

# Public Perception of Islamic Higher Education Institutions on Twitter in Indonesia: A Social Media Sentiment Analysis

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## ABSTRACT

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With the advent of social media, particularly Twitter, public opinion has become a dynamic and influential force. This study explores the public's perception of Islamic higher education institutions on Twitter, employing sentiment analysis to decipher the nuances of public sentiment. A comprehensive quantitative research methodology employing sentiment analysis was applied to a dataset of 11,809 tweets collected from 2018 to 2022, all focused on perceptions of Islamic higher education. The preprocessing phase involved cleaning, case folding, punctuation, number removal, stopword elimination, and tokenization. Sentiment analysis techniques were utilized to categorize tweets into positive, negative, or neutral sentiments. The analysis revealed a prevalent positive sentiment, constituting 73.16% of the dataset, 21.37% exhibited negative sentiment, and 5.47% reflected neutral sentiment. Visualizations, including word clouds, highlighted key topics shaping public perception. Words like "university," "religion," and "student" emerged prominently, influencing sentiment across categories. These results underscore a positive public perception of Islamic higher education, indicating the effectiveness of social media in shaping favorable opinions. The research emphasizes the significance of social media, specifically Twitter, as a platform for fostering positive perceptions of Islamic higher education. Strategic communication, proactive content dissemination, and responsive engagement are essential for enhancing institutional image. Future research directions, including advanced methodologies like topic modeling and word association techniques, promise a deeper understanding of public sentiment nuances, guiding educational institutions and policymakers toward effective social media engagement strategies.

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## INTRODUCTION

Islamic higher education institutions play a vital role in shaping academically and vocationally competent community members in Indonesia (Rasyid & Tunggal, 2022). The organizational structure of higher education is characterized by its systemic unity and openness, fostering creativity while embracing societal pluralism (Suryana, 2018; Nursanjaya, 2019). The categorization of higher education institutions in Indonesia includes universities, colleges, institutes, academies, and other specialized forms, as outlined in Higher Education Law No. 22 of 1961



(Rahmat, 2014).

Among these institutions, Islamic religious colleges stand as pillars of established education, paralleled in status with public universities. Their distinction is in their emphasis on general and religious education disciplines. Indonesia boasts 52 State Islamic Higher Education Institutions, constituting 13.3 percent, and 539 Private Islamic Higher Education Institutions, making up 86.7 percent of Islamic Religious Universities. The remarkable quantitative growth of these institutions, both public and private, underscores their strategic importance in national education, aiming to produce graduates adept at integrating scientific knowledge with Islamic values (El Junusi, 2017).

The significance of Islamic values instilled by these institutions transcends mere strategic planning; it profoundly influences the perception of these institutions within the community (Arifin et al., 2017). In the contemporary era, managing and enhancing the image of Islamic higher education institutions have become imperative, given the current surge in information flow and communication openness (El Baqquer, 2015; Budi et al., 2017). The concept of “brand image,” encompassing the emotional and aesthetic impressions of a product in the target market, is central to this discourse (Oryzativa & Ernungtyas, 2020; Pertiwi et al., 2022). Constructing a positive image requires meticulous attention to each unit’s performance, ensuring that achievements are not confined to internal circles but are disseminated widely within the institution and among the public (Salim & Rosdian, 2022), ensuring that achievements are not confined to internal circles but are disseminated widely, both within the institution and among the public (Setiady, 2016). This branding effort is crucial for Islamic Religious Universities, internally and externally, aligning the desired image with societal perceptions.

In the contemporary age of technological advancements, social media platforms have become ubiquitous, profoundly impacting society (Mayangsari & Salim, 2021; Amalia & Suprayogi, 2019). The ease of access to information, particularly on social media platforms like Twitter, has amplified the influence of public opinion. Digital media, especially Twitter, provides a unique cyberspace meeting place where individuals express spontaneous and emotional responses, shaping public perception of various topics, including Islamic higher education (Inayah & Purba, 2021). Twitter, with 18.5 million users in Indonesia as of January 2022, is a significant platform for discussions and opinions, making it an ideal focus for our research.

