

Translating scientific articles to the non-
scientific public using the Wikipedia
Encyclopedia

Julien Leuthold, Adrian Gilli

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Frontiers in Education: Digital Scholarship

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frontiers
in Education

SCIENTIFIC COMMUNICATION: Creating Wikipedia pages in a class



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General observations

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The total electronic recoil background in 1 tonne fiducial volume and (1, 12) keV electronic recoil equivalent energy region, before applying any selection to discriminate between electronic and nuclear recoils, is $(1.80 \pm 0.15) \cdot 10^{-4} \text{ (kg}\cdot\text{day}\cdot\text{keV)}^{-1}$, mainly due to the decay of ^{222}Rn daughters inside the xenon target. The nuclear recoil background in the corresponding nuclear recoil equivalent energy region (4, 50) keV, is composed of $(0.6 \pm 0.1) \text{ (t}\cdot\text{y)}^{-1}$ from radiogenic neutrons, $(1.8 \pm 0.3) \cdot 10^{-2} \text{ (t}\cdot\text{y)}^{-1}$ from coherent scattering of neutrinos, and less than $0.01 \text{ (t}\cdot\text{y)}^{-1}$ from muon-induced neutrons.

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- New article metrics consider social impact (e.g. tweets, Facebook, Wikipedia citations).
- Wikipedia is a top-10 website, frequently used by our students. However, it is incomplete (and sometimes contains errors).

The image shows a Google search interface for the query "middle age paintings". The search bar at the top contains the text "middle age paintings" and a magnifying glass icon. Below the search bar, navigation tabs for "Tous", "Images", "Vidéos", "Shopping", "Actualités", "Plus", "Paramètres", and "Outils" are visible. The search results indicate "Environ 110000000 résultats (0,74 secondes)".

The first search result is a snippet from Ducksters with the text: "The end of the Middle Ages is often signaled by a great change in art with the start of the Renaissance Period." Below this snippet is a list of related topics: "Byzantine Art", "Romanesque Art", "Gothic Art", "Artists of the Middle Ages", "Literature", "Activities", and "More on www.ducksters.com". To the right of the text is a small image of a medieval painting depicting a battle scene.

A magnifying glass is positioned over the search results, focusing on a Wikipedia entry titled "Medieval art - Wikipedia". The magnified text includes the URL "https://en.wikipedia.org/wiki/Medieval art", a brief description: "The medieval art of the Western world, covering Europe, and at times the Middle East", and navigation links: "Overview · Romanesque art · Gothic art".

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→ I have designed a reading seminar to practice the communication of published scientific results :

- 1) orally to scientific peers**
- 2) to the wider public, using updates and creation of Wikipedia pages.**

Taught class:

Heat and Mass Transfers in Magmatology

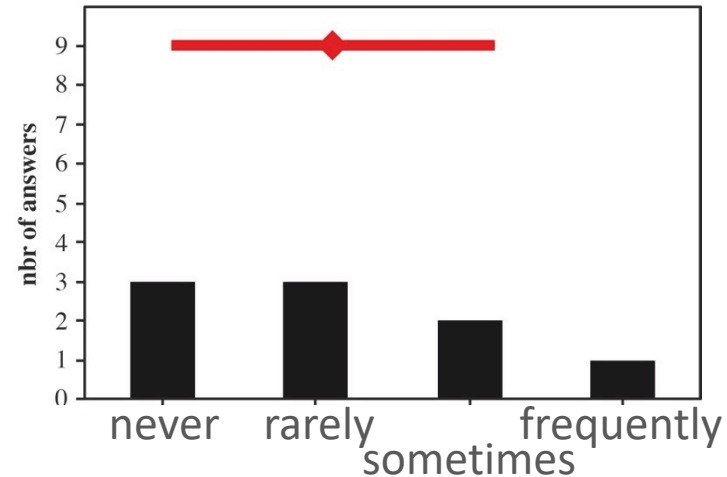
- A MSc. + PhD. class.
- 1 ECTS: 2 weekly hours, 7 weeks.
- 9 students: 7 from Geochemistry-Petrology, 2 from Geophysics.
- Designed as a reading seminar, to improve students communication skills.
- Takes place every year, in Nov-Dec (two-yearly course seminar I and II, so that students can attend it twice).

