Improving Wikipedia Articles on the SDGs - Bridging a Knowledge Management Gap

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Date

Presentation based on the project: “Communication of SDG-related knowledge on Wikipedia”

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This is the website for a Wikipedia communications project entitled "Communication of SDG-related research knowledge in water and sanitation (SDG 6), climate action (SDG 13) and life below water (SDG 14) in Wikipedia while engaging professional networks". It is also part of the meetups on SDGs and connected to a larger initiative called "Wiki loves SDGs" which is supported by members of Wikimedians for Sustainable Development.

Anyone with an interest in Wikipedia editing is welcome to participate. This project follows the Friendly Space policy and the Code of conduct for Wikimedia technical spaces.

6 CLEAN WATER AND SANITATION
13 CLIMATE ACTION
14 LIFE BELOW WATER

Logos of SDGs 6, 13 and 14 - the focus of this communications project

The project is administered by Stockholm Environment Institute and funded by Formas. Formas is a Swedish government research council for sustainable development and a state authority under the Swedish Ministry of the Environment.

https://en.wikipedia.org/wiki/Wikipedia:Meetup/SDGs/Communication_of_environment_SDGs

A little background on Wikipedia

Currently, the English Wikipedia has more than 6 million articles and averages 591 new articles per day.

Wikipedia is about 100 times the size of Encyclopedia Britannica (in terms of numbers of words)

Wikipedia gets 13.6 billion visits and 23 billion pageviews per month

Wikipedia is open-source, a multi-authored encyclopedia that is updated continuously through dedicated peer collaboration. In 300 languages

Wikipedia develops at a rate of over 1.9 edits every second, performed by editors all over the world.

Example of Wikipedia's outreach capacity

- The release of the August 2021 IPCC report offers an example of WPs powerful reach
- The report received a peak of 10 000 daily views on the related Wikipedia page
- Many of the SDG topics get several thousand views per day (eg climate change gets 4500)
- Re. dissemination of global knowledge, Wikipedia will almost always dwarf that of the original, institutional sources.
- **Experts need to be more engaged in updating the Wikipedia articles covering complex scientific topics**

Wikipedia can shape science and policy

- scientific articles referenced in Wikipedia receive more citations (Thompson, N., Hanley, D. 2018)
- this is more about the role of repositories of scientific knowledge
- Encyclopedias live on and on as vehicles for learning and knowledge dissemination
- Individual publications are quickly forgotten

What's the concern?

Quality of Wikipedia articles involving complex science and policy is highly variable - partly because the world's experts are not sufficiently involved

Often Wikipedia articles in the fields of environment and development start off as university course assignments and it takes years before that work gets improved by content experts (if ever)

In 2020 when we started this project there were almost no articles dealing with the individual SDGs – although it was already 5 years after the UN initiated the 2015-2030 programme

This is a new area of work for research institutes like SEI

The challenge exemplified by the Wikiproject on Climate Change

75 active editors at present

lists 3900 Wikipedia climate change-relevant articles most of which require improvement by experts

Only 7 have Featured Article status and 46 have Good Article status

A BBC article from Dec 21, 2021 describes the continuous task of 9 of these editors to fend off the onslaught of climate change deniers

Much more engagement by the world's experts is needed if Wikipedia is to live up to its potential

Our SDG Wikipedia project

- Between July 2020 and August 2022 we looked at 3 SDGs: water/sanitation/hygiene (SDG 6), climate action (SDG 13) and oceans (SDG 14)
- 50 Wikipedia articles per SDG were targeted based on high daily view rates combined with low quality scores and the need for improvement
- 35 academics helped us improve and update the articles thus bringing their knowledge to Wikipedia
- Project home page https://en.wikipedia.org/wiki/Wikipedia:Meetup/SDGs/Communication_of_environment_SDGs

