

A Quick Overview of Open Educational Resources Videos available on YouTube through Sentiment Analysis

Manashjyoti Deka, Yadukrishnan T A and Amit Kumar

In an environment where higher education is competitive, learning resources are frequently seen as significant intellectual property and often come at a cost that leads to the exclusion of a group of aspiring learners. Open Educational Resources (OER) are digital learning materials that are freely and publicly available on the Internet from organizations and people in recent times. One such platform where OER contents are available is YouTube. By means of examining OER videos on YouTube throughout the year 2021, this article intends to look into the development of the open-source movement. Using sentiment and emotional analysis approaches, this article looks at how viewers perceive and engage with OER YouTube content. It then offers useful information to OER enablers for the movement's efficient growth and spread in the context of user interaction. In the end, this study offers a route towards understanding how sentiment analysis might help in structuring the tactics to make significant and pertinent materials survive and thrive in an era of unending explosion of random information.

Introduction

It has been a while since social media took over the world and unlocked countless opportunities for humanity to advance, flourish, and interact. It is more important to understand how YouTube emerged, stood out, and rose to prominence among all the social media platforms, such as Facebook, Instagram, Twitter, etc. It has grown to be the largest video-uploading site in the world, where anyone may publish anything and engage in virtual real-time communication with other users. From its stumbling beginnings to the billions of videos that are now available on the site, posted by everyone from a school student to multinational organizations, YouTube has profoundly changed much of the way we work, rest, and play (Hemelryk). It's amazing how diverse the content is, since it allows individuals to learn from and connect with content creators in ways they choose. It's also intriguing how it's evolved into an efficient learning tool. The way society functions have been revolutionized by YouTube, and it has the potential to undergo much more profound changes in the future (Denison, 2020).

The popularity of a video on YouTube is primarily determined by the many responses and comments left by the users, thus gathering information on what people are thinking is a vital activity because it may give producers and parental groups important insights. An efficient technique to comprehend users is to determine whether the underlying attitude is positive, negative, or neutral as user studies are necessary for the success of any content. Sentiment analysis of the text content can be used to determine user perception, which can then be used by content producers to help their future work. Sentiment analysis, also known as

opinion mining, is the technique of automatically interpreting, extracting, and processing textual data, which subsequently aids in recognizing the emotions expressed in a single opinion statement (Muhammad, Bukhori, & Pandunata, 2019). It has grown to be a significant topic of research in the field of information science and adds value to what machine learning can accomplish to help understand how people interact in the virtual world.

Any educational resources which are publicly accessible in the public domain and with open licenses are referred to as open educational resources (OER). OERs provide educators with the chance to go at, alter, and use innovative, easily available, and affordable educational materials (Goldberg, 2020). Since it contains the key to bridging the information access gap globally, the open education movement is playing a growing role and is becoming a must for knowledge seekers of the information society. The idea of open educational resources has become one of the most important research areas, and more and more academics and researchers are becoming interested in the domain (Kumar & Deka, 2022). Open educational resources are discussed in a sizable number of videos on YouTube by academics and their creators, who also educate the public about these resources at various levels. In anticipation of the potential of sentiment analysis and how it would help pave the way for the flourishing of quality content like OER in the age of information explosion, this paper seeks to examine the sentiments expressed in comments made by users in response to videos on open educational resources.

2. Review of Related Literature

Researchers in information science are increasingly focusing on sentimental analysis as it has attracted the interest of academics and intellectuals. The studies relating to the suggested topic are being examined by researchers in this section to understand the scope.

In their study, Thelwall and Cash (2021) looked into the online and offline harassment of 34 well-known UK lifestyle influencers in YouTube comments. They conducted a thematic analysis of the keywords associated with comments that mentioned bullying in order to find themes linked to bullying. The comments of these YouTube channels revealed a strategy discussed to help victims of bullying. Karadia (2021) conducted a content analysis of the most viewed OER videos on YouTube. The data gathered from the content analysis allows for a better understanding of what content is shared and how it is shared. All of the videos cover similar concepts and ideas related to the integration and use of Open Educational Resources, as well as the explained growth of YouTube videos about OER. Parabhoi and Saha (2018) in their study analyzed sentiment of comments left on Koha ILS videos. A total of 404 comments were found in the poll. The evaluation of the comments was based on a variety of predetermined criteria, including intention, subjectivity, emotion, sentiment, and word frequency. In their work, Alhujaili and Yafooz (2021) looked at the process and methodology of sentiment analysis of YouTube videos. Sentiment analysis is a technique for finding out what clients feel and think of a service or a product. Daily views on YouTube total millions. These receive a large number of comments, many of which provide insightful commentary that raises the rating levels of the posted item. These remarks were processed using natural language processing and machine learning techniques. There have been several attempts at academic study using two classes (positive or negative),

