

# **WikiMotivate: A Facebook Plugin for Motivating Content Creation and Contribution on Wikipedia**

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A report submitted to the Department of Library and Information Science, The University of Zambia, in partial fulfillment of the requirements of the degree of Bachelor of Information and Communication Technologies with Education

THE UNIVERSITY OF ZAMBIA

LUSAKA

2023

## **Abstract**

Wikipedia is a widely recognized and valuable source of information, However, it encounters persistent challenges in attracting and retaining active contributors. It is recorded that only 10 people from Zambia contribute and create content on wikipedia in the month of may 2023. while a large number consumes the content. This creates an imbalance between content consumers, who greatly benefit from the platform, and content creators, who play a crucial role in its sustainability and growth. The reluctance of users to contribute can be attributed to various factors, including a lack of motivation, limited awareness of the contribution process, or uncertainty about the value of their own expertise. Zambia, a nation endowed with rich cultural legacy, a historical significance, and breathtaking natural beauty, is underrepresented on wikipedia. WikiMotivate aims to close this knowledge gap by enticing zambians to update pre-existing content, add new entries, and share their natural expertise. By displaying the most active contributors on a scoreboard, the plugin will encourage participants to engage in healthy competition and recognition

The goal of the WikiMotivate facebook plugin WikiMotivate is to encourage and improve Zambian content contributions to wikipedia, the largest online encyclopedia, By utilizing gamification features like leaderboards and badges to encourage and incentivise active engagement, the plugin aims to solve the lack of locally produced information about zambia on the network.

An automated process was set up and used to fetch the history of edits from wikipedia and then posted on WikiMotivate which was able to rank and allocate badges. An evaluation process of the software was then conducted in order to assess the effectiveness of the software.

We derived history of edits from 4 distinct pages on wikipedia into WikiMotivate and discovered that the majority of the contributions do not come from zambians. Only a small fraction of zambians were discovered to have come from zambia. During the evaluation process, the ministry of health page was used to test the WikiMotivate software where a number of people interacted with the software in order to test its effectiveness.

In conclusion, WikiMotivate used badges and recognition to honor and commemorate the milestones and accomplishments of contributors. Users were encouraged to consistently create and share material on a range of topics related to zambian society, geography, history, and culture by means of these gamified features.

Through the application of gamification techniques on the widely used facebook platform, WikiMotivate hopes to encourage more content creation while also giving zambian users a sense of pride and ownership in their country. It is expected that this strategy will promote teamwork, leading to a more thorough and varied wikipedia entry about zambia.

WikiMotivate is an innovative initiative that seeks to greatly increase the exposure and richness of zambian material on a worldwide website such as wikipedia. In this abstract, the suggested application of gamification is described along with how it might help to increase the visibility of zambian stories in the digital realm of the world's most popular online encyclopedia.

## **Acknowledgements**

We would like to express our heartfelt gratitude to the individuals who have supported us in completing this research report. Their guidance, encouragement and assistance were invaluable throughout this journey.

First and foremost, we want to extend our appreciation to our dedicated research supervisor, Dr Lighton Phiri, whose expertise, patience and unwavering support guided us through every phase of this research. Your insightful feedback and mentorship was instrumental in shaping the project. We also wish to thank the staff of the University of Zambia for creating an environment conducive to learning and research. Your commitment to academic excellence has been a constant source of inspiration.

To our classmates and fellow researchers we are grateful for the help you rendered by engaging in discussions that contributed to the development of our ideas. We extend our gratitude to our families for their support, love, and understanding during this research endeavor. Your encouragement provided us with the motivation to persevere. Last but not least, we want to thank all participants who willingly shared their time and insights, making this research possible. This report would not have been achievable without the collective support and encouragement of these individuals. We are sincerely grateful for their contributions to the successful completion of this project.

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## **List of Acronyms and Abbreviations**

<b>Abbreviation</b>	<b>Description</b>
API	Application Programming Interface
CORS	Cross-Origin Resource Sharing
IMI	Intrinsic Motivation Inventory
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
IP	Internet Protocol
PIL	Pillow
SDK	System Development Kit
UGT	Uses and Gratification Theory
URL	Uniform Resource Locator
UNZA	University of Zambia

## **1. Introduction**

The world of information sharing and cooperation has undergone remarkable change in the digital age. Wikipedia, a beacon of open knowledge, relies on the efforts of numerous volunteers from all over the world. Maintaining and improving user engagement, motivation, and content creation on these platforms, on the other hand, is a constant issue. As a potential answer to this difficulty, the concept of merging social media technologies with collaborative knowledge platforms has evolved.

The purpose of this research is to investigate and offer an in-depth analysis of “WikiMotivate,” a facebook plugin designed to encourage zambians to create and contribute material to wikipedia.

Wikipedia, with its massive collection of information, shows the power of collaborative content creation. However, wikipedia editors frequently struggle to maintain their drive and productivity. Burnout, a drop in editor numbers, and difficulties finding and retaining new writers are among the challenges.

WikiMotivate joins the setting as a unique approach in light of these difficulties. WikiMotivate intends to urge wikipedia editors to participate more actively, produce valuable information, and remain committed to the platform's objective of making knowledge freely accessible to all by leveraging facebook's expensive and engaging platform.

The main aim of this paper is to thoroughly investigate the impact and effectiveness of WikiMotivate on wikipedia editors and the content creation process as a whole. We specifically intend to:

- Assess the extent to which WikiMotivate encourages zambian wikipedia editors to become more active in content production and contributions.
- Analyze important engagement indicators such as the number of revisions and article creation among WikiMotivate users.
- Collect and evaluate quantitative comments from wikipedia editors who have used WikiMotivate to gain a better understanding of their experiences, obstacles and the influence of the plugin on their motivation.

### **1.1. MAIN OBJECTIVE**

To increase the number of *Zambians* who contribute to and create content on Wikipedia about *Zambia*.

#### *1.1.1. SPECIFIC OBJECTIVES*

1. To quantify Wikipedia content creation and contribution about *Zambia* by *Zambians*.

2. To determine the levels of awareness and willingness to create and contribute content on Wikipedia
3. To design and implement a software that will use a leaderboard to motivate and increase content creation and contribution on Wikipedia.

## **1.2. RESEARCH QUESTIONS**

1. What can be used to quantify Wikipedia content creation and contribution about Zambia by Zambians?
2. What can be used to determine the levels of awareness and willingness to create and contribute content on Wikipedia?
3. How does the presence of a leaderboard in a software application impact user motivation and engagement in creating and contributing content on Wikipedia?

Following this introductory section, the following sections will dive into the related works (see chapter 2), the methodology used for the study (see chapter 3), discuss the implications of the results (see chapter 4), and conclude with a comprehensive summary(see chapter 5) and finally, the appendix (see chapter 6).

## **2. Related Work**

### **2.1. Exploring Motivational Theories in Wikipedia Content Contribution: A Focus on Uses and Gratification Theory and Intrinsic Motivation Inventory.**

The creation and upkeep of Wikipedia, one of the biggest and most well-known online encyclopedias, depends on the volunteer contributions of a wide range of editors. An important topic of research is discovering what inspires people to add content to Wikipedia. To shed light on the intricate dynamics of Wikipedia content creation, we explore the theories of motivation in this topic area, in particular the Uses and Gratification Theory and the Intrinsic Motivation Inventory. Uses and Gratification Theory (UGT) is an approach to understanding why and how people actively seek out specific media to satisfy specific needs [15]. According to UGT, people deliberately choose the media and material that will best meet their unique wants and desires. It highlights that when it comes to their media consumption decisions, users are active agents rather than passive recipients. This idea, when applied to Wikipedia content contributors, contends that editors' motivation to contribute stems from the variety of rewards they receive from taking part. Information gratification, social interaction gratification, self-expression

gratification, and entertainment gratification are important components of Uses and Gratification theory that are applicable to contributions on Wikipedia. By accumulating and disseminating information, contributors to information gratification look for satisfaction. By researching and contributing to interesting topics, they can satisfy their need for knowledge on Wikipedia. With Social Interaction Gratification, Wikipedia provides a platform for editors to interact with like-minded people, share ideas, work together, and foster a feeling of community inside the Wikipedia ecosystem. Certain Wikipedia editors find self-expression gratification by utilizing the platform to showcase their expertise and actively engage in discussions about subjects they are passionate about. Simultaneously, editing Wikipedia can offer entertainment gratification, serving as an enjoyable and intellectually stimulating activity that provides both mental engagement and a source of entertainment. According to [7], Intrinsic Motivation Inventory (IMI) is a multidimensional measurement grounded on the self-determination theory used in assessing the subjective experiences of participants when developing an activity. Intrinsic motivation, as used in the context of contributing to Wikipedia, refers to the internal drive and enjoyment generated by editing as opposed to rewards or acknowledgment from others. Enjoyment, Perceived Competence, and Autonomy constitute significant IMI aspects that are relevant to Wikipedia editors. Wikipedia editing is intrinsically engaging and rewarding for contributors who are intrinsically driven. They are content with the process itself, independent of outside influences. Wikipedia editors may be motivated by a desire to appear knowledgeable and capable of handling their editing tasks. This sensation of accomplishment can serve as an effective motivator. The open and collaborative structure of Wikipedia gives editors a great deal of freedom in deciding what to change and how to contribute. Because editors can follow their interests and passions, this autonomy can promote intrinsic drive. Relatedness: Belonging to the Wikipedia community and making a meaningful contribution to a broader group effort can be major sources of intrinsic motivation.

## **2.2. Measuring Impact and Engagement of Content Contributions.**

Quantitative Analysis of Wikipedia:

- [8], [11] both conducted studies focusing on quantitative analysis of Wikipedia, aiming to measure various aspects of the platform and gain insights into its collaborative nature.
- These studies utilized large datasets of user-contributed data from Wikipedia, including article edits and revisions.
- They employed various quantitative metrics to measure engagement and impact within the Wikipedia community, analyzing factors such as the number of edits, revisions per page, and user distribution to uncover patterns of contribution and participation.

### *2.2.1. A Comparative Quantitative Analysis*

- [11] study extended the methodology used by [8] to precisely identify the fraction of authors responsible for most changes in Wikipedia articles and how their behavior evolved over time.
- They found that the analysis of sysops is not a good method for estimating different levels of contributions, since it is dependent on the policy for electing them (which changes over time and for each language).

- Moreover, they found new activity patterns by categorizing authors based on their contributions during specific time periods, rather than using their total contributions throughout Wikipedia's history.

### 2.2.2. *Measuring User Participation Across Online Communication Platforms*

- [9], explored the measurement of user participation across various online communication platforms and investigated the factors influencing participation levels.
- Their study employed a mixed methods approach, combining quantitative and qualitative case studies.
- Through quantitative analysis, the authors measured user activity and contribution patterns, including metrics like the number of users, contribution frequency, and volume.
- Additionally, they analyzed temporal patterns of participation to understand fluctuations in activity over time.

## 2.3. **Understanding Factors Influencing User Engagement And Participation On Wikipedia**

Understanding the Contributors: A Comparative Analysis of Motivations:

- [14] conducted a study exploring the motivations behind user contributions to Wikipedia compared to traditional knowledge sharing websites.
- The researchers employed a comparative analysis approach, collecting data from participants who contributed to both Wikipedia and other knowledge sharing websites.
- An online survey instrument was used to gather responses on demographic information, motivations for contributing, perceived benefits, and perceived barriers to participation.

## 2.4. **Gamification Strategies For Enhancing User Engagement And Contribution On Wikipedia**

- Gamification in Wikipedia: A Study on Incentives and User Motivation:
- [3] focused on the implementation of gamification elements within the Wikipedia platform.
- Their research utilized a mixed methods approach, combining quantitative data analysis with qualitative insights from interviews.
- A survey was used to collect data from Wikipedia editors, exploring gamification elements, motivation factors, and the perceived impact of gamification on user behavior.

Gamifying Content Creation in Wikipedia:

- This study proposes a gamification framework introducing badges and reputation systems to motivate users to create and contribute high-quality content within Wikipedia.
- The research evaluated the effectiveness of gamification elements in increasing user engagement and participation, providing insights into the impact of gamification on content creation and user contribution dynamics [2] .

## **2.5. Designing And Implementing Gamified Systems For Motivating Content Creation And Contribution On Wikipedia.**

Crowdsourcing User Studies with Mechanical Turk:

- This study focuses on crowdsourcing techniques, specifically utilizing Amazon Mechanical Turk, to engage users in content creation and contribution tasks.
- It examines the effectiveness of crowdsourcing platforms as a gamified approach to motivate user engagement and participation [4].

Strava/Running, Cycling & Hiking Application:

Strava is an American internet service for tracking physical exercise which incorporates social network features. Strava records data for a user's activities, which can then be shared with the user's followers or shared publicly. If an activity is shared publicly, Strava automatically groups activities that occur at the same time and place (such as taking part in a marathons sportive or group ride). An activity's recorded information may include a route summary, elevation (net and unidirectional), speed (average, minimum, maximum), timing (total and moving time), power and heart rate. Activities can be recorded using the mobile app or from devices manufactured by third parties like Garmin, Google fit, Suunto, and Wahoo. Activities can also be entered manually via the Strava website.

Tools and Features

- Strava maintains a system of leaderboards that show the most frequent runners or riders on a segment as well as the fastest times by activity [5] .

## **3. Methodology**

### **3.1. Research Approach**

Research approaches consist of strategies and methods for research that extend the decisions from general assumptions to through methods of data gathering and reasoning. There are three types of research approaches, which are quantitative, qualitative and mixed method approaches that afford specific direction for procedures in a research study [1]. This research study employed a mixed method approach. The mixed methods approach blends qualitative and quantitative research methods to provide a more comprehensive understanding of a research study. It entails gathering and analyzing both numerical and non-numerical data in order to get insights from various angles and triangulate results to confirm conclusions [12].

## **3.2. Research Design**

### *3.2.1. Quantifying Wikipedia content creation and contribution about Zambia by Zambians*

This objective sought to quantify the extent of content creation and contribution related to Zambia on Wikipedia, specifically focusing on contributions made by individuals who are Zambian.

#### **Target population**

The focus of this objective was directed toward the target population comprising all Wikipedia editors actively contributing to the pages specifically related to Zambia. Therefore, the target population includes all wikipedia editors editing to the Zambia-related pages.

#### **Sampling method**

Purposive sampling involves selecting respondents based on their possession of desired information. Therefore, it was utilized to intentionally sample pages with similar characteristics, in this scenario, pages on and about Zambia.

#### **Data collection**

The main source of information used to measure Zambians' engagement was Wikipedia Zambia-related articles. The history view page of the quantified pages served as the measurement instrument. Therefore, data of both user account editors as well non-user editors was collected from the history view page of the pages quantified.

#### **Procedure**

The data collection process involved retrieving IP addresses from editors without user accounts, identified as IP accounts, through the Wikipedia view history of pages relevant to Zambia. These IP addresses were used to determine the origin of the editors in order to assess the level of engagement. For editors with user accounts, the procedure involved a manual retrieval of their origin information by checking their biography on Wikipedia. In cases where editors did not provide origin details in their biography, an extensive approach was employed. This included cross-referencing information on other social media platforms associated with the editors to ascertain their geographic origin.

### *3.2.2 Determining the level of awareness and willingness to create and contribute content on Wikipedia*

The goal of assessing the level of awareness and willingness was to measure the level of awareness and willingness among individuals from Zambia to participate in content creation and contribution on and about Zambia-related articles on Wikipedia .