Class objectives:

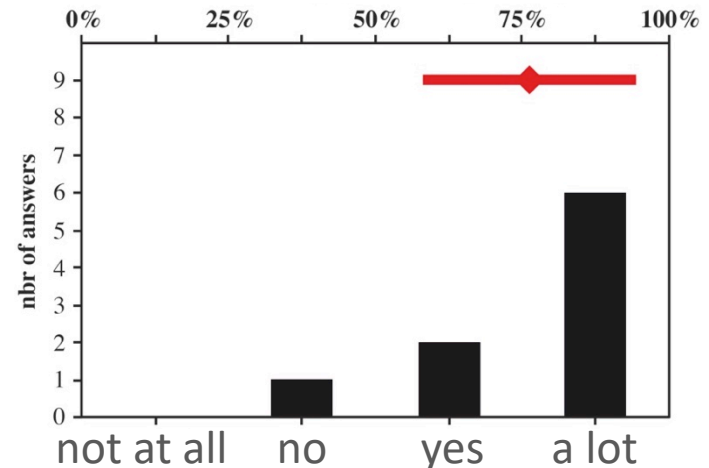
Communicate Earth sciences

- Communication: reading scientific articles; rethink and rewrite text for the non-scientific public.
- Text analysis: what is important in the paper? what information is already available on Wikipedia?
- Popularize geology to the non-scientific public.

In the past, I have already been involved in scientific communication to the public



It was challenging to 'translate' a scientific article to a large public Wikipedia page



Weeks 2-5

- Pairs of student read a scientific paper (20-30 pages), prepared a PPT presentation and presented the main points to their peers.
- The other students had to go through the paper and prepare 2 questions.
- The presenters answered the questions (I helped, or completed the answer, when necessary).

Week 6

- Attribution of a topic related to the paper students had presented.
- This topic had no entry on Wikipedia.
- Creation of a Wikipedia account, reading Wikipedia tutorials and edition of existing pages.



<https://en.wikipedia.org/wiki/Wikipedia:Tutorial>

<https://dashboard.wikiedu.org/training/students>

Week 7

- Homework: create a new Wikipedia page.
- Last 2 hours: revision and updates of the peer pages, with the knowledge acquired from their paper and from the class.
- Submission of Wikipedia pages for review by Wikipedia volunteers.

4-6 weeks later...

WikiProject article quality grading scheme			
Class	Criteria	Reader's experience	Editing suggestions
 FA	The article has attained featured article status by passing an official review. More detailed criteria [show]	Professional, outstanding, and thorough; a definitive source for encyclopedic information.	No further content additions should be necessary unless new information becomes available; further improvements to the prose quality are often possible.
 GA	The article has attained good article status by passing an official review. More detailed criteria [show]	Useful to nearly all readers, with no obvious problems; approaching (but not equalling) the quality of a professional encyclopedia.	Some editing by subject and style experts is helpful; comparison with an existing featured article on a similar topic may highlight areas where content is weak or missing.
B	The article is mostly complete and without major problems, but requires some further work to reach good article standards . More detailed criteria [show]	Readers are not left wanting, although the content may not be complete enough to satisfy a serious student or researcher.	A few aspects of content and style need to be addressed. Expert knowledge may be needed. The inclusion of supporting materials should be considered if practical, and the article checked for general compliance with the Manual of Style and related style guidelines .
C	The article is substantial, but is still missing important content or contains much irrelevant material. The article should have some references to reliable sources, but may still have significant problems or require substantial cleanup . More detailed criteria [show]	Useful to a casual reader, but would not provide a complete picture for even a moderately detailed study.	Considerable editing is needed to close gaps in content and solve cleanup problems.
Start	An article that is developing, but which is quite incomplete. It might or might not cite adequate reliable sources. More detailed criteria [show]	Provides some meaningful content, but most readers will need more.	Providing references to reliable sources should come first; the article also needs substantial improvement in content and organisation. Also improve the grammar, spelling, writing style and improve the jargon use.
Stub	A very basic description of the topic. However, all very-bad-quality articles will fall into this category. More detailed criteria [show]	Provides very little meaningful content; may be little more than a dictionary definition. Readers probably see insufficiently developed features of the topic and may not see how the features of the topic are significant.	Any editing or additional material can be helpful. The provision of meaningful content should be a priority. The best solution for a Stub-class Article to step up to a Start-class Article is to add in referenced reasons of why the topic is significant.