three classes (two with neutral), or multiple classes (happy, sad, fear, surprise, and anger). Nevertheless, it can be challenging to choose the most realistic model. Therefore, utilizing sentiment analysis of YouTube comments, efforts have been undertaken to determine the polarity in the study. Various methodologies useful in sentiment analysis and data mining research were also explained and categorized.

In a study conducted by Hettige, Dasanayaka, and Ediriweera(2022), the authors looked at how the University of Kelaniya, Sri Lanka's medical students used social media and open educational resources for learning. 257 responses to the poll were received (response rate: 89.5 percent). 96.1 percent of students and 88.3 percent of students, respectively, used OER and SM at least once each month for educational purposes. According to the survey, OER and social media use did not differ by gender. The two main justifications for embracing OER were the accessibility of information at all times (36.1%) and the simplicity of information access (31.5%). The most popular OER and SM platforms were Wiki sites (84.4%) and Facebook (79.5%), respectively. Most students used open educational resources and social media for their education. The primary drawbacks of using social media were the time-consuming nature of academic work and the challenges in locating trustworthy information. The study demonstrates the importance of helping medical students become information literate. Given that YouTube has grown in significance as a teaching and learning resource for medical students and instructors, Curran et al. (2020) assessed the usefulness, efficacy, and validity of YouTube video resources for medical education. Their analysis revealed that 31 of the 113 articles satisfied the criteria for inclusion and were devoted to the use of YouTube for medical education. Only 19.4% of the publications contained analyses of YouTube's performance as a teaching tool. They offered some advice on how to make YouTube videos more useful and high-quality as a teaching resource in medical education.

3. Study Objectives

This study aims to fulfill the below mentioned objectives;

- i. To explore the growth of OER videos on YouTube;
- ii. To identify the duration of OER videos on YouTube;
- iii. To categorize the top viewed and top liked videos of OER on YouTube;
- iv. To evaluate the sentiment and emotion of viewer's comments on the OER videos on YouTube; and
- v. To identify the most frequent terms used in the comments under OER videos on YouTube.

4. Scope and Methodology of the Study

Within the framework of the aforementioned goals, the current study is restricted to investigating open educational resource (OER) videos on YouTube and is further restricted to OER videos uploaded to YouTube only in the year, 2021. The Webometric Analyst software, version 4.4, was used to retrieve data, i.e. videos on OER and comments beneath them. The sentiments and emotions discussed in the comments of the obtained videos were examined using Parallel Dots API. The software Mozdeh was employed to look at the terms that appeared most frequently in the comments.

5. Data Analysis and Interpretation

5.1 Growth Pattern of OER Videos posted on YouTube

The growth pattern of OER videos that have been uploaded on YouTube in 2021 is shown in Table 1 and Figure 1. There are currently 147 videos about OER available on YouTube, according to a month-by-month distribution of the videos. The month of August has the most videos on OER, with 34 (23.12%); it is followed by June and September, with 15 (10.20%) apiece. There seems to be a fluctuating growth rate for YouTube videos about open educational resources.

Table1: Growth rate of the videos on OER

Sl. No.	Published Month	No. of Videos	%
1	January	6	4.08
2	February	10	6.81
3	March	12	8.16
4	April	7	4.76
5	May	10	6.81
6	June	15	10.20
7	July	10	6.81
8	August	34	23.12
9	September	15	10.20
10	October	9	6.12
11	November	9	6.12
12	December	10	6.81
Total	147	100	