Despite the ubiquity of social media, scant literature comprehensively investigates public perceptions of Islamic higher education institutions, particularly on Twitter. Existing studies often limit their scope to regional analyses or specific aspects such as sentiment or conversation topics, focusing predominantly on Islamic higher education. This research seeks to address this gap, adopting a more holistic approach and advanced methodology to explore the public’s perception of Islamic higher education institutions, offering a nuanced understanding of the evolving social media landscape (Prabowo et al., 2022). Through this study, we aim to generate profound and relevant insights that can benefit both the institutions under scrutiny and the wider community.

## METHOD

This methodological section presents a comprehensive quantitative research study employing sentiment analysis. This technique automatically comprehends, extracts, and processes textual data to discern sentiment information from opinion sentences (Pang, 2002). Sentiment analysis, also known as opinion mining, involves the automatic understanding, extraction, and processing of textual data to derive sentiment information from opinion sentences (Rozi et al., 2012). It categorizes expressions into neutral, negative, or positive views or opinions about a particular problem or object based on sentences containing negative, positive, and neutral words.

The objective of this study was to conduct sentiment analysis on Twitter to gauge public perception regarding Islamic Higher Education. The dataset comprises 15,118 tweets collected from 2018 to 2022, all about perceptions of Islamic higher education. Data was collected using web scraping, a semi-structured document retrieval technique from the Twitter API, with the keyword “Islamic campus” as the focal point for data collection on the Twitter platform. The analysis process utilized R Studio software, enabling classification based on the specific textual topic under examination (Juditha, 2019). The methodology incorporated Natural Language Processing (NLP) and Machine Learning techniques within the framework of Sentiment Analysis. This approach involved categorizing opinions as positive, negative, or neutral, primarily aiming to analyze public sentiments, evaluations, attitudes, and emotions (Restanti, 2017) towards entities such as products, services, organizations, individuals, problems, events, or topics (Cahyono, 2017; Mentari et al., 2018). The sentiment analysis was carried out by collecting tweets related to specific topics on Twitter, where opinions and emotions were treated as variables corresponding to dispositions, affections, and behaviors (Rakhman et al., 2021).

## FINDINGS AND DISCUSSION

In Indonesia, the world’s most populous Muslim nation, boasting a population of 231 million, constituting 86.7 percent of its populace (Rasyid et al., 2019), Islamic education has flourished, giving rise to many Islamic

universities. These institutions diversify Indonesia's educational landscape by offering unique and integrating Islamic values, thereby equipping graduates with academic excellence rooted in religious traditions. The influence of these Islamic principles on public perception of Islamic Higher Education is substantial. The term "image," as defined in the Big Indonesian Dictionary, represents a collective mental impression of an entity, shaping individuals' tangible experiences. Higher education's image, intricately tied to service quality encompassing facilities, skills, and overall conditions, can lead to negative perceptions of dissatisfaction, affecting verbal expressions of discontent. The institutional image embodies society's overall impression of an organization (Harahap et al., 2020). Consequently, an Islamic university's effective integration of Islamic values directly influences societal perception. Analyzing language in tweets reveals specific framing or narratives in discussions concerning Islamic higher education.

Society's perceptions are vital indicators, reflecting the efficacy of Islamic universities' endeavors and public expectations. Rooted in the understanding that perception directly responds to stimuli acquired through the senses, this theory of perception recognizes it as a cognitive process involving selection, organization, and interpretation of environmental stimuli. Due to its subjective nature, various individuals can perceive the same stimulus differently. This study scraped 15,118 tweets related to Islamic universities via the Twitter API. After eliminating duplicates, 11,809 distinct tweets remained.

**Table 1. Sample Initial Tweets Data**

No	Preliminary Data
1	<i>An Islamic religion-based campus is an educational institution that uses Islamic teachings as its basis, right? Needs correction, thank you (Kampus berbasis agama islam itu lembaga pendidikan yg menjadikan ajaran agama islam sebagai dasarnya ya? Butuh koreksi, nuhun) <a href="https://t.co/BYQRWYrdWe">https://t.co/BYQRWYrdWe</a></i>
2	<i>@UtuhWibowo @ardi_riau now it's an Islamic-based campus... it's been labeled a terrorist base... yesterday it was a mosque, it used to be a boarding school... (sekarang kampus berbasis Islam..di cap basis teroris.. kemaren2 mas masjid, dulu ponpes,,)</i>
3	<i>@koreanthingy My campus is Islamic, but today I'm holding an event with isyana included hahaha (Kampus gue kampus islam tapi hari ini bikin acara yang ada isyana nya wkwk)</i>