SDG 6 articles	SDG 13 articles	SDG 14 articles
Water scarcity	Sendai Framework for Disaster Risk Reduction	Marine plastic pollution
Freshwater ecosystem	Nationally Determined Contributions	Sustainable tourism
Capacity building	Disaster risk reduction	SDG 14
Official development assistance	Energy policy	Nutrient pollution
Water scarcity in Africa	Climate change in Africa	Ocean
Sustainability	Effects of climate change on human health	Least developed countries
Public health	Effects of climate change on agriculture	Coast
Sustainable Development Goals	Climate change adaptation	Convention on Biological Diversity
WASH	Climate change and indigenous peoples	Planetary boundaries
Sewage	Effects of climate change on mental health	Eutrophication
Sewage treatment	Carbon capture and storage	Microplastics
Wetland	Carbon farming	Marine ecosystem
Water security	Greenhouse gas emissions	Fishing industry
Sustainable development	Climate resilience	Aquatic ecosystem
Groundwater	Effects of climate change on oceans	Sea
Water resources	Sustainable energy	Overfishing
Industrial wastewater treatment	Paris Agreement	Marine pollution
Freshwater	Sustainable Development Goal 13	Marine debris
Waterborne diseases	Intergovernmental Panel on Climate Change	Sea surface temperature

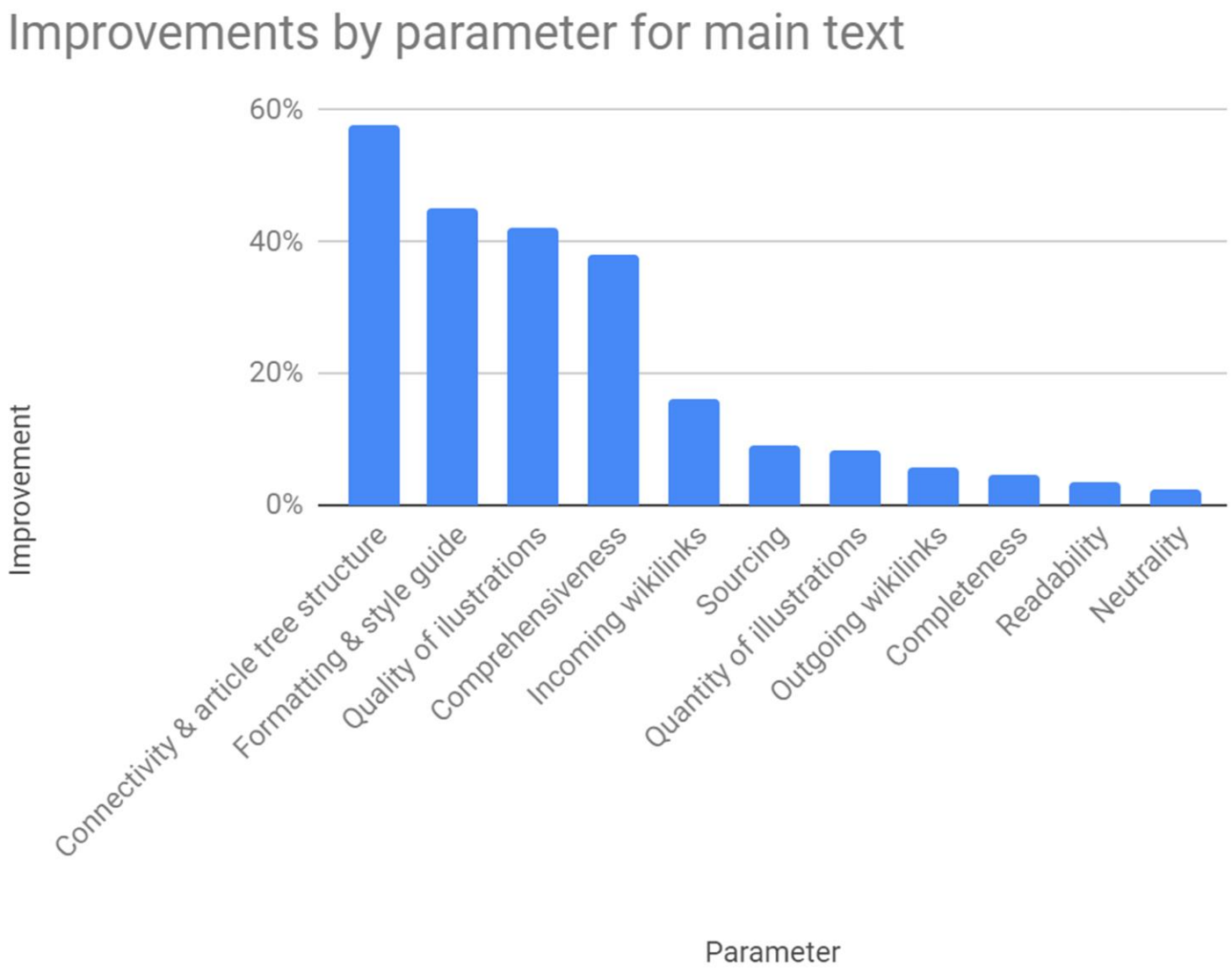
Neglected tropical diseases	Climate change vulnerability	Marine protected area
Ecosystem	Flood	Ocean fertilization