#### **Target population**

The University of Zambia (UNZA) students and informed Zambian employees were the target population for assessing the level of awareness and willingness to create and contribute content on Wikipedia about Zambia.

#### **Sampling Method**

Purposive sampling and voluntary sampling are the two sampling methods utilized in this research study. Purposive sampling involves selecting respondents based on their possession of desired information such as knowledge, expertise and availability while, voluntary sampling is a non-probability technique where participants self-select themselves based on their willingness to engage. In our research study, we utilized purposive sampling by selecting UNZA students and employees from Zambia, taking into account their expertise, knowledge, interest, and enthusiasm. On the other hand, voluntary sampling involved individuals independently opting to participate based on their availability and willingness.

### **Sample size**

[16] defines a sample as a group or subset of the total populations selected for observation and analysis. Our target population consists of UNZA students with a population of 21 000 and 3 600 000 informed Zambian employees. Consequently, we determined the sample sizes using Slovin's formula:  $n = N / (1 + N * e)$  [10].

where n represents the sample size,

N = the total population,

e = the margin of error.

Student sample size was calculated as follows:

$$n = 21000 / (1 + 21000 * (0.05)^2)$$

$$n = 21000 / 53.5$$

$$n = 392.523364$$

$$n = 393$$

Therefore, the sample size of the UNZA students was 393.

Zambia employees sample size calculated as follows;

$$n = 3\ 600\ 000 - 21\ 000 / (1 + 3\ 600\ 000 - 21\ 000 * (0.05)^2)$$

$$n = 3\ 600\ 000 - 21\ 000 / 8\ 948.5$$

$$n = 3\ 579\ 000 / 8\ 948.5$$

$$n = 399.9553$$

$$n = 400$$

Therefore, the sample size of the employees was 400

### **Data collection**

Data was collected using the questionnaires which were launched to both the UNZA students and employees respectively. The questionnaire included questions assessing the level of awareness and willingness to participate in Wikipedia content creation and contribution. Additionally, an open-ended question was also included, allowing participants to make specific suggestions for improvement such as their thoughts, previous experiences, and worries.



## **Pilot study**

Prior to the main study, a pilot study was carried out to assess the questionnaire's validity, detect ambiguities, gauge sensitivity, and refine the wording of the questions. Specifically, the student questionnaire was distributed to 20 students, with seven responding, while the employee questionnaire was sent to 20 employees, and 12 provided responses

## **Procedure**

The data collection procedure of the main study involved several key steps. First, the online questionnaires were designed using Google Forms, with careful consideration given to question types, logical flow, and aesthetics. Upon accessing the questionnaire, participants were introduced to the survey's purpose and assured of their data's confidentiality and will be used for academic purposes only. After providing demographic information, respondents proceeded to answer likert scale-based questions and open-ended queries.

### *3.2.3 WikiMotivate Design and Implementation*

#### *Software Development Methodology*

Waterfall model was the software process model that was used in the design and implementation of the software and these are the steps that were involved.

#### *Requirements Analysis:*

- The goal was to create a comprehensive and detailed set of requirements that was supposed to guide the rest of the development process. The requirements were clearly defined and included needs and expectations of the users

#### *System Design:*

- Design of the architecture and user interface of Wikimotivate was made based on the defined requirements. Creation of detailed plans for how users will interact with the system was designed. This involved creating a blueprint for the entire Wikimotivate system, including the structure of the database, the user interface, and the interactions between different components

#### *Implementation of the System*

- coding and implementation of the Wikimotivate software began based on the design specifications. Developers worked on creating the various components and features outlined in the design phase.

#### *Testing of the System:*

- Testing of the system was conducted to identify and fix any defects in Wikimotivate. This involved both individual component testing and broader system testing to ensure that the software functions as intended.

### *Deployment of the System:*

- The finalized version of Wikimotivate was deployed to a suitable environment on render.com , making it available for users to access and utilize.

### *Overview of the Design and Implementation*

WikiMotivate is a multifaceted web application developed primarily in Python using the Flask framework. Its core objective is to enhance engagement with contributors on Zambian Wikipedia pages. The project follows a systematic approach by utilizing the XTools API to retrieve data about top editors, dynamically creating visually appealing leaderboard images, and seamlessly sharing these images on the dedicated Wiki-Motivate Facebook page.

### *Dependencies and programming languages*

The project's foundation is laid upon the robustness of Python, a versatile programming language known for its readability and ease of integration. Flask, a micro web framework, is employed to structure and manage the web application. The Pillow library, a fork of the Python Imaging Library (PIL), facilitates image creation and manipulation. The Facebook SDK for Python provides an interface for interacting with the Facebook Graph API, while the 'requests' library simplifies HTTP requests, particularly for fetching data from the XTools API.

### *XTools API Integration*

Central to WikiMotivate's functionality is the integration with the XTools API. The ``get_top_editors`` function in the main.py script acts as the gateway to this external service. By sending an HTTP GET request to the XTools API endpoint specific to each Wikipedia page, the script retrieves data about the top editors. This data includes information such as usernames, edit counts, and other relevant metrics. The specific endpoint XTools API end point:  
``https://xtools.wmcloud.org/api/page/top_editors/en.wikipedia.org/{page_name}///5?nobots=true``  
``.`

### *Leaderboard Image Generation*

The ``create_leaderboard_image`` function showcases a meticulous process of dynamically generating visually appealing leaderboard images. Leveraging the fetched top editors' data, the function calculates layout dimensions to ensure optimal presentation. The Pillow library is then

utilized to create an image with a structured table, including usernames, edit counts, and ranks. This process ensures that each leaderboard is uniquely tailored to the specific Wikipedia page, enhancing the overall visual experience.

### *Facebook Graph API Integration*

The WikiMotivate project seamlessly integrates with the Facebook Graph API through the `'post_leaderboard_on_facebook'` function. This function constructs a message that encapsulates details about the leaderboard, such as ranks, usernames, and edit counts. Leveraging the Facebook Graph API, the script then posts this message along with the dynamically generated leaderboard image on the Wiki-Motivate Facebook page. This integration not only recognizes contributors but also shares their achievements within the broader community.

### *Web Application and User Interface:*

The Flask-based web application, defined in `app.py` (server side script), provides the backbone for user interaction. The `'/run-script'` route, triggered by a POST request, serves as the entry point for the `main.py` script. This initiates a comprehensive process, including fetching top editors, generating leaderboard images, and posting on Facebook. The HTML file (`index.html`) complements this functionality by offering a user-friendly interface with a button to initiate the WikiMotivate process. Real-time updates and messages from the server further enhance the user experience.

WikiMotivate emerges as a sophisticated and thoughtfully architected project that seamlessly combines various technologies to recognize and motivate Wikipedia contributors. Its intricate integration with external APIs, meticulous image generation process, and user-friendly web interface collectively contribute to its effectiveness. This detailed report provides an in-depth exploration of each component, offering a comprehensive understanding of WikiMotivate's inner workings.

### *Deployment of the software*

The deployed website on `render.com` seamlessly integrates both Python and JavaScript to create a dynamic web application. `Render.com` is chosen as the hosting platform, known for its user-friendly deployment process and support for multiple programming languages.

### *Deployment Environment*

The website's deployment environment is configured to accommodate both Python and Node.js, showcasing the flexibility of render.com. This allows developers to leverage the strengths of both languages in different aspects of their application.

### *Directory Structure*

Organizational clarity is maintained through a structured directory layout. The Python backend resides in a designated directory, often named 'backend' or 'server,' housing files like 'app.py' or 'server.py.' Simultaneously, the JavaScript frontend is organized separately, commonly in a 'frontend' or 'static' directory, containing files such as 'index.html' and 'main.js.'

### *Start Command for Python*

The Python backend is initiated using a specified start command in the render.com configuration. This command, such as 'python app.py' or 'Gunicorn -w 4 -b 0.0.0.0:\$PORT app:app,' launches the Python server, running the server-side logic powered by a web framework like Flask or Django.

### *Build Commands*

Build commands play a crucial role in preparing the deployment environment. For the Node.js frontend, typical build commands involve installing dependencies and bundling JavaScript files with commands like 'npm install' and 'npm run build.' Similarly, for the Python backend, the build command might include installing dependencies through 'pip install -r requirements.txt.'

### *Deployment Workflow*

The deployment process involves developers pushing code changes to the repository. Render.com, in turn, monitors the repository for changes, automatically triggering the deployment workflow upon detection. This workflow encompasses executing build commands, launching the Python server, and ensuring the website's accessibility.

#### *3.2.4. WikiMotivate Evaluation*

The main objective of the WikiMotivate evaluation was to measure the frequency and consistency of contributions by users, Assess the effectiveness of leaderboard and badge incentives and analyze their influence on user motivation and content creation.

Our target population was the University of Zambia students and we randomly selected to work with only 9 volunteer students. This is because Conducting evaluations with a larger number of participants may be resource-intensive in terms of time, personnel, and costs. Therefore, a

smaller sample might be more feasible and still yield valuable insights. Our sample size was 66.6% females and 33.3% males.

While interacting with the volunteers, we began by explaining the reason for the evaluation. Then we helped them create wikipedia accounts and handed them different amounts of data to contribute to wikipedia. After they contributed the data, we showed them their ranking on the leaderboard and then gave them the questionnaire to fill in. The questionnaire was designed as the measurement instrument which was used to elicit data about the most effective incentives for contributing to Wikipedia. Badges, leader-boards and a mix of both were available. Participants completed the questionnaire by indicating their preferences.

Our findings in Figure 26 shows that the volunteers were more motivated by both the leaderboard and badges.

### **3.3. Data Analysis**

According [6], data analysis is defined as the process used by researchers for reducing data to a story and interpreting it to derive insights. It is a complex action of moving back and forth between data and concepts, between descriptions and interpretations using both inductive and deductive reasoning. Although data analysis is often described as a complex task, it is a creative and fascinating process with the objective of uncovering valuable insights, drawing meaningful conclusions and aiding in decision making processes. This assertion is supported by who indicates that three things occur in data analysis including data being organized, reduced through summarization and categorization and themes and patterns in the data to be identified and linked.

#### *3.1. Quantifying Wikipedia content creation and contribution about Zambia by Zambians*

The number of Zambian contributors who contributed information about Zambia to Wikipedia was determined using the descriptive analysis. Descriptive statistics are numbers that summarize the data with the purpose of describing what occurred in the sample [13]. This made the numbers easier to summarize and understand. To determine the average number of contributions, we used data to compute the mean, mode, and median. To determine how widely the values differed, we also looked at the range, standard deviation, and variance. The contributor numbers were very dissimilar from one another if the range or standard deviation was large. So, the descriptive analysis offered us a clear picture of the number of active Zambian Wikipedia contributors. We made use of several calculations to comprehend the average and the degree of variation in the statistics, which improved our comprehension of the overall situation.

#### *3.2. Determining the level of awareness and willingness to create and contribute content on Wikipedia*

In addition, a complete knowledge of the participant feedback and responses was made possible by the quantitative and qualitative analysis of the information acquired through online questionnaires. Quantitative analysis was performed on the quantitative information gathered using questions with Likert scales. The ratings and impressions of participants were compiled using descriptive analysis including mean, median, and standard deviation. To find trends,

patterns, and discrepancies in the responses of various groups, including students and staff, comparative analysis was used. The objective of the quantitative analysis was to convey participants' attitudes and opinions in a clear numerical manner. Additionally, qualitative analysis was used to glean theme insights from open-ended responses. Concerns, comments, and ideas were identified after the responses were examined and coded.

### 3.3. WikiMotivate Design and Implementation

The software application continuously gathered data regarding the creation and contributions of content on Zambia by Wikipedia contributors. This data was analyzed using quantitative analysis in order to determine quantitative metrics, such as the frequency of contributions. These criteria were subsequently applied to gauge each Facebook user's contributions. Additionally, the information was presented graphically through rankings, making it easier to understand and see how contributors performed and how involved they were with Wikipedia on the Facebook platform.

## 4. Results and Discussions

### 4.1. Results for content creation and contribution concerning Zambia by Zambians.

Table 1: Quantified Wikipedia pages

Name of Pages	URLs
Zambia	<a href="https://en.wikipedia.org/wiki/Zambia">https://en.wikipedia.org/wiki/Zambia</a>
History of Zambia	<a href="https://en.wikipedia.org/wiki/History_of_Zambia">https://en.wikipedia.org/wiki/History_of_Zambia</a>
Victoria Falls	<a href="https://en.wikipedia.org/wiki/Victoria_Falls">https://en.wikipedia.org/wiki/Victoria_Falls</a>
Economy of Zambia	<a href="https://en.wikipedia.org/wiki/Economy_of_Zambia">https://en.wikipedia.org/wiki/Economy_of_Zambia</a>

As of 24th October, 2023, there are 6,733,541 articles in the English Wikipedia containing 4.3 billion words. This averages out to approximately 658 words per article, solidifying its status as the most extensive encyclopedia available. Within this vast repository, there are 244 articles specifically related to Zambia. Our primary objective was to quantify articles related to Zambia involving the identification of editors' origin entailed pinging the IP addresses of non registered editors. It is important to note that Wikipedia users can choose to either register and create accounts or edit articles without the need for registration or login, leading to their edits being associated with their Internet Protocol (IP) address. In our analysis, we considered contributions

from both registered and non-registered (IP address) contributors, while systematically excluding contributions made by bots, which are automated or semi-automated software tools. We included both the user account editors as well as the non user account editors in order to eliminate biases and ensure accurate findings. In an effort to precisely quantify the contributions and creations of Zambian content on wikipedia, a methodical strategy was used. The first step involved was the extraction of IP addresses from the article's view history. Subsequently, for the editors whose IP addresses were recorded as private, a thorough investigation was conducted to ascertain their original country of editing. To present this data in an accessible and visually informative manner, it was subjected to analysis using Google Sheets. The outcome of this analysis was presented through data visualization in the form of bar charts.

#### *4.1.1. Results for content creation and contribution for the Zambia article by IP account editors.*

During the period from July 21, 2002, to September 18,2023, the Wikipedia article on Zambia received contributions from editors worldwide, particularly those without Wikipedia user accounts. The United States led with 839 edits, indicating a significant level of engagement from contributors in that country. The United Kingdom followed with 302 edits, and Canada with 113 edits. Notably, Zambia itself had 82 edits, suggesting local interest in maintaining and updating the article. Other countries, including Australia, South Africa, and India, also made substantial contributions, with 80, 73, and 41 edits, respectively. This distribution highlights the global collaboration on Wikipedia content, showcasing diverse perspectives and knowledge-sharing on the topic of Zambia over the specified timeframe. The varying edit counts may indicate differing levels of interest, expertise, or involvement in the development of the Wikipedia entry among contributors from different countries. The visual representation of the collected data is depicted in figure 1 below.

