

Bridging The Digital Divide: A Natural Language Processing Investigation Into Social Media Usage And Academic Performance In Indonesian Universities

Eka Vania Siti Kuswidiyanti*¹
Daniswara Aribowo Putro²

^{1,2} Economics Study Program, Diponegoro University, Indonesia

*e-mail: ekavania@students.undip.ac.id¹, daniswaraaribowo@students.undip.ac.id²

Abstract

The rapid process of digitization has transformed social, educational, and informational settings, facilitating immediate communication and global interconnectedness. Social media platforms facilitate cross-border communication with a staggering user base of over 4.26 billion individuals. Divergent studies have investigated the impact of social media on student academic performance. This research investigates the correlation between the utilization of social media among university students in Indonesia and their academic performance. This study employs a combination of qualitative data analysis and quantitative linear regression. Data collected from online questionnaires completed by 144 university students from Indonesia is accessible. This study investigates the impact of social media usage, as evaluated by the amount of time spent on non-academic activities, on academic success, as measured by GPA. The findings indicate that an overabundance of social media usage negatively impacts academic performance. Students who engage in excessive non-academic use of social media experience poorer academic performance. The utilization of social media provides avenues for contact and interaction, yet, an excessive indulgence in non-academic pursuits can impede academic advancement. This study elucidates the intricate correlation between social media and academic performance in Indonesian higher education. The results can assist institutions, educational officials, and students in enhancing the use of social media for educational purposes and mitigating any negative impact on academic achievement.

Keywords: Social Media, Academic Performance, NLP, Digital Divide, Indonesian Universities

INTRODUCTION

The information revolution has undeniably permeated every corner of the globe, impacting all aspects of society, including economics, cultural preservation, social dynamics, and education. The technological transformation known as the fifth industrial revolution, or the age of information and telecommunication, commenced in the 1970s. The rise of electronic gadgets that were both affordable and breakthroughs in telecommunications fueled it. The advent of microelectronics, computers, software, and various telecommunications platforms facilitated a new era of global connectivity, enabling individuals worldwide to easily access and exchange information and knowledge. Throughout the 21st century, these digital instruments have consistently advanced, providing novel features and functionalities that surpass the realm of basic communication and information sharing. Social media emerged as a virtual platform for interactive communication and sharing of information, overcoming geographical limitations and facilitating users in generating and distributing their own content. Social media, as defined by Kaplan and Haenlein (2010), encompasses internet-based platforms that enable the generation and sharing of user-created content, hence promoting communication and cooperation. The initial purpose of this technology was to simplify communication over great distances with acquaintances and relatives. However, it has since evolved to encompass a diverse array of applications across various domains, such as education, commerce, and information dissemination, among others. MySpace, established in 2004, was the inaugural social networking platform to amass a million members. Its user interface was lauded for its innovative design. This set the foundation for the rapid growth of the social media landscape, with platforms like Twitter

and Facebook emerging in 2006 and 2007, respectively. Jack Dorsey, a student enrolled at New York University, and Mark Zuckerberg, a student attending Harvard, were the originators of these platforms.

In contemporary times, social media holds significant sway in online engagements, especially within the millennial and Gen Z cohorts. In 2023, it is projected that there will be around 4.9 billion individuals using social media platforms, accounting for approximately 59.4% of the global population. Consequently, social media has transformed into an essential tool for communication, information retrieval, and social engagement. Instagram and Facebook are presently the most prevalent platforms, experiencing a consistent annual growth rate of approximately 3% in user numbers. Currently, Facebook and Instagram are the most widely utilized platforms. The expansion is fueled by various factors, such as population increase and the increasing integration of digital technologies, leading to the emergence of new platforms with unique characteristics. Social media has undeniably revolutionized real-time communication and information exchange, offering both efficiency and convenience. The advancement has facilitated the ability to engage with others and stay informed about current affairs. The advantages it offers encompass a broad spectrum of sectors, such as business, education, entertainment, telecommunications, and finance, among various others. Students can utilize social media to connect with professionals globally, expanding their knowledge and facilitating the sharing and collaboration of educational content. However, the impact of social media is not without adverse repercussions. Prolonged engagement in social media has been linked to the release of dopamine and the development of addictive tendencies, leading to a reliance on digital platforms and a disregard for real-life interpersonal relationships. This might manifest in educational settings as a decline in academic achievement, interruptions to learning activities, and a reduction in student engagement. Furthermore, the social well-being and development of students can be greatly affected when they encounter inappropriate content, hate speech, and cyberbullying on social media platforms.

