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A Study on the Role of Facebook in Highlighting Climate Change Issue

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Abstract

The contribution of Facebook towards raising awareness about climate change among university students has been explored through a quantitative study based on a cross-sectional survey research design. The sample included 50 active Facebook users from the Mass Communication Department of The Women University, Multan. Data were collected using an online survey questionnaire, and descriptive and inferential statistics in SPSS were employed to analyze the data. Findings show that 76% of the respondents are well-informed about climate change, and 86% find it a priority. Although 50% believe Facebook propagates news about climate change, the biggest percentage (40%) is indifferent, showing skepticism about the authenticity of content. Additionally, 44% believe Facebook helps in providing early warnings for climate catastrophes, but 48% are still doubtful about its effectiveness. Emotional responses were also observed, with 51% of the participants indicating that they felt frightened by climate posts and 64% indicating that they felt urged to take action. The study further finds that 59% consider Facebook effective in reaching large audiences and 54% admit its role in government-sponsored climate campaigns, though its effectiveness is dubious. The report emphasizes the need for authoritative, science-based climate information, increased government involvement, and better online strategies to



establish public confidence and action.

Keywords: Climate Change Awareness, Social Media, Digital Engagement, Public Perception, Misinformation, Environmental Communication,

Introduction

Climate change refers to a global phenomenon that depicts changes in the climate of the Earth at regional, local, or global levels. Throughout the last decades, the name has nearly been used interchangeably with human impact, specifically, carbon dioxide emissions caused by the burning of fossil fuels and deforestation (Rafiq & Blaschke, 2012). These changes have multiplied environmental risks and resulted in intense weather conditions such as floods, droughts, heatwaves, and wildfires. The weaker sections of society, especially in the developing world like Pakistan, suffer disproportionately from the adverse effects of climate change that are experienced on environmental, economic, and social levels (Aziz, 2016; Zaurez & Hussain, 2025; Mohammad & Mutahir, , 2025). Pakistan is among the climatically vulnerable countries of the globe due to its geology and geography. It has experienced big natural disasters in the form of the devastating earthquake in 2005 and floods in 2010, causing massive displacement, fatalities, and infrastructure loss (Abid et al., 2020; Shah et al., 2020; Ali et al., 2025).

Urbanization and aggressive infrastructural development also heighten these vulnerabilities. Climate consciousness programs and good disaster management programs are crucial in reducing the impacts of climate change and promoting sustainable development (Pervin, 2019; Anjum & Kabir, 2019; Sachin & Jagdish, 2024). With the advent of the digital era, social media sites have become prominent platforms in sharing information and creating awareness on important global issues such as climate change. Meta Platforms-owned Facebook has been one of the biggest social networking websites with more than 2.93 billion monthly active users as of July 2022 (Pew Research, 2021; Dixit & Jangid, 2024). Since its founding in 2004, Facebook has grown to become a social interaction, information-sharing, and campaign advocacy platform, thereby becoming an important vehicle for climate knowledge and policy discussion (Shah et al., 2020; Jagdish, 2023).

Facebook has also made a concerted effort to battle climate change misinformation and promote evidence-based, science-driven content. The company built the Climate Change Information Center in order to provide users with genuine information from notable climate scientists. The initiative, inspired by Facebook's COVID-19 hub, serves to rebut misinformation and push individuals towards climate credible sources of news (Pew Research, 2021). Climate conversation on social media has influenced public opinion and support, as well as policy support, with climate-active social media users being supportive of climate action policies (Pew Research, 2021, p. 26).

Facebook is a powerful tool for promoting climate change awareness in Pakistan, with more than 43.55 million active members enjoying environmental content through to early 2022 (Meta Advertising, 2022). Through different campaigns and efforts, Facebook enables individuals, NGOs, and global organizations to mobilize the community, campaign for climate action, and increase the awareness of the climate change-related issues in developing nations. The



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platform's mission has shifted from "making the world more open and connected" to "empowering people to build community and bring the world closer together," thus confirming its role to enhance climate awareness and trigger efficient interactions (Abid et al., 2020; Anjum et al., 2013).

Facebook's high-tech platform, such as Virtual Reality (VR), brings with it novel strategies for facing environmental issues. Virtual reality experiences allow people to see the potential effects of climate change and offer a clear vision of the scenario and motivating decisive action. Facebook utilizes such virtual technologies for disseminating global campaigns for awareness and emphasizes taking immediate action on climate issues, particularly by disadvantaged communities that are heavily impacted by severe environmental repercussions (Shah et al., 2020; Abid et al., 2020; Sawyer et al., 2025). This study aims to examine the contribution of Facebook to combating climate change, its potential to raise awareness, fight misinformation, and influence climate policy. The study will assess the extent to which Facebook enables climate discussion and collaborative action, particularly in Pakistan, with an emphasis on climate catastrophe (Rafiq & Blaschke, 2012; Pervin, 2019; Nguyen et al., 2018; Hood & Al-Oun, 2014; Abuamoud et al., 2016).

This research investigate the contribution of Facebook in climate change awareness, looking at how it educates users on environmental matters and shapes public opinion. It seeks to find out if Facebook offers early warnings of climate disasters and compares its contribution with other social media. Since Facebook has a global presence, the research underscores its importance in influencing climate talk, fighting disinformation, and organizing communities for climate action. Knowing its effectiveness will assist policymakers, researchers, and activists in making digital engagement efforts more effective to raise environmental awareness and urge active action against climate change.

Methodology

The research utilized a Quantitative Research Approach to analyze the contribution of Facebook in bringing issues of climate change into focus. Quantitative research was utilized because it can yield objective, measurable, and statistically significant information on how Facebook impacts climate change awareness. Utilizing a structured survey approach, this research guaranteed accuracy, reliability, and consistency in data collection and analysis. The research sought to identify the extent of awareness generated by Facebook, its role in influencing public opinion, and how effective it was in providing early warnings about climate change.

Research Design

A cross-sectional survey design was employed to survey participants at one particular point in time. This enabled the research to determine the degree to which Facebook was serving as an awareness device for climate change issues. A cross-sectional method was most appropriate because it allowed for the measurement of current attitudes, perceptions, and knowledge levels among Facebook users towards climate change. The formal questionnaire enabled systematic collection of the information needed, ensuring a focused and effective study.



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Population and Sample Size

The study was conducted among 50 students from the Mass Communication Department of a Women's University, focusing on active Facebook users. The sample size was chosen to ensure a manageable yet diverse group for reliable analysis. Inclusion criteria required participants to be enrolled in the Mass Communication Department, actively use Facebook, have encountered climate change-related content on the platform, and provide informed consent. Exclusion criteria included students from other departments, individuals who do not use Facebook or have inactive accounts, those who have never interacted with climate change-related content, and those who declined to participate. These criteria ensured that the collected data was relevant to assessing Facebook's role in climate change awareness.

Sampling Technique

The research employed a purposive sampling method to recruit participants who were actively using Facebook and were familiar with online media use. Purposive sampling was used because it made sure that only the people who were active on Facebook and discussing climate change were included in the survey. This approach increased the relevance of the study and made sure that the answers provided were significant and relevant to the goals of the research. By targeting a particular group, the research was able to make inferences regarding the effect of Facebook on people who were consistently exposed to information online.

Data Collection Tool

The study employed an **online survey questionnaire** as the main data gathering instrument, developed and distributed using **Qualtrics**, a high-end survey software that guaranteed effective distribution and analysis while avoiding data loss and manual entry mistakes. The questionnaire comprised **closed-ended questions** that aimed to quantify participants' awareness, perceptions, and interaction with climate change content on