

CULTURAL DIVERSITY OF COOPERATION FORMS IN VIRTUAL COMMUNITIES OF PRACTICE. THE CASE OF WIKIMEDIA PROJECTS

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Purpose: The purpose of this paper was to present the diversity of forms of cooperation within Wikimedia projects in terms of creating high-quality content, mobilising users to take action, and building relationships with external institutions.

Design/methodology/approach: To achieve the research objective, a quantitative and qualitative analysis of data obtained from 50 language versions of Wikipedia was conducted. The first stage involved the statistical testing of three hypotheses concerning engagement in the creation of high-quality content; the second stage comprised a qualitative analysis of Wikipedia's website structures regarding the occurrence of cooperation initiatives with external institutions.

Findings: The research allowed for the acceptance of the hypothesis that cooperation effectiveness – in terms of the number of high-quality articles produced and the identification of low-quality articles – depends primarily on the size of the virtual communities of practice. Furthermore, the diversity of cooperation forms aimed at user engagement and relations with external institutions was greater in larger communities. However, it was observed that local socio-cultural factors may influence the nature and intensity of cooperation.

Research limitations/implications: Capturing the specifics of local determinants of cooperation would require an in-depth analysis of cooperation forms within individual Wikimedia projects.

Social implications: The research findings indicate that online projects oriented towards knowledge co-creation should consider the size of their own communities when replicating forms of cooperation from other projects.

Originality/value: Unlike previous studies, which focused on factors increasing the effectiveness of cooperation in Wikimedia, this paper presents a wide range of cooperation forms by comparing 50 language versions of Wikipedia.

Keywords: virtual communities of practice, knowledge sharing environment, forms of cooperation, Wikimedia projects.

Category of the paper: Research paper.

1. Introduction

Within the first few years of the 21st century, the user-generated encyclopaedia known as Wikipedia became one of the most frequently visited websites on the Internet. Among the research community, this triggered a need to define the phenomenon of cooperation that contributed to the success of this form of knowledge sharing and the mobilisation of intellectual capital resources on a global scale. A significant proportion of the encyclopaedia's early contributors originated from the free software movement, which subsequently led to the formation of the much broader free culture movement. Lessig, an advocate of free culture, described Wikipedia as a model example of the sharing economy (Lessig, 2008). For Benkler (2008), it represented a successful project in the field of peer production. Using Wikipedia as a case study, Tapscott and Williams defined a new format of global collaboration – *wikinomics* – which they argued must be adopted by global players if they are to remain competitive in the market (Tapscott, Williams, 2008). In turn, Levinson – drawing on Wikipedia and other services created by virtual communities of practice – identified a distinct category of media which he termed "new media" (Levinson, 2009).

Although the aforementioned authors were pioneers in describing online knowledge-sharing processes, they lacked extensive personal experience in the co-creation of Wikipedia. Over time, however, scholarly articles authored by Wikipedians themselves began to emerge. Certain initiatives aimed at fostering cooperation, particularly within the English-language version of Wikipedia, were supported by specific grants, including those from the Wikimedia Foundation, the organisation overseeing the project. This facilitated the diffusion of knowledge concerning modes of collaboration between the academic community and the community of Wikipedians. Nevertheless, the applicability of these research findings remained limited and was generally confined to technical solutions.

Researchers focusing on the communities developing both Wikipedia and its sister projects (collectively referred to as Wikimedia) have for years sought to identify factors that facilitate or constrain cooperation between users. In contrast to conventional organisations, where knowledge management is central to operational efficiency, Wikipedia lacks top-down directives regarding forms of collaboration. Studies suggest, however, that the strength of intra-group relations, evidenced by the intensity of interactions, leads to the creation of higher-quality content within that group. Efficiency is also impacted by the presence of a structure that enables direct communication while remaining linked to the global social network within a given language version of Wikipedia (see Rychwalska et al., 2025). The absence of formal guidelines and managerial roles is linked to the decentralised nature of collaboration. It is noted, however, that committed users who patrol the contributions of others are pivotal actors within the project's social structure and may play a significant role in mobilising other users for collaborative action. Typically, within individual language versions, the core is composed of

"first-generation" Wikipedians. These individuals also constitute the "elite" of Wikipedians, exhibiting a strong predisposition towards cooperative activities (Skolik, 2023; Pilati et al., 2025).

As Wikipedia is created in over 350 language versions and developed by communities from diverse cultural backgrounds, this results in the cultural differentiation of forms of cooperation. Previous research has demonstrated the significance of cultural influence on user engagement within internal Wikimedia structures and on the diversity of collectively produced knowledge resources (Nemoto, Gloor, 2011; Karczewska, 2023; Kukowska, 2023; Wang et al., 2025). The purpose of this article is to determine the diversity of areas of cooperation within Wikimedia, primarily among the largest language versions of Wikipedia. The author seeks to answer how cooperation is shaped in the following areas: (1) enhancing the quality of content; (2) identifying and eliminating low-quality content; (3) mobilising users for collaborative action; and (4) building relationships with external institutions to develop resources. The research conducted, which allowed for answering the above questions, was exploratory in nature. These studies employed a netnographic approach, using qualitative and quantitative methods.