Rainwater harvesting	Climate justice	Aquaculture
Water supply	Instrumental temperature record	Artisanal fishing
Developing country	Effects of climate change	Commercial fishing
Open defecation	Arctic sea ice decline	Coral reef
Hygiene	Drought	Destructive fishing practices
Sustainable Development Goal 6	Tropical cyclone	Exclusive economic zone
Reclaimed water	Natural disaster	Fish stocks
Water issues in developing countries	Renewable energy	Fisheries management
Drinking water	Wildfire	Fisheries subsidy
Hand washing	SDG 7	Fishery
Wastewater treatment	Carbon sequestration	Illegal, unreported and unregulated fishing
Sanitation	Retreat of glaciers since 1850	Intergovernmental Oceanographic Commission
Aquifer	Extreme weather	Law of the sea
Dangerous goods	Greenhouse gas	Marine conservation
Water pollution	Climate change mitigation	Marine habitats
International development	Sea level rise	Marine life
Groundwater pollution	World energy supply and consumption	Marine technology
Fecal sludge management	UNFCCC	Overexploitation
Behaviour change (public health)	Climate change	Small Island Developing States
Cholera	Efficient energy use	Sustainable fishery
Diarrhea	Developed country	UNCLOS
Gastroenteritis	Carbon dioxide in Earth's atmosphere	SDG 14 articles
International waters	Green Climate Fund	Marine plastic pollution
Public participation	Low-carbon economy	Sustainable tourism
Wastewater	Ocean acidification	Sustainable Development Goal 14