Published and rejected pages

Wikipedia page topic ²	Written by	Reviewed by	Decision, grade ³	Date of decision	Nbr visits/month since publication
Lower oceanic crust	Group week 2	Group week 6	Accepted: C	28.01.2018	145
Experimental petrology	Group week 3	Group week 2	Declined: Missing references	30.01.2018	
Deep Crustal Hot Zones	Group week 4	Group week 5	Accepted: Start	20.12.2017	19
Torres del Paine Sill complex	Group week 5	Group week 4	Accepted: C	10.02.2018	23
			Later deleted on	08.03.2018	
Kilauea Iki lava lake	Group week 6	Group week 3	Declined: Reads more like an essay	17.02.2018	

² Pages not yet submitted, under review or rejected can be accessed searching for *draft: name of the topic* on Wikipedia.

³ Wikipedia grades: Stub, Start, C, B, GA, FA

A Wikipedia page created during the class



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The Free Encyclopedia

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Lower oceanic crust

From Wikipedia, the free encyclopedia

The **lower oceanic crust** is the lower part of the **oceanic crust** and represents the major part of it (volumetrically biggest part).^[1] It is generally located 4–8 km below the **ocean floor** and the major **lithologies** are **mafic** (**ultramafic** and gabbroic rocks) which derive from melts rising from the earth's mantle.^[2] This part of the oceanic crust is an important zone for processes such as melt accumulation and melt modification (**fractional crystallisation**^[3] and crustal assimilation). And the recycling of this part of the oceanic crust, together with the upper mantle has been suggested as a significant source component for tholeiitic magmas in Hawaiian volcanoes.^[4] Although the lower oceanic crust builds the link between the mantle and the **MORB**, and can't be neglected for the understanding of MORB evolution, the complex processes operating in this zone remain unclear and there is an ongoing debate in **Earth Sciences** about this.

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 - [2.2 Slow spreading ridges](#)
- [References](#)

Processes [\[edit\]](#)

The lower oceanic crust connects the earth's mantle with the **MORB**, where around 60% of the total **magma** production of the **Earth** happens. The three main processes happening in this region of the oceanic crust are **partial melting** of the earth's mantle, melt accumulation at various depths and the chemical modification of this melts during ascent^{[5],[6]}. This three processes do not happen in a strict order but occur all simultaneously over a depth range of 4–18 km suggesting that these processes can occur already in the upper mantle. The mantle melts are most commonly modified by fractional crystallisation due to cooling^[7] and by assimilation of crustal rocks^[8].

Spreading rates [\[edit\]](#)

The most important parameter controlling the processes operating in the lower oceanic crust is the magma supply, this is further controlled by the spreading rate, and therefore, spreading rate is a critical variable in models for the formation of the lower oceanic crust.^[9] The rate at which plate divergence occurs at mid-ocean ridges is not the same for all ridge segments. Ridges with a spreading rate less than 3 cm/a are considered slow-spreading ridges, while those with a rate greater than 5 cm/a are considered fast-spreading ridges ^[10]