2. Literature Review on Aspects of Collaboration in Wikipedia

The synchronisation of joint activities and the manner of their organisation are crucial for the quality of cooperation. In the initial stages of Wikipedia's development, efforts towards quantitative and qualitative growth were described in terms of the "wisdom of the crowd", and the term itself became a frequent subject of scholarly research (Surowiecki, 2005; Miller, Steyvers, 2011; Mannes et al., 2014). Subsequent studies pointed out that a term which better reflects the effectiveness of high-quality content creation, or more precisely the improved formulation of judgements, is sequential cooperation. The best results were achieved not when judgements were formulated independently, but when they were contingent upon the contributions of other users who had previously modified the content. Another factor conducive to quality was the option to refrain from expressing a judgement (Mayer, Heck, Kimmerle., 2025).

A large number of users representing different cultures and various specialisations can lead to a relatively comprehensive collection of knowledge resources. For this reason, cooperation is undertaken between Wikipedians and external institutions, including academic centres, to bridge knowledge gaps within Wikipedia's resources. One such initiative was the Wikipedia Diversity Observatory, supported by a grant from the Wikimedia Foundation. The aim of this initiative was, firstly, to create tools and visualisations of knowledge gaps within the project and, subsequently, to engage the community of Wikipedians and independent researchers in

collaboration. During the implementation of this project, it was possible to identify users' needs regarding the filling of knowledge gaps. Participants in the project were able to compare gaps across different language versions and determine priority tasks in this regard (Miquel-Ribé, Laniado, 2021). However, this project was short-lived. The websites where it was presented ceased to function, and awareness of it was not widespread across most language versions. Another solution was the creation of the WikiGap tool, which allowed Wikipedians to quickly familiarise themselves with the differences between article content in various languages. This is significant because non-Wikipedians are often convinced of the consistency of knowledge regardless of the language version (Wang et al., 2025). Ultimately, such a tool could also be used by readers. However, this would entail implementing a complex interface, which would be difficult to push through at a global level. Furthermore, individuals testing such tools too often abandon them after the initial phases of experiments, which are primarily conducted on the English-language Wikipedia.

The diversity of forms of cooperation arises from the fact that Wikipedia is created in over 350 language versions, which implies the influence of various socio-economic and cultural factors on negotiating rules, creating tools that facilitate editing, or accepting guidelines established at the Wikimedia Foundation level. Furthermore, within large language versions, distinct disparities in editing activity are also visible. A small percentage of Wikipedians is responsible for the majority of edits performed (see Shimada et al., 2023). In 2007, when Wikipedia was developing intensively in terms of both content volume and community size, it was noted that 0.1% of Wikipedians contributed over 40% of the encyclopaedia's value (Priedhorsky et al., 2007). The differentiation of projects is also affected by the fact that individual language versions were established at different times, and their creators had varying degrees of influence on formulating the rules of co-creation. Levels of engagement also vary, which can be attributed to cultural influences (Kukowska, 2022). Certain active minorities, such as the Catalans, strive more strongly to intensively develop the Wikipedia version in their own language. This is primarily accompanied by a focus on describing topics related to their own region and its culture (Massa, Scrinzi, 2012). Certain parameters of language versions may also result in different methods of identifying content quality. One such parameter is the number of existing articles. In large language versions, to detect content requiring improvement, it can be compared to the quintile of the best articles. In the case of smaller versions, there are too few high-quality articles for such a model to be useful. In studies concerning mid-sized language versions (Albanian, Basque, Catalan), articles were first compared in terms of length, number of citations, links to other articles, and illustrations, after which a corpus of the best articles was prepared. This approach enabled the relatively effective detection of content requiring verification through footnotes (Halitaj, Zubiaga, 2024).

The COVID-19 pandemic represented a particular situation that contributed to research into the diversity of factors influencing knowledge sharing. One study noted that the pandemic might have catalysed the diffusion of knowledge within the digital environment. Furthermore,

it was observed that socio-economic proximity could influence the intensity of interactions, consequently leading to a convergence of knowledge structures across different cultural regions (Yoon et al., 2023). Another study focused on diversity within a single language version (Japanese). In this instance, it was observed that users editing socio-political topics were more actively involved in developing articles related to the pandemic than those representing the natural and medical sciences. This phenomenon was particularly prevalent during the period of the pandemic's rapid progression. As it began to recede, individuals oriented towards the natural and medical sciences became more engaged with these topics. As noted, this resulted from the attitude of "scientists" who preferred to remain silent in the face of scientific uncertainty (Yang, Tanaka, 2023).

The diversity of cooperation forms also depends on individual user preferences regarding the type of activity. Only a small percentage of individuals who begin participating in the project remain active in the long term. Committed Wikipedians employ various methods to encourage further editing among those who produce reasonably correct contributions. Early experience can influence one's subsequent "career" on Wikipedia. Users may thus engage in article editing, building social relationships, supporting subsequent newcomers, patrolling other users' contributions, undertaking administrative tasks, focusing on team activities, or editing meta-pages (i.e. pages concerning Wikipedia and its community) (Antin, Cheshire, Nov, 2012).