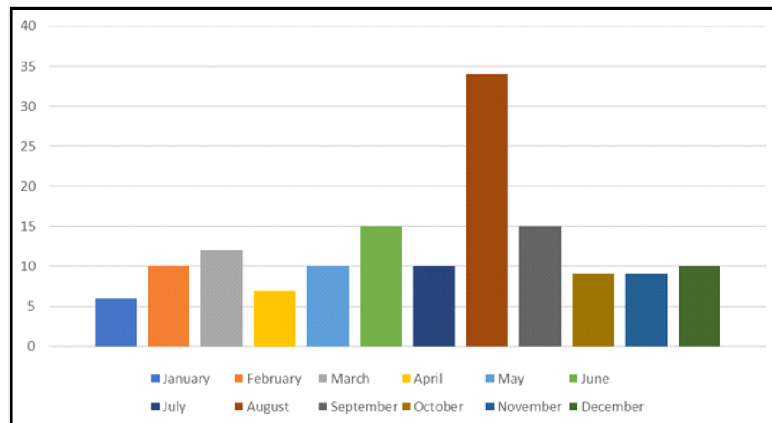


Figure 1: Growth Pattern of OER Videos posted on YouTube

5.2 Duration of videos of OER on YouTube

The length of OER YouTube videos is displayed in Table 2. An interval has been systematically set up to assess the length of the videos. The table shows that 73 (49.65%) videos of all videos, fall into the 1–10 minute category. A total no. of 23 (15.65%) videos has been found whose duration is more than 60 minutes.

Table 2: Time duration of videos of OER on YouTube

Sl. No.	Duration of Video	No. of Videos	%
1	0-10 min	73	49.65
2	11-20 min	10	6.81
3	21-30 min	12	8.16
4	31-40 min	11	7.49
5	41-50 min	6	4.08
6	51-60 min	12	8.16
7	>60 min	23	15.65
Total	147	100	

5.3 Top viewed Videos of OER on YouTube

The rank-wise distribution of the total number of views for OER videos on YouTube is shown in the table 3. The top view-count was found for the title “Webinar Sessions on Open Educational Resources for all ALS Teachers Part 2” with 59,839 followed by “VINSET 2.0 DAY 1 ANSWER KEY Advantages of Using Open Educational Resources OERs Quiz INSET” with 48,804 and “Webinar Sessions on Open Educational Resources for all ALS Teachers Part 1” with 37,201.

Table 3: Top viewed Videos of OER on YouTube

Rank No.	View Count	Title
1	59,839	Webinar Sessions on Open Educational Resources for all ALS Teachers Part 2
2	48,804	VINSET 2.0 DAY 1 ANSWER KEY Advantages of Using Open Educational Resources OERs Quiz INSET
3	37,201	Webinar Sessions on Open Educational Resources for all ALS Teachers Part 1
4	5,711	Open Educational Resources 2.1 (Morning Session)
5	4,618	VINSET DAY 1// ANSWER KEY// ADVANTAGE OF USING OPEN EDUCATIONAL RESOURCES (OER)
6	3,094	The Michelson 20MM Foundation: Open Educational Resources Initiative

7	2,683	Open Educational Resources
8	2,415	VINSET 2.0 ANSWER KEY Advantages of Using Open Educational Resources (OERs)-Exit Quiz
9	2,211	VINSET 2.0 DAY 1 ANSWER KEY: Advantages of Using Open Educational Resources OER Quiz
10	1,988	OER (Open Educational Resources)

5.4 Top Liked Videos of OER on YouTube

The quality and the reach of the video content on YouTube can be assessed by the number of likes. So, table 4 shows the rank of the videos of OER in terms of like-count. Most liked video is on the title; “Webinar Sessions on Open Educational Resources for all ALS Teachers Part 1” with 1700 followed by “Webinar Sessions on Open Educational Resources for all ALS Teachers Part 2” with 1100 and “Open educational Resources – OER” with 288.

Table 4: Top Liked Videos of OER on YouTube

Rank No.	Like Count	Title
1	1700	Webinar Sessions on Open Educational Resources for all ALS Teachers Part 1
2	1100	Webinar Sessions on Open Educational Resources for all ALS Teachers Part 2
3	288	Open educational Resources – OER
4	97	VINSET DAY 1// ANSWER KEY// ADVANTAGE OF USING OPEN EDUCATIONALRESOURCES (OER)
5	86	Advance Open Educational Resources
6	84	Open Educational Resources 2.1 (Morning Session)
7	68	OER (Open Educational Resources)
8	67	RUSA sponsored Workshop on Open Educational Resources
9	64	Open Educational Resources (OER): A boon for Education (Part- 1)... Please like and subscribe
10	51	Open educational resources/ OER – easy ??????????. Learn from exam viewpoint ¹⁰⁰¹⁰⁰¹⁰⁰

5.5 Sentiment analysis of comments

Sentiments can be assessed by means of three output criteria namely; positive, neutral, and negative. Out of 147 videos of OER that have been selected, 268 comments were extracted. It was found that; 36 of the 268

comments are in languages other than English and 232 English-language comments were therefore taken into account for sentiment analysis. Out of the 232 comments, 179 were positive, 42 were neutral, and 11 were negative, which implies that the most of the viewers are satisfied and happy with the OER videos' content on YouTube.

