Addressing Wikipedia's Gender Gaps Through Social Media Ads

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Abstract

The 2020 Wikimedia Strategy aims to address gender gaps and make Wikipedia more inclusive. To attract skilled women to join the Wikipedia community, we will design a survey and distribute it via targeted social media ads to determine the willingness of female participants to contribute or edit Wikipedia articles. The performance of the ad's campaigns will be analyzed to develop a blueprint of strategies for reaching potential female editors on different social media platforms.

Introduction

Wikipedia suffers from a wide range of knowledge gaps, defined as underrepresentation of certain groups in content coverage, readership, and contribution [17]. One of the best-studied knowledge gaps is the gender gap, with women being minority among both readers and editors [9, 2]. The 2020 Wikimedia Movement Strategy stresses the importance of closing the knowledge gaps in terms of gender representation and to ensure that the Wikimedia platforms become more inclusive [17].

This research aims to increase the gender representation in Wikipedia by proposing to target skilled women in social media platforms. In particular, the initiative seeks to test the hypothesis: "social media campaigns bring women to Wikipedia's front door".

We will design a survey to determine whether women are willing to contribute to Wikipedia based on their skills and knowledge. Social media ads will be used to target and invite participants to complete the survey.

The outcome will be a blueprint proposing a variety of targeting strategies for reaching out to female editors on different social media platforms, by better understanding their willingness. The blueprint benefits the Wikimedia Foundation's research and development team. It also benefits researchers and experts interested in tackling gender gap issues.

We aim to start the project on June 1, 2024 and conclude it by June 30, 2025.

Related work

Several studies have identified a gender gap in the users' representation on Wikipedia. This gender gap pertains to disparities in different dimensions including: 1) content covering women [11, 17, 20, 22]; 2) the number of female readers [9, 17, 20]; and 3) the number of female editors [2, 12, 17]. The gender gap has been observed in several Wiki languages [7, 14]. Studies have delved into the reasons such as the high level of conflict involved in the editing process [3, 6, 7].

Studies have had limited discussion on approaches and techniques to encourage more women to participate in Wikipedia, with only Edit-a-thons [4, 19], workshops [8], and social media campaigns [5] have been tested as potential methods. Recently, Wikimedia researchers have experimented with Facebook ads and found that they should continue using (or expand use of) paid media to reach Wikipedia

audiences[1]. As a result of the findings from our previous study [1], we intend to test targeted social media advertisements on different platforms to locate and connect with prospective Wikipedia editors, specifically targeting women via a survey.

For more details on how our proposal differs from previous studies on gender gaps in the Wikipedia community, please refer to Review 1 (R1-2).

Methods

To achieve the research goal, we plan to follow the following steps:

1. **Survey:** Designing an online survey to assess willingness to read or edit Wikipedia articles aligned with skills, expertise, and domain knowledge. The survey will include questions on different constructs: demographics, skills, prior experience, willingness, and nudging techniques to contribute to Wikipedia.
2. **Campaigns:** Creating social media advertising campaigns on 5 different platforms. These campaigns aim to target active users based on various traits (such as gender and interests) to invite them to participate in the survey.
3. **Analysis:** Evaluating campaigns' performance in terms of impressions, clicks, and survey response rate per platform.

For more details on the methods, please refer to Review 1 (R1-1, R1-3, R1-6), Review 2 (R2-2, R2-3, R2-4), and Review 3 (R3-2).

Expected output

1. **Insights to inform decision making:** Suggesting insights covering blueprints of strategies to target female editors in multiple social media platforms to address the gender disparities in Wikipedia. The audience is Wikimedia Foundation's research and development team.
2. **Scientific publications & events:** Publishing in top-tier venues to showcase our findings and receive feedback. The audience is researchers interested in Wiki-related research or gender gaps. Potential venues include the Web Conference, Transactions on the Web, ICWSM, and Wiki Workshop.

For more details on the expected output, please refer to Review 1 (R1-5).

Risks

Trial and error risks: This risk involves that the social media targeting approach may not reach the intended audience and will need to be refined at multiple iterations. Moreover, platforms' pre-launch approval may take longer than planned. These risks may result in project slippage.