To ensure the heterogeneity of the Wikipedian community, initiatives were undertaken to increase newcomer retention. One such initiative was the creation of a dedicated forum for newcomers called the Teahouse, where they could contact mentors and obtain answers to questions about the project. A tool was also implemented to allow new users to engage in article improvement immediately after creating an account (Warncke-Wang et al., 2023). In this way, newcomers become involved in activities before learning the rules. Consequently, a significant portion of their work is flawed and must be corrected or reverted. The problem also stems from the fact that those implementing this solution failed to mobilise the community in many language versions to conduct joint evaluations. Furthermore, based on past experiences, committed Wikipedians often do not expect newcomers to remain engaged and thus limit their activities as mentors. This also applies to experts wishing to fill knowledge gaps, who are frequently accustomed in their professional lives to being treated differently from amateurs. For the community, however, the extent to which experts adhere to established rules is more important than encouraging them to enhance the quality of resources. Moreover, Wikipedia is not a particularly attractive venue for experts relative to their professional work; therefore, they find it easier to abandon editing when differences of opinion arise (see Konieczny, 2021).

Hundreds of thousands of users collaborate on Wikimedia projects every month. In the case of the English-language version alone, this amounts to approximately 40,000 individuals (*Wikimedia Statistics*, 2026). Entering the rhythm of collaboration may, however, require a considerable amount of time. Nevertheless, to integrate new users, collaboration is undertaken

with educational institutions, among others. One such form of cooperation is edit-a-thons. Participation in these events allows for the development of critical thinking and provides participants with a sense of agency (Vetter, Sarraf, Woods, 2022). Activities performed by newcomers, if not supervised by committed Wikipedians, may nevertheless be perceived as harmful and the content removed, leading to frustration among participants. This is because the work performed may conflict with internal agreements, such as those regarding the scope of content that should be described in separate articles. Previous research has shown that the problems experienced by students included difficulties in finding instructions on article editing, an unintuitive interface, and a lack of feedback during the edit-a-thon (Gluza, Turaj, Meier, 2021). Some institutions or their employees do not even inform the Wikipedian community about the organisation of events related to editing Wikipedia.

The final significant aspect of cooperation is the identification and removal of flawed content, as well as the elimination of behaviours detrimental to the projects. To facilitate the identification of articles requiring improvement, Wikipedians place specific maintenance notices on their pages. The design of these notices results from spontaneous actions and they do not always influence the recipient appropriately, regardless of whether the recipient is another Wikipedian or a reader who has yet to become involved. Research indicates that the appropriate phrasing of the notice, as well as the colour scheme employed, can influence trust in the content presented in the article (Kuznetsov et al., 2022). However, this does not necessarily affect the recipient's motivation to resolve the reported issue. This applies primarily to content that is difficult to improve while simultaneously being free from obvious vandalism. Such "damage" to articles is typically reverted immediately. Yet, as early as 2007, it was noted that among edits performed in bad faith or other forms of article "damage", approximately 10% were accessible for 100 page views, while 0.06% remained for 10,000 views (Priedhorsky et al., 2007). This had the effect of weakening the project's credibility and undermining readers' trust in the content created. In certain language versions, including Polish, German, and Russian, a solution was introduced in the form of "flagged revisions"; this meant that edits performed by individuals without specific permissions were not visible to readers.

Alongside the identification of vandalism, users whose actions are judged to be intentionally detrimental to the project are detected and blocked. This also pertains to trolling behaviours and the creation of sockpuppets, that is, additional accounts established by "recidivists" (Skolik, 2017). Since many users may make mistakes or react emotionally during the initial stages of their activity, the detection of sockpuppets is non-trivial. Consequently, a specific type of cooperation occurs in this area. The general user base can identify behaviours resembling those of persistent offenders known to the community, while individuals with special permissions can compare the consistency of IP addresses, operating systems, or browsers used by the suspicious accounts. In large communities where hundreds or even thousands of edits are performed per hour, such detection requires support. In such cases, the use of machine learning models is advocated. One option being prepared for testing is meta-learning, where a model gains

experience across a set of tasks rather than just one, thereby improving performance in future tasks (Raszewski, Kock, 2025). Tools alone are insufficient for making decisions regarding the blocking of a specific user. However, the communication style of the most problematic users is relatively easily recognisable by community members. The more individuals participate in such detection and share knowledge of sockpuppet behaviours, the more rapidly they are identified.