How we worked with experts

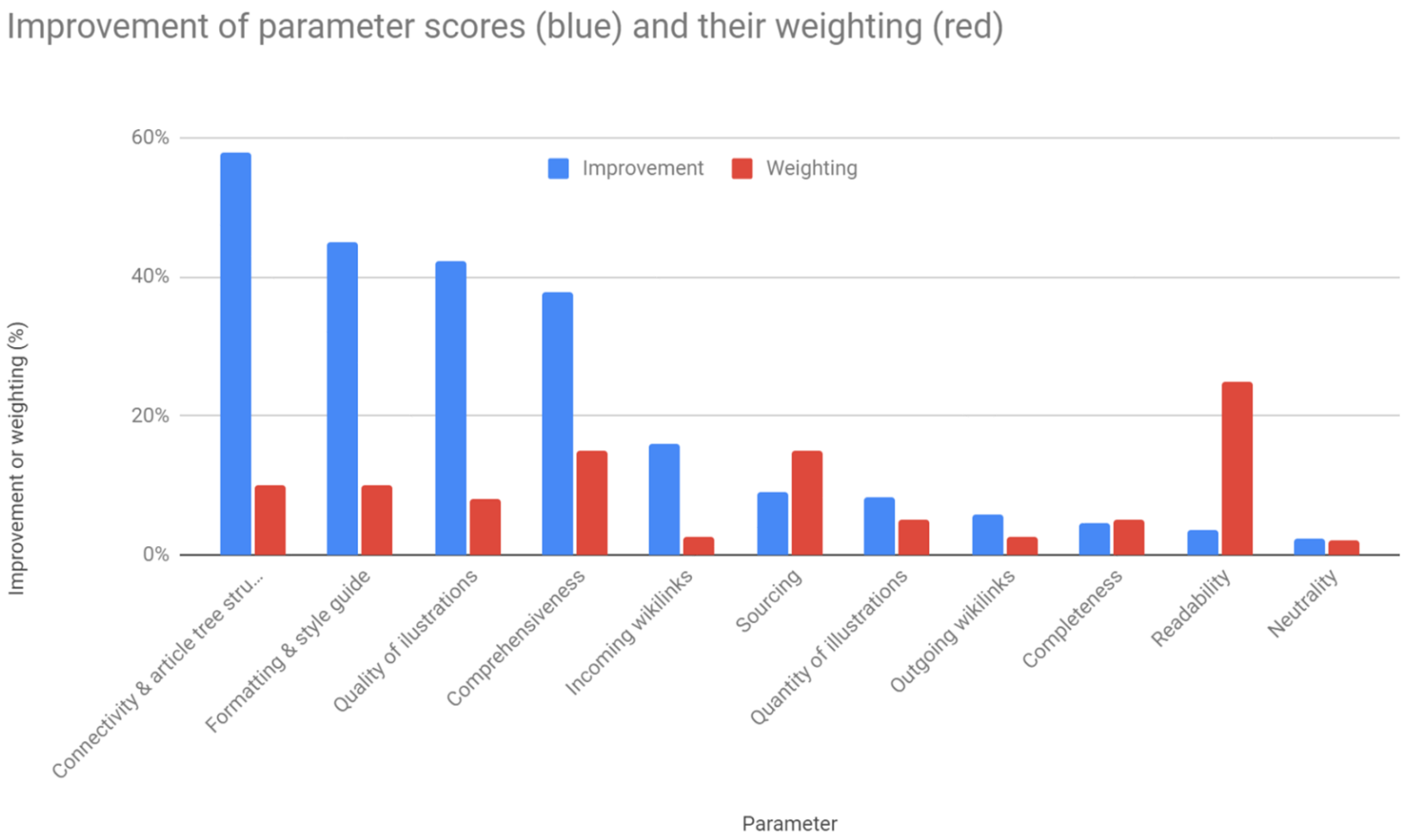
- For each article we researched potential **content experts** to contact (ca 150)
  - targeted mainly mid-career or late-career experts;
  - recently retired academics often willing to help
  - success rate for academics contacted - about 23%
- Articles which received detailed expert comments**:** 35
  - They marked-up Word document copies of the articles
- We entered the changes to the Wikipedia articles, followed by fine tuning and follow up with the experts
- We used Wikipedia article **talk** pages to let other Wikipedians know about this process, see e.g. here

Improvements in scores of individual parameters (see next 3 slides for bar charts)