We tackled these risks by conducting a feasibility test [1]. These risks could be addressed through recommendations from the Wikimedia Foundation team.

For more details on risks and contingency plans, please refer to Review 1 (R1-4).

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[1] https://www.mediawiki.org/wiki/Growth/Personalized_first_day/Newcomer_experience_marketing_pilot#What_kind_of_results_did_we_get?

Community impact plan

The proposed research seeks to partner with stakeholders from academia, industry, and governments who work on gender equality issues. Besides, we aim to communicate the findings via blogs, infographics, and reports (i.e Web Foundation report on Women's Rights Online). We intend to collaborate with Wikipedia affiliates to connect with stakeholders and develop educational resources.

For more details on the community impact plan, please refer to Review 2 (R2-1).

Evaluation

1. **Originality:** The project aims to experiment with a new method using social media ads to locate and contact potential female editors via targeted surveys.
2. **Feasibility:** The project has a clear research plan and has been previously tested for feasibility and potential limitations [1].
3. **Success measures and impact:** Success is measured by engagement with our social media campaigns through impressions, clicks, and completing the survey. Other measures include positive feedback from the Wikimedia Foundation team and stakeholders.

Budget

Average social media advertising pricing can cost anywhere from $450 to $6,000 per month[2]. Our funding will be solely dedicated to setting up social media ads. Please find the Budget Sheet[3] for the Wikimedia Research Proposal.

For further details about our choice of using the entirety of the requested budget to pay big tech companies to run the ads, please refer to Review 3 (R3-1).

Response to reviewers and meta-reviewers

We would like to extend our gratitude for the valuable feedback and insightful comments you provided on our Wikimedia Research Fund proposal. Please find below our response to each point raised in the review or meta-review on our Stage I proposal:

Response to the meta review (Program Chairs): Support from the multiple levels involved to proceed to Stage II. Great (and surprisingly novel) idea at its core. The details of the budget and proposal will be important. For example, it is not entirely clear why all 5 platforms should be targeted versus a fewer count.

Details about the budget have been provided in the Budget section and in our response to Review 3 (R3-1). Our decision to select all 5 platforms has been addressed in our response to Review 2 (R2-4).

Response to Review 1 (Reviewer Dj6a on OpenReview):

R1-1: The types/classes/dimensions of questions the online survey will contain. Designing an online survey to assess willingness to contribute to Wikipedia articles aligned with skills, expertise, and domain knowledge. The survey will include questions on different constructs:

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demographics, skills, prior experience, willingness, and nudging techniques to contribute to Wikipedia. The first construct is **Demographics**, which aims to collect information about participants' gender, age, and location. The second construct is **Expertise**, where we ask respondents to self-rate their skills, interests, and prior experience contributing to Wikipedia (as either readers, editors to articles, or joiners to any community related to Wikipedia). The third construct is **willingness to contribute to Wikipedia**, where we identify and rate on a scale the factors influencing the willingness to contribute to Wikipedia covering dissatisfaction, helping or involvement with the Wiki, self-enhancement, anxiety reduction, advice seeking, social benefit, or economic incentives. The fourth construct is **nudging techniques to contribute to Wikipedia**, where we identify and rate on a scale different nudging strategies to contribute to Wikipedia. Examples of nudging-related survey questions include:

1) If we offer writing support services, would you edit specific Wikipedia articles?

2) If you found editing this specific Wikipedia article beneficial, would you be willing to edit another Wikipedia article in the future?

3) Here is an article on topic X related to your expertise, which needs expanding. Would you be willing to help?

These nudging strategies will likely be related and adapted to each factor that influences the willingness to contribute to Wikipedia (related to the third construct).

R1-2: How does the proposal differ from previous studies on gender gap in the WM community?

This proposal is different from previous studies on gender gaps in the Wikipedia community because it is focused on understanding the willingness to engage with the Wikipedia community. This covers understanding contributing to Wikipedia, such as satisfaction/dissatisfaction, altruism (helping others), altruism (helping Wikipedia), involvement with the Wiki projects, vengeance, self-enhancement, anxiety reduction, advice seeking, social benefit, or economic incentives [16].