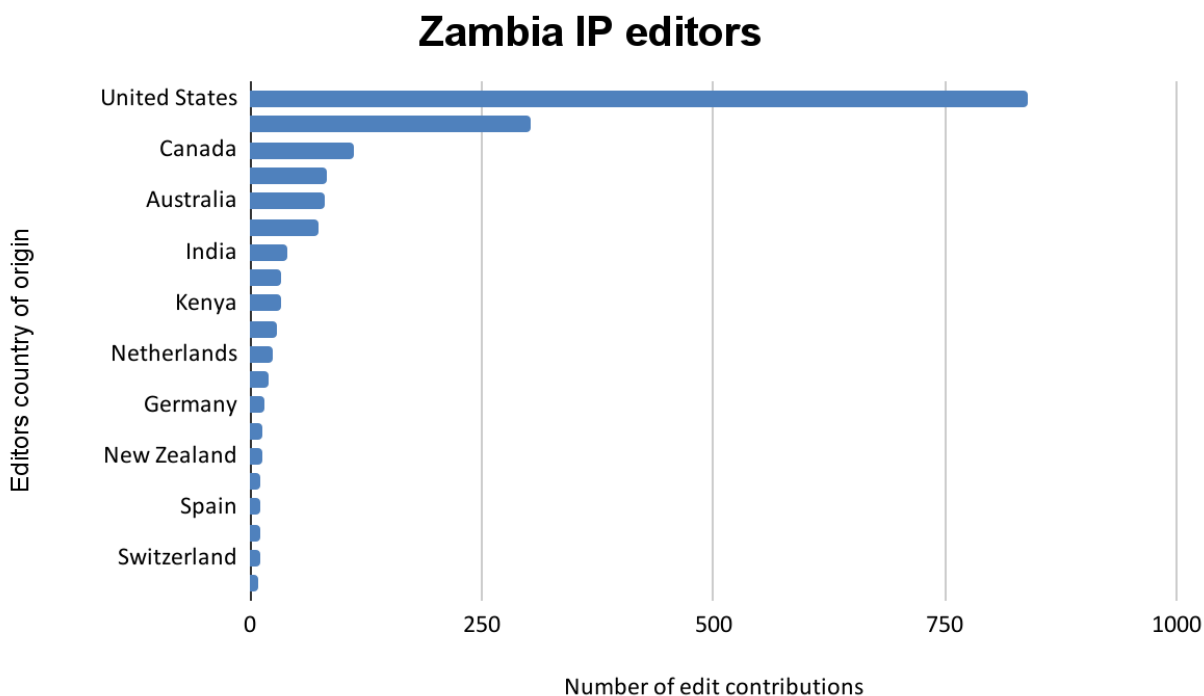


Figure 1: Level of contributions to the Zambia article from Ip account editors.

*4.1.2. Results for content creation and contribution for the History of Zambia article by IP account editors.*

Figure 2 illustrates the number of contributions made to the history of Zambia article, differentiating between contributions made by individuals from Zambia and those from other countries. This date spans from July 25, 2004 to August 12, 2023. The results show that a mere 6 editors from Zambia engaged with the history of Zambia article. The recovered IP addresses from the view history, all of which could be linked to the history of Zambia article, support this conclusion. The United States takes first place, with a startling 50 IP addresses participating in editing. Following closely behind the United Kingdom with 16 IP addresses, Finland with 8 IP addresses and South Africa with 8 IP addresses. Zambia ranks fifth in terms of editing with 6 IP addresses all traced to locations in Zambia.



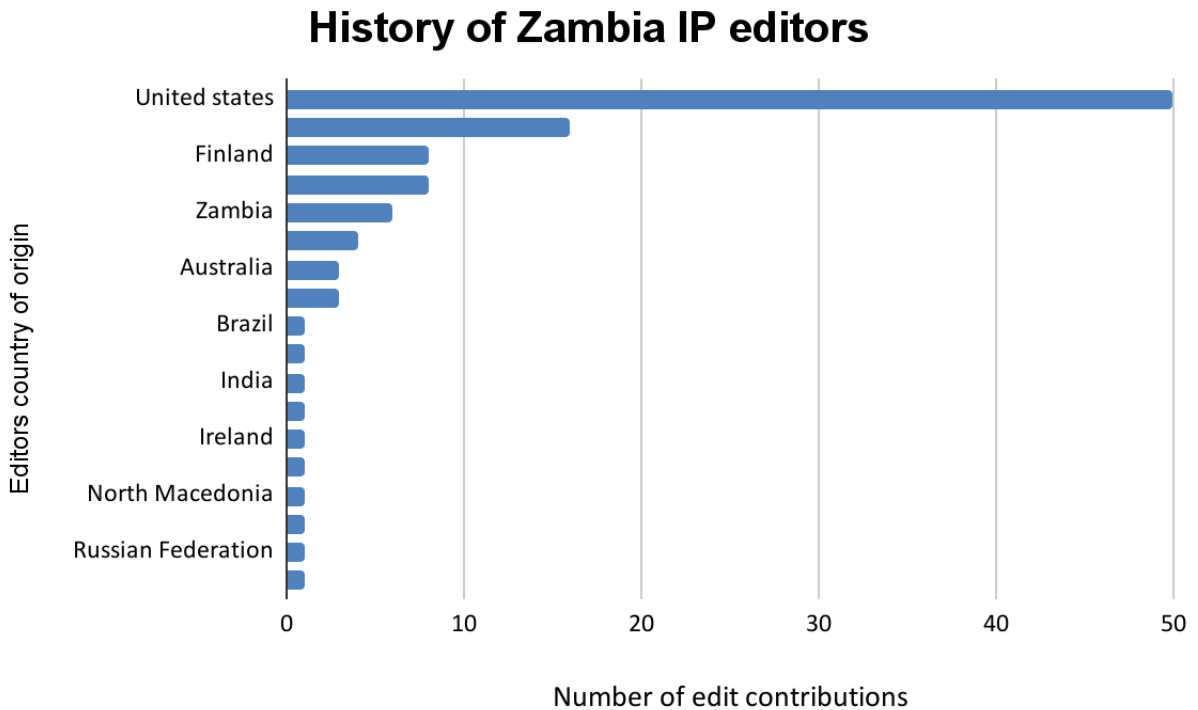


Figure 2: Level of contributions to the history of Zambia article from IP account editors.

#### 4.1.3. Results for content creation and contribution for the Victoria Falls article by ip account editors.

The Wikipedia article on Victoria Falls has seen substantial contributions from users without accounts, reflecting a widespread interest in the subject. The United States leads with a notable 653 contributions, followed by the United Kingdom with 293, and Australia with 118. Canada, South Africa, and India also made significant contributions with 87, 41, and 28 respectively. Contributions from countries such as New Zealand, Thailand, Kuwait, and Viet Nam, each with 17, 17, 15, and 14 contributions, showcase a global engagement in shaping and expanding the content on Victoria Falls. Additionally, the Netherlands, Germany, Norway, Spain, and Zambia each have contributed 13, 12, 12, 12, and 12 times, emphasizing a diverse international collaboration in documenting and sharing information about Victoria Falls on Wikipedia. Figure 3 below illustrates the contributions to the article.

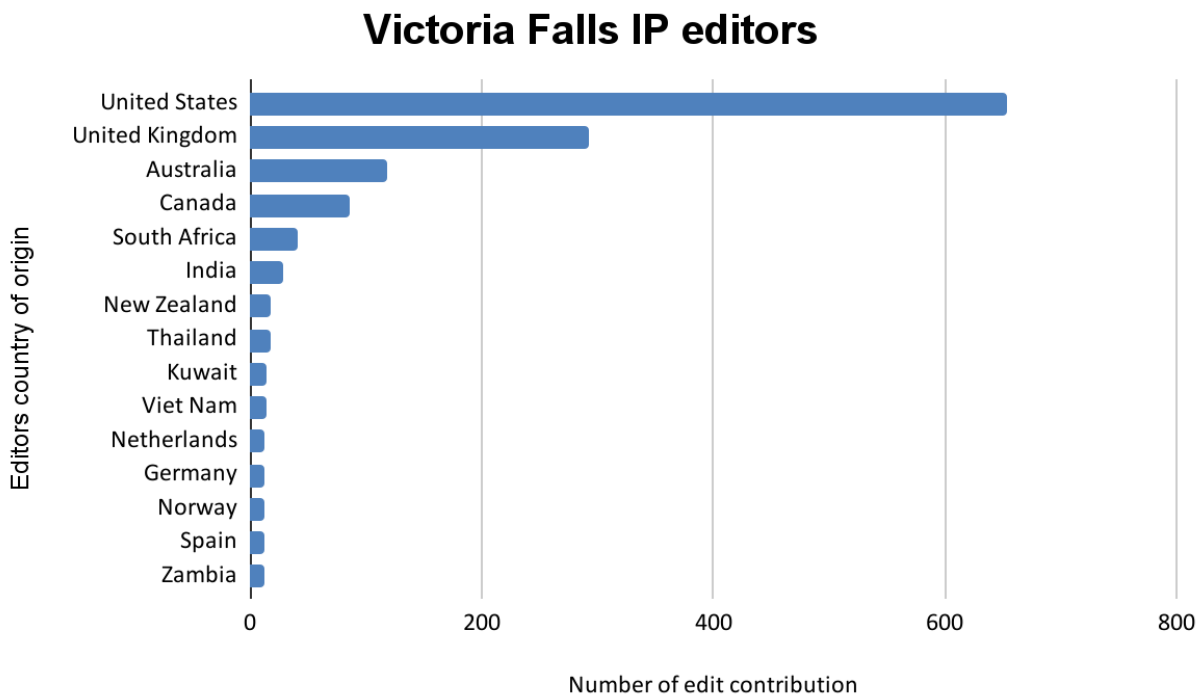


Figure 3: Level of contributions to the Victoria Falls article from Ip account editors

*4.1.4. Results for content creation and contribution for the Economy of Zambia article by IP account editors.*

Editors without user accounts have made significant contributions to the economy of Zambia through various edits on Wikipedia. While the majority of these contributors hail from countries such as the United States (45 edits), the United Kingdom (28 edits), and Australia (13 edits), it is noteworthy that Zambia itself has garnered attention with 8 edits. These editors, though a smaller representation in comparison to some other nations, have played a role in disseminating information and knowledge about Zambia's economic landscape. The global reach of contributions is evident with editors from diverse nations like Brazil, Canada, Algeria, South Africa, Argentina, China, France, Germany, Italy, and Japan collectively contributing 18 edits. This collaborative effort underscores the international nature of Wikipedia editing, where individuals from around the world actively engage in sharing and enhancing information related to Zambia's economy. Figure 4 below shows the visual representation of the Wikipedia non-user account edits.

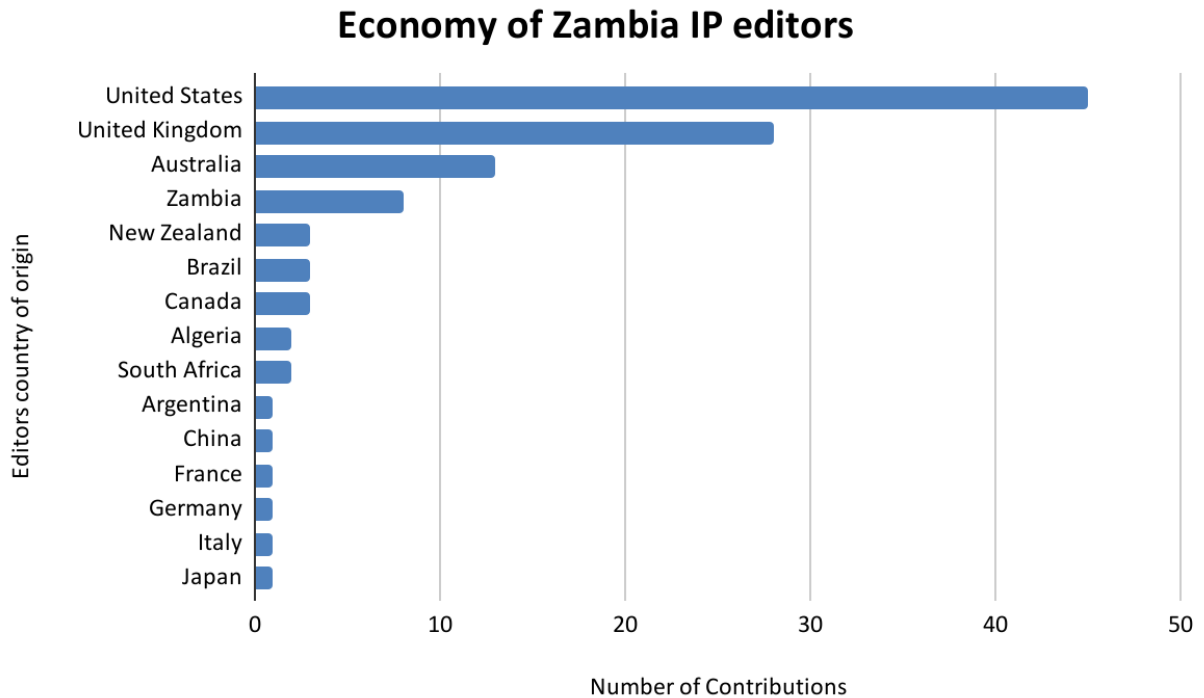


Figure 4: Level of contributions to the Economy of Zambia article from IP account user editors.

*4.1.5. Results for content creation and contribution for the Zambia article by user account editors.*

The distribution of Wikipedia account users contributing to the Zambia article reveals a diverse set of contributors from various countries. Zambia leads with 110 edits, followed by the United states with 88 edits, the United Kingdom with 84 edits, Ireland with 7 edits, Germany and India with 6 edits, Netherlands 4, Australia, Indonesia, Kenya, South Africa, Sweden with 3 edits respectively, Denmark, New Zealand, Italy, Puerto Rico, Scotland with 2 edits respectively and Botswana, Brazil, Canada, China, Ghana, Norway, Pakistan, Philippines, Poland, Romania, Russia, Singapore, Switzerland, Tanzania with one edit each. These edits span from the 17th of January 2016 to 16th November 2023. This diverse global participation reflects a collaborative effort in maintaining and expanding the information available on the Zambia article, incorporating perspectives from contributors around the world. However, quantifying the account users was not as reliable as quantifying the Ip addresses as people can be Zambians while editing data from another country. But with Ip accounts, it will extract the origin of the country where the edit was made from. The visual representation is illustrated in the figure 5 below.

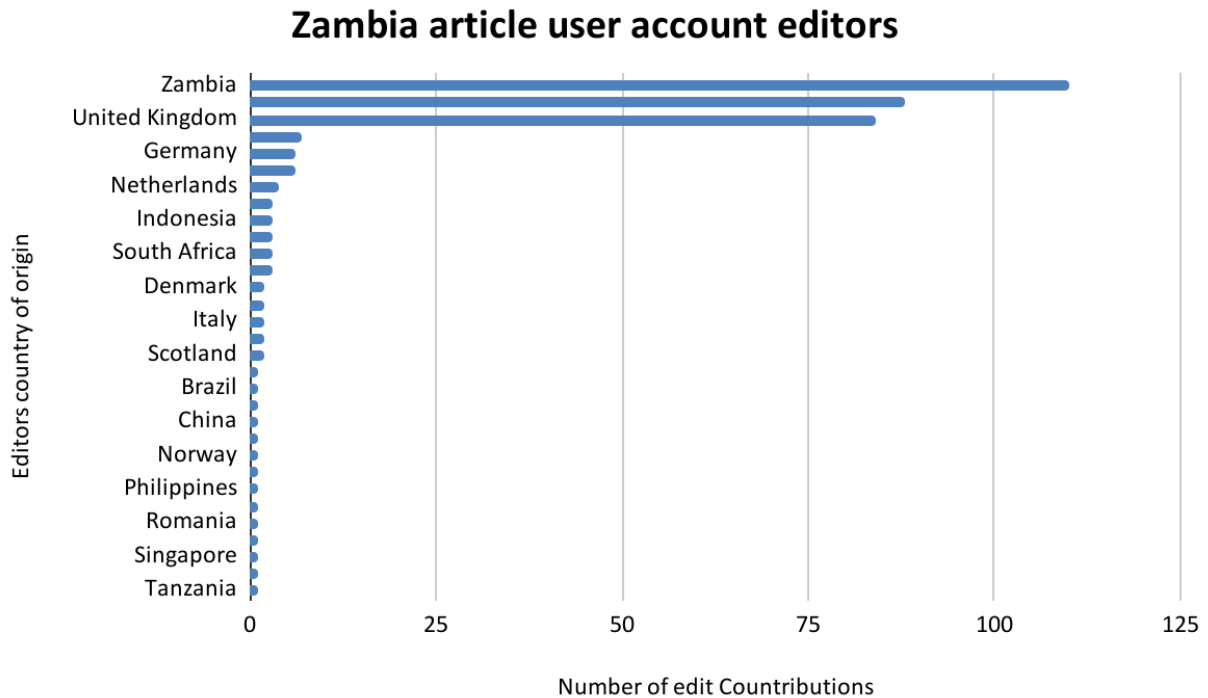


Figure 5: Level of contributions to the Zambia article from user account editors.