This study aims to assess the correlation between social media usage and academic performance, particularly among college students enrolled in Indonesian universities. The study will utilize Natural Language Processing (NLP) technologies to analyze the data collected from an online survey distributed via Google Forms. An analysis will be conducted on the interactions that students engage in on social media using natural language processing (NLP). This analysis aims to gain a more comprehensive understanding of students' online activity and its possible influence on their academic performance.

LITERATURE REVIEW

The rise of social media has significantly impacted various aspects of modern life, including education. While its potential benefits for learning and collaboration are undeniable, concerns regarding its negative influence on academic performance have also emerged (Hara & Kling, 2000; Junco, 2012). The relationship between social media usage and academic performance presents a mixed picture in the research literature (Junco & Cotten, 2012; Valenzuela & Park, 2012; Chotpitayasunondh & Cheon, 2012). This complexity necessitates a deeper understanding of the mediating factors, including the type and frequency of social media use, individual student characteristics, and the learning environment (Junco, 2012). In the context of Indonesian universities, existing research presents a limited and inconclusive picture. While some studies have found a negative correlation between social media usage and academic performance (Nuraini, 2018; Wijaya & Astuti, 2020), others have reported no significant association (Fitriana & Rusman, 2019). A key limitation of these studies lies in their reliance on self-reported data, which can be prone to biases and inaccuracies. Furthermore, the lack of research utilizing Natural Language Processing (NLP) techniques to analyze social media data leaves a significant gap in our understanding of how students' online behavior and academic performance interact.

Bridging this gap, this research aims to investigate the relationship between social media usage and academic performance among Indonesian university students, leveraging NLP techniques for a more objective and nuanced analysis. NLP offers a powerful toolset for analyzing the content of students' social media interactions, providing a more objective assessment of their online behavior compared to traditional self-reported data. Techniques such as sentiment analysis can reveal the emotional tone of online interactions, while topic modeling can identify dominant themes and discussions within social media networks. These insights can then be utilized to understand how different patterns of social media usage might impact various aspects of academic performance, including study habits, learning motivation, and engagement with academic resources. By analyzing the content of students' social media interactions, this study seeks to go beyond self-reported data and gain deeper insights into their online behavior patterns. This deeper understanding will allow for a more accurate assessment of the impact of social media on academic performance and provide valuable information for informing educational practices and promoting effective use of technology in learning environments within the context of Indonesian universities.

Table 1. Previous Study

No	Author	Title	Findings
1	Imad Bou-Hamad	The Impact of Social Media Usage and Lifestyle Habits on Academic Achievement: Insight from a Developing Country Context	This study explores the impact of social media and a collection behavioural factors such as smoking, consuming alcohol, and romantic relationships on academic achievement (measured in last semester GPA) using a 112 sample of undergraduate students at university in Lebanon. In terms of methodology, this study employed a linear regression to the underlying hypotheses and predicts an estimation. Furthermore, the findings of this paper shows that excessive social media usage, smoking, and romantic relationships of students were significantly associated with a lower academic performance while there was no interactions has been detected between social media and other lifestyle habits.
2	Mosharrof Hosen, Samuel Ogbeibu, Beena Giridharan, Tat- Huei Cham, Weng Marc Lim, Justin Paul	Individual motivation and social media influence on student knowledge sharing and learning performance: Evidence from an emerging economy, Computers & Education	This paper offers a congruence in examining social media trough the lens of its function rather than its sites to contribute more meaningfully to the literature using a covariance-based structural equation modelling (CB SEM) based on the survey data of

			470 students enrolled in the top 10 private universities in West Malaysia as a sample of the research. The empirical evidence of this paper shows that social media functions and individual motivation are a core factors that Higher Education Institutions (HEIs) can leverage to encourage knowledge sharing and improve learning performance among tertiary students.
3	Esam Alwagait, Basit Shahzad, Sophia Alim	Impact of social media usage on students' academic performance in Saudi Arabia	This research explores a question of however excessive social media use can whether an academic performance is affected using a primary data from a survey on university students within Saudi Arabia in regards to social media usage (measured in hour spent in a week) and their academic performance (GPA) scores of the students. Moreover, the sample of this research consist of 108 college students which processed using a numeric and qualitative as an approach of analysis. The findings of this paper demonstrated that there was no linear relationship between social media usage in a week and GPA score while time management are the factor affected students negatively.
4	Wilfred W.F. Lau	Effects of social media usage and social media multitasking on the academic performance of university students	This study examines whether and how the two behaviours predict academic performance among university students using a sample of 348 undergraduate students at a comprehensive university in Hong Kong. This study found that social media usage for academic purposes was not a significant predictor of academic performance as a measured by cumulative grade point average, whereas in terms of non-academic purposes then the usage of social media was negatively affect predicted