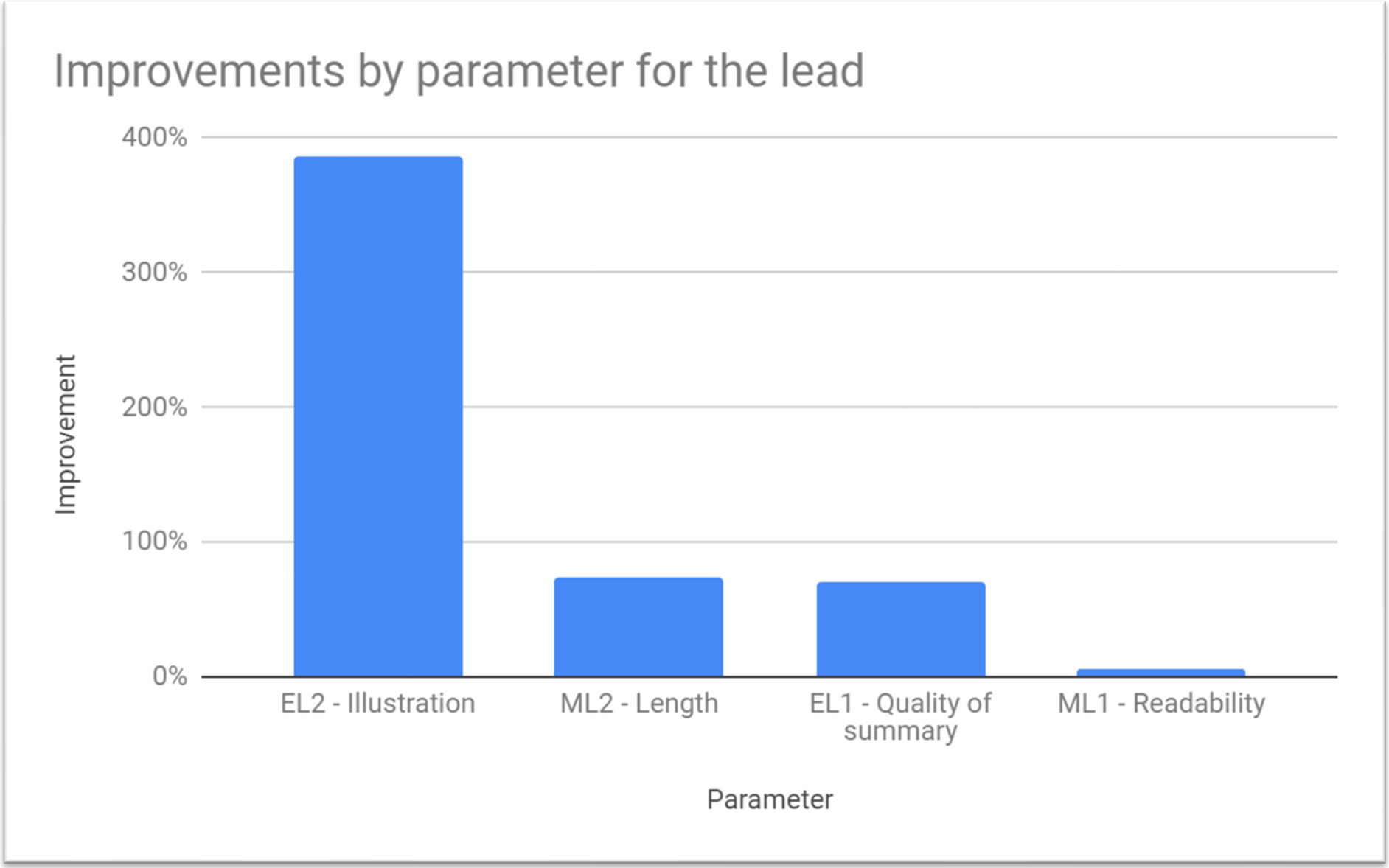
Parameter (M: machine, E: expert)	Improvement (%)
M1 - Readability	3%
M2 - Sourcing	9%
M3 - Completeness	4%
M4 - Illustrations (quantity)	8%
M5 - Embedding (incoming wikilinks)	16%
M6 - Embedding (outgoing wikilinks)	6%
E1 - Comprehensiveness	38%
E2 - Connectivity and article tree structure	58%
E3 - Formatting and adherences to style guide	45%
E4 - Neutrality	2%
E5 - Illustrations (quality)	42%
Total	22%