Table 5: Sentiments of videos

Sentiment	No. of Comments
Positive	179
Neutral	42
Negative	11

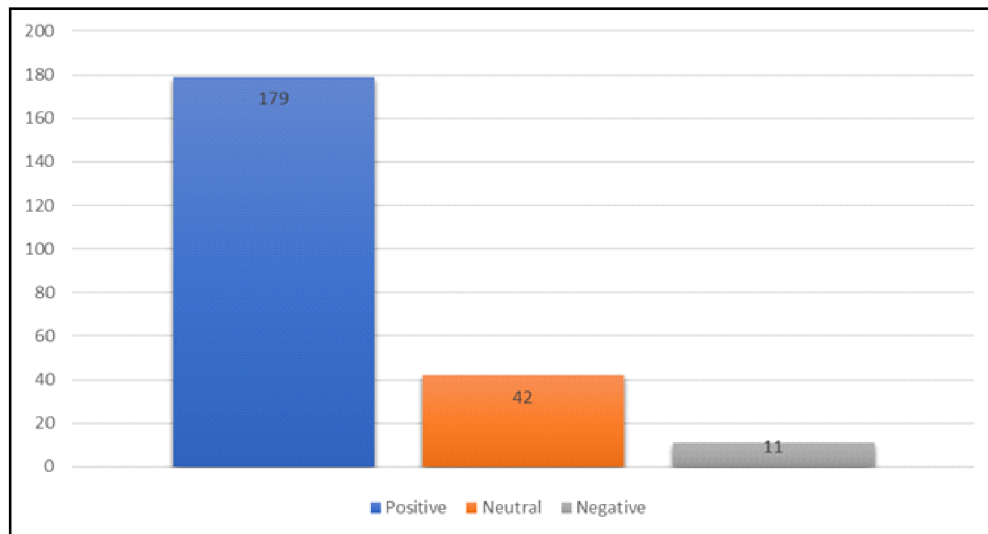


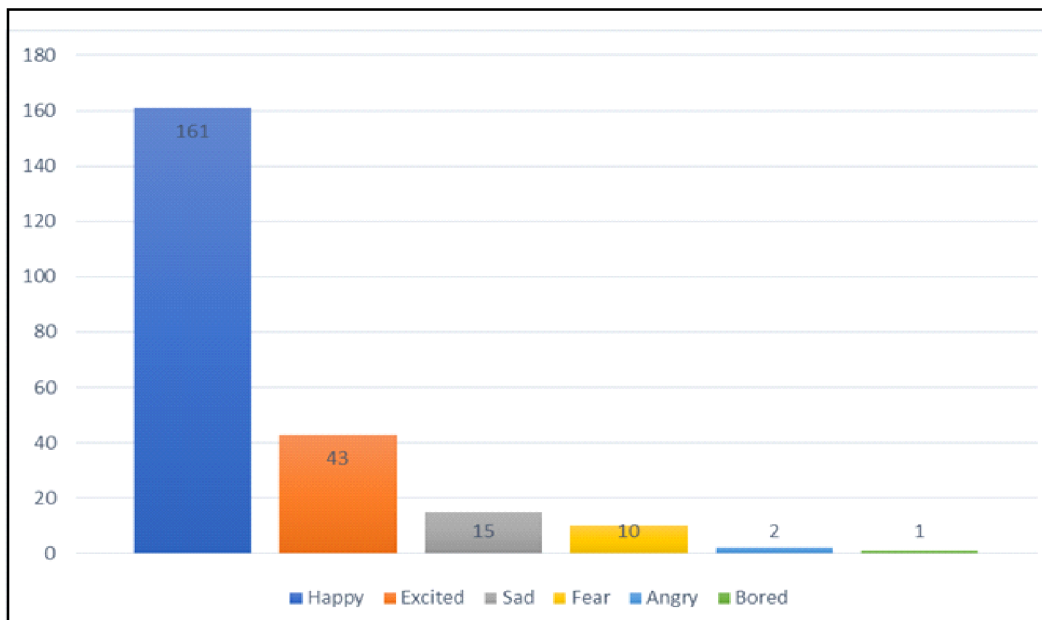
Figure 2: Sentiments of videos

5.6 Emotion of the viewers' comments

When it comes to emotions, it is assessed based on feelings like happiness, excitement, sadness, anger, and fear (Ekman, 1992). Table 6 and Figure 3 display the count of comments that comes under each category for the OER videos. After the analysis of emotions, it has been found that, among all other emotions, the emotion "Happiness" is found to be the most expressed emotion of all by viewers with 161 comments, which is followed by "excitement" with 43 comments. The emotion "sadness" was found to belong in 15 comments of OER.

Table 6: Emotion of the viewers' comments

Emotion	No. of Comments
Happy	161
Excited	43
Sad	15
Fear	10
Angry	2
Bored	1

**Figure 3: Emotions of viewers' comments**

5.7 Top terms

The easiest technique to comprehend and illustrate the data in terms of the frequency of themes in a text corpus so that one can quickly grasp the notion is through word clouds. The frequency of that particular subject can be deduced from the word cloud by evaluating the size of the words that appear. The more prominent the size, the more prevalent the term or topic. Figure 4 shows the whole set of data as a word cloud which has been made with the use of the website Word Art (<https://wordart.com/>) which depicts the frequency of phrases that appear in the comments of OER videos on YouTube as listed in table 7. The term “Good” was found to be the most frequently mentioned one among the comments which occurred by 81 times followed by “From” with a frequency of 78 followed by “Watching” and “Morning” with a frequency of 64 and 45 respectively.

Table 7: Top ten terms with their frequency

Rank No.	Term	Word Frequency
1	Good	81
2	From	78
3	Watching	64
4	Morning	45
5	City	44
6	Thank	33
7	Of	32
8	School	30
9	Division	28
10	You	26



Figure 4: Word Cloud of comments on OER

6. Discussion & Conclusion

This research's goal was to assess the state of the open source movement in relation to YouTube's Open Education Resource Videos. It is crucial to discuss the significance of open educational resources in the information society. It has the potential to close the access and availability gaps for educational materials for everyone who wants to learn, making it a burgeoning field of study that draws academics. The researchers looked at OER videos that were uploaded to YouTube in 2021 to examine the rise of OER videos and audience interaction related to them. Understanding how users perceive OER is essential when it comes to conducting studies on it.