*4.1.6. Results for content creation and contribution for the History of Zambia article by user account editors.*

Figure 6 below indicates the number of contributions made to the history of Zambia article by editors with registered accounts across the world. Wikipedia account users from a range of countries have actively contributed to shaping the content on the history of Zambia article. Both the United Kingdom and the United States lead with 14 edit contributions each, emphasizing a collaborative effort from contributors in these nations. Additionally, Slovakia has made two contributions, while Canada, Germany, India, Nigeria, Portugal, Slovenia, South Africa, Sweden, and Zambia have each added valuable content with one contribution each. This diverse geographical representation underscores a global interest in and commitment to documenting and enhancing the historical information available on Zambia through Wikipedia. The collaborative nature of these contributions enriches the article by incorporating a variety of perspectives and insights from contributors worldwide.

## History of Zambia account user editors

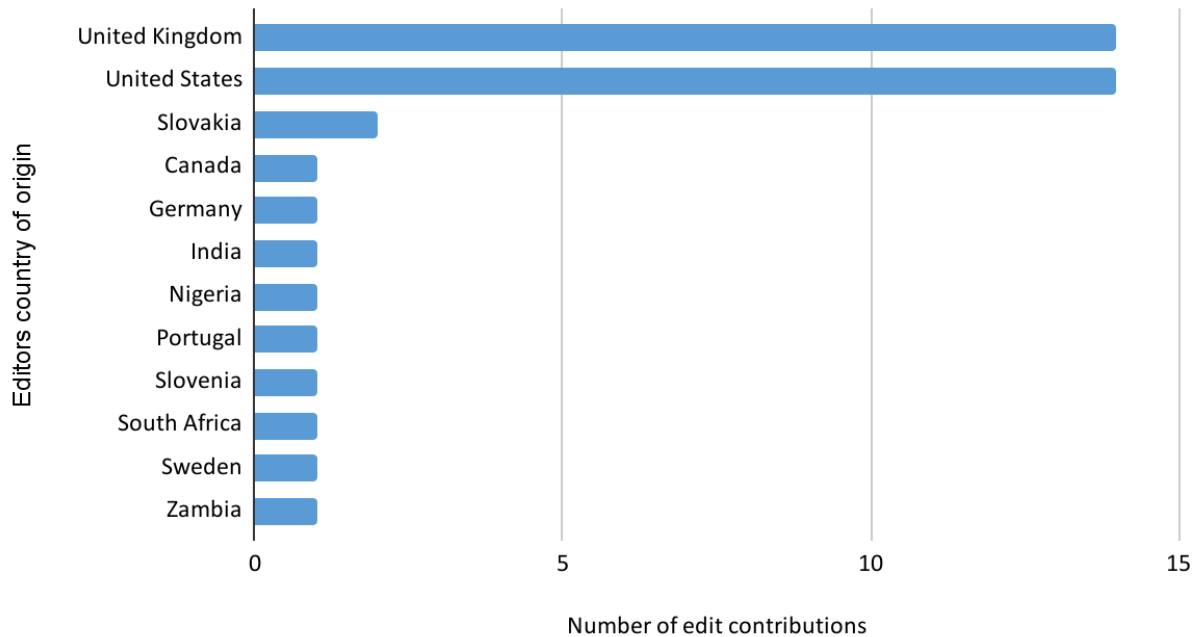


Figure 6: Level of contributions to the history of Zambia article from user account editors.

### *4.1.7. Results for content creation and contribution for the Victoria Falls article by user account editors.*

Figure 7 illustrates how Wikipedia account users from various countries actively contributed to shaping the content of the Victoria Falls article. The United States leads with nine contributions, followed by the United Kingdom with four, and Germany with three. Notably, Zambia has made two contributions, underscoring a local interest in enhancing the information about Victoria Falls. Additionally, Australia, Brazil, Canada, Greece, the Netherlands, Poland, South Africa, Vietnam, and Zimbabwe have each made one contribution, reflecting a diverse international collaboration in documenting and expanding the details surrounding Victoria Falls on Wikipedia. The engagement of users from different countries adds richness and depth to the article by incorporating a variety of perspectives and insights into this natural wonder.

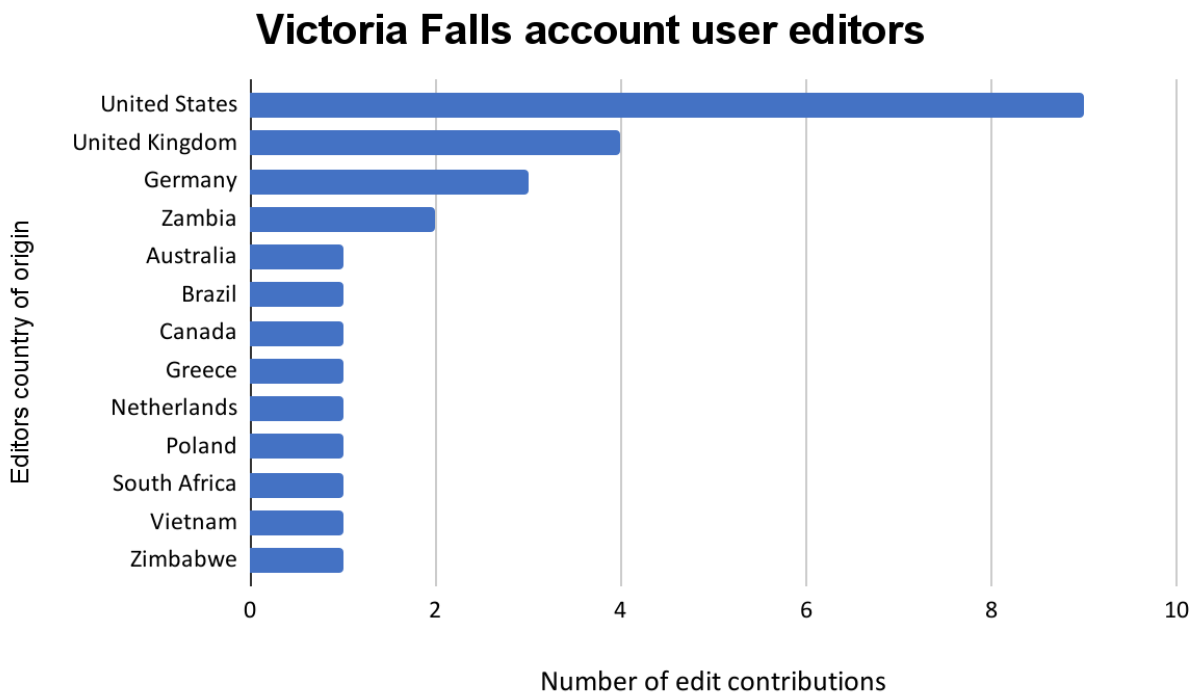


Figure 7: Level of contributions to the Victoria Falls article from user account editors.

*4.1.8. Results for content creation and contribution for the Economy of Zambia article by user account editors.*

Editors with Wikipedia user accounts have made noteworthy contributions to the depiction of Zambia's economy on Wikipedia. The majority of these contributors come from the United States, with 10 edits, followed by Canada and the United Kingdom, each with 7 edits. While other nations such as Brazil and Germany have made smaller but still valuable contributions with 2 edits each, Australia, Egypt, Norway, South Africa, Turkey, and Zambia itself have each seen a single edit. This data reflects a more focused but geographically diverse effort by editors with user accounts, emphasizing a global collaboration to enrich the information available on Zambia's economic landscape. The involvement of contributors from various countries underlines the international dimension of Wikipedia editing, showcasing a collective commitment to presenting a comprehensive view of Zambia's economy. The visual representation of edits made by user accounts on Wikipedia is depicted in Figure 8 below

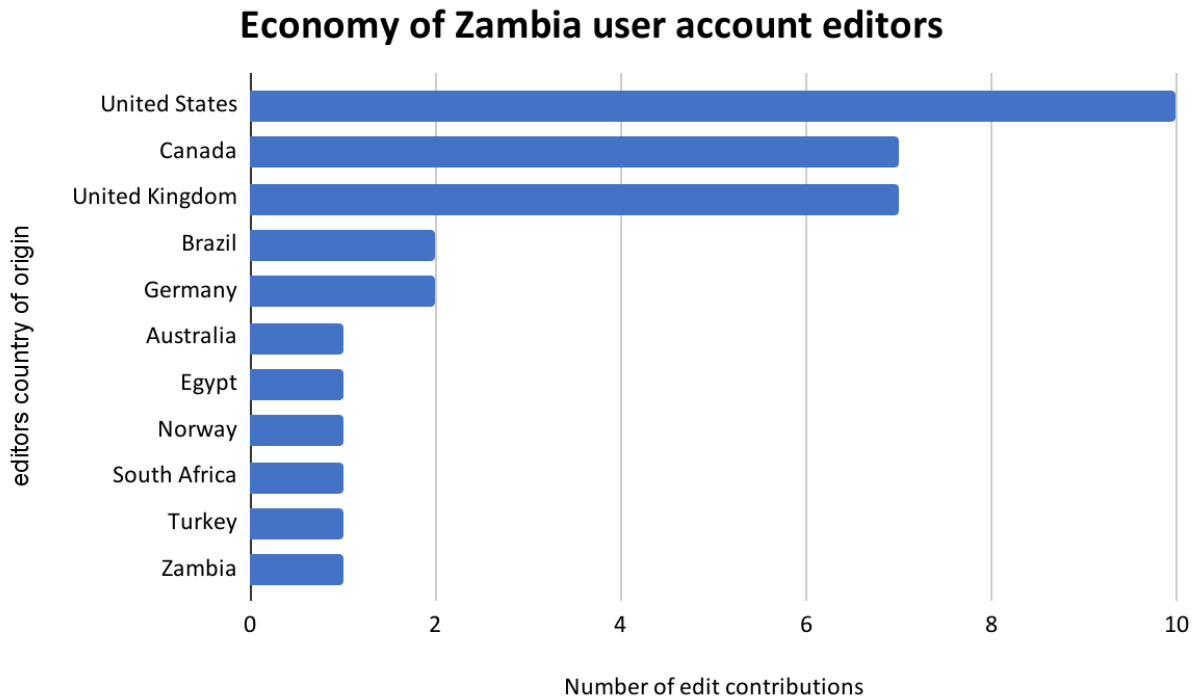


Figure 8: Level of contributions to the Economy of Zambia article from user account editors.

#### 4.1.9. Limitations

It is possible that the 4 articles we used in our research do not fairly represent all of the Wikipedia articles concerning Zambia. These articles were selected at random from a list of roughly 5000 keywords that came from the database, the databases that were devoted to Zambia and some important articles about Zambia. As a result, when selecting our sample size, there may have been significant Wikipedia articles that were overlooked.

Another limitation of the study is the challenge in determining the origin of the registered wikipedia editors who have not provided their location information. Despite our proactive outreach via email to encourage the editors who have not provided their location to voluntarily share their country of origin, the response rate was lower than anticipated. This limitation introduces the possibility that some editors were not included in the study due to the difficulty in ascertaining their origin, potentially leading to an incomplete representation of contributor demographics.

#### 4.2 Determining the level of awareness and willingness to create and contribute content on Wikipedia.

This chapter of the report presents the results of two questionnaires that were used to collect data on the awareness and willingness of Zambian employees and students from UNZA regarding

content creation and contribution on Wikipedia about topics related to Zambia. The first section of this chapter reports the data collected from the employees questionnaire, while the second section reports data collected from the students questionnaire.

#### 4.2.1 Results of Employees' Questionnaire

The employees questionnaire was used to collect data with the purpose of analyzing Zambian employee's level of awareness and willingness to contribute and create content on wikipedia. The goal of distributing this questionnaire to 400 employees around the country was done so using whatsapp, facebook and email. There were only 60 participants, hence the responses were scarce. Among these participants, 21 were female employees and 39 were male employees with the mean age of 31.725. In terms of educational qualifications, 1 had a junior secondary education qualification, 10 had senior secondary education qualification and 49 had a tertiary education qualification. Regarding their departments, 9 worked in the construction and engineering department, 9 in healthcare and medical services, 6 in education and teaching, 5 in software development and technology, 4 in government and public administration, 4 in media and journalism, 4 in nonprofit and social services, 3 in financial services and banking, 2 in agriculture and farming, 1 in legal service and law, 1 in mining and extraction, 1 in retail and sales, 1 in tourism and hospitality, 1 in transport and logistics then 8 of them were in other departments. Concerning the geographical location among the 60 respondents, 31 were from Lusaka province, 11 from Luapula province, 5 from Copperbelt province, 4 from Southern province, 3 from Central province, 2 from Muchinga province, 1 from Eastern province, 1 from Northern province, 1 from North-Western province, 1 from Western province. To visually present and analyze the findings from the concerning employees' awareness and willingness, bar charts were utilized as a graphical representation tool.

