making something more enjoyable."
	E02- "I would make a more interactive class than usual."
	E06- "I would do more practices, to participate more actively."
	E07- "I think the History of the Earth is interesting, but it can get a bit heavy. I would propose a dynamic group activity, like a game, to be able to understand it better."
	E08- "Maybe it could be improved by doing some more dynamic activity, but in general I liked it a lot."
	E09- "I would propose making games to make it more motivating, because I think that so much information is not retained in the same way."
	E10- "I would propose to intersperse a game to review between sessions."
	E12- "We could go on excursions to a museum, do theatre, etc., that is, something more dynamic so that the information stays with us better."
	E13- "Games could have been interspersed, even if it is one or two, to attract more attention and make it more entertaining. For example, in the middle of the explanation, play a quick game for us to participate."
	E14- "Look for some kind of tool such as a <i>Kahoot</i> to make it more entertaining and help us to make it fit better, because this topic has many names, and the information crosses my mind."
	E15- "It is a topic with a lot of information. I wish there was some interactive activity to learn all the names of the periods and fossils."
	E16- "From my point of view, this theme could be done in the style of a gymkhana."
	E17- "The class seemed normal to me, with images and explanation, although I would propose something more dynamic."
	E18- "I would propose something that would make students more engaged."
	E19- "The syllabus is interesting, but this type of information with data, names, etc., I think would be better done in a practical and participatory way. PowerPoint is fine, but I'd rather move around more."
	E20- "I think that, although the class has been very good, I would do something more dynamic."
	E21- "I would propose some practice with this theory."
	E23- "I would have liked to make a game or something similar."
	E24- "I'd like to do something to go over the most important things through a game or something."
	E25- "I wish there was a model with the timeline to remember each period when you move on to the next."

Appendix S6.2. Students' answers (from units of meaning), within the categories established for the questions of the experimental group.

Table S4 Student answers (from units of meaning), within the categories established for the first question of the experimental group

Q1_1. Did you like this way of teaching the subject?	
Category	Units of meaning
Strongly liked	100% say yes
Q1_2. Do you prefer it to the usual methodology?	
Category	Units of meaning
Strongly liked	100% say yes
Q1_3. Why?	
Category	Units of meaning
Interspersing explanation/review	E26- "I did like it, <u>I think that, with an extra review</u> and the interactive way of teaching the class, I could have gotten a very good grade. The class was enjoyable and fun, I really like this methodology, because it means we retain the information better."
Enjoyable and fun	E26- "I did like it, I think that, with an extra review and the interactive way of teaching the class, I could have gotten a very good grade. <u>The class was enjoyable and fun, I really like this methodology</u>, because it means we retain the information better." E29- "Yes, since it is more didactic and entertaining." E30- "I personally prefer this way of <u>teaching the syllabus, because it becomes more entertaining</u>, and the competition between groups awakens our interest in the subject and helps us to pay more attention during the classes." E34- "Yes, because it is more dynamic <u>and at the same time you learn, you have fun.</u>" E36- "It is better than the usual methodology, <u>because the topic is explained more pleasantly</u> and interactively." E37- "Yes, I liked this methodology more than usual, because in addition to having found out, I have learned about the subject, <u>I have also had a good time learning</u>, because it gave you the opportunity to be part of activities, as well as being able to do it with your classmates." E40- "<u>This way is much more entertaining</u> because it interacts with the students, I prefer it to the usual methodology, since in this way the explanation captures our attention." E44- "I did like this way of teaching the class. <u>I think it is a way of giving a slightly dense syllabus, in a more enjoyable and entertaining way.</u> In addition, I think that all the images and fossils that were there made learning easier and helped me to understand everything better, since it was very visual." E45- "I quite liked the way the subject was taught. I prefer to do the class like this instead of how we usually do it, because it is more dynamic <u>and becomes very enjoyable</u>. In addition, I think that I retained the information more easily." E48- "Yes, I prefer it, <u>because it's more enjoyable</u>, you take notes, and you find out about things. In addition, the fact that there are divided rooms makes it easier to place the syllabus." E50- "I found the methodology very good and beneficial, it <u>has been very enjoyable</u> and has made me enjoy the subject and learn quickly".
Information is better retained/facilitates learning	E26- "I did like it, I think that, with an extra review and the interactive way of teaching the class, I could have gotten a very good grade. The class was enjoyable and fun, I really like this methodology, <u>because it allows us to retain the information better.</u>" E27- "For my part, I like this way of teaching the subject better, since we don't have to be doing nothing listening to the teacher. <u>This way is more dynamic, and you learn more.</u>" E32- "Yes, I liked it, and I prefer it more than the usual methodology, because it is more dynamic and <u>from my point of view you learn better by doing activities.</u>" E37- "Yes, I liked this methodology more than usual, <u>because in addition to having found out, I have learned about the subject,</u> I have also had a good time learning, because it gave you the opportunity to be part of activities, as well as being able to do it with your classmates." E41- "Yes, I think the best thing about this methodology is that everything is more visual. What has helped me the most has been that each period had visual things like fossils. Also to take note because later I remember where I have written down, and more or less from what period it was."