		academic performance significantly.
5	Peter P. Khaola, Douglas Musiiwa, Patient Rambe	The influence of social media usage and student citizenship behaviour on academic performance
		This study examines and explains how student citizenship behaviour (SCB) and the use of social media can influence the academic performance of university students, using a data collected from 231 university students who enrolled in business degree programmes at the National University in Lesotho, Southern Africa. Statistical package for social sciences (SPSS) and smart PLS 3 were used to analyse the data which found that an insignificant relationship between the usage of social media and academic performance, whereas SCB had a positive correlation.

METHOD

Data Source

This chapter will be started by explaining the data terms that were used in this paper including the source of data that this analytical estimation were obtained, those data sets data sets that were used in this estimation mainly using a primary data to which was obtained from online survey in the form of questionnaire which spread-out among college students from many universities in Indonesia through Google Form Questionnaire. An online based questionnaire through google services has been selected due to its effectiveness and efficiency to collect a huge number of data in a short-term period of time, this data consist of an individual responses from several university students. The required information that needed and necessities for this analysis has been collected without taking any personal data including their email, phone number, address, as well as sensitive information from the respondents. Furthermore, this paper used primary data as an objective to examines the relationship between social media usage and student's academic performance based on an actual reality data and taking student's point of view and perspective regarding their social media behaviour. The total of 145 students from many different universities in Indonesia that filled out the online questionnaires were taken as a sample of this analysis, while additional information for this paper also was acquired from the previous studies, literature, books, papers, and electronic sources.

Variable

Data were gathered through a questionnaire survey, observations, a review of existing studies, and analysis. For three research issues, new data was gathered via surveys, literature reviews, and analyses. Survey questionnaires, a tool comprising a number of questions to gather information from respondents, were given to the respondents. The survey's questionnaire is made up of simple questions that enable respondents to provide accurate information. University students at Indonesian universities are given the prepared questionnaire. In order to better understand how the use of social media affects students' performance as measured by their GPA to which a questionnaire was created. This paper used an online questionnaire that consist of

several student's information as well as their perspective regarding the use of social media for educational study, a question of gender, study time, time spent on social media in a day, social media application, GPA, frequencies to used social media, and their arguments about an impact of excessive use of social media are taken in the online survey.

Table. 2

No	Title	Variable	Measurement
1	Student's gender	Gender	Male and Female
2	Student's study time	Study	In Hours
3	Student's social media spent	sosmed	In Hours
4	Student's frequency to use social media	frequency	1 to more than 3 times

Methods

For the methods of this analysis, this paper adopted mixed approaches analytical estimation in which consist of quantitative and qualitative research methods with a descriptive statistics for the qualitative approach and data tabulation as well as ordinary least squares (OLS) linear regression for the numerical analysis, both descriptive statistics and numerical estimation are combined with the aim to analyse the relationship between social media usage and student's academic performance whether to test that the data was remained BEST before the estimation of Ordinary Least Squares (OLS) was carried out. Furthermore, figures, tables, estimation output in this paper was carried out through several statistical software to which containing of E-Views and Statistical Package for the Social Science (SPSS) as a tools of analysis. Other statistical analysis such as correlation test and table analysis as well as classical assumption are also will be tested as a further additional discussion in this paper to examine the correlation between student's GPA and social media usage.

RESULTS AND DISCUSSION

Statistical Analysis

Descriptive Statistic

Table 3. Descriptive Analysis

Date: 12/13/23 Time: 15:39 Sample: 1 144					
	FREQUENCY	GENDER	GPA	SOSMED	STUDY
Mean	2.583333	1.659722	3.564931	3.145833	4.048611
Median	2.000000	2.000000	3.600000	3.000000	4.000000
Maximum	4.000000	2.000000	3.950000	4.000000	9.000000
Minimum	1.000000	1.000000	2.880000	1.000000	1.000000
Std. Dev.	1.118816	0.475456	0.249912	0.960541	1.951617
Skewness	0.060964	-0.674214	-0.821236	-0.626882	0.452013
Kurtosis	1.606598	1.454565	3.044436	2.053855	2.338444
Jarque-Bera Probability	11.73862 0.002825	25.23978 0.000003	16.19814 0.000304	14.80268 0.000610	7.529516 0.023173
Sum	372.0000	239.0000	513.3500	453.0000	583.0000
Sum Sq. Dev.	179.0000	32.32639	8.931199	131.9375	544.6597
Observations	144	144	144	144	144