Table 2: Employees Participants' demographic information

<b>Participants characteristics (N=60)</b>	
Variable	n(%)
<b>Gender</b>	
Male	39(65)
Female	21(35)
<b>Age(band)</b>	
17 or less than	1(1.67)
18-20	4(6.67)
21-29	30(50)
30-39	13(21.67)



40-45	5(8.33)
50-59	4(6.67)
60 or older	3(5)
<b>Highest level of education</b>	
Primary education	0(0)
Junior secondary education	1(1.67)
Senior secondary education	10(16.67)
Tertiary education	49(81.67)
<b>Field of profession</b>	
Agriculture and farming	2(3.33)
Construction and engineering	9(15)
Education and teaching	6(10)
Financial services and banking	3(5)
Government and public administration	4(6.67)
Healthcare and medical services	9(15)
Legal services and law	2(3.33)
Manufacturing and industry	0(0)
Media and journalism	4(6.67)
Mining and extraction	1(1.67)
Non-profit and social services	4(6.67)
Retail and sales	1(1.67)
Software development and technology	5(8.33)
Tourism and hospitality	1(1.67)
Transport and logistics	1(1.67)
Other	8(13.33)
<b>Geographical location</b>	

Central Province	3(5)
Copperbelt Province	5(8.33)
Eastern Province	1(1.67)
Luapula Province	11(18.33)
Lusaka Province	31(51.67)
Muchinga Province	2(3.33)
Northern Province	1(1.67)
North-Western Province	1(1.67)
Southern Province	4(6.67)
Western Province	1(1.67)
<b>Experience in Editing Wikipedia Content</b>	
No experience	30(50)
Basic experience	13(21.67)
Intermediate experience	6(10)
Advanced experience	6(10)
Extensive experience	5(8.33)

## Employees' level of awareness

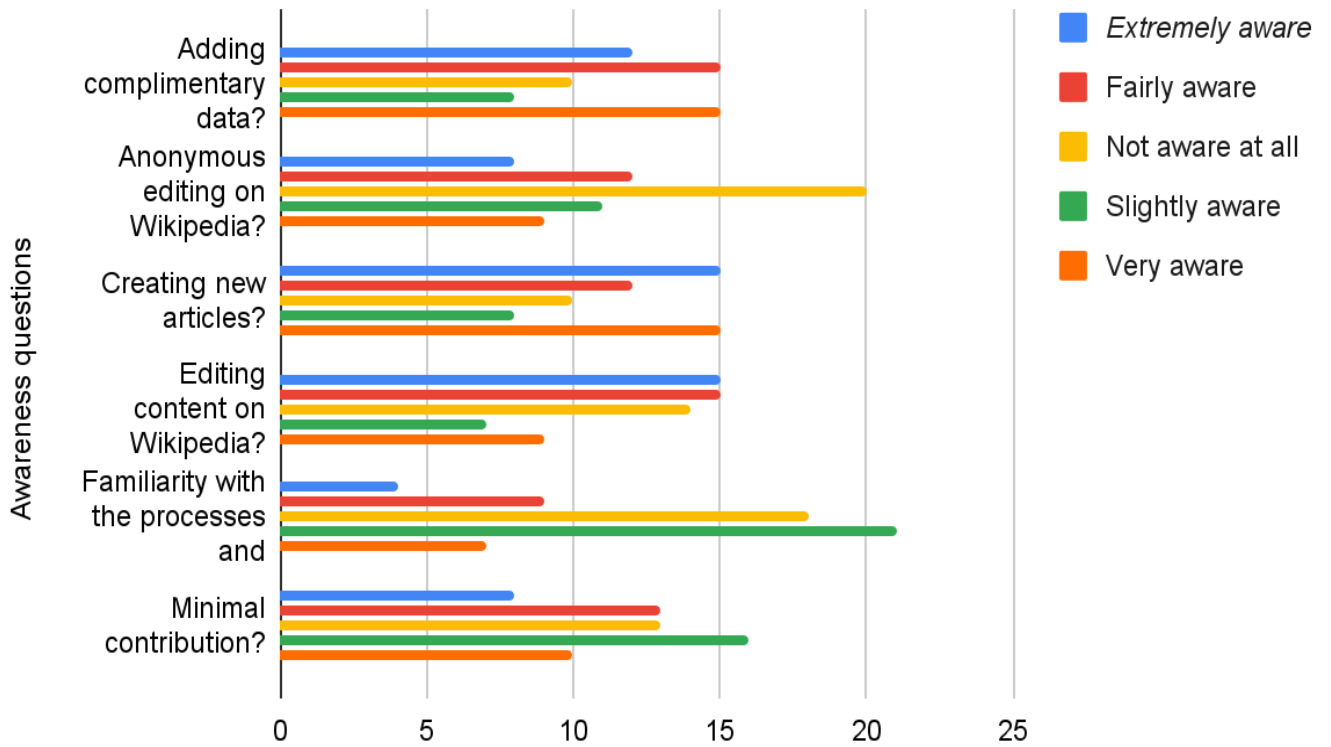


Figure 9: Employees' level of awareness concerning content creation and contribution on Wikipedia

## Employees' level of willingness if taught

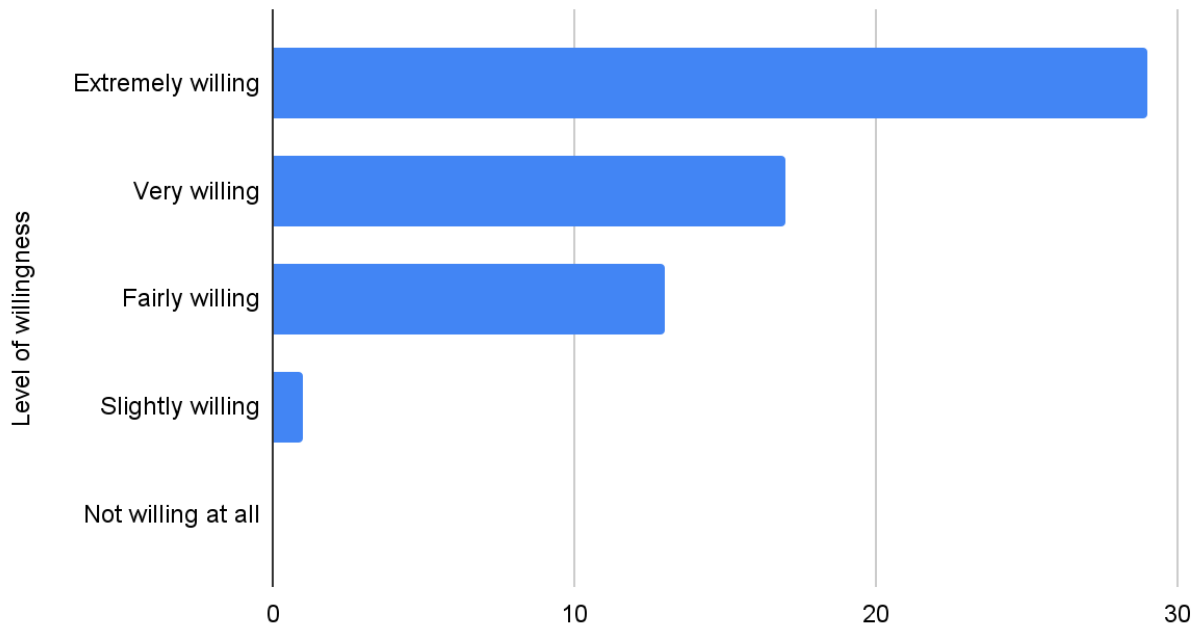


Figure 10: Employees' level of willingness to contribute content on Wikipedia if they were taught

## Level of motivation for different incentives

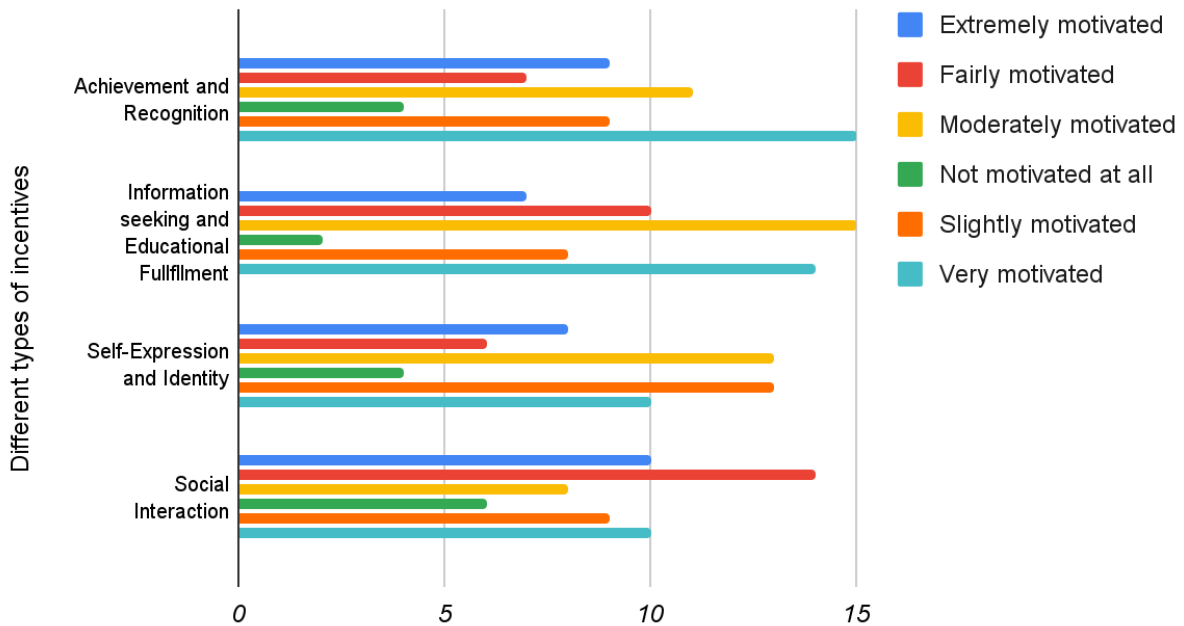


Figure 11: Employees' level of motivation for different incentives

### 4.2.2 Results of Students' Questionnaire

The students questionnaire was intended to be distributed to 394 UNZA students via Whatsapp and email. However, only 40 female students and 42 male students took part in the study, with an average age of 24.8625(range 18 -35 and above). There were 67 undergraduate students and 15 postgraduate students in terms of educational qualification. Furthermore, students from first year were 7, second year were 11, third year were 14, fourth year were 38, fifth year were 5, sixth year were 2 and 5 seventh year. Bar charts were used to interpret findings associated with students' awareness and willingness.

Table 3: Students Participants' demographic information

Participants characteristics (N=82)	
Variable	n(%)
<b>Gender</b>	
Male	42(51.22)
Female	40(48.78)

<b>Age(band)</b>	
18-24	51(62.2)
25-34	22(26.83)
35 and above	9(10.98)
<b>Level of education</b>	
Undergraduate	67(81.71)
Post graduate	15(18.29)
<b>Year of study</b>	
First	7(8.54)
Second	11(13.41)
Third	14(17.07)
Fourth	38(46.34)
Fifth	5(6.1)
Sixth	2(2.44)
Seventh	5(6.1)
<b>Experience in Editing Wikipedia Content</b>	
No experience	45(54.88)
Basic experience	14(17.07)
Intermediate experience	17(20.73)
Advanced experience	4(4.88)
Extensive experience	2(2.44)

## UNZA students level of awareness

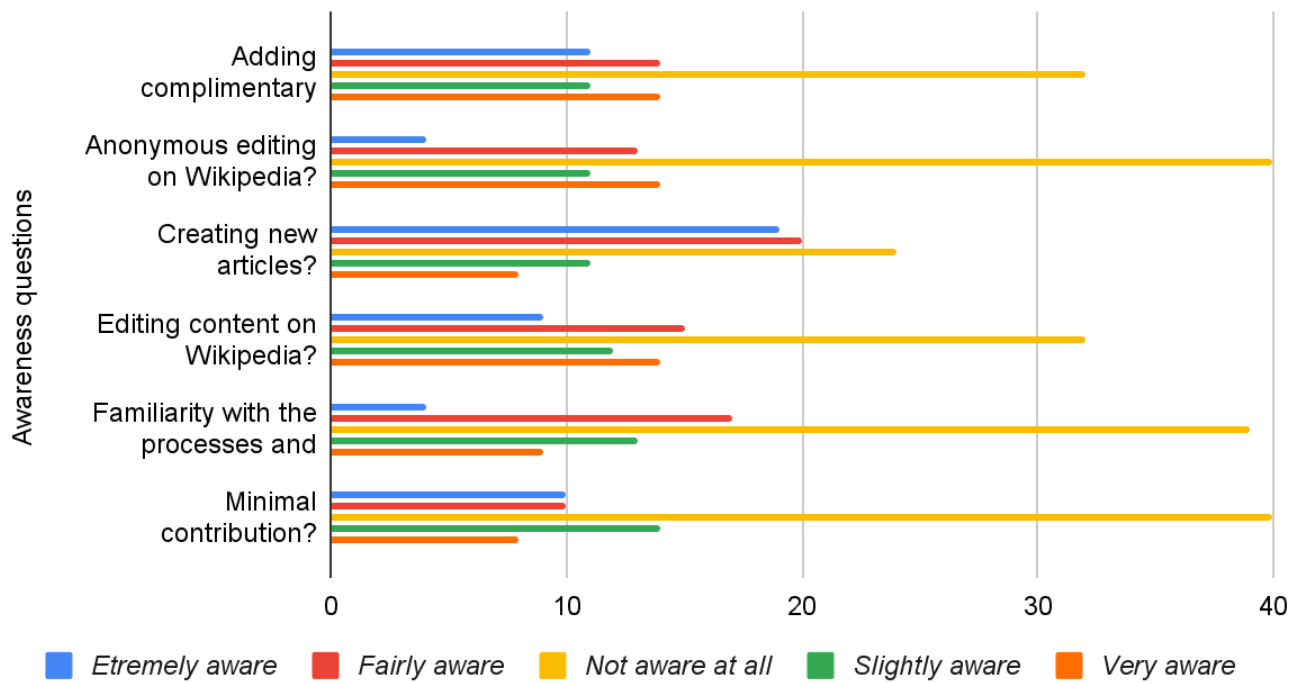


Figure 12: Students' level of awareness on Wikipedia

### Students' level of willingness to contribute if taught

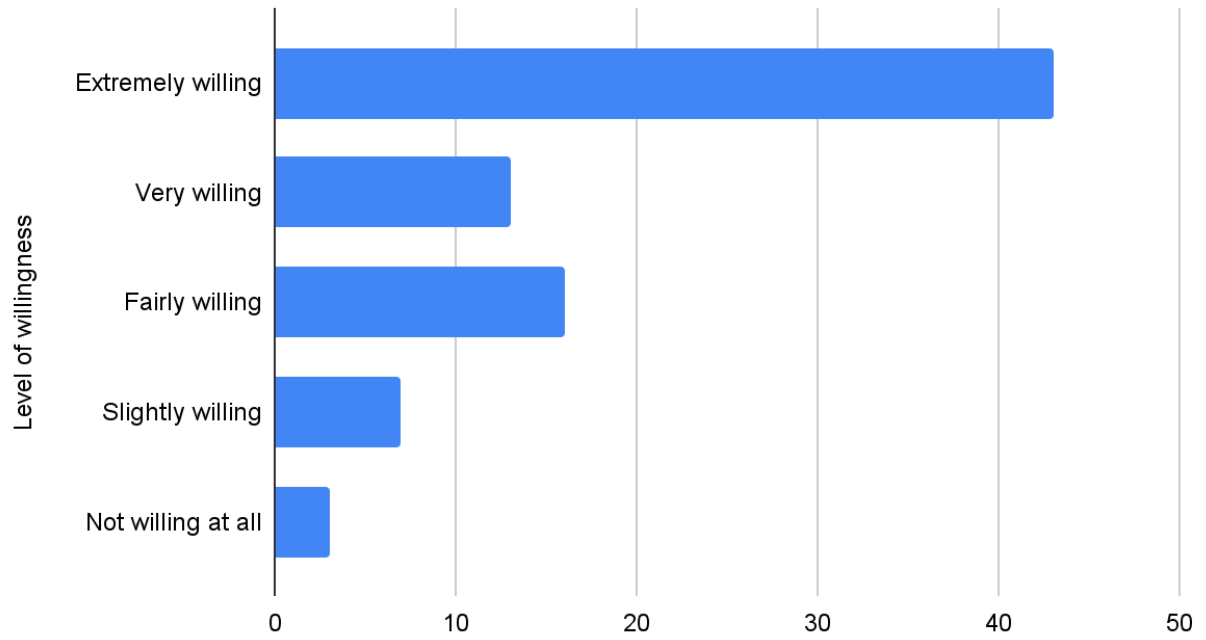


Figure 13: Students' level of willingness to contribute content on Wikipedia if they were taught