Based on each underlying willingness factor, we can propose a nudging technique to encourage female editors to participate in Wikipedia. For instance, if we find that anxiety reduction is a major factor that motivates female editors to participate in editing Wikipedia, we can follow up with understanding several techniques to help sustain this motivation, such as making the editing process simpler or providing positive feedback. In other words, this proposal delves deeper into understanding female motivations behind contributing to Wikipedia, rather than immediately involving female editors through edit-a-thons, workshops, and social media campaigns, as has been done previously [8, 5, 4, 19, 5], Simultaneously, this proposal aligns with previous research that aims to address the gender gaps and support gender diversity on Wikipedia [17].

R1-3: What is the recruitment strategy and the target population to reach? What is the expected target in participation?

Based on our feasibility study on Linkedin [1], the targeting audience size after specifying the targeting criteria is 1,200+. The Linkedin Ad has received a total of 4,936 impressions, and 25 survey web-site visits for an ad cost of $71.4 after running for 1 week. The target population to reach will depend on the allocated budget for each social media platform. Depending on the platform, daily advertisement spending could increase or decrease based on the advertisement's specific demographics being targeted and other criteria. As a result, the

expected target population is likely to vary across social media platforms and the allocated budget. At the top level, we plan to create an advertisement campaign with the following targeting criteria: [Location] AND [Gender] AND [Skills or Interests].

R1-4: What is the contingency plan in case the user base of the survey does not reach the expected target?

As a contingency plan, we aim to recruit participants via crowdsourcing in case the user base of the survey does not reach the expected target on different social media channels. Primarily, we plan to utilize Amazon Mechanical Turk (AMT) or Prolific to recruit a larger pool of participants to complete the survey. Hiring crowdworkers via Amazon Mechanical Turk (AMT) has been successfully employed as a data collection methodology in Wikipedia-related research [10, 13, 15].

We plan to work closely with the Wikimedia Foundation team to manage and mitigate all the risks involved in the survey requirement strategy.

R1-5: How will the survey result inform future strategies to reduce female participation gaps?

The survey results could contribute to informing future strategies to reduce female participation gaps in different ways. First, the survey results will help support evidence on whether matching expertise or interests with contributions to specific Wikipedia articles will encourage more participation in contributing to Wikipedia. This could lead to creating functions or tools that facilitate synergies between expertise or interests and suggested Wikipedia articles for contribution.

Second, the survey results will help assess which factors could positively motivate female editors to contribute to Wikipedia. This could lead to designing nudging strategies, policies, and tools to target each motivating factor while being sensitive to the gender of contributors and their interests and expertise.

These future strategies are novel and currently underdeveloped. Quantitative methods will be used to evaluate the results such as T-Test, ANOVA, Regression and Factor analysis. Visualizations will be also used to show and compare the results.

R1-6: The representativeness of the female population willing to participate in the Wikimedia community activities is not discussed in detail

We plan to focus on recruiting participants located in the USA. This is to mitigate the effects of cultural and language differences that could exist in the sample, as well as to build on our previous work that relied on targeting participants located in the USA [1]. We will recruit the sample using quota sampling, given that it offers a comparative advantage, including giving researchers control over how they recruit subjects and allowing researchers to target specific subpopulations (such as participants with specific demographic characteristics or interests). Depending on how each social media platform assigns a budget to recruit participants, we will allocate the budget to each stratum that contains a subpopulation. Usually, social media platforms assist in the quota sampling process depending on the budget and targeting criteria [21].

To ensure the representativeness of our sample, we followed the steps of previous research that used Facebook advertisements for recruiting participants for health research [18].

First, the representativeness of the Facebook sample was assessed by comparing sociodemographic characteristics of participants with the underlying population obtained from the US Census data. Second, Goodness-of-fit chi-square tests will be conducted to compare frequency counts from our sample with the expected relative frequency of the population to determine if the distribution

of the recruited sample was statistically consistent with the population. To determine the magnitude of difference between the sample distribution and the population, Cramer V posttest for effect size was calculated and interpreted as per Cohen, where values of 0.10, 0.30, and 0.50 corresponded to small, medium, and large effect sizes [18].