3. Methods

To characterise the diversity of forms of cooperation within Wikimedia projects, both qualitative and quantitative data analyses were applied. The study was conducted in two stages. In the first stage, three hypotheses concerning cooperation in the creation of content defined by Wikipedians as either "good" or "problematic" were tested based on quantitative data. To this end, data were obtained from the 50 largest Wikipedias in terms of the number of active users, covering: the number of registered users, the number of featured articles (FA), the number of articles marked as having sourcing issues, and the length of articles from the list of 10,000 articles that every Wikipedia should have. The following research hypotheses were formulated at this stage:

- H1. Engagement in detecting problematic articles depends on the size of the overall user base. Articles marked as lacking sources were adopted as the indicator of problematic articles, while the number of registered accounts was taken as the indicator of the total number of users.
- H2. The effectiveness of cooperation in developing core encyclopaedic articles depends on the size of the community core. As an indicator of the effective development of core articles, the number of articles exceeding 16,000 characters from the list of 10,000 articles that every Wikipedia should have (top 10k) was adopted. The indicator for the size of the community core was the number of Wikipedians performing at least one edit in the last thirty days. The activity rate for the end of January 2026 was used; however, this value is relatively constant, as demonstrated in previous research (Skolik, 2025).
- H3. The higher the effectiveness of cooperation in developing core encyclopaedic articles, the more the volume of articles presented to readers as the best increases. In this case, the median size of articles from the top 10k list was adopted as the indicator of effective development of core articles. The indicator of articles presented to readers as the best is the number of articles evaluated by communities as "featured". While the increase in the size of articles from the top 10k list occurs independently of awareness of the list's existence, featured articles (FA) are submitted by authors for evaluation regarding compliance with established standards.

In the second stage of the study, the same language versions of Wikipedia were compared in terms of user mobilisation for collaborative action and cooperation with external institutions. A review of web pages concerning forms of cooperation was conducted, alongside an interpretation of the differences between language versions in this regard. A broader characterisation of the diversity was made possible by the netnographic approach (see Kozinets, 2015), particularly through the author's previous involvement in co-organising initiatives for content development across several Wikimedia projects.

4. Results

In the initial years of Wikipedia's development, users were primarily mobilised to create new articles, often only in stub form, assuming that they would be expanded by others at a later time. Simultaneously, it was assumed that the development of entries created en masse by thousands of Wikipedians would lead to an increase in their quality. Subsequently, attention began to be drawn to the fact that a significant proportion of the articles created in this manner were not being further developed. This, in turn, led to a need to identify such articles and eliminate flawed content through correction or deletion. One method of such identification involved the placement of specific templates within articles to provide information about their defects. Not all flawed articles were tagged in this way, and critical voices emerged within communities, asserting that tagging alone does not lead to content improvement. If, however, a larger number of users tagging defects did not directly lead to an increase in content quality, it could nonetheless contribute to the more frequent identification of problematic articles. For the purposes of this study, it was examined whether a higher number of registered users correlates with a larger number of articles tagged with a template indicating a lack of sources. Statistical testing revealed a statistically significant relationship between the two variables at $p < 0.05$. Spearman's rho correlation coefficient equals 0.5638. Consequently, H1 can be accepted. The results on logarithmic scales are presented in Figure 1.

The correlation between the intensity of tagging problematic articles and the number of users would likely be higher if a greater number of templates (notices) were taken into account. In the French version, there are over a dozen notices describing sourcing issues, while the one indicating a complete lack of sources was used significantly less frequently in relation to the number of users.