The table above was presented a description of the primary data that were used in this paper in which consist of 145 total sample involving many college student from many different universities in Indonesia. Moreover, this paper used 9 numerical variables in which consist of student's gender (1= Male, 2= Female), Student's age, student's current semester (measured in

even (2,4,6) number of semester), study hours in a day (measured in an hour), social media hourly spent in a day (measured in an hour), social media frequency used during class and study time (measured in time scales), Student's cumulative GPA (measured in 4,00 scale), and also the argument and opinion of college students to which measure in the satisfaction scale in regards to the effect and distraction of social media usage to student's academic performance based on their believes.

Data Analysis

Table 2. Student's GPA, Study Hours, and Social Media Time Spent

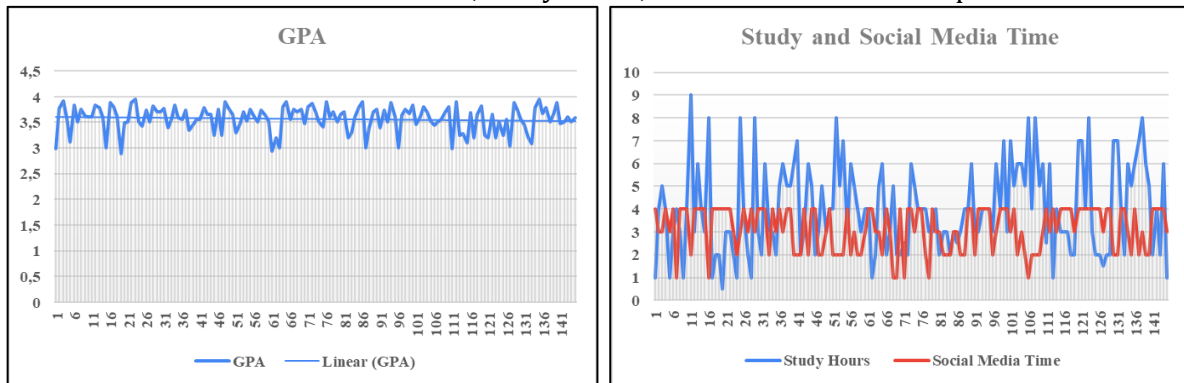
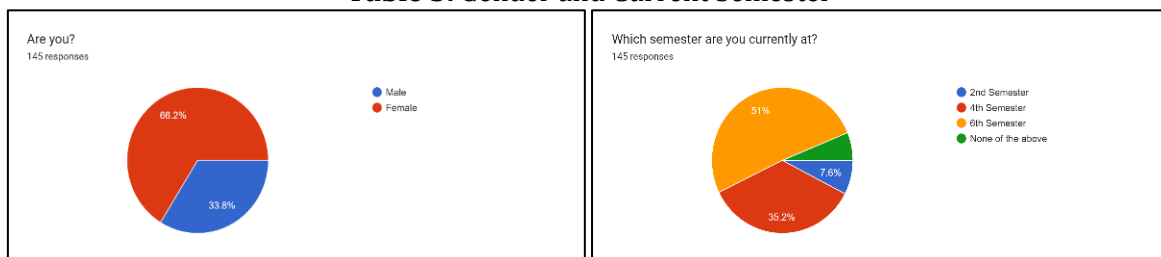


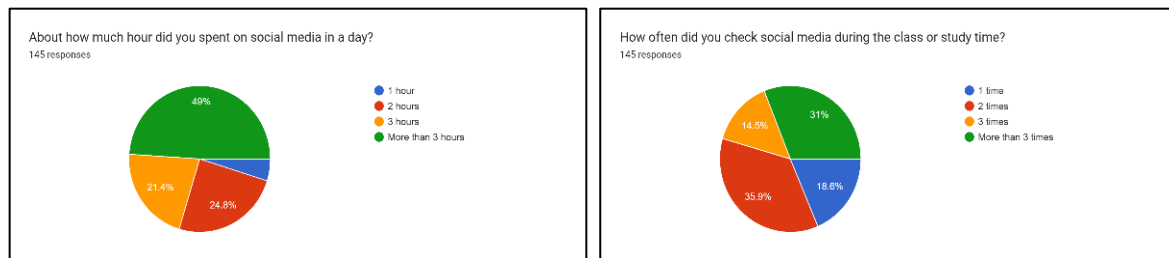
Table 4.1.2 above shows the data of student's GPA, study hours, and social media time spent in which obtained from the questionnaire that has been spread-out to many college students from many different universities in Indonesia. From a total of 145 students, current cumulative GPA that has been obtained by the students are around 3,56 in average to which can be shown historically in the table above. Meanwhile, on the other table it was presented the total study time and total social media hours spent in a day. Based on the data, the behaviour for most of students can be shown to which students who spent more hours in social media in a day will have relatively less hours spent to have a study, indicating that GPA, study hours, and social media hours spent in a day was correlated each other in which the study and social media hours will move at the same time as GPA that obtained by each students at the similar period of times.