The collected data underwent rigorous R Studio software preprocessing involving cleaning, case folding, punctuation, number removal, stopword elimination, and tokenization. This meticulous process aimed to cleanse unstructured data, eliminating disruptive elements like punctuation marks and extraneous words that could interfere with the analysis. This preprocessing stage aimed to transform raw text data into a more structured format. Table 1 presents examples of preprocessed tweet data related to Islamic universities from 2018-2022, illustrating the steps taken to refine the dataset for analysis. The following section outlines the comprehensive preprocessing procedures undertaken in preparation for the analysis, ensuring the integrity and reliability of the data analysis process.

### A. Data Cleaning

Data Cleaning removes information not required for analysis, such as noise; omitted words include HTML characters, emoticons, hashtags (#), usernames, URLs, and emails.

**Table 2. Data Cleaning Process**

No	Before Cleaning	After Cleaning
1	<i>Kampus berbasis agama islam itu lembaga pendidikan yg menjadikan ajaran agama islam sebagai dasarnya ya? Butuh koreksi, nuhun <a href="https://t.co/BYQRWYrdWe">https://t.co/BYQRWYrdWe</a></i>	<i>Kampus berbasis agama islam itu lembaga pendidikan yg menjadikan ajaran agama islam sebagai dasarnya ya? Butuh koreksi, nuhun</i>
2	<i>@UtuhWibowo @ardi_riau sekarang kampus berbasis Islam..di cap basis teroris..kemaren2 masjid, dulu ponpes,,</i>	<i>sekarang kampus berbasis Islam..di cap basis teroris.. kemaren2 mas masjid, dulu ponpes,,</i>
3	<i>@koreanthingy Kampus gue kampus islam tapi hari ini bikin acara yang ada isyana nya wkwk</i>	<i>Kampus gue kampus islam tapi hari ini bikin acara yang ada isyana nya wkwk</i>

### B. Case Folding/ Lowercase

Case folding or lowercase is a data preprocessing step that transforms capital letters into non-capital or lowercase letters. Table 3 provides an example of the outcomes of the data preprocessing procedure for the dataset.

**Table 3. Data Cleaning Process**

No	Before Cleaning	After Cleaning
1	Kampus berbasis agama islam itu lembaga pendidikan yg menjadikan ajaran agama islam sebagai dasarnya ya? Butuh koreksi, nuhun	kampus berbasis agama islam itu lembaga pendidikan yg menjadikan ajaran agama islam sebagai dasarnya ya? butuh koreksi, nuhun
2	sekarang kampus berbasis Islam..di cap basis teroris..kemaren2 masjid, dulu ponpes,,	sekarang kampus berbasis islam..di cap basis teroris.. kemaren2 masjid, dulu ponpes,,
3	Kampus gue kampus islam tapi hari ini bikin acara yang ada isyana nya wkwk	kampus gue kampus islam tapi hari ini bikin acara yang ada isyana nya wkwk

### C. Punctuation & Number Removal

Punctuation and Numbers Removal is the operation of removing unnecessary punctuation and numbers from an analysis. Table 4 displays the results of Remove Punctuation & Number.

**Table 4. Remove Punctuation & Number Process**

No	Before Cleaning	After Cleaning
1	kampus berbasis agama islam itu lembaga pendidikan yg menjadikan ajaran agama islam sebagai dasarnya ya? butuh koreksi, nuhun	kampus berbasis agama islam itu lembaga pendidikan yg menjadikan ajaran agama islam sebagai dasarnya ya butuh koreksi nuhun
2	sekarang kampus berbasis islam..di cap basis teroris..kemaren2 masjid, dulu ponpes,,	sekarang kampus berbasis islam di cap basis teroris kemaren masjid dulu ponpes
3	kampus gue kampus islam tapi hari ini bikin acara yang ada isyana nya wkwk	kampus gue kampus islam tapi hari ini bikin acara yang ada isyana nya wkwk

### D. Stopword Removal

Stopword removal is utilized to remove words that are extra to the analysis process and words that are meaningless or irrelevant. Table 5 displays the outcomes of the stopword elimination process