## Level of motivation for different incentives

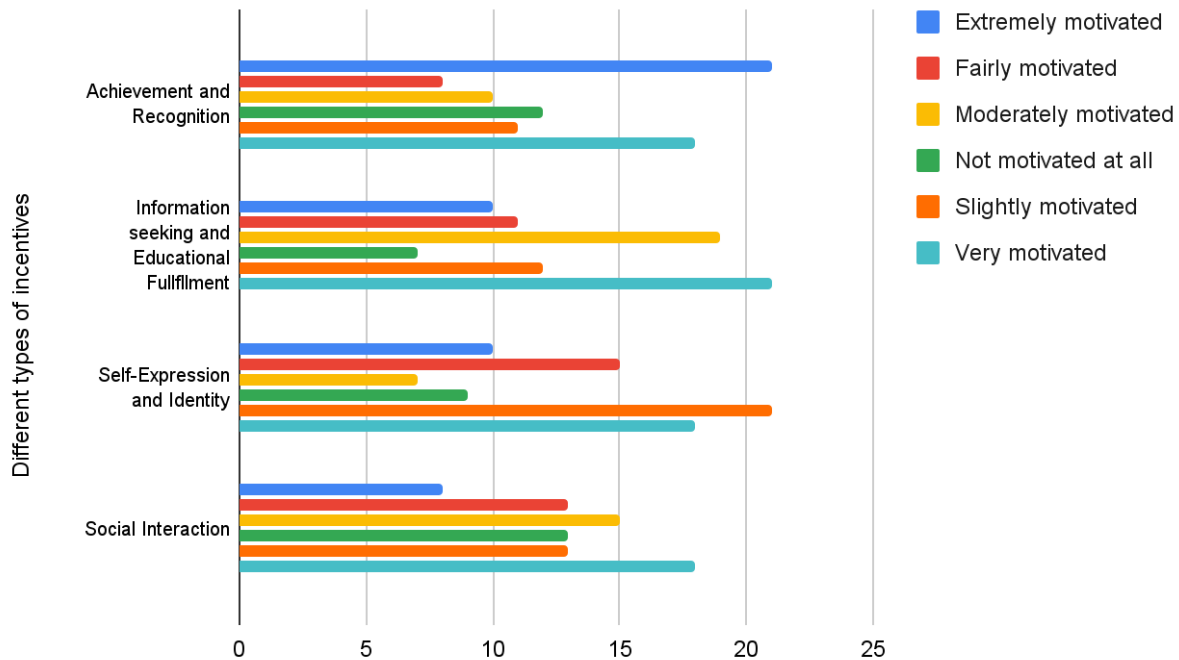


Figure 14: Students' level of motivation for different incentives

### 4.2.3 Limitations

The employees questionnaire had a target population of 400, whereas the students questionnaire had a target population of 394. Nonetheless, due to limitations, only 60 responses from the employees questionnaire and 80 responses from the students questionnaire were acquired, reducing the statistical power of the study and introducing biases that may affect the representativeness of the sample. These constraints can be attributed to time constraints in part. The time frame the researchers had to collect the appropriate responses was insufficient to achieve the anticipated participation rates.

Respondents' desire and willingness to participate may have been influenced by the lack of acknowledgement or enough incentives. This constraint had an impact on the quality and number of responses obtained.

Despite meticulous efforts to provide financial assistance for internet access to students, there were insufficient finances to accommodate all possible respondents. Because mostly those who received financial support were motivated to participate in this study. This constraint resulted in the exclusion of certain participants and added biases.

The online questionnaires may have not reached certain demographics such as those that do not have devices, internet access or are not technologically competent.

### 4.3 Operational Mechanism of the Software

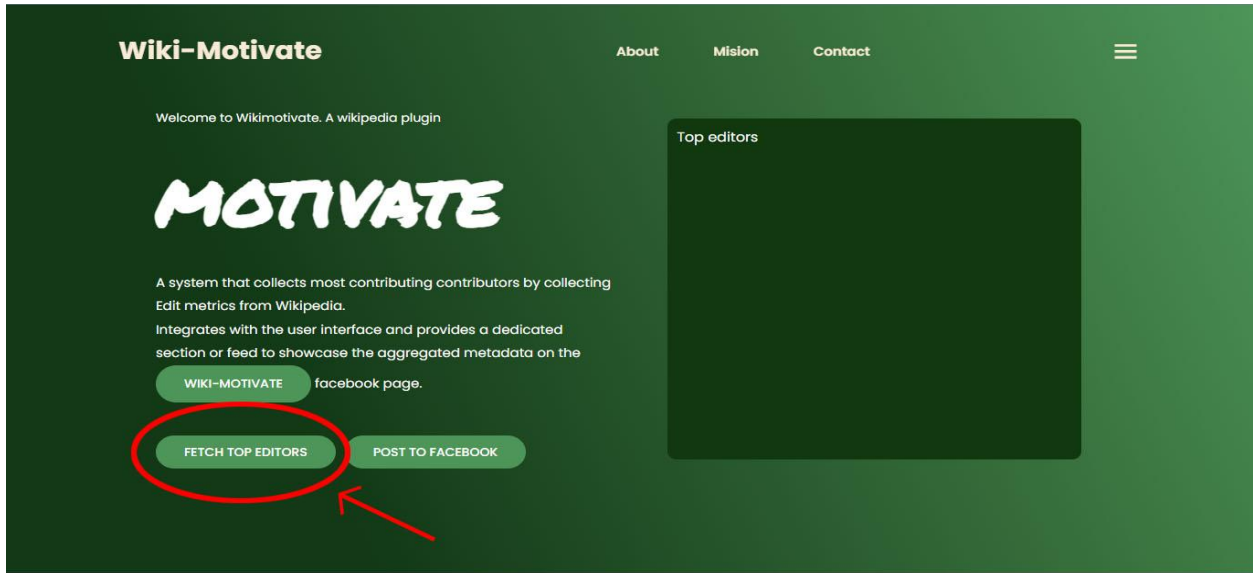


Figure 15 : The software’s Fetch Top Editors Interface

First the software fetches data from the wikipedia history of edits of a particular page.

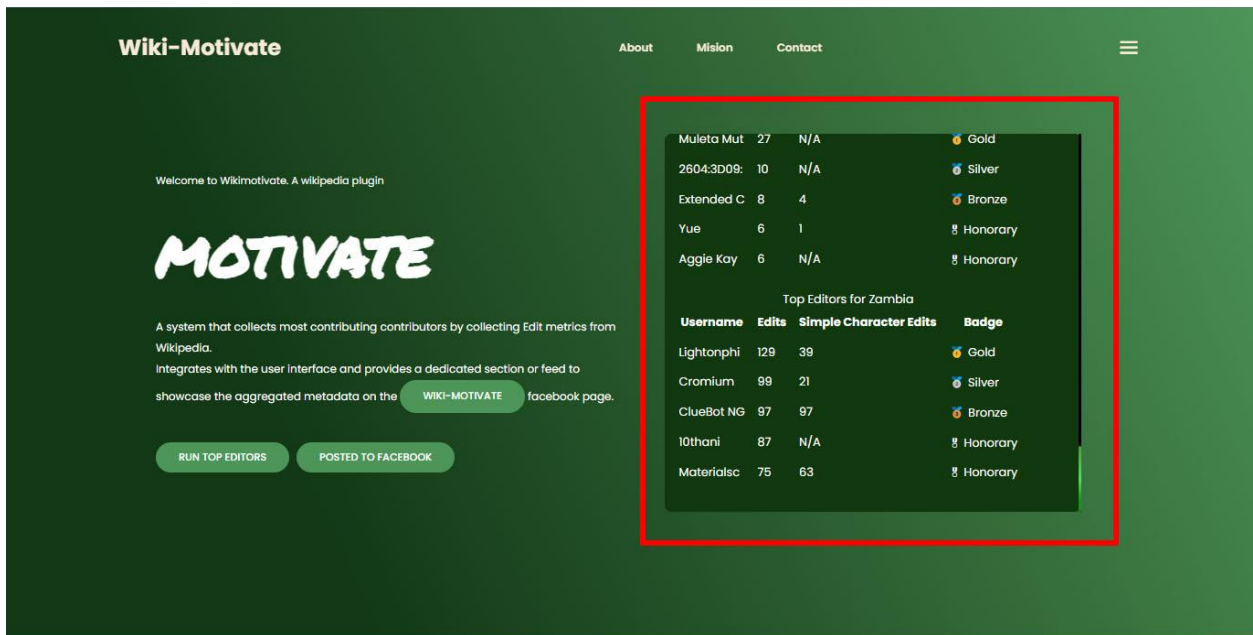


Figure 16 : The software’s leaderboard and Ranking of Top Editors Interface

Then shows the leaderboard top editors ranked from the most contributing to the least with corresponding badges according to their rank.

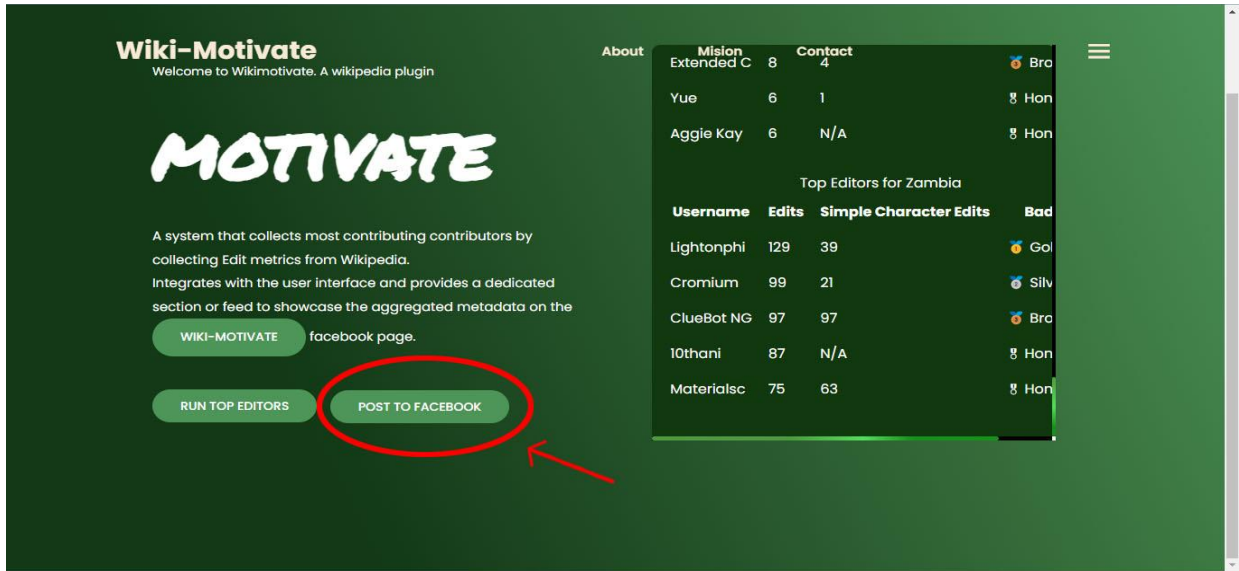


Figure 17 : The software’s Interface to Post the Top Editors to Facebook

The information that shows the leaderboard and the top editors from the most contributing to the least is now posted on facebook by clicking the post to facebook button.

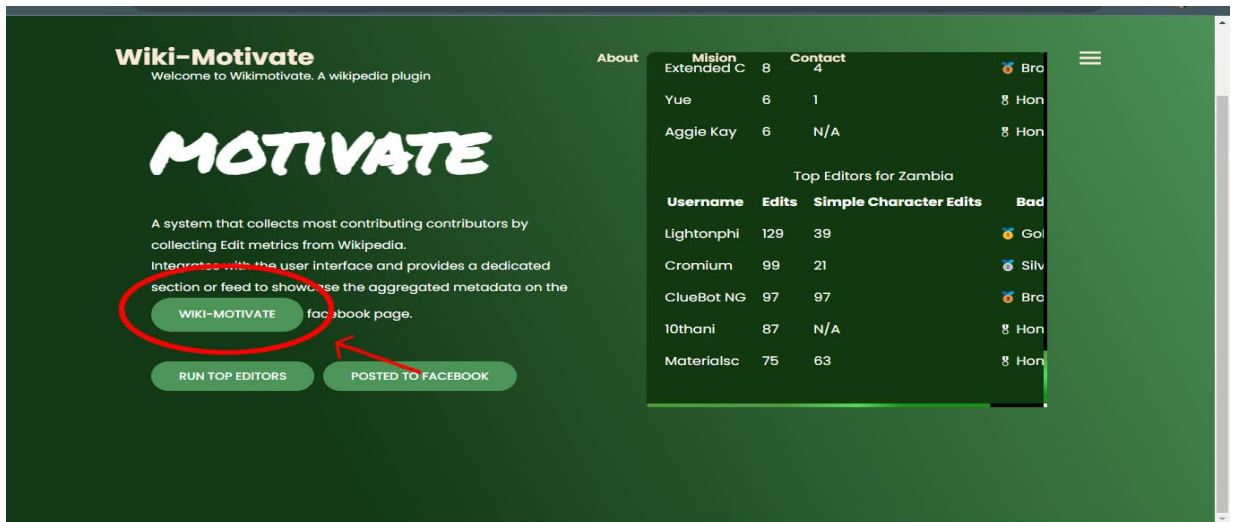


Figure 18 : The software’s Interface to go to WikiMotivate Facebook Page

Then the WikiMotivate button is clicked in order to go to the WikiMotivate facebook page.

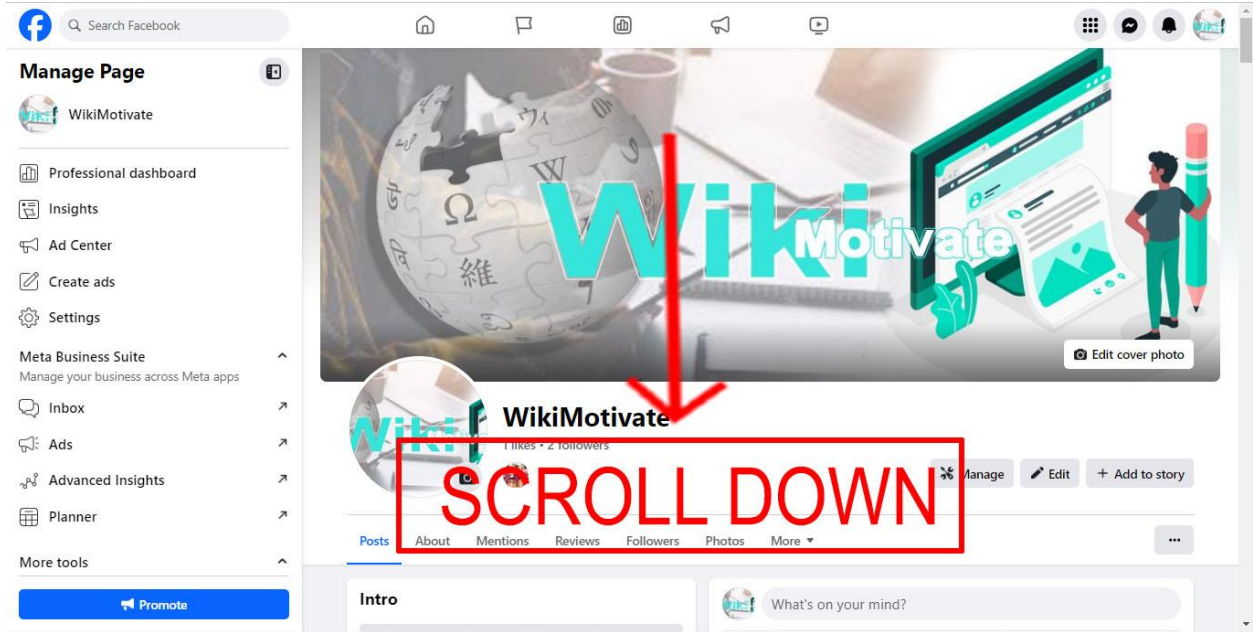


Figure 19 : WikiMotivate Facebook Page

After the leader board has been posted go to the facebook page and check if the leader board has been displayed on the page.