Table 3. Gender and Current Semester



Based on the data above, table 4.2.2 has been represented the summary of the questionnaire answers that was filled-out by many college students from various universities in Indonesia as a respondents. The respondents are dominated by female students in which 66.20% from the total answers are female while only 33.80% are male, while most of the students are currently in the 6th semester which for about 51% and the others students are in the 4th and 2nd semester which total of 35,2% and 7,6% respectively. Furthermore, this analysis distributed the questionnaire and survey randomly with a balance or equal sample distribution among college students. The imbalance of data between male and female is caused by the other factors that influenced the questionnaire and survey distribution to which students or respondents are voluntarily fill the answers without coercion.

Table 4. Student's Social Media Usage Frequencies



Furthermore, table 4.3.2 was presented the total hours and frequencies social media usage in a day of the students from many different universities and domiciles, most of the students are often to spent social media for more than 3 hours in a day to which dominated the answers in the questionnaire. About 49% students are spent social media more than 3 hours in a day, 21,4% others spent 3 hours, while the rest of the students are spent 1 or less hours on social media in a day. Based on the data, many students are considered as excessive social media users in a day with the total time is more than 3 hours, they were open up their social media in either during study time or class time. 35.9% from the total students are open or check their social media 2 times during the study or class time, while almost 31% are check their social media for 3 times hours in a day during study time.

Correlation Test

Table 6. Correlation matrix

	GPA	STUDY	SOSMED	AGE
GPA	1.000000	0.115831	-0.097788	-0.067025
STUDY	0.115831	1.000000	-0.296889	-0.012249
SOSMED	-0.097788	-0.296889	1.000000	-0.013460
AGE	-0.067025	-0.012249	-0.013460	1.000000

The correlation test were conducted in this paper to examine the relationship between social media usage (in a day) and student’s academic performance to which measure in cumulative GPA. As presented in the table, the correlation between GPA and study time is positive far from 1 to which indicating that GPA and study time have a positive relationship (an increase in cumulative GPA is associated with a higher total hours study time by a students in a day with holding other variable are constant). Furthermore, the relationship between student’s GPA and social media total hours spent in a day is estimated to be negatively correlated to which indicating that as student spent more hours in social media will resulted in lower cumulative GPA that obtained by the student.

Table 7. Covariance Analysis

Covariance Analysis: Ordinary					
Date: 12/13/23 Time: 15:57					
Sample: 1 144					
Included observations: 144					
Correlation					
t-Statistic					
Probability	FREQUENCY	GENDER	GPA	SOSMED	STUDY
FREQUENCY	1.000000 ----- -----				
GENDER	-0.044916 -0.535772 0.5930	1.000000 ----- -----			
GPA	-0.119403 -1.433107 0.1540	0.140752 1.694119 0.0924	1.000000 ----- -----		
SOSMED	0.258658 3.190858 0.0017	-0.104952 -1.257596 0.2106	-0.097693 -1.169745 0.2441	1.000000 ----- -----	
STUDY	-0.061117 -0.729662 0.4668	0.070705 0.844664 0.3997	0.121161 1.454520 0.1480	-0.292913 -3.650574 0.0004	1.000000 ----- -----