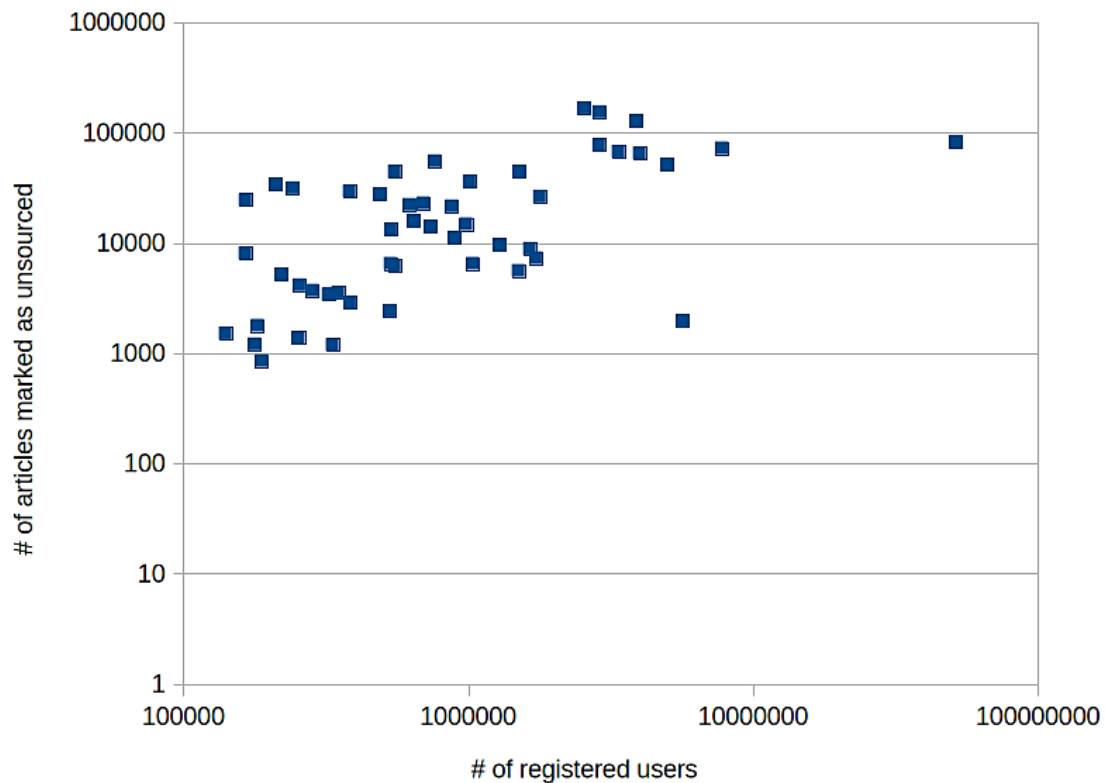


Figure 1. Correlation between the number of registered users and the number of articles marked as unsourced.

Source: own work.

The number of registered users does not imply that these individuals are active in the project. Only a fraction of those who create accounts perform edits on Wikipedia and become part of the community. Individuals engaged in editing and familiarising themselves with the operating principles can contribute to a greater extent to the increase in the quality of the accumulated knowledge. Therefore, it was assumed that the number of active users correlates with the development of articles recognised as core to the encyclopaedia. The list of 10,000 core articles (top 10k) was developed on a dedicated meta-page by the global community of Wikipedians. Specific metrics were also developed for these articles, including the number of articles containing at least 16,000 characters and the median article size (*List of Wikipedias by expanded sample of articles*, 2026). The study found that a statistically significant relationship exists between the number of active Wikipedians and the number of "huge articles" (> 16k characters) every Wikipedia should have. For $p < 0.05$. Spearman's rho correlation equals 0.7603 (Figure 2). Hypothesis 2 was also accepted.

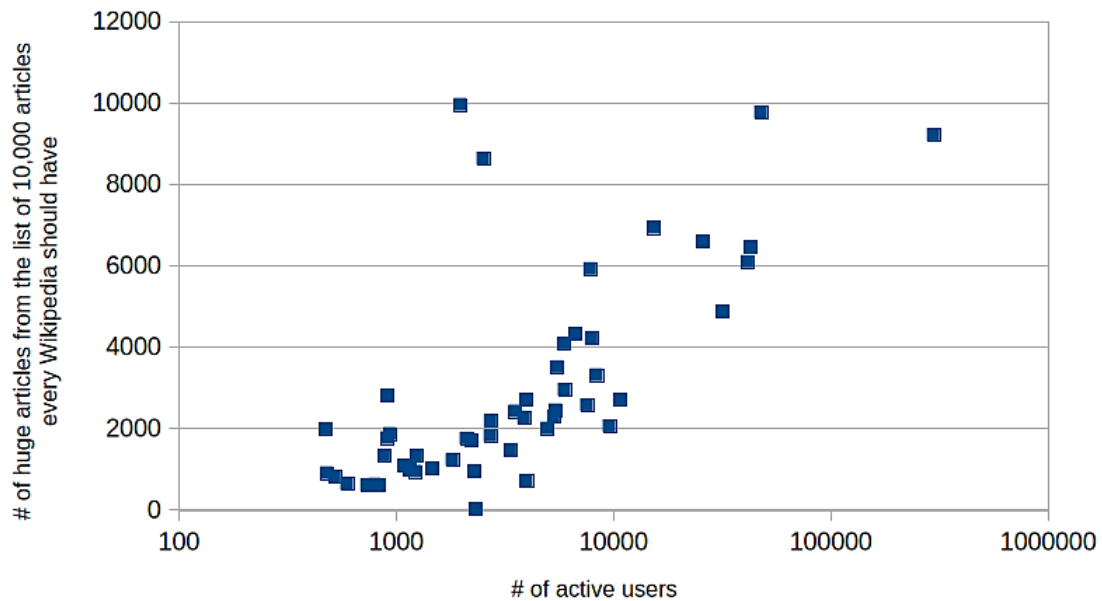


Figure 2. Correlation between the number of active users and the number of "huge articles" from the list of 10,000 articles every Wikipedia should have.

Source: own work.

Although the correlation strength in this case is greater than in the H1 test, more outliers from the trend are visible. In several cases, it can be said that communities exist which are more focused on developing these arbitrarily selected articles. These include Wikipedians from the Serbian, Catalan, and Spanish language versions, as well as the Basque and Galician versions among the smaller ones. It is noteworthy that, with the exception of the Serbian Wikipedia, the others are created by communities residing in a single country: Spain.

An increase in article size does not necessarily mean they are free from defects. It is possible that Wikipedians from the aforementioned versions compete with one another to achieve a higher position in the top 10k ranking. In large Wikipedia versions, communities attach significant importance to the projects' image and feature specially selected content on their main pages, most notably FAs. Such articles are often developed by individuals; however, they are subsequently peer-reviewed by active users, and any identified errors prevent them from being featured. It was assumed, nevertheless, that the increase in the volume of articles (median article size) from the top 10k list correlates with the number of FAs. A statistically significant relationship was demonstrated between these variables; for $p < 0.05$. Spearman's rho correlation equals 0.7702 (Figure 3.). Thus, H3 was also accepted.