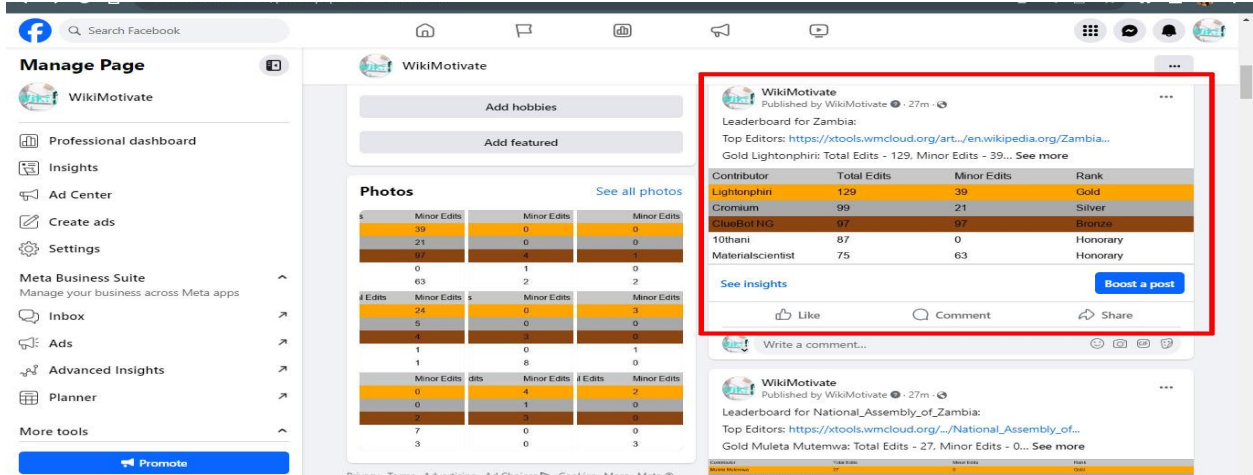


Figure 20 : Top Editors Posted Ranked and Given Badges to Facebook WikiMotivate Page

The users can now view the leaderboard which has top editors ranked from the most contributing to the least, with corresponding badges according to their rank.

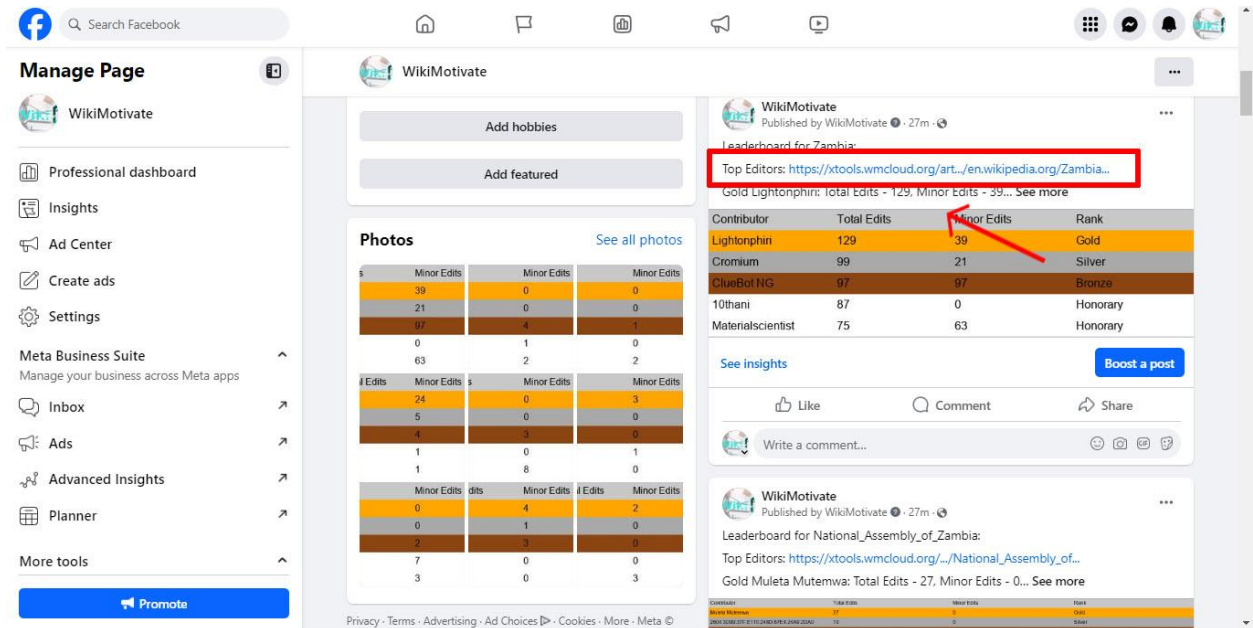


Figure 21 : Link to View More than 5 Top Editors Displayed on the Leaderboard

For the users to see other editors and the amount of data being contributed the link in the above picture needs to be clicked as it will redirect the users to view more information on the XTools website.

Top editors [hide] Editor statistics over the history of the article. [Download](#)

**Top 10 by edits**

- Lightonphiri - 129 (20.1%)
- Cromium - 99 (15.4%)
- 10thani - 87 (13.5%)
- Materials scientist - 75 (11.7%)
- Arjayay - 59 (9.2%)
- Lycaon - 47 (7.3%)
- Ei C - 39 (6.1%)
- Chipmunkdavis - 37 (5.8%)
- Twillsjr - 36 (5.6%)
- Rexparry sydney - 35 (5.4%)

**Top 10 by added text (approximate)**

- Whiteboygreener - 306,964 (50%)
- 122.107.236.185 - 102,456 (16.7%)
- Blurpeace - 50,153 (8.2%)
- Moxy - 48,897 (8%)
- 10thani - 24,038 (3.9%)
- Tumbuka Arch - 23,870 (3.9%)
- Cantus - 18,399 (3%)
- Lightonphiri - 14,812 (2.4%)
- 69.132.197.146 - 13,499 (2.2%)
- Nshimbi - 10,624 (1.7%)

Rank	Username	Links	Edits	Minor edits	Minor edits %	First edit	Latest edit	atbe <sup>1</sup>	Added (bytes) <sup>2</sup>
1	Lightonphiri	<a href="#">Top Edits</a> - <a href="#">Edit Counter</a>	129	39	30.2%	2013-04-17 14:00	2021-09-25 15:22	24	14,812
2	Cromium	<a href="#">Top Edits</a> - <a href="#">Edit Counter</a>	99	21	21.2%	2006-04-23 05:02	2018-02-23 14:57	44	5,402
3	10thani	<a href="#">Top Edits</a> - <a href="#">Edit Counter</a>	87	0	0%	2020-10-27 14:00	2023-05-18 08:49	11	24,038
4	Materials scientist	<a href="#">Top Edits</a> - <a href="#">Edit Counter</a>	75	63	84%	2010-02-12 08:19	2023-04-17 10:47	65	2,164
5	Arjayay	<a href="#">Top Edits</a> - <a href="#">Edit Counter</a>	59	31	52.5%	2018-05-21 10:08	2022-08-03 21:49	26	219
6	Lycaon	<a href="#">Top Edits</a> - <a href="#">Edit Counter</a>	47	34	72.3%	2005-11-17 07:16	2012-09-04 13:24	54	2,398
7	Ei C	<a href="#">Top Edits</a> - <a href="#">Edit Counter</a>	39	37	94.9%	2005-02-27 12:44	2020-07-17 07:32	148	7,749
8	Chipmunkdavis	<a href="#">Top Edits</a> - <a href="#">Edit Counter</a>	37	16	43.2%	2011-07-24 09:34	2023-04-21 08:53	119	45
9	Twillsjr	<a href="#">Top Edits</a> - <a href="#">Edit Counter</a>	36	0	0%	2013-09-09 14:48	2013-09-11 13:41	0	3,071
10	Rexparry sydney	<a href="#">Top Edits</a> - <a href="#">Edit Counter</a>	35	16	45.7%	2007-01-31 00:25	2007-11-19 12:02	9	3,596
11	Muleta Mutemwa	<a href="#">Top Edits</a> - <a href="#">Edit Counter</a>	34	0	0%	2020-05-26 13:17	2021-05-18 15:07	11	1,038

SCROLL DOWN TO SEE MORE

Figure 22 : Zambia's editors Displayed on the Leaderboard

The picture above shows the information that is displayed after the users click the link that will redirect them to the x-tools website.

#### 4.3.1. WikiMotivate Software Evaluation

Following the completion of the WikiMotivate software, the evaluation procedure was carried out. The review process's goal was to determine whether the leaderboard, the badge, or both might capture users' attention, keep it, and inspire them to consistently provide new content to Wikipedia. A group of university of Zambia student volunteers tested the system; there were more females in the group than males. About 88.89% of our volunteers were between the ages of 18 and 24, with the remaining age range being between 25 and 34. Every volunteer had a different amount of data to modify, and if they weren't satisfied with where they stood on the scoreboard, they could add additional content. The volunteer with the most edits, 16, was able to add more content. Some interesting participants' general comments were “The system was really motivating. I enjoyed seeing my name on the leaderboard” [participant 3] and “This software has really given me a reason to edit more and more content” [ participant 7]. Both comments from participant 3 and participant 7 suggest that the software has proven to be very impactful.

The wikipedia page that was used for editing content was the Ministry of health of Zambia page this specific page allowed WikiMotivate to fetch to the editors and rank them based on their contributions.

Table 4: Evaluation participants’ demographic information

<b>Participants characteristics (N=9)</b>	
Variable	n(%)
<b>Gender</b>	
Male	3(33.33)
Female	6(66.67)
<b>Age(band)</b>	
18-24	8(88.89)
25-34	1(11.11)
35 and above	0(0)
<b>Level of education</b>	
Undergraduate	9(100)
Post graduate	0(0)

Year of study	
First	1(11.11)
Forth	8(88.88)

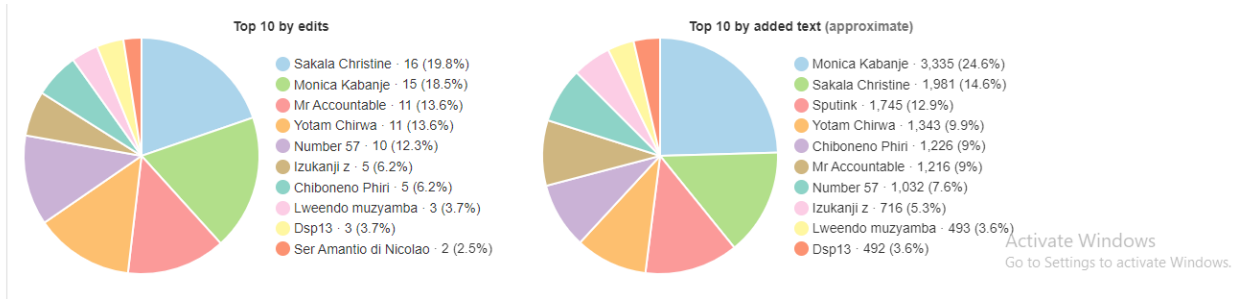


Figure 23 : Top Ten Editors for Ministry of Health (Zambia) article

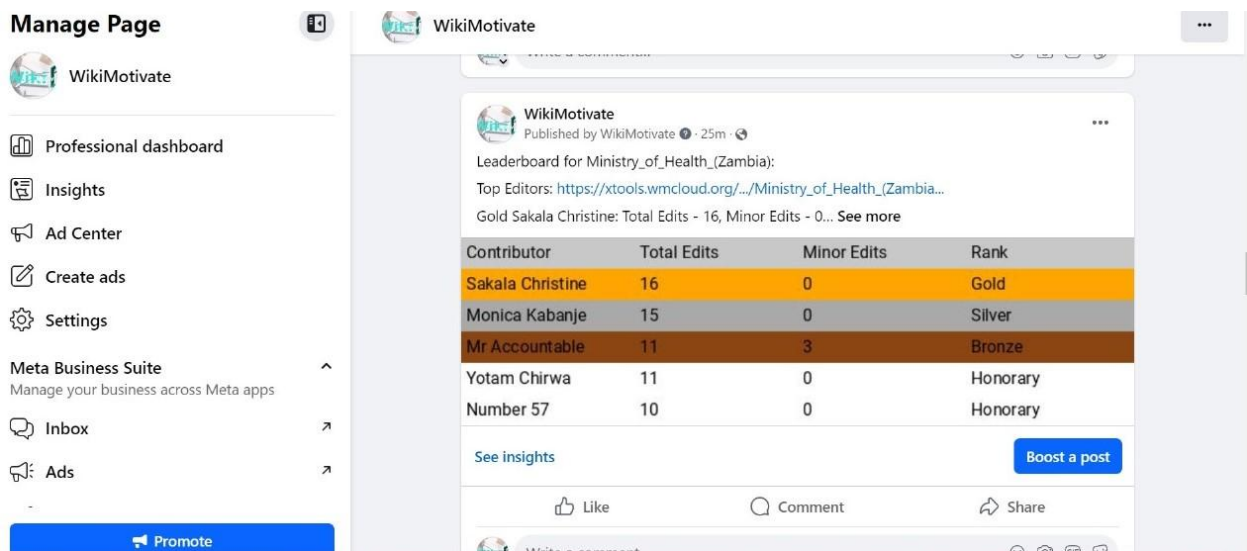


Figure 24 : Top Editors for Ministry of Health (Zambia) article posted to Facebook

Rank	Username	Links	Edits	Minor edits	Minor edits %	First edit	Latest edit	atbe <sup>1</sup>	Added (bytes) <sup>2</sup>
1	Sakala Christine	<a href="#">Top Edits</a> · <a href="#">Edit Counter</a>	16	0	0%	2023-11-16 11:09	2023-11-16 11:44	0	1,981
2	Monica Kabanje	<a href="#">Top Edits</a> · <a href="#">Edit Counter</a>	15	0	0%	2023-11-16 10:58	2023-11-16 11:45	0	3,335
3	Mr Accountable	<a href="#">Top Edits</a> · <a href="#">Edit Counter</a>	11	3	27.3%	2008-12-26 19:30	2008-12-26 20:10	0	1,216
4	Yotam Chirwa	<a href="#">Top Edits</a> · <a href="#">Edit Counter</a>	11	0	0%	2023-11-16 11:57	2023-11-16 12:10	0	1,343
5	Number 57	<a href="#">Top Edits</a> · <a href="#">Edit Counter</a>	10	0	0%	2018-02-28 21:54	2021-01-10 19:28	116	1,032
6	Izukanji z	<a href="#">Top Edits</a> · <a href="#">Edit Counter</a>	5	0	0%	2023-11-16 12:18	2023-11-16 12:22	0	716
7	Chiboneno Phiri	<a href="#">Top Edits</a> · <a href="#">Edit Counter</a>	5	0	0%	2023-11-16 11:57	2023-11-16 12:04	0	1,226
8	Lweendo muzyamba	<a href="#">Top Edits</a> · <a href="#">Edit Counter</a>	3	0	0%	2023-11-16 12:26	2023-11-16 12:28	0	493
9	Dsp13	<a href="#">Top Edits</a> · <a href="#">Edit Counter</a>	3	0	0%	2020-05-08 10:59	2020-05-08 11:06	0	492
10	Ser Amantio di Nicolao	<a href="#">Top Edits</a> · <a href="#">Edit Counter</a>	2	1	50%	2020-04-30 03:17	2021-01-29 16:54	275	120