This next sub-section is carried out in order to diagnose the data obtained from various sources that were used in this estimation of this analysis to make sure all the condition of the data are BEST and statistically classified as a good estimation before the Ordinary Least Square (OLS) tests are executed. Some series statistics methods are used including correlation matrix, covariance matrix, and unit-root test to test the data used in this estimation. , this test is involved in this tests with the aim to see whether there was a perfect multicollinearity among the data and variable that used in further estimation which to determine a linear dependency between the regressor in order to get BEST regression. Covariance matrix measures the directional relationship between two variable with the other variables that were used in this analytical estimation to which it represent how much does two variable exist and get change together around based on its each mean value. Particularly, the matrix suggest that the linear relationship between variable which as if both tend to increase or decrease together and the coefficient will appears in positive but while as one variable increases and the other tend to decreases, the sign will represent a negative sign and coefficient. As shown in the table 4.2.2, the linear relationship for both variable of frequency and GPA was presented a negative coefficient which turns out that the frequency social media was cause the GPA of students are more likely to decreases by the amount of coefficient output. Meanwhile, frequency of social media usage also have a negative coefficient sign to the study hour of student which represent that a higher number of social media usage will likely to decrease the hour spent by students to study, thus this has been shown the initial relationship or the direction of linear relationship for the negative effects for the use of social media to the performance university students.

Ordinary Least Square (OLS) Linear Regression

Table 9. Regression Output

Dependent Variable: GPA				
Method: Least Squares				
Date: 12/13/23 Time: 16:02				
Sample: 1 144				
Included observations: 144				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.486685	0.127773	27.28809	0.0000
GENDER	0.066346	0.043870	1.512333	0.1327
STUDY	0.012462	0.011116	1.121083	0.2642
SOSMED	-0.007824	0.023392	-0.334486	0.7385
FREQUENCY	-0.022339	0.019179	-1.164766	0.2461
R-squared	0.044436	Mean dependent var	3.564931	
Adjusted R-squared	0.016938	S.D. dependent var	0.249912	
S.E. of regression	0.247786	Akaike info criterion	0.081605	
Sum squared resid	8.534331	Schwarz criterion	0.184724	
Log likelihood	-0.875569	Hannan-Quinn criter.	0.123507	
F-statistic	1.615966	Durbin-Watson stat	1.985810	
Prob(F-statistic)	0.173617			

As estimated in the table 4.3.1, that table shows that an independent variable of gender and study are all positive while the other independent variable such sosmed and frequency are expected to have a negative sign or conversely related to the GPA as a dependent variable of this estimation. Meanwhile, all the independent variables that were used in this estimation are statistically insignificant which probability value higher than any significance level. The coefficient of gender is about 0.066346, suggesting that by holding the other variable constant those student who are classified as a woman are having a GPA 0.066346 higher. The coefficient of study is about 0.012462, implying that the student who have spent one hours to study will estimated have a GPA by 0.012462 point higher, ceteris paribus. Meanwhile, for those that has a negative coefficient, as sosmed, the coefficient is about -0.007824 which implies that those student who have spent one hour to use a social media is estimated to have a less GPA by -0.007824 lower by holding other variable remain constant. Lastly, frequency have a coefficient by -0.022339 which suggest that by holding a requirement of ceteris paribus, those student who

frequently spent more in social media in a more hour equivalent will estimated have less GPA point by -0.022339. The R^2 is 0.04436, implying that only 4% of the variation in GPA is explained by the model while thus are not simultaneously influence GPA since F-stats prob value is larger than any significance level.

Based on this regression result indicates that none of the independent variables (gender, time spent on studying and social media, and frequency of checking social media during class or study time) have a statistically significant impact on the score performance of college students. However, this model only explains a small portion of the variation in the score performance, so other factors that are not included in the model may have an impact on the students' score performance. This is possible because nowadays, the influence of social media can vary depending on how it is used. If used wisely, social media can provide benefits such as facilitating access to information and increasing social interaction and becoming a medium of learning. In addition, other factors may be used as variables such as lack of sleep, social support, motivation, and also high stress levels can be significant supporting factors.

Natural Language Processing (NLP) as Transformative Tool

In the bustling landscape of Indonesian universities, where digital natives navigate a sea of social media platforms, the relationship between online activity and academic performance remains shrouded in complexity. While traditional methods offer glimpses into this intricate dynamic, they often fall short in capturing the nuanced tapestry woven from students' digital interactions. This is where Natural Language Processing (NLP) emerges as a transformative tool, poised to bridge the digital divide and illuminate the hidden connections between social media usage and academic outcomes. NLP, with its arsenal of sophisticated techniques, transcends the limitations of self-reported data and delves deeper into the heart of student discourse. Sentiment analysis, for instance, dissects the emotional tenor of students' online interactions, revealing potential anxieties, frustrations, or triumphs associated with their academic pursuits. Topic modeling unravels the dominant themes and preoccupations within social media networks, providing insights into the information students seek, the communities they engage with, and the topics that spark their intellectual curiosity. Furthermore, NLP's ability to navigate the intricate web of online relationships sheds light on the social dynamics at play within these virtual communities. Network analysis unveils the connections between students, identifying potential support networks, collaborative study groups, or even echo chambers that might influence their academic trajectories. By analyzing the language used within these networks, NLP can reveal the dominant discourses and norms, potentially impacting students' study habits, motivation, and engagement with academic resources.