It has been discovered that, out of the 147 videos that were retrieved, the OER video pattern exhibits erratic growth, with no discernible increase in the number of videos published to YouTube in 2021. With 34 (23.12 %) videos, the month of August has the most OER videos, followed by June and September, each with 15 (10.20 %). And most of the videos (73) on OER are found to be of the duration of 1-10 minutes which constitutes a percent of 49.65 whereas videos beyond the length 60 minutes are found to be in the range of 15.65% only which implies that content makers prefer to upload short videos rather than lengthy videos. In the analysis part, it has been found that the most popular video with 59,839 views; “Webinar Sessions on Open Educational Resources for all ALS Teachers Part 2” followed by “VINSET 2.0 DAY 1 ANSWER KEY Advantages of Using Open Educational Resources OERs Quiz INSET” with a view count of 48,804. The most liked video of OER on YouTube was found to be “Webinar Sessions on Open Educational Resources for all ALS Teachers Part 1” with 1700 likes followed by “Webinar Sessions on Open Educational Resources for all ALS Teachers Part 2” with 1100 likes.

To further understand the viewer engagement with OER on YouTube, researchers used sentiment and emotion analysis on the comments. Only the 232 comments that were in the English language out of a total of 268 comments were chosen for analysis. The fact that 179 of the 232 English comments on YouTube were positive, 42 were neutral, and 11 were negative suggests that the majority of viewers are content with the OER videos' content. Following a study of the comments, it was discovered that, out of all the other feelings, "Happiness" was by far the most frequently expressed feeling by viewers, garnering 161 responses, followed by "Excitement" with 43 comments. This demonstrates that the opinions of the viewers of the OER content are largely favorable. The researchers retrieved the most commonly occurring terms from the corpus of comments about OER, and "Good" was discovered to be the term that was used 81 times the most. Hence, the theme of the viewers' involvement can also be seen as favorable in terms of interaction with the OER videos.