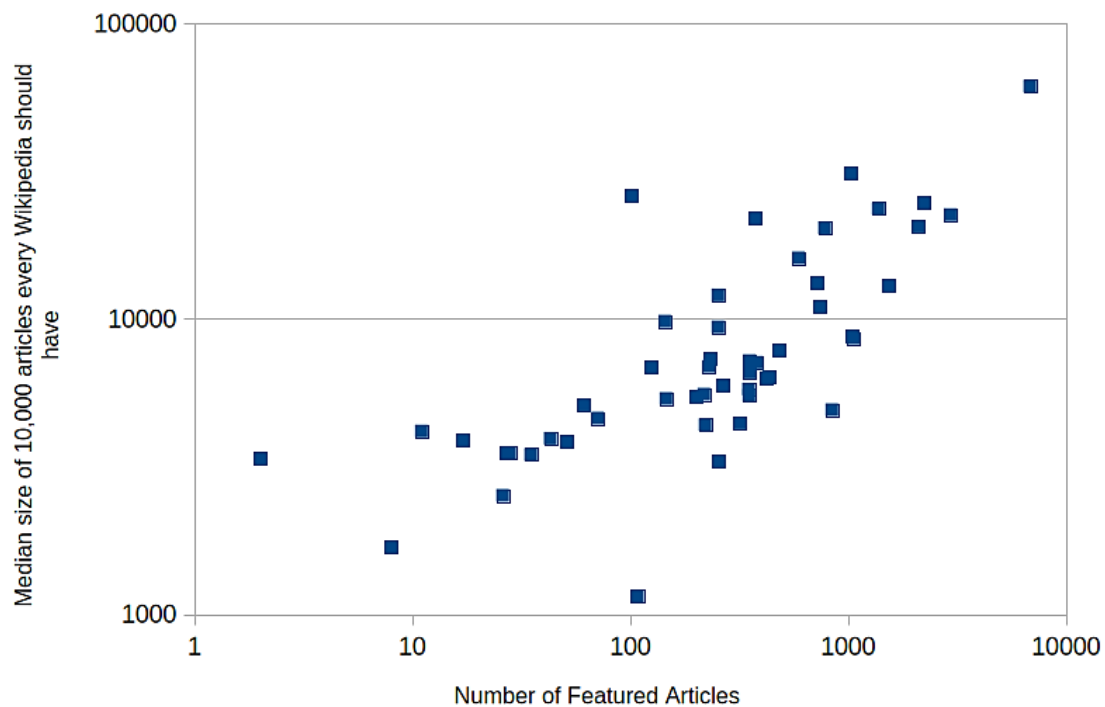


Figure 3. Correlation between the number of Featured Articles and the median size of the 10,000 articles every Wikipedia should have.

Source: own work.

In this case, certain deviations from the trend are also visible. The Japanese-language Wikipedia, despite its large community and highly developed articles from the top 10k list, has almost the same number of FAs as the Cantonese version, which is created by a small community. The median article size from the top 10k list is 25 times smaller in the Cantonese version compared to the Japanese version. This may result from less restrictive article evaluation in the Cantonese version due to a smaller number of mutually monitoring actors within the social network. Individual communities may also have priorities other than generating a large number of FAs. Additionally, it was examined whether and how strong the correlation is between the number of active users and the number of FAs. A statistically significant relationship was demonstrated between these variables; however, for $p < 0.05$, Spearman's rho correlation equals only 0.6285. The strength of this correlation is therefore weaker than the relationship between article size and quality.

In the second phase of the study, a qualitative analysis of cooperation in user mobilisation and building relationships with external institutions was conducted. Although the software used by Wikimedia was developed with collaborative content creation in mind, the communication method for novice users was unintuitive. Consequently, a range of external communication channels was launched, from mailing lists and chats to social media. However, offline meetings were more conducive to adopting a shared perspective, even though they typically gathered only a fraction of the most active users. Nonetheless, events of this type were popular enough to be documented in almost every major language version. Of the 50 versions studied, only five

(Simple English, Estonian, Galician, Tamil, and Cantonese) did not have established pages dedicated to community meetings (Table 1).

Table 1.

Selected types of pages documenting methods of mobilising Wikipedians for collaborative action in the studied language versions of Wikipedia

Language version	MEET	EDIT	COMP	COLL	Language version	MEET	EDIT	COMP	COLL
English	x	x	C	C	Greek	x			C
Spanish	x	x	C		Norwegian	x		p	
French	x		C	p	Catalan	x	x	C	
German	x	x	C		Bengali	x	x	C	C
Italian	x	x			Malay	x			C
Japanese	x		p		Romanian	x		p	C
Chinese	x		C	C	Bulgarian	x			
Polish	x	x		p	Serbian	x		C	
Dutch	x		p	C	Danish	x	x	p	
Hebrew	x				Slovak	x		p	
Portuguese	x		C	C	Croatian	x			
Russian	x	x			Estonian			C	
Persian	x	x		C	Hindi	x	x	C	C
Arabic	x	x	C	C	Azerbaijani	x			C
Czech	x	x	p		Slovenian	x	x	C	C
Ukrainian	x		C	C	Basque	x			
Korean	x	x		C	Armenian	x			
Turkish	x	x		C	Min Nan Chinese				
Indonesian	x			C	Lithuanian	x			
Swedish	x			C	Uzbek	x	x	C	
Simple English					Latvian	x		C	p
Vietnamese	x		C	C	Tamil				
Finnish	x				Albanian	x			
Hungarian	x				Georgian	x	x		
Thai	x			C	Galician			p	