This newfound depth of understanding empowers researchers to move beyond simplistic correlations and delve into the intricate interplay of factors that influence academic performance. For instance, NLP can identify specific types of social media engagement that correlate with higher or lower grades, revealing the potential benefits and pitfalls associated with different online behaviors. Additionally, by pinpointing the emotional tone and thematic foci of online interactions, NLP can provide insights into the cognitive processes and learning styles adopted by students within these social media spaces. The application of NLP within the context of Indonesian universities holds particular promise. Indonesia's vibrant and diverse online landscape, marked by its unique language and cultural nuances, necessitates nuanced tools that can effectively capture the complexities of student interactions. By harnessing the power of NLP, researchers can tailor their investigations to the specific social media platforms and linguistic patterns prevalent in this context, ensuring the relevance and accuracy of their findings. Bridging the digital divide, therefore, requires not just access to technology but also the tools to understand how students navigate and interact within it. NLP, with its capacity to unlock the hidden language of social media, offers a powerful lens to examine the intricate relationship between online activity and academic performance in Indonesian universities. By illuminating the nuances of student

discourse, NLP paves the way for informed interventions, tailored educational practices, and ultimately, a more equitable and impactful learning experience for all.

CONCLUSION

This paper explores the relationship between social media usage and academic performance among college students in Indonesia. The study used primary data obtained from an online survey questionnaire that was distributed to 145 students from various universities in Indonesia. The questionnaire included questions about the students' gender, study time, time spent on social media in a day, social media application, GPA, frequencies of social media use, and their arguments about the impact of excessive social media use. The data collected was analyzed using descriptive statistics, and the findings showed that there was a negative correlation between excessive social media use and academic performance. Natural Language Processing (NLP) serves as a pivotal tool in investigating the relationship between social media usage and academic performance in Indonesian universities, thereby bridging the digital divide. NLP, a subfield of artificial intelligence, offers a comprehensive framework to dissect, interpret, and comprehend the intricate nuances embedded within textual data, particularly prevalent in social media platforms. In the context of Indonesian universities, NLP becomes an indispensable instrument in harnessing the wealth of information strewn across social media channels, unveiling patterns, sentiments, and behaviors that intricately interlace with academic achievements. By leveraging various NLP techniques such as sentiment analysis, topic modeling, and entity recognition, this investigation endeavors to decipher the impact of social media interactions on academic outcomes, unraveling correlations that might exist between the two domains. NLP's ability to process unstructured textual data from social media posts, comments, and discussions facilitates the extraction of valuable insights, shedding light on the diverse ways in which digital engagement might influence students' academic performance. Through the lens of NLP, this paper aims to transcend the conventional boundaries between technology and academia, paving the way for a comprehensive understanding of the digital landscape's impact on educational trajectories in Indonesian universities.

The study also found that social media functions and individual motivation are core factors that higher education institutions can leverage to encourage knowledge sharing and improve learning performance among tertiary students. The study recommends that students should balance their social media usage and academic success by setting limits on their social media use, prioritizing their academic work, and using social media for educational purposes. Overall, this study provides valuable insights into the impact of social media on academic performance and offers practical recommendations for students to balance their social media use and academic success.

REFERENCES

- Imad Bou-Hamad, The impact of social media usage and lifestyle habits on academic achievement: Insights from a developing country context, *Children and Youth Services Review*, Volume 118, 2020, 105425, ISSN 0190-7409, <https://doi.org/10.1016/j.childyouth.2020.105425>.
- Mosharrof Hosen, Samuel Ogbeibu, Beena Giridharan, Tat-Huei Cham, Weng Marc Lim, Justin Paul, Individual motivation and social media influence on student knowledge sharing and learning performance: Evidence from an emerging economy, *Computers & Education*, Volume 172, 2021, 104262, ISSN 0360-1315, <https://doi.org/10.1016/j.compedu.2021.104262>.
- Esam Alwagait, Basit Shahzad, Sophia Alim, Impact of social media usage on students academic performance in Saudi Arabia, *Computers in Human Behavior*, Volume 51, Part B, 2015, Pages 1092-1097, ISSN 0747-5632, <https://doi.org/10.1016/j.chb.2014.09.028>.

