Supplementary File S1 PAOCS Questionnaire

Note: this instrument was developed in French. The English version presented here is for information purposes only.

Instruction to students: Indicate how much you agree or disagree with these statements (1: Strongly Disagree, 2: Disagree, 3: Agree, 4: Strongly Agree).

Oral communication in science - how you feel

1. I feel tense during an oral communication in science.
2. If I had a choice, I would never do oral communication in my science classes.
3. I usually feel stressed when I do oral communication in a science class.
4. I feel nervous during an oral communication in science.
5. Doing an oral communication in science makes me happy.
6. Oral presentations in science are fun.
7. I usually have a lot of fun doing an oral presentation in a science class.
8. I feel stressed when I do an oral communication in science.
9. In general, I enjoy doing oral communication in science.
10. Doing an oral communication in science makes me nervous.
11. I look forward to the next science oral presentation activities.
12. Doing an oral science presentation makes me excited.
13. I feel happy when I do an oral science presentation.
14. I have a lot of fun doing an oral science presentation.
15. I enjoy doing oral communication in my science classes.
16. We should spend more time doing oral communication in my science classes.

Oral communication in science - how you see yourself

17. For me, being good at oral communication in science is important.
18. I am effective at preparing for oral communication in science.
19. I generally use accurate and precise language when communicating orally with my science teachers.
20. My language level is adequate when communicating orally in science.
21. I use my body effectively in oral science communication (posture, movement, etc.).
22. I am able to respond well to questions from the audience during oral science presentations.
23. I am able to present my ideas in a structured manner when communicating orally in science, with a clear "thread".
24. Learning how to do good oral communication in science will be relevant in my future work.
25. In general, learning about how to do good oral science communication is useful.
26. I give clear explanations in my oral science presentations.
27. It is important for me to be good at oral science presentations.
28. I am effective in making good contact with the audience during oral science presentations.
29. Speaking well gives me credibility in my academic career in science.
30. When I communicate orally in science, I usually generate interest.
31. I have the required level of scientific vocabulary when communicating orally in science.
32. When I communicate orally in science, people understand on the first try.
33. I am able to capture the attention of my audience when I give oral science presentations.
34. I am dynamic when giving oral science presentations.

Distribution of items in the factors: Enjoyment (2 reversed, 5, 6, 7, 9, 11, 12, 13, 14, 15, 16); Anxiety (1, 3, 4, 8, 10); Perceived relevance (17, 24, 25, 27, 29); 'Showmanship' S-E (21, 28, 30, 33, 34); 'Code and content' S-E (18, 19, 20, 22, 23, 26, 31, 32).

Supplementary File S2 AOCSS Rubric

Note: this instrument was developed in French. The English version presented here is for information purposes only.

Category: Norms

		Performance levels				
Criteria	**Description**	**Superior**	**Good**	**Satisfying**	**Unsatisfying**	**Weak**
Language	*Use of standard vocabulary, grammar, and syntax*	Vocabulary is rich, syntax is well-developed, and grammar is correct.	Vocabulary is fairly rich. Syntax is correct, but without research. One or two errors in grammar or syntax are made, but they do not interfere with comprehension.	Vocabulary is common. Syntax and grammar are often correct, but frequent errors are noted. However, the comprehension of the message is not affected.	Vocabulary is poor. Grammatical errors are frequent. Syntax is often incorrect, and errors interfere with comprehension.	Vocabulary is very poor. Grammar and syntax are mostly incorrect, making comprehension very difficult.
Fluency of speech	*Rate and rhythm of speech; absence of hesitation markers (e.g., uh, hmm).*	Speech rate and rhythm are appropriate and make the presentation lively, interesting. Speech is very fluent, with no hesitations or stray words.	Speech rate and rhythm are appropriate. Speech is fluent with few stray words or improprieties that do not interfere with understanding.	Pace is generally correct, but at times the rate of speech is too fast. Speech has several stray words and hesitations that could interfere with understanding.	Pacing is not smooth, or the flow is often too fast. Stray words or hesitations are frequent and interfere with understanding.	The rhythm is not fluid, the flow and the hesitations make comprehension very difficult.
Voice (prosodic elements)	*Articulation, pronunciation, volume and intonation*	Articulation, pronunciation and volume of the voice are quite appropriate and allow for excellent	Articulation, pronunciation, and voice volume are generally appropriate and allow for a good understanding of	Articulation and pronunciation are, for the most part, clear. The volume is sometimes too low (or too high), but the speech is	Articulation or pronunciation is problematic to the point of making speech difficult to understand. The volume is often too	Speech is very difficult to understand because of severe articulation, pronunciation, or volume problems.

		comprehension of the presentation. Intonation supports interest in the presentation.	the presentation. There is little variation in intonation, but it does not detract from interest.	still understandable. The voice is often monotone.	low (or too loud) or the voice is always monotone and this detracts from the interest in the presentation.	The monotony of the voice is very disturbing.