**Table 5. Stopword Removal Processing**

No	Before Cleaning	After Cleaning
1	kampus berbasis agama islam itu lembaga pendidikan yg menjadikan ajaran agama islam sebagai dasarnya ya butuh koreksi nuhun	kampus berbasis agama islam lembaga pendidikan menjadikan ajaran agama islam dasarnya butuh koreksi nuhun
2	sekarang kampus berbasis islam di cap basis teroris kemaren masjid dulu ponpes	kampus berbasis islam cap basis teroris kemaren masjid ponpes
3	kampus gue kampus islam tapi hari ini bikin acara yang ada isyana nya wkwk	kampus kampus islam bikin acara isyana

### E. Tokenizing

Tokenizing separates text into tokens or word fragments that will become valuable words for sentiment analysis. Table 6 depicts the tokenization procedure that has been executed.

**Table 6. Tokenizing Processing**

No	Before Cleaning	After Cleaning
1	kampus berbasis agama islam lembaga pendidikan menjadikan ajaran agama islam dasarnya butuh koreksi nuhun	"kampus" "berbasis" "agama" "islam" "Lembaga" "Pendidikan" "menjadikan" "ajaran" "agama" "islam" "dasarnya" "butuh" "koreksi" "nuhun"
2	kampus berbasis islam cap basis teroris kemaren masjid ponpes	"kampus" "berbasis" "islam" "cap" "basis" "teroris" "kemaren" "masjid" "ponpes"
3	kampus kampus islam bikin acara isyana	"kampus" "kampus" "islam" "bikin" "acara" "isyana"

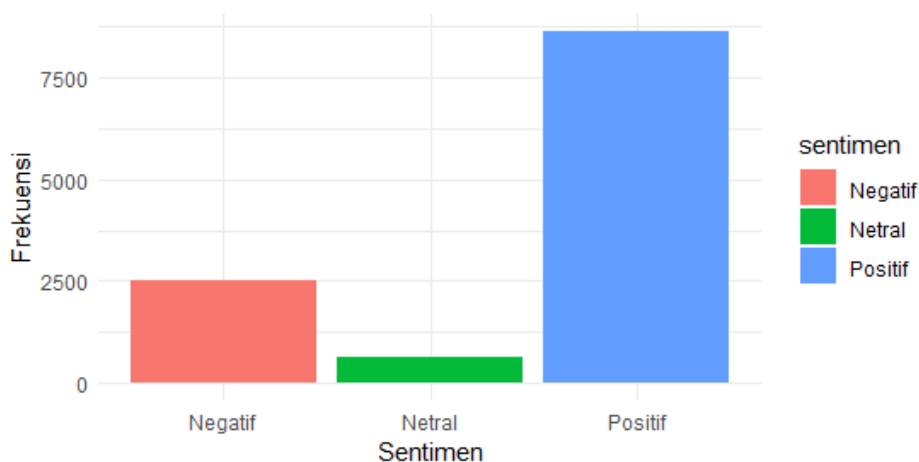
In the subsequent phase, after meticulous preprocessing, the sentiment analysis process commences with the crucial step of data labeling. Sentiment scores are calculated employing a lexicon dictionary, resulting in numerical values ranging from -5 to 5. A negative score signifies negative sentiment, while a positive score represents positive

sentiment; a score of 0 indicates neutral sentiment. The determination of each tweet’s sentiment class involves summing up the positive word values (> 0), neutral word values (= 0), and negative word values (< 0). Tweets with a sentiment score exceeding zero (> 0) are categorized as positive, those with a score below zero (< 0) are classified as negative, and tweets with a score of 0 are designated as neutral. The calculation process for labeling scores is exemplified below.

**Table 7. Table Styles**

Data Tweet	Tokenization	Score
<i>kampus islam jorok dana semrawut</i>	<i>kampus</i>	0
	<i>islam</i>	4
	<i>jorok</i>	-5
	<i>dana</i>	4
	<i>semrawut</i>	-5
<b>Score calculation</b>		<b>-2</b>

As demonstrated in Table 7, an illustrative calculation of scores for labeling tweet data is presented for the following tweet commentary: “The Islamic campus is filthy and unorganized.” This specific data exhibits negative sentiments because of two words associated with positivity, namely Islam and funds, one neutral word, campus, assigned a value of zero, and two words with negative connotations, namely dirty and chaotic. Upon summing these values to calculate the labeling score, the resultant value is -2, unequivocally classifying the sentiment as negative.