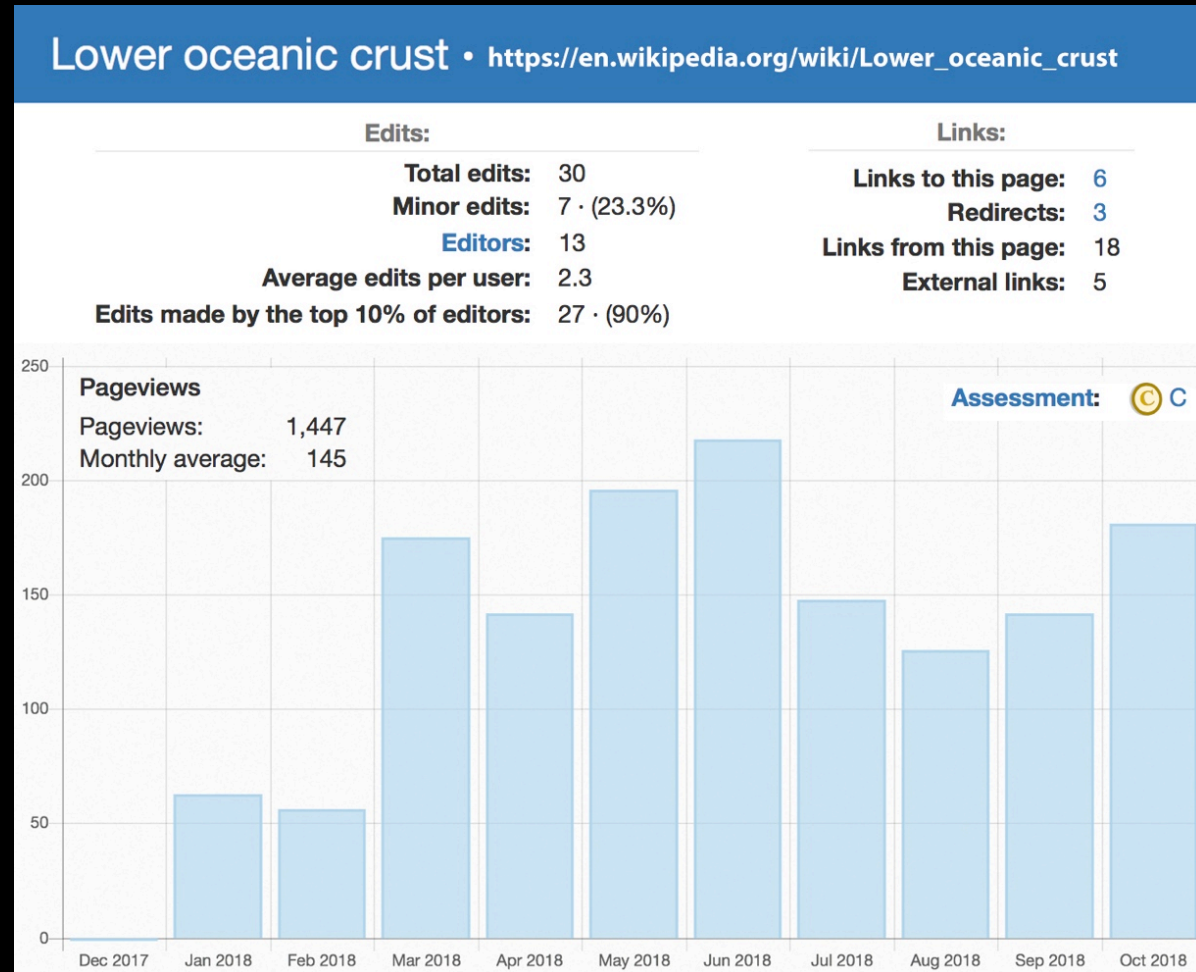
Fast spreading ridges [\[edit\]](#)

Intensive search spanning over three decades of **seismic imaging** have shown that the ridge axis is underlain by a crystal mush containing a small percentage of **melt**,^[11] capped by a thin melt lens containing a generally high, but variable melt fraction.^[12] The completely liquid body is a thin and narrow **sill-like lens** (10 to 150 m thick and < 2 km wide).^[13] The lens is maintained by reinjection of primitive magma.^[14] The lack of any detectable large **magma chamber** and the common detection of small lens/mush zone at fast-spreading ridges emphasize the small magma chamber model. Modally and compositionally layered gabbroic rock is often found (or abundant) in the lower crustal sections of **ophiolite**.^[15] The layered