Category: Content

		Performance levels				
Criteria	**Description**	**Superior**	**Good**	**Satisfying**	**Unsatisfying**	**Weak**
Scientific Vocabulary	*Use of Scientific Terms*	The most accurate and precise scientific terms are always chosen and they are always used correctly.	Scientific terms are used correctly, but once or twice a more accurate or precise term could have been chosen.	The correct scientific terms are used correctly most of the time, but some terminology errors are made.	Several terminology errors are made, where the wrong term is used or the correct term important to the topic is not used.	Most of the scientific terms important to the topic are used incorrectly.
Thread	*Organization of the presentation*	The presentation follows a clear, relevant and coherent thread throughout.	The presentation follows an appropriate thread and the sections flow fairly smoothly.	There is a common thread throughout the presentation, but the flow is sometimes not smooth, or the organization of the presentation is not always clear.	The organization of the presentation is confusing and this makes it difficult for the audience to follow.	The presentation does not seem to have a common thread.
Argument	*Way of presenting and organizing the argument*	The thesis is supported by good scientific arguments, which makes the argument convincing.	The argument is generally convincing, but on one occasion the arguments made are not scientifically sound enough (e.g., anecdotal, teleological, or tautological explanation).	The argument is often unconvincing because several arguments are not scientifically sound.	The argument very often relies on anecdotal, teleological or tautological explanations and arguments.	The argument is virtually absent and does not convince at all.

		Performance levels				
Criteria	**Description**	**Superior**	**Good**	**Satisfying**	**Unsatisfying**	**Weak**
Scientific explanations	*Scientific concepts and their use in explanations*	Important concepts are presented, all concepts are relevant. Explanations are rigorously accurate and clear.	Most important concepts are present, some minor concepts are superfluous or missing. Explanations are accurate.	Several minor concepts are superfluous or missing. Explanations are mostly accurate.	At least one central concept is missing. Explanations have errors.	Information is often incomplete or explanations contain several errors.

Category: Showmanship

		Performance levels				
Criteria	**Description**	**Superior**	**Good**	**Satisfying**	**Unsatisfying**	**Weak**
Appropriateness to the audience	*Appropriateness of the level of the presentation to the learning potential of the audience*	Techniques to aid understanding are manifestly used. The choice of techniques is appropriate. The presentation allows the audience to learn.	Manifest efforts are made to have the audience understand and learn from the presentation. Choices of techniques are mostly appropriate.	On one or two occasions, a technique for making people understand or learn is noted. However, this technique is not used regularly, or a better technique could be used.	On one or two occasions, there is an attempt to make people understand or learn. However, this technique is not appropriate and does not allow the audience to understand or learn.	No particular technique for getting the audience to understand or learn is evident in the presentation.
Presence and non-verbal language	*Appropriate general attitude: eye contact, enthusiasm, posture, gestures*	Eye contact is maintained with the entire audience throughout the presentation. The presenter occupies the space and moves through the space deliberately and appropriately. The presenter is always well positioned in relation to the supporting material and has a dynamic body language.	Eye contact is periodically made with the entire audience. The presenter occupies the space well but moves minimally. The presenter is well positioned in relation to the support material and has a dynamic body language.	Eye contact is sometimes made, but the presenter often looks in the same place. There is little movement in space, or the presenter is poorly positioned in relation to the support material. His or her drive and gestures are acceptable throughout the presentation.	There is little eye contact with the audience. Presenter is static and generally addresses the support material or team partner. The presenter's demeanor is not positive, nonchalant, passive or unenthusiastic.	The presenter never makes eye contact with the audience. His/her posture is completely static, or he/she looks down or only at his/her support material. He or she is not dynamic or displays a condescending or blasé attitude.