Response to Review 2 (Reviewer hazD on OpenReview):

R2-1: My main concern with the proposal is the little information about organizations already devoted to mitigating gender gap in Wikipedia. One would have expected that the community action plan includes explicit mentions to organizations like WikiWomen's User Group, Art+Feminism or Wiki Women in Red. Interacting with these organizations is key, as they have been running campaigns for years and could inform researchers on best practices when creating such ads. I recommend that the authors initiate contacts with the aforementioned organizations, discuss the limitations of their focus and answer the questions I have posed above.

We recognize and commend the efforts of organizations such as WikiWomen's User Group, Art+Feminism, and Wiki Women in Red dedicated to mitigating the gender gap on Wikipedia. We intend to engage with these organizations and collaborate closely in various ways. This collaboration would start at the beginning of the research project and continue as the project unfolds. Our main aim is to seek input on two aspects. First, to learn about best practices for conducting our study and running advertisements on various social media platforms. Second, to understand how to translate our findings into policies and guidelines that contribute to diminishing gender disparities on Wikipedia. Partnering with organizations like WikiWomen's User Group and

Art+Feminism would greatly enhance our research project.

To begin, we have compiled a list of all the projects and organizations involved in research related to gender gaps on Wikipedia:

Project Rewrite: Raises awareness of the ongoing gaps in content by and about women on Wikipedia and encourages everyone to participate in closing these gaps. This is achieved through campaigns to add missing articles about women to Wikipedia, training events for new volunteers, and more.

Art+Feminism: A nonprofit organization leading an international campaign to enhance coverage of cis, trans women, gender, and the arts on Wikipedia through in-person training and editing events.

Whose Knowledge?: A global campaign collaborating with individuals, communities, movements, user groups, and other organizations worldwide to create, collect, and curate knowledge from and with marginalized communities.

WikiDonne: A group of users focusing on issues related to women and various forms of diversity within the Wikimedia movement.

WikiGap: Organized by Wikimedia Sverige and the Swedish Ministry of Foreign Affairs, this initiative facilitates Wikipedia edit-a-thons worldwide in collaboration with Swedish embassies and local Wikimedia affiliates and volunteers. #WikiGap promotes broad and diverse participation and allows for local adaptations on the theme of closing the gender gap and other relevant diversity gaps on Wikipedia.

Women Do News: A nonprofit organization and community committed to amplifying the voices and profiles of women journalists online.

Women in Red: A WikiProject and community dedicated to increasing the representation of women on Wikipedia, focusing on narrowing the content gender gap and encouraging editors of all genders to participate.

Women and Wikipedia (W&W) project: The W&W project focuses on analyzing the gender gap in knowledge co-production in Spain.

WikiWomen's User Group: A user group supporting women and allies in the Wikimedia movement.

R2-2: Another limitation of this proposal is the focus on women joining the Wikipedia editor community. Previous work has shown that female editors tend to leave Wikipedia much more quickly [1]. Furthermore, the increase in women may not be sufficient to address the structural biases that limit the visibility of content created by female editors [2]. Consequently, the authors might reflect on whether their approach could include the sustainability and efficacy of skilled women joining the editing community of Wikipedia.

Similarly, we aim to address concerns regarding the sustainability and effectiveness of skilled women joining the Wikipedia editing community by analyzing the motivating factors that could facilitate increased contributions by female editors to Wikipedia. Analyzing these motivating factors will direct in designing nudging strategies that align with each motivator. These nudging strategies will help inform the creation of policies and guidelines that sustain motivation for contributing to Wikipedia.

For example, previous work indicated[4] that anxiety could be a significant factor hindering participation in Wikipedia-related initiatives such as edit-a-thons. To support ongoing contribution to Wikipedia, initiatives have been suggested to alleviate contributors' anxiety, enabling them to edit Wikipedia confidently, such as linking the Art+Feminism edit-a-thon to three writing courses.