E42- "Yes, I liked it, and obviously I prefer it to a normal class. Above all, because of the participation when carrying out activities and also being set in an escape room, you keep more of all the data when you remember the room, or an image that had been pasted, or an object that was to be themed".

E43- "I liked the escape room methodology".

E44- "I did like this way of teaching the class. I think it is a way of giving a slightly dense syllabus, in a more enjoyable and entertaining way. In addition, I think that all the images and fossils that were there made learning easier and helped me to understand everything better, since it was very visual."

E45- "I quite liked the way the subject was taught. I prefer to do the class like this instead of how we usually do it, because it is more dynamic and becomes very enjoyable. In addition, I think that I retained the information more easily."

E47- "I liked it, I think it's a good methodology because it helps you to be part of it and understand what you're studying."

E48- "Yes, I prefer it, because it's more enjoyable, you take notes, and you find out about things. In addition, the fact that there are divided rooms makes it easier to place the syllabus."

E49- "I liked it a lot. I prefer it because taking notes, the setting and going from room to room made me retain many more things than I expected."

E50- "I found the methodology very good and beneficial, it has been very enjoyable and has made me enjoy the subject and learn quickly".

Group work

E30- "I personally prefer this way of teaching the syllabus because it makes it more entertaining, and the competition between groups awakens our interest in the subject and helps us to pay more attention during the classes."

E33- "Yes, I do prefer it to the usual methodology because it makes you be attentive during the class, as you move and do tests in groups. In addition, since we are the ones who write the notes, there are things that are already staying."

E37- "Yes, I liked this methodology more than usual, because in addition to having found out, I have learned about the subject, I have also had a good time learning, because it gave you the opportunity to be part of activities, as well as being able to do it with your classmates."

**Dynamic/
interactive**

E26- "I did like it, I think that, with an extra review and the interactive way of teaching the class, I could have gotten a very good grade. The class was enjoyable and fun, I really like this methodology, because it means we retain the information better."

E27- "For my part, I like this way of teaching the subject better, since we don't have to be doing nothing listening to the teacher. This way is more dynamic, and you learn more."

E28- "Personally, changing from time to time is pretty good, it keeps us motivated."

E31- "Yes, I prefer this way, as it is much more dynamic."

E32- "Yes, I liked it, and I prefer it more than the usual methodology, because it is more dynamic and from my point of view you learn better by doing activities."

E33- "Yes, I do prefer it to the usual methodology because it makes you be attentive during the class, as you move and do tests in groups. In addition, since we are the ones who write the notes, there are things that are already staying."

E34- "Yes, because it is more dynamic and at the same time you learn you have fun."

E36- "It is better than the current methodology, because the subject is explained more pleasantly and interactively."

E38- "Yes, I liked this methodology more, because it is more dynamic and catches my attention more, although I don't know if this methodology would be useful for all topics, since there are some that are more technical."

E40- "This way is much more entertaining because it interacts with the students, I prefer it to the usual methodology, since in this way the explanation captures our attention."

E42- "Yes, I liked it and obviously I prefer it to a normal class. Above all, because of the participation when carrying out activities and also being set in an escape room, you keep more of all the data when you remember the room, or an image that had been pasted, or an object that was to be themed".

E45- "I quite liked the way the subject was taught. I prefer to do the class like this instead of how we usually do it, because it is more dynamic and becomes very enjoyable. In addition, I think that I retained the information more easily."

E47- "I liked it, I think it's a good methodology because it helps you to be part of it and understand what you're studying."

Improves attention	E30- "I personally prefer this way of teaching syllabus because it makes it more entertaining, and the competition between groups awakens our interest in the subject and <u>helps us to pay more attention during classes.</u>" E33- "Yes, I do prefer it to the usual methodology <u>because it makes you be attentive during the class,</u> as you move and do tests in groups. In addition, since we are the ones who write the notes, there are things that are already staying." E35- "Yes, I liked it, even more than the usual methodology, since I usually get distracted by having my head elsewhere." E38- "Yes, I liked this methodology more, because it is more dynamic and <u>catches my attention more,</u> although I don't know if this methodology would be useful for all topics, since there are some that are more technical." E40- "This way is much more entertaining because it interacts with the students, I prefer it to the usual methodology, <u>since in this way the explanation captures our attention.</u>" E46- "I prefer this one in the usual way because it arouses more interest and attention is not lost. In addition, the subject was very well structured in the place."
Doubts about the effectiveness if the syllabus were always done like this	E38- "Yes, I liked this methodology more, because it is more dynamic and catches my attention more, <u>although I don't know if this methodology would be useful for all topics, since there are some that are more technical.</u>" E39- "Yes, this is a methodology that can be applied from time to time and replace some specific classes. But I doubt that it can be applied to the entire syllabus because of the complexity and preparation time."