Figure 25 : All Editors for Ministry of Health (Zambia) article displayed

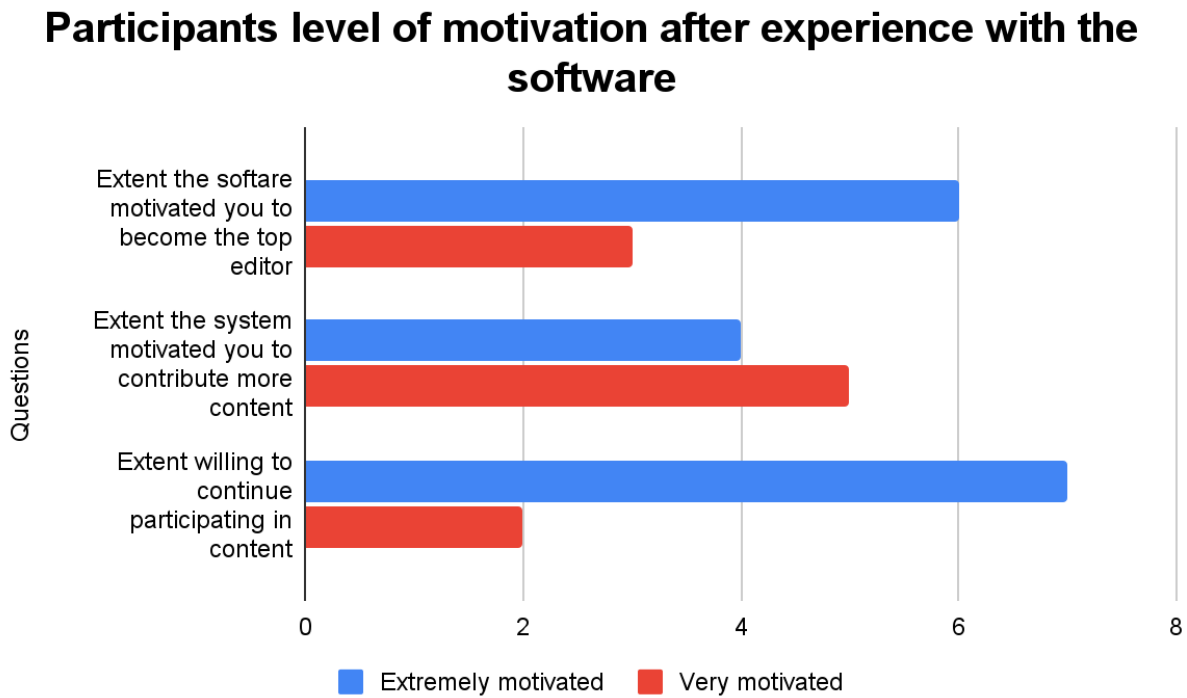


Figure 26 : Evaluation participants' level of motivation after experience with the software



## Comparing the level of motivation among badges leader board and a combination of both

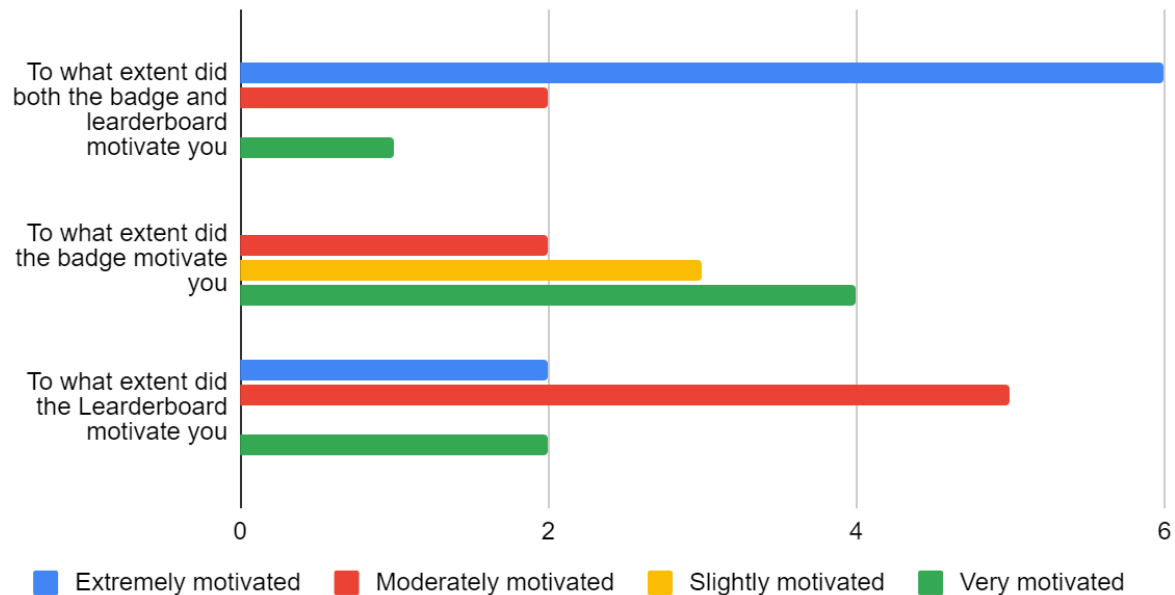


Figure 27 : Evaluating the most impactful incentive among badges, leaderboards and a combination of both.

## 5. Conclusion

Compared to other nations, the proportion of Zambians editing and adding content to Wikipedia has been appallingly low. The goal of this project was to inspire Zambian content creators who will be updating Wikipedia articles on their country. The suggested remedy was to develop a Facebook plugin that, by placing users on a leaderboard, would incentivize them to produce more material. In addition, WikiMotivate gives badges to the top three content creators. The implementation of the Facebook plugin "WikiMotivate" holds significant potential for inspiring and mobilizing the Zambian community to actively participate in creating and contributing content to Wikipedia. By seamlessly integrating with Facebook, WikiMotivate can leverage the widespread use of the platform to reach a broader audience and foster a sense of community engagement. The history of edits from Zambia related pages on Wikipedia were used to quantify content creation and contributions coming from Zambia by Zambians in order to compare the level of engagement coming from zambians and other countries. Two questionnaires were launched in order to determine the levels of willingness and awareness to create and contribute content on wikipedia. One was sent to zambian employees and the other was sent to students from the university of Zambia. The results in Figure 12 and Figure 9 show that the students and employees were unaware of the fact that they could contribute content on Wikipedia. Figure 10

and Figure 13 shows that employees and the students were more willing to contribute content after being shown the procedure of how to contribute content.

Positive feedback was obtained after a system evaluation was conducted to ascertain the effectiveness of this approach. Majority of the volunteers felt more motivated by the use of both the leaderboard and badges compared to having them separately. This innovative approach not only aligns with the principles of open collaboration but also addresses the specific needs and interests of the Zambian population, ultimately contributing to the growth and enrichment of the global knowledge repository. Future works to be considered in line with increasing content contribution on wikipedia is to create instructional programs to increase public knowledge about content generation and editing on Wikipedia. To inform potential contributors about the process of editing Wikipedia and the importance of their contributions, workshops, conferences, or online tutorials could be arranged. Examine the potential for extending WikiMotivate to online communities or other social media sites other than Facebook. By connecting the initiative with various online communities where possible contributors can be present, this can increase its effect and reach. Another future work to consider is integrating a content verification system within WikiMotivate to ensure the accuracy and reliability of information contributed. This could involve implementing a peer-review process or utilizing external tools to validate the authenticity of edits.

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## 6. Appendix A:

### QUESTIONNAIRE FOR THE EMPLOYEES

2. What is your gender? \*

Male.

Female

3. What is your highest educational qualification? \*

1. Primary education

2. Junior Secondary Education

3. Senior Secondary Education

4. Tertiary Education

4. What is your current field of work or profession? \*

1. Agriculture and farming

2. Mining and extraction

3. Manufacturing and industry

4. What is your current field of work or profession \*

1. Agriculture and farming
2. Mining and extraction
3. Manufacturing and industry
4. Construction and engineering
5. Healthcare and medical services
6. Education and teaching
7. Software development and technology
8. Financial services and banking
9. Tourism and hospitality
10. Media and journalism
11. Government and public administration
12. Legal services and law
13. Transport and logistics
14. Retail and sales

7. How much experience do you have in creating and contributing content on Wikipedia? \*

No experience      1      2      3      4      5      Extensive experience

8. To what extent are you aware that you can anonymously make changes to content on Wikipedia? \*

Not aware at all      1      2      3      4      5      Extremely aware

9. To what extent are you aware that it is possible to contribute minimal edits to content on Wikipedia? \*

Not aware at all      1      2      3      4      5      Extremely aware

10. To what extent are you aware that you can create your own article on Wikipedia? \*

13. If you were taught on how to make changes to content on Wikipedia. To what extent are you willing to contribute content on Wikipedia? \*

	1	2	3	4	5	
Not willing at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely willing

14. To what extent do you think the following factors would motivate you to contribute more content? \*

	Not motivat...	Slightly moti...	Moderately ...	Fairly motiv...	Very motivat...	Extremely m...
Information ...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-Express...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social Intera...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Achievemen...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Could you please share your thoughts on content creation and contribution within platforms like Wikipedia? We're interested in understanding your level of awareness and willingness to participate. Feel free to elaborate on any previous experiences, concerns, or \*



12. Legal services and law
13. Transport and logistics
14. Retail and sales
15. Non-profit and social services
16. Other

5. What is your Geographic location \*

1. Central Province
2. Copperbelt Province
3. Eastern Province
4. Luapula Province
5. Lusaka Province
6. Muchinga Province
7. Northern Province

- 7. Northern Province
- 8. North-Western Province
- 9. Southern Province
- 10. Western Province

#### Awareness

This section is going to be used to collect data among employees across the country that will be used to determine the levels of awareness about contributing and creating content on Wikipedia.

6. To what extent are you aware that you can edit content on Wikipedia? \*

	1	2	3	4	5	
Not aware at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely aware

7. How much experience do you have in creating and contributing content on Wikipedia? \*

	1	2	3	4	5	
No experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extensive experience

14. To what extent do you think the following factors would motivate you to contribute more content? \*

	Not motivat...	Slightly moti...	Moderately ...	Fairly motiv...	Very motivat...	Extremely m...
Information ...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-Express...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social Intera...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Achievemen...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Could you please share your thoughts on content creation and contribution within platforms like Wikipedia? We're interested in understanding your level of awareness and willingness to participate. Feel free to elaborate on any previous experiences, concerns, or motivations you might have in this regard. \*

Short answer text

# QUESTIONNAIRE FOR STUDENTS

Questionnaire ✕ ⋮

This questionnaire is intended to determine the level of awareness and willingness among the the University of Zambia student regarding content creation and contribution on Wikipedia specifically on Zambia related topics.

1. What is your age? \*

18-24

25-34

35 and above.

2. What is your gender? \*

Male

Female

3. What is your level of study? \*

Undergraduate

Postgraduate

4. What is your year of study? \*

1. First

2. Second

3. Third

4. Fourth

5. Fifth

6. sixth

7. seventh

Awareness

This section is going to be used to collect data among students that will be used to determine the levels of awareness about contributing and creating content on Wikipedia.

5. To what extent are you aware that you can edit content on Wikipedia? \*

	1	2	3	4	5	
Not Aware at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely Aware

6. How much experience do you have in creating and contributing content on Wikipedia? \*

	1	2	3	4	5	
No experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extensive experience

7. To what extent are you aware that you can anonymously make changes to content on Wikipedia ? \*

	1	2	3	4	5	
Not Aware at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely aware

8. To what extent are you aware that it is possible to contribute minimal edits to content on Wikipedia? \*

	1	2	3	4	5	
Not aware at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely aware

9. To what extent are you aware that you can create a new article on Wikipedia ? \*

	1	2	3	4	5
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. To what extent are you aware that you can create a new article on Wikipedia ? \*

	1	2	3	4	5	
Not aware at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely aware

10. To what extent are you aware that you can include images, diagrams, audio clips and videos to complement the textual information on Wikipedia? \*

	1	2	3	4	5	
Not aware at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely aware

11. How familiar are you with the processes and guidelines for creating and contributing content on Wikipedia? \*

	1	2	3	4	5
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



11. How familiar are you with the processes and guidelines for creating and contributing content on Wikipedia? \*

	1	2	3	4	5	
Not familiar at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely familiar

### Willingness

This section will be used to collect data among employees across the country that will be used to determine the levels of willingness that Zambia have towards content creation and contribution on Wikipedia. Contributing content on Wikipedia is very important as it helps to enhance the quality of educational resources and can help preserve and document cultural, historical, and regional information that might otherwise be overlooked. It can also be used to showcase work done by individuals who possess expertise in a particular field to showcase their knowledge, making a positive impact on the broader understanding of that subject.

12. If you were taught on how to make changes to content on Wikipedia. To what extent are you willing to contribute content on Wikipedia? \*

	1	2	3	4	5
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. If you were taught on how to make changes to content on Wikipedia. To what extent are you willing to contribute content on Wikipedia? \*

	1	2	3	4	5	
Not willing at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely willing

13. To what extent do you think the following factors would motivate you to contribute content on Wikipedia? \*

	Not motivated	Slightly moti...	Moderately ...	Fairly motiva...	Very motivat...	Extremely m...
Information ...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-Express...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social Intera...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Achievemen...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Not motivated	Slightly moti...	Moderately ...	Fairly motiva...	Very motivat...	Extremely m...
Information ...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-Express...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social Intera...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Achievemen...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. Could you please share your thoughts on content creation and contribution within platforms like Wikipedia? We're interested in understanding your level of awareness and willingness to participate. Feel free to elaborate on any previous experiences, concerns, or motivations you might have in this regard. \*

Short answer text

---

# EVALUATION QUESTIONNAIRE

## QUESTIONNAIRE

This questionnaire is intended to determine which incentives are most effective in encouraging Zambians to contribute and create content on Wikipedia.

⋮

What is your age? \*

- 18-24
- 25-34
- 35 and above

What is your gender? \*

- Male
- Female

What is your level of study? \*

- Undergraduate
- postgraduate

what is your year of study? \*

- First
- Second
- Third
- Fourth
- Fifth
- Sixth
- Seventh

To what extent did the system motivate you to contribute more content? \*

	1	2	3	4	5	
Not motivated at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely motivated

To what extent do you think the following incentives from the software would motivate you to contribute more content? \*

	Not motivated ...	Slightly motiva...	Moderately mo...	Very motivated	Extremely moti...
Badges	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leaderboard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Both	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