**Fig 1. Results of Classification of Sentiments Regarding Public Perception of the Image of Islamic Higher Education on Twitter**

Figure 1 illustrates the comprehensive sentiment analysis conducted on 11,809 tweets related to Islamic Higher Education. Among these tweets, 8,639 (approximately 73.16 percent) were characterized by positive sentiment, while 2,524 tweets (21.37 percent) exhibited negative sentiment. Additionally, there were 646 tweets (5.47 percent) expressing neutral sentiment. These results indicate a prevailing positive disposition among the public regarding the image of Islamic Higher Education.

The outcomes of the sentiment analysis are further translated into a visual representation in the form of a word cloud. This visualization extracts pertinent information by highlighting the topics and opinions most frequently discussed in tweets reflecting public perceptions of Islamic Higher Education. Initially, tweets with positive sentiments were processed, employing a positive word lexicon dictionary for accurate labeling. Subsequently, the visualization captures the outcomes of information extraction from the acquired tweet data, shedding light on the prevalent positive sentiments associated with the public’s perception of Islamic universities.



Figure 6 presents the conclusive data visualization about negative sentiments on Twitter. Within this visualization, prevalent negative words in the tweet data, such as “religion,” followed by “university,” “college,” “entry,” “student,” and others, are distinctly visible. These words are pivotal in shaping negative sentiments in the public’s perception of Islamic Higher Education.

Our descriptive quantitative research results, employing sentiment analysis to assess public perception of Higher Education images on Twitter, have identified neutral, negative, and positive sentiments. The findings indicate a prevalence of positive sentiments, accounting for 73.16 percent, while negative sentiments constitute 21.37 percent, and neutral sentiments amount to 5.47 percent. These results underscore a predominantly favorable public perception of Islamic Higher Education on Twitter. This highlights the significance of social media as an entertainment platform and a tool to foster a positive university image, especially for Islamic universities. The abundance of positive tweets from various entities such as individual and government accounts, media outlets, and institutions likely contributes to the higher proportion of positive sentiments than negative and neutral ones.

Practical sentiment analysis plays a crucial role in identifying responses and categorizing them into predefined classifications, enabling a comprehensive understanding of individual and group perceptions regarding specific phenomena, such as the image of Islamic Higher Education. The visualizations conducted for each sentiment category provide a visual representation of the data and extract valuable information regarding the most frequently discussed topics and opinions in public discourse related to Islamic Higher Education. The prominence of the word “university” in positive sentiments, “religion” in negative sentiments, and the coexistence of “university” in neutral sentiments illustrates the significant impact of these words on shaping public sentiment concerning the image of Islamic Higher Education on Twitter.

## CONCLUSION

The analysis presented in the results and discussion sections unequivocally demonstrates the prevalence of positive sentiment on Twitter in the context of Islamic Higher Education, encompassing 8,639 out of 11,809 tweets, constituting approximately 73.16 percent of the total dataset. Conversely, 2,524 tweets were identified as bearing negative sentiment (21.37 percent), and 646 tweets reflected neutral sentiment (5.47 percent). These findings underscore a widespread favorable disposition among users regarding Islamic Higher Education, signifying a positive public perception.

These results imply actionable insights for Islamic higher education institutions aiming to bolster their image on social media, specifically Twitter. Strategic enhancements in communication strategies, responsiveness to issues, and marketing initiatives can significantly reinforce a positive public image. Additionally, it is imperative to recognize the potential of social media as a powerful tool for shaping the perception of Islamic colleges. Proactive efforts in disseminating positive content can augment the institution’s visibility, fostering a more favorable public sentiment.

Future research endeavors could employ advanced methodologies such as topic modeling to discern specific themes eliciting positive or negative responses annually. Moreover, leveraging word association techniques could enhance information retrieval within the dataset, further refining our understanding of the nuanced nuances in public sentiment. These research directions promise a more nuanced exploration of public perceptions, providing valuable insights for educational institutions and policymakers aiming to navigate the complex landscape of social media communication effectively.

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