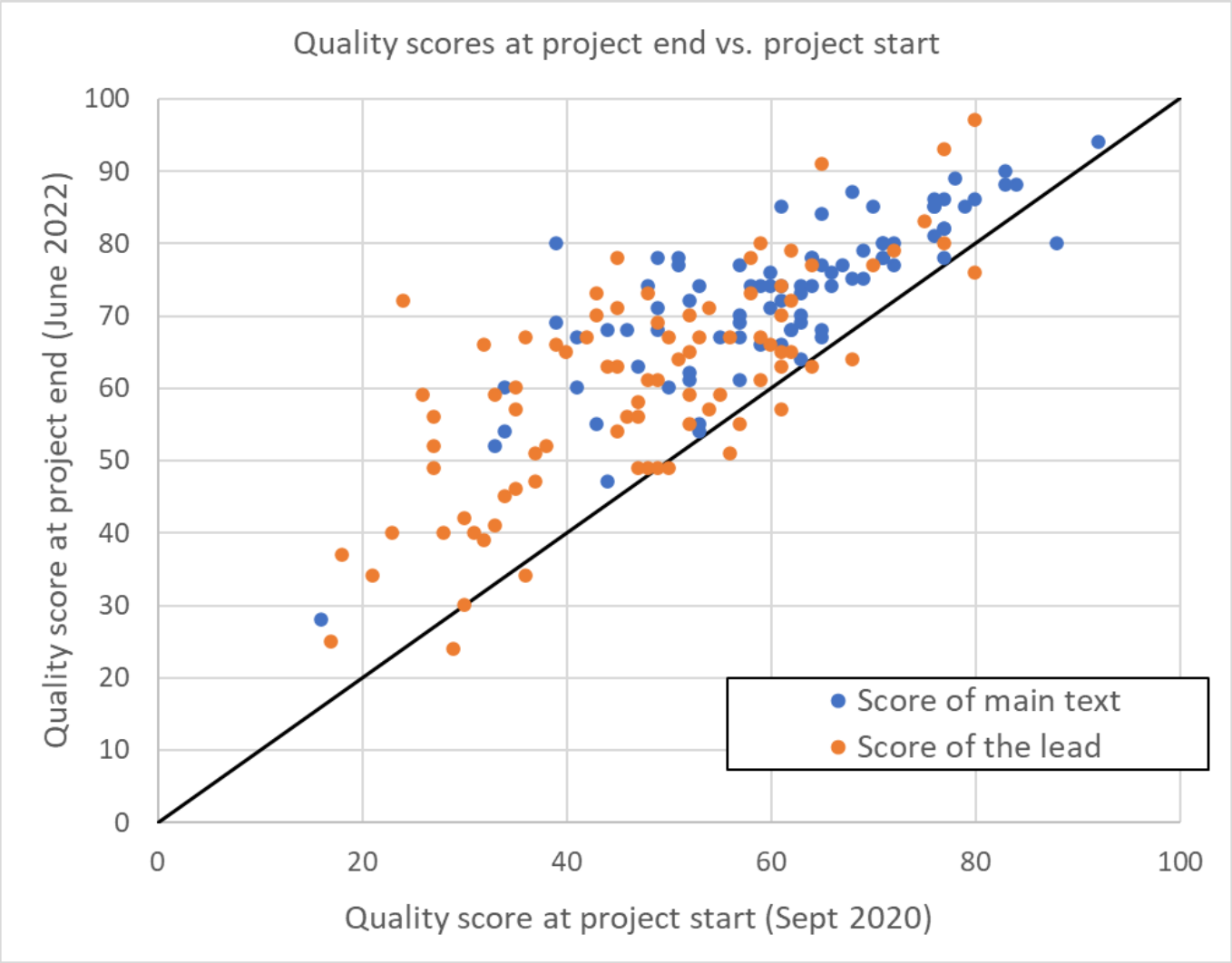
- We managed to improve some parameters by a lot: connectivity & article tree structure, formatting & adherence to style guide, quality of illustrations, comprehensiveness.



- The parameter "readability" was not improved by much even though we had allocated a high weighting for it.
- Problem: Readability cannot be improved if the content of the article is not right.
- This will be a focus for Phase 2.


Improvements by parameter for the lead
400%
300%
200%
100%
0%
Improvement
EL2 - Illustration
ML2 - Length
EL1 - Quality of summary
ML1 - Readability
Parameter