Table S5 Students' answers (from units of meaning), within the categories established for the second question of the experimental group

Q2. Is there any aspect that you didn't like or didn't think was appropriate?	
Category	Units of meaning
Everything adequate	E27- "No." E41- "Nothing." E43- "Nothing." E47- "Nothing" E48- "No".
Lack of time	E26- "The short time, but I think it's because we didn't have more classes." E28- "We ran out of time." E29- "That we did not have enough time to carry out the activity well." E31- "I was very hard-working, but I think it would have been better to do it in one more session." E32- "Perhaps the issue of time, it would be better to do it more calmly." E33- "The only negative thing I highlight is the time; it was a little lacking." E34- "No, but if I had to say something, the lack of time." E35- "The duration, I would have liked shorter, but I understand that this method needs more time." E37- "It is true that for a class like this it takes more time than for a class with the usual methodology. However, it is worth investing a few more minutes and doing it more calmly." E38- "I don't like that you have little time to do the activity, since you need more to make the games without losing content." E39- "The duration of the activity has been short." E42- "The problem is time, since in this case we have lacked a little. And another more specific one is that I have not managed to keep all the names, in Biology and Geology there are many terms". E50- "With more time the experience would have improved".
Combine with masterclass explanations	E30- "In general I liked it quite a bit, but I would have preferred a previous explanation class before taking the previous ideas test, and two before reviewing to do this one." E45- "Maybe it requires a lot of work for the teacher. It is true that I learned a lot, and all the activities helped me to retain. Despite this, I really like the normal class we usually do. But well, the activity was fun and especially helped me differentiate between Eras and the evolution of animals and plants."
Smaller groups	E36- "Make smaller groups for group activities, to participate more times." E44- "I think that in general everything was very adequate. I also think that since we behaved well, it favoured the activity to go well. Maybe with more people it wouldn't have been as effective."

Dislike some of the specific challenges	E40- "I didn't like the activity of the chest with the code or the activity of digging up fossils."
No answer	E46- "-" E49- "-".

Table S6 Student answers (from units of meaning), within the categories established for the third question of the experimental group

Q3_1. Do you think you have expanded your knowledge on the subject?	
Category	Units of meaning
Strongly liked	100% say yes
Q3_2. In what way?	
Category	Units of meaning
Spatial location of geological time (Eras and Periods) / setting and visual material	E26- "Yes, since now I locate more clearly in which era everything was formed."
	E31- "Yes, since it was a subject, I knew nothing about, and now I orient myself in the periods."
	E33- "Yes, and very much, since I knew nothing about the History of the Earth, and even less about the Ages into which it is divided."
	E35- "A lot, especially with the material used in practice, since it helps you to have the stages photographed in your mind."
	E39- "Yes, the most interesting thing has been the layout of the different rooms. I don't know if it has been done, but the concept that the first stage (where not many things happened) was a long corridor with almost nothing has seemed interesting to me the way in which time was represented through space."
	E41- "Yes, this way when it comes to taking the exam I have <i>flashbacks</i> of the <i>escape</i> . I think that way the ideas fit me better. Obviously later it would be necessary to study, but the basis is clearer."
	E42- "Yes, especially because of the images and the setting, because you can better imagine each stage of the Earth's history."
	E44- "Yes, when I started, I had no idea about anything, and now I know more. Of course, I haven't memorized everything, but I've managed to keep small characteristics of each period and get a general idea of the subject."
	E45- "I think so. As the activity was dynamic, I retained the information better and for example the codes on the chests helped me a lot to keep the date of the years of the extinctions, I don't know why."
	E46- "By having images, fossils, games, etc., I have been able to go deeper."
Dynamic activities and promote attention	E49- "A lot. I used to have some knowledge, but I didn't have it in order. Now I'm aware of the timeline."
	E50- "It has made me learn a lot and expand my knowledge, mainly because of the <i>flashbacks</i> that came to me from the <i>escape room</i> ."
	E28- "In my opinion, a little yes, since doing these things keeps you more attentive."
	E34- "Yes, quite a lot, since I didn't know much about the subject and doing dynamic activities helps."
It does not specify how	E38- "Yes, I have expanded them, since they are more attended to in this type of class."
	E43- "I think the game helped me understand it better."
	E27- "I think I have expanded my knowledge on this subject, since I knew a little, but now I know more."
	E29- "Yes, since I was completely unaware of this subject, and it is very interesting."
	E30- "Quite a lot, since at first I had no idea and now I more or less control the subject."
	E32- "Yes, because at the beginning I didn't know anything about the subject and now with everything we've done, we've learned."
	E36- "Yes, in the first exam I had no idea about the syllabus, but now, regardless of the grade I got, I think I have learned a lot."
	E37- "Yes, I have learned a lot about the history of the Earth."
	E40- "Yes."
	E47- "Yes, because I have learned the whole history of the Earth, which I did not know before."
	E48- "Yes, because I have learned new things."