Newly created pages statistics

- Page views/day: 5
- More edits after publication
- Links to this page

→ live process



https://en.wikipedia.org/wiki/Lower_oceanic_crust

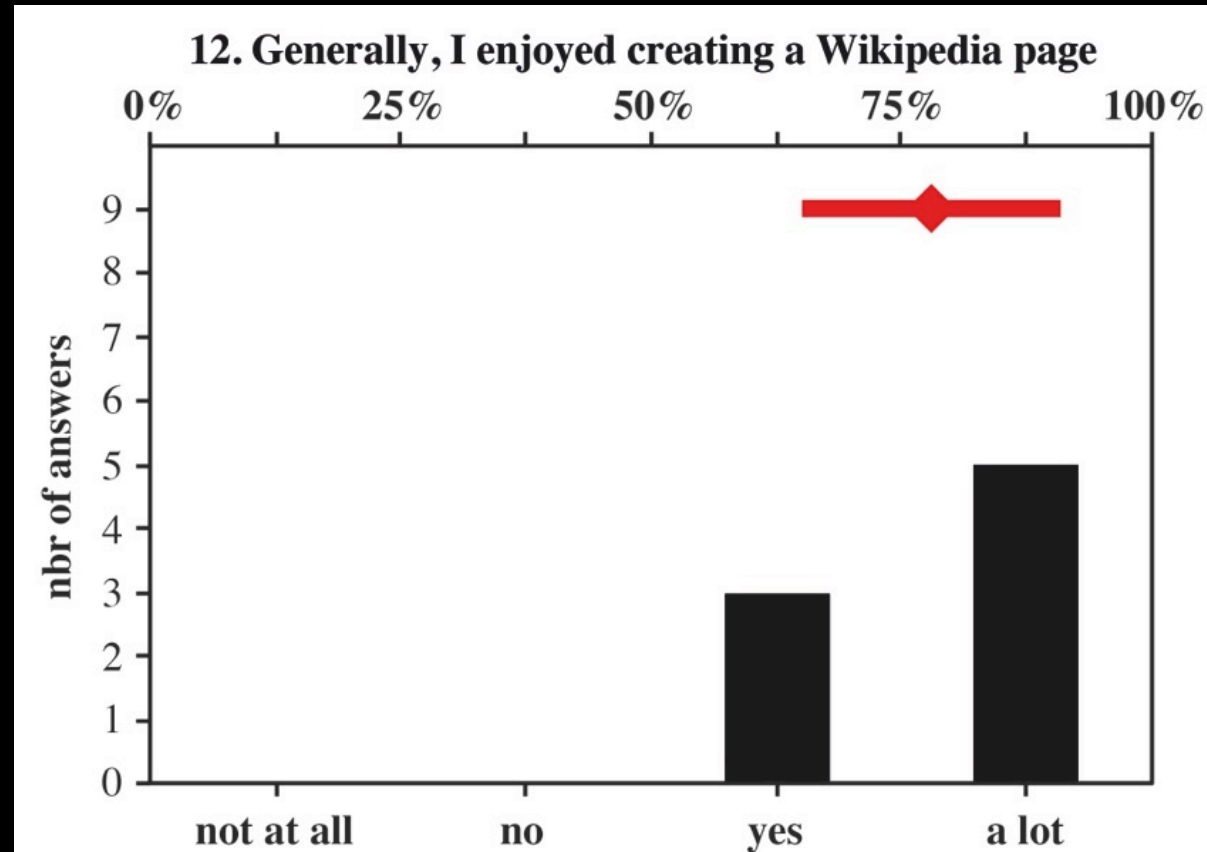
https://en.wikipedia.org/wiki/Deep_crustal_hot_zone

Evaluations by the students

Wikipedia \approx Social media

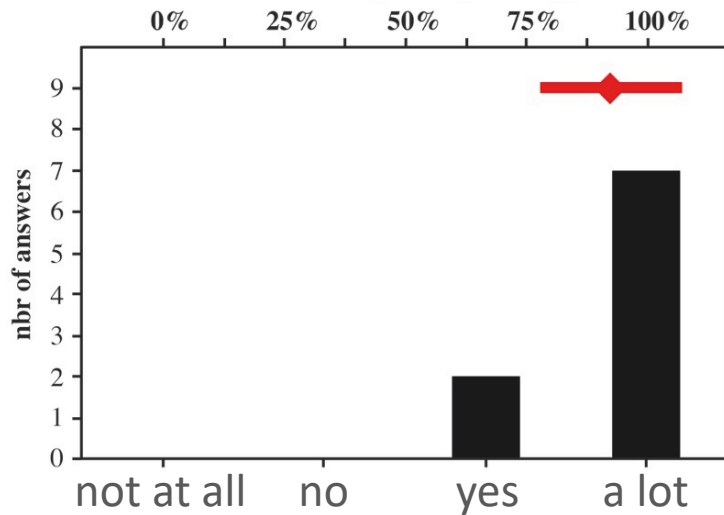
- Modern
- Easy
- Fun
- Worldwide &
- High impact

→ Students were highly motivated from the beginning!