The reach and popularity of educational videos are limited compared to those on YouTube with other types of material, such as entertainment. Although it is encouraging to observe how open educational resource videos are surviving, there is a dire need for the enablers of the OpenSource Movement to do everything possible to promote the spread of OER videos in order to inform and educate the public. To ascertain and assess the perception and level of engagement of the viewers, sentiment and emotion analysis can be employed efficiently. This study paves the way for additional investigation and future research into how users perceive and interact with OER videos in order to gain deeper insights into the growth and spread of the Open Source Movement and, in turn, help the knowledge society understand OER and its significance in the current academic environment around the world. In an era of limitless content, it's crucial to assess how users interact with quality, relevant knowledge content in order to implement the essential strategies that will let these materials survive and thrive. This study serves as an excellent illustration of how sentiment analysis might aid in accomplishing that.

References

1. Alhujaili, Rawan Fahad and Yafooz, Wael M.S. (2021). Sentiment Analysis for Youtube Videos with User Comments: Review. In Proceedings of the International Conference on Artificial Intelligence and Smart Systems (ICAIS-2021). International Conference on Artificial Intelligence and Smart Systems, JCT College of Engineering and Technology, Coimbatore, India, 25th -27th March 2021. (pp. 814-820). Coimbatore: IEEE.
2. Curran, Vernon [et. al.]. (2020). YouTube as an Educational Resource in Medical Education: a Scoping Review. *Medical Science Educator*, 30(4), 1775-1782.
3. Denison, Caleb. 15 Years of YouTube: How a failed dating site became the king of online video. Available at <https://www.digitaltrends.com/web/how-youtube-has-changed-the-world-in-15-years/> (Accessed on 15/07/2022).
4. Ekman, Paul. (1992). Are there basic emotions? *Psychological Review*, 99(3), 550–553.
5. Goldberg, Chana. (2020) 5 Benefits of Open Educational Resources. Available at <https://blogs.onlineeducation.touro.edu/5-benefits-of-open-educational-resources/> (Accessed on 15/07/2022).
6. Hemelryk, Simon. How YouTube changed the world. Available at <https://www.readersdigest.co.uk/lifestyle/technology/how-youtube-changed-the-world> (Accessed on 15/07/2022).
7. Hettige, Samankumara, Dasanayaka, Eshani and Ediriweera, Dileepa Senajith. (2022). Student usage of open educational resources and social media at a Sri Lanka Medical School. *BMC medical education*, 22(1), 1-11.
8. Karadia, Alekha. (2021) Content Analysis of Top View YouTube Videos on Open Educational Resources. *Library Philosophy and Practice*, 5474, 1-15.
9. Kumar, Amit and Deka Manashjyoti. (2022). A Quick Perusal to Open Educational Resources (OERs) Presence for the Past One Decade through Bibliometric Lens with Special Reference to SpringerLink. *Qualitative and Quantitative Methods in Libraries*, 11(2), 259-290.
10. Muhammad, Abbi Nizar., Bukhori, Saiful and Pandunata, Priza. (2019). Sentiment Analysis of Positive and Negative of YouTube Comments Using Naïve Bayes – Support Vector Machine (NBSVM) Classifier. In 2019 International Conference on Computer Science, Information Technology, and Electrical Engineering (ICOMITEE 2019). International Conference on Computer Science, Information Technology, and Electrical Engineering (ICOMITEE) Jember, Indonesia, 16-17 October 2019. (pp. 199-205). Indonesia: IEEE.
11. Parabhoi, Lambodara and Saha, Payel. (2018). Sentiment analysis of YouTube comments on Koha open source software videos. *International Journal of Library and Information Studies*, 8(4), 96-102.

12. Thelwall, Mike and Cash, Scottye. (2021). Bullying discussions in UK female influencers' YouTube comments. *British Journal of Guidance & Counselling*, 49(3), 480-493.

Keywords: Open Educational Resources (OER); YouTube Videos; Sentiment Analysis; Webometric Analyst; ParallelDots API

About Authors

Mr. Manashjyoti Deka

Research Scholar

Department of Library & Information Science, Mizoram University, Aizawl

Mr. Yadukrishnan TA

Research Scholar

Department of Library & Information Science, Mizoram University, Aizawl

Dr. Amit Kumar

Assistant Professor

Department of Library & Information Science, Mizoram University, Aizawl