Language versions are listed from largest to smallest. In the column headings, abbreviations denote documented forms of cooperation: MEET – meetups; COMP – competitions; EDIT – edit-a-thons; COLL – general category of collaboration. The letters denote: x – occurrence of a document; p – existence of a web page; C – existence of a broader category of documents.

Source: own work.

Specific forms of user mobilisation have been developed within Wikimedia projects. One such form involved various types of competitions, often involving rivalry between language versions regarding the number of articles. Spontaneously conceived ideas for subsequent contests attracted a considerable number of Wikipedians. Over time, however, a degree of routinisation occurred in their organisation, which rendered them less attractive. Furthermore, the emphasis on the quantity of content produced faced criticism, as a significant proportion of "competition" articles did not meet accepted standards. A similar situation was observed in the case of edit-a-thons. At times, it is difficult to distinguish between these two forms of mobilisation for collaborative action. In the Polish-language version, organised special actions involve internal competition, including the awarding of symbolic prizes; however,

they are associated with the edit-a-thons category rather than competitions. To improve the structuring of cooperation forms, larger language versions of Wikipedia often established general pages dedicated to collaboration or assigned individual initiatives to a general category of collaboration. A summary of the documentation types for mobilising users for collaborative action is presented in Table 1.

To present the diversity of cooperation with external educational and cultural institutions, three types of initiatives popular in large Wikimedia projects were selected. These included GLAM projects, which relate to cooperation with galleries, libraries, archives, and museums (from which they took their name); initiatives named the Wikipedia Education Program (WEP); and Wikipedia School and University Projects (WSUP). It was observed that this type of cooperation was primarily developed in the largest language versions (Table 2).

A page dedicated to the GLAM initiative was absent in only three out of the 25 largest language versions: Chinese, Vietnamese, and Simple English. The last of these languages is artificial, while the first two are associated with communities originating from countries where internet users lack access to Wikipedia websites. These versions are developed primarily by diasporas active in other countries. GLAM projects lack dedicated pages in languages representing certain Asian communities and those from Central and Eastern Europe. During the first decade of Wikipedia's development, communities reported significant difficulties in cooperating with cultural institutions in Central and Eastern European countries. Sometimes, however, such initiatives are described more broadly outside of Wikipedia's own pages. Within the Wikimedia Commons project, which serves as a global repository for multimedia files used by Wikipedia (among others), categories have been created for GLAM initiatives in individual countries. Although such a page was not established in the Wikipedias created in the Armenian, Azerbaijani, Bengali, and Bulgarian languages, GLAM initiatives developed in Armenia, Azerbaijan, Bangladesh, and Bulgaria can be found on Wikimedia Commons (*GLAM by Country*, 2026). Typically, this type of cooperation involves the photographic documentation of cultural heritage.

Table 2.

Documentation of major cooperation initiatives with external institutions in the studied language versions of Wikipedia

Language version	GLAM	WEP	WSUP	Language version	GLAM	WEP	WSUP
English	x	C	C	Greek			a
Spanish	x	C	a	Norwegian	x		a
French	x		C	Catalan	x	C	a
German	x	a	C	Bengali			
Italian	x		C	Malay			
Japanese	x	C		Romanian		a	
Chinese		C	a	Bulgarian			
Polish	x	a	C	Serbian	x		
Dutch	x	C		Danish	x		
Hebrew	x		a	Slovak			a
Portuguese	x	C	C	Croatian	x		

Cont. table 2.

Russian	x	a	a	Estonian	x		
Persian	x	C	a	Hindi	x	a	
Arabic	x	C	a	Azerbaijani			
Czech	x			Slovenian			C
Ukrainian	x	a	a	Basque		C	
Korean	x	C	a	Armenian			
Turkish	x	C	C	Min Nan Chinese			
Indonesian	x		C	Lithuanian			
Swedish	x	C		Uzbek		a	
Simple English			C	Latvian	x	C	
Vietnamese		a		Tamil			
Finnish	x			Albanian			
Hungarian	x		C	Georgian			
Thai	x	a	C	Galician			C

Language versions are listed from largest to smallest. In the column headings, abbreviations denote documented forms of cooperation: GLAM – pages dedicated to cooperation with galleries, libraries, archives, and museums; WEP – Wikipedia Education Program; WSUP – Wikipedia School and University Projects. The letters denote: x – occurrence of a document; p – existence of a web page; C – existence of a broader category of documents.

Source: own work.