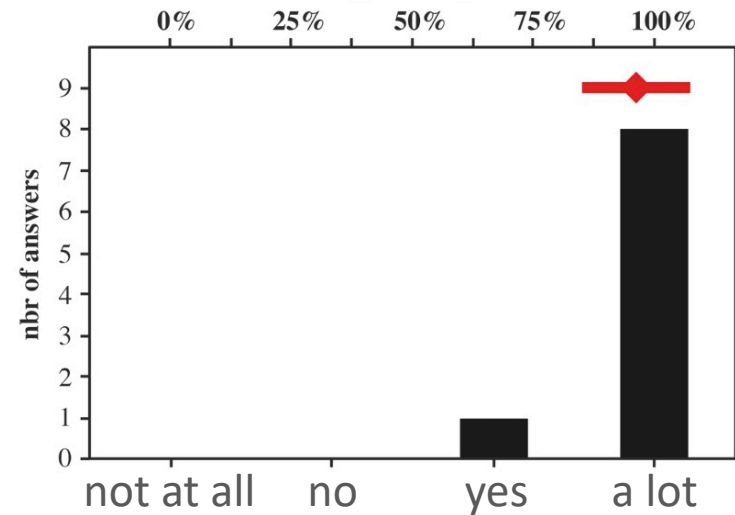


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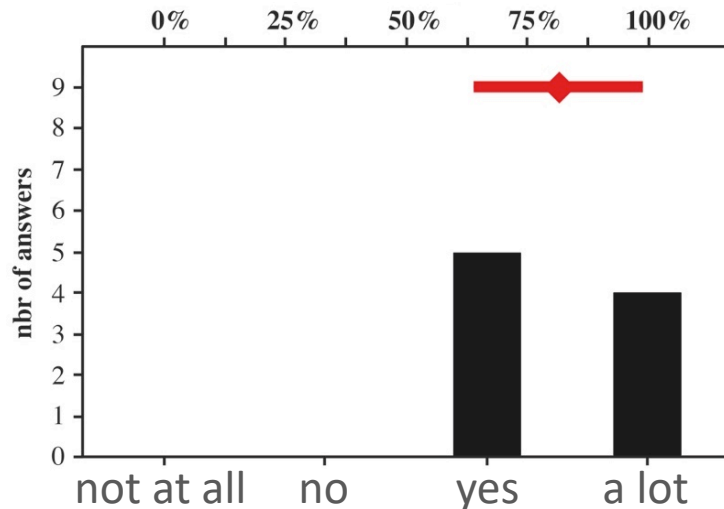
Reading my paper helped me gain deeper understanding of magmatology



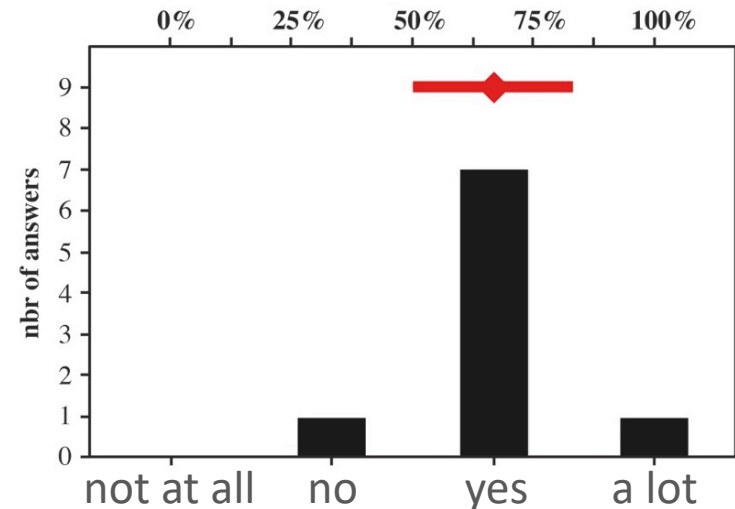
I learned something about magmatology while listening to oral presentations



Presenting an article orally helped me to better understand the article



Presenting a topic in Wikipedia helped me to better understand the article





and



- Students are highly motivated.
 - Students learned about the topic,
 - Students acquired writing skills.
 - Possible to return to the pages in future classes.
 - Global outreach.
 - Possible to use Wikiedu platform dedicated for teaching.
- Long revision time.
 - Should give more time to the students to review pages written by peers.
 - Students haven't worked further on their page (e.g. adding images) (despite reminders).
 - Redaction for the non-scientific public could be improved.