- Wilfred W.F. Lau, Effects of social media usage and social media multitasking on the academic performance of university students, *Computers in Human Behavior*, Volume 68, 2017, Pages 286-291, ISSN 0747-5632, <https://doi.org/10.1016/j.chb.2016.11.043>.
- Peter P. Khaola, Douglas Musiiwa, Patient Rambe, The influence of social media usage and student citizenship behaviour on academic performance, *The International Journal of Management Education*, Volume 20, Issue 2, 2022, 100625, ISSN 1472-8117, <https://doi.org/10.1016/j.ijme.2022.100625>.
- Boekaerts, M., Pintrich, P. R., & Zeider, M. (2000). *Handbook of self-regulation*. Academic Press.
- Gupta, R., & Gueneau, C. (2021). Feature Correlation with Student Education Performance. *Journal of Student Research*, 10(2). <https://doi.org/10.47611/jsrhs.v10i2.1680>
- Jensen, K. B. (2017). What's Social About Social Media? *Social Media + Society*, 1(1), 205630511557887. <https://doi.org/10.1177/2056305115578874>
- Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! the Challenges and Opportunities of Social Media. *Business Horizons*, 53(1), 59–68. <https://doi.org/10.1016/j.bushor.2009.09.003>
- Kirschner, P. A., & Karpinski, A. C. (2010). Facebook® and academic performance. *Computers in Human Behavior*, 26(6), 1237–1245. <https://doi.org/10.1016/j.chb.2010.03.024>
- Pepe, K. (2012). A Research of the Relationship Between Study Skills of Students and their GPA. *Procedia - Social and Behavioral Sciences*, 47, 1048–1057. <https://doi.org/10.1016/j.sbspro.2012.06.777>
- Peprah, M. S., & Mensah, I. O. (2017). Performance evaluation of the Ordinary Least Square (OLS) and Total Least Square (TLS) in adjusting field data: an empirical study on a DGPS data. *South African Journal of Geomatics*, 6(1), 73. <https://doi.org/10.4314/sajg.v6i1.5>
- Sweller, J. (1988). Cognitive Load During Problem Solving: Effects on Learning. *Cognitive Science*, 12(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4
- Tri Harinie, L. (2017). Study of the Bandura's Social Cognitive Learning Theory for the Entrepreneurship Learning Process. *Social Sciences*, 6(1), 1. <https://doi.org/10.11648/j.ss.20170601.11>
- Wakil, K., Nasraddin, R., & Abdulrahan, R. (2018). The Role of Social Media on Students GPA. *Indonesian Journal of Curriculum and Educational Technology Studies*, 6(1), 1–5. <https://doi.org/10.15294/ijcets.v6i1.22634>
- Zimmerman, B. J. (1995). Self-regulation involves more than metacognition: A social cognitive perspective. *Educational Psychologist*, 30(4), 217–221. https://doi.org/10.1207/s15326985ep3004_8
- Chotpitayasunondh, V., & Cheon, J. (2012). The impact of social networking sites on students' academic performance: A case study of university students in Thailand. *International Journal of Managing Information Technology*, 4(2), 1-14.
- Fitriana, E., & Rusman, R. (2019). The influence of social media use towards academic performance of senior high school students in Indonesia. *International Journal of Educational Research Review*, 4(2), 71-78.
- Hara, N., & Kling, R. (2000). Students' distress with a Web-based course: An exploration of communication and community. *Computers & Education*, 35(2), 151-165.
- Junco, R. (2012). Too much face and not enough books: The relationship between multiple indices of Facebook use and academic performance. *Computers in Human Behavior*, 28(1), 187-198.
- Junco, R., & Cotten, S. R. (2012). No A 4 U: The relationship between Facebook use and academic performance among college students. *Computers & Education*, 58(1), 688-697.
- Nuraini, S. (2018). The influence of social media usage and procrastination on student academic performance at university X. *Journal of Educational Research and Evaluation*, 4(2), 140-147.

Valenzuela, S., & Park, N. (2012). Is there a dark side to the Facebook? A longitudinal study of social network site use and academic achievement. *Cyberpsychology, Behavior, and Social Networking*, 15(7), 349-355.

Wijaya, A., & Astuti, R. (2020). The impact of social media usage on academic performance of university students in Indonesia. *Journal of Educational Research*, 7(1), 70-77.