Educational programmes, in turn, do not always entail formal cooperation with educational institutions and may be implemented independently by teachers or lecturers. The lack of formal cooperation, however, results in Wikipedians having no control over how new users adapt to established rules. This frequently leads to the reverting of contributions made by students as part of their coursework. If WEP and WSUP projects are considered complementary, they were absent from only the Czech and Finnish language versions among the 25 largest Wikipedias. Nevertheless, Czech Wikipedians undertake educational initiatives supported by the Wikimedia Česká republika association, aimed at developing region-related knowledge (*Czechoslovakia 2025*, 2026). Similar actions were taken by the Wikimedia Suomi association, which oversees the Finnish-language Wikipedia (Perhiö, 2017). Unlike GLAM, under which global competitions such as Wiki Loves Monuments are continually organised, educational programmes tend to have a shorter lifespan. WSUP were relatively popular in the Polish-language Wikipedia prior to 2010, but were only rarely implemented in the following decade.

5. Discussion

Regardless of the various factors influencing the effectiveness of cooperation, the number of users contributes to the growth of qualitative resources within Wikimedia projects. Previous studies have noted the existence of a specific mechanism of sequential content supplementation and correction (Mayer, Heck, Kimmerle, 2025). However, the creation of top-tier content (FA) is often the result of actions by individual users who conduct source research and expand

articles based on their findings. Similarly, the identification of problematic articles is frequently carried out by a small number of users who specialise in reviewing content and posting notices regarding identified defects. If, therefore, one can speak of a sequentiality of actions, it is often not a synchronised team effort, but rather an "assembly-line" process of content creation, development, and modification. Over time, the most committed users specialise in a very narrow range of activities, and the choice of "career paths" may begin as early as the initial stage of editing Wikipedia (Antin, Cheshire, Nov, 2012). This applies to both the thematic scope and the type of edits performed. On a macro scale, this sequentiality of action may also be linked to the mobilisation to edit or the decision to withdraw from activity, depending on a sense of uncertainty regarding one's knowledge, as pointed out by Yang and Tanaka (2023).

The size of the Wikipedian community may also influence the heterogeneity of the structure of documented forms of cooperation within the project. Small communities operating in smaller teams do not require a large number of pages and categories reflecting the spontaneously emerging division of labour. For any initiative to be effective, it requires the involvement of at least several or a dozen individuals. Launching too many initiatives in small communities may lead to cannibalisation or result in the atrophy of initiatives as the number of users decreases. In very large projects, such as the English-language Wikipedia, it is possible to determine the properties of social networks within its structures (e.g. in the WikiProjects workspace). Such research allows for the identification of conditions for group efficiency (Rychwalska et al., 2025). In smaller communities, however, internal structures are less permanent and tend to disappear. In the Polish-language Wikipedia, dozens of WikiProjects were established before 2010; however, by the third decade of the 21st century, high activity was observed in only a few of them, and many had been abandoned. The decline in efficiency and the subsequent dying out of some WikiProjects could also have been influenced by fluctuations resulting in a mismatch with the optimal team size (Kukowska, 2023).

Large communities also possess greater capacity to mobilise users for cooperation with external institutions. Greater experience results in more frequent engagement of cultural and academic institutions in the collaboration on knowledge resource creation within Wikimedia. Despite this, situations are still observed where newcomers joining through such collaborations encounter significant difficulties in expanding Wikipedia's content (Gluza, Turaj, Meier, 2021; Konieczny, 2021). This primarily concerns communication problems between Wikipedians and representatives of external institutions. Newcomers typically do not know at least some of the most important rules; sometimes, even event organisers are themselves unfamiliar with the guidelines. Furthermore, the later institutions joined the cooperation, the more difficult it was to convey knowledge of internal rules, the number of which has increased over time.

6. Summary

The research findings presented in the article indicate that achieving a substantial "critical mass" is a vital factor in the development of cooperation on Wikipedia. A larger user base leads to the creation of a higher number of articles evaluated as featured and enables the identification of flawed articles, while also fostering a diversity of cooperation forms in terms of both user mobilisation and collaboration with external institutions. However, in certain communities, a significantly greater focus on activities aimed at improving the quality of core articles can be observed. This may be linked to local cultural determinants. In other cases, political factors may restrict Wikipedians' ability to cooperate with cultural institutions.

A better understanding of the specifics of individual language versions of Wikipedia would require a more detailed examination of the collaboration processes in the projects. Numerous articles highlighted for quality or marked as defective may be the result of short-term community initiatives. In this regard, two forms of collaboration can be distinguished: on the one hand, routine efforts to improve the project's quantity and quality; on the other, initiating initiatives and mobilizing many active users. However, the mobilization activities themselves lose momentum over time and turn into routine activities involving a small part of the Wikipedia community.

Selecting the 50 largest language versions for the study made it possible to illustrate certain disparities between them. However, this did not constitute an exhaustive review of all forms of cooperation within individual language versions. Further research in this area would allow for a more in-depth analysis of local conditions and help to capture how specific forms of cooperation emerge within virtual communities of practice.

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