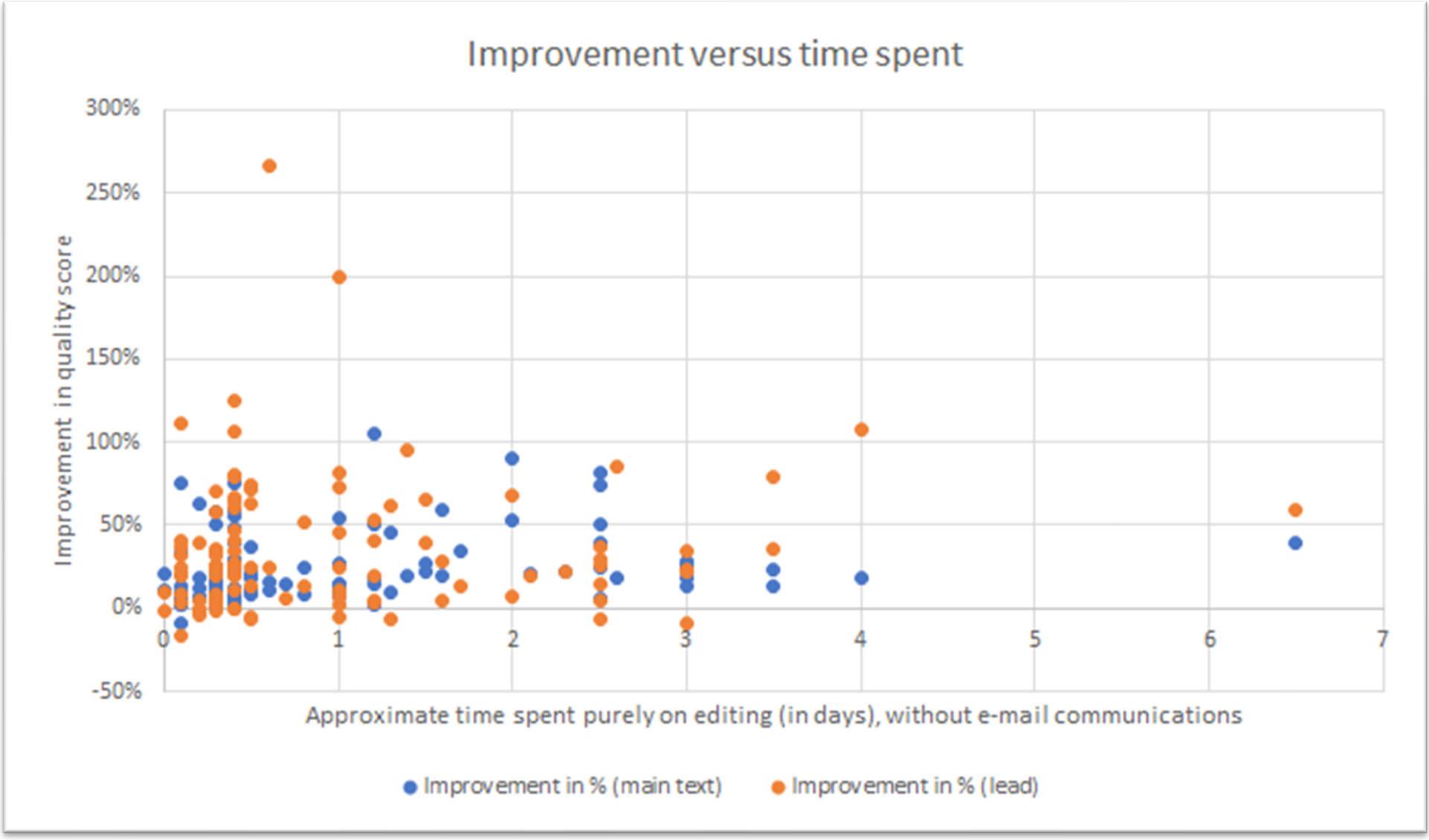
Improvements of article overall quality scores



Quality scores for 103 Wikipedia articles at start and end of the project.

The further above the diagonal line the point, the more the article has been improved.

Some articles have lower quality scores than before, e.g. a few of the leads when they were for example reduced in length or the readability was made worse. It's the automated parameters that can pull the score down.



- Time spent on an article is not always proportional to improvement achieved.
- Some improvements are time consuming to do, e.g. the Wikipedia article on sustainability, eutrophication, water security, effects of climate change

Conclusions

- Most Wikipedia articles pertaining to the SDGs and sustainable development in Wikipedia are complex, multi-disciplinary and need improvement
- A knowledge gap therefore exists since world experts are not sufficiently involved in sharing their expertise while search engines (that cannot determine scientific quality) are still bringing readers to these articles
- Readability of Wikipedia articles is also often low, meaning that the target readers (the general public) struggle to understand the content
- Wikipedia articles can be updated and improved using a much needed expert review process – this is an ongoing, iterative process.

- For those interested in participating in the second phase of this project now dealing with SDG 13 (climate change) which commenced in August 2022, please contact the authors: arno.rosemarin@sei.org

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Content experts:

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For SDG 13: Baylor Fox-Kemper Blair Trewin, Fiona Charlson, Henry Shue, Ian Hamilton, Gonéri Le Cozannet, Jonathan Lynn, Nick Watts, Peter Alexander, Pierre Friedlingstein, Richard Taylor, Thian Yew Gan.

For SDG 14 topics: David A. Fennell, Gianluca Ferraro, Michael Petterson, Ivan Nagelkerken, Tim Jickells, F. Stuart Chapin III.

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