Our work follows a similar approach by linking each motivating factor to a specific nudging strategy to maintain and enhance contributions.

For instance, we could design questions that inquire whether anxiety is a factor that hinders motivation to contribute to Wikipedia. We could then ask about different nudging techniques to alleviate participants' anxiety, such as offering writing support or Questions & Answers services.

R2-3: Which language editions of Wikipedia will researchers focus on? Will geographic or thematic limitations be defined?

We will focus on the English language and recruit participants located in the USA. This is to mitigate the effects of cultural and language differences that could exist in the sample.

R2-4: What is the criteria for the selected social media platforms? (I am surprised to see Tumblr and not TikTok).

We selected 5 different platforms to set up our social media campaigns: LinkedIn, Google, Tumblr, Reddit, and Twitter. We chose LinkedIn, Google, and Twitter as they are among the best-paid advertising platforms, and we have experience and skills in setting up advertisement campaigns on these platforms. We also included Tumblr and Reddit because they are microblogging social networking apps where users can share their ideas and interests. Therefore, we aim to determine whether users on microblogging platforms would show more interest in completing our surveys or contributing to Wikipedia. We are open to experimenting with fewer or additional social media platforms such as TikTok, depending on the allocated budget and advice from the Wikimedia Foundation.

Response to Review 3 (Reviewer FwkH on OpenReview):

R3-1: My reservation is regarding the choice of using the entirety of the requested budget to

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[4]https://library.oapen.org/handle/20.500.12657/43467

pay big tech companies to run the ads. Is this really the only feasible approach? Could you justify better why this is a route worth taking? What are the benefits and harms of this methodology? Is the cost worth it?

What are the benefits and harms of this methodology? Is the cost worth it? -Expected output could talk about the concrete benefits (new editors)

To better justify why this is a route worth taking, based on the feasibility study we conducted, we spent approximately $71 to run a LinkedIn Ad for 1 week (approximately $10 per day). Consequently, in this proposal, we allocated $6000 for advertisements on each social media channel. This budget includes experimenting with 10 different campaigns involving various targeting criteria and running these campaigns for 60 days. In total, this amounts to ($10 per day * 60 days * 10 campaigns = $6000).

The main benefit of this methodology is utilizing innovative web-based recruitment methods to reach participants, which could be costly and time-consuming to reach through other means such as Edit-a-thons or workshops. This will open up the possibility of identifying pools of contributors who might not join more traditional events, such as workshops.

However, there are risks associated with this methodology, including trial and error risks that could potentially lead to project delays (discussed in the Risks Section). There are also risks related to recruiting a large and representative sample, as detailed in our response to Review 1 (R1-6).

R3-2: Could there be any other alternatives to consider, at least partially, that also reach wide demographics? Could the survey be administered to a broad audience in any other way? Adding alternative digital recruitment channels would significantly improve the scope, while minimizing the risks too (campaigns taking a while to go live, etc).

We plan to experiment with 10 different campaigns with various targeting criteria, encompassing both narrow and broad approaches. We also discussed utilizing other alternative digital recruitment channels to enhance the scope, such as through Amazon Mechanical Turk or Prolific (as detailed in our response to Review 1 (R1-4).

R3-3: The abstract doesn't make it clear if this is about readers or editors

We modified the abstract to make it clear that it is about editors.

R3-4: I am not clear on the part about "The blueprint benefits the Wikimedia Foundation's research and development team." How exactly would the Wikimedia Foundation use the ad framework?

Please check our response in details to clarify how will the survey result inform future strategies to reduce female participation gaps to Review 1 (R1-5).

R3-5: How is this approach different from reference 5?

The article referenced in [5] examined the content of #VisibleWikiWomen, a global digital advocacy campaign aimed at promoting the inclusion of women's voices in the global technology conversation and enhancing the digital sustainability of feminist data on Wikipedia. Our research differs in that it seeks to explore motivations for contributing to Wikipedia through a gender lens. Furthermore, our research aims to launch a survey targeting participants through 5 different social media platforms (and not on Twitter only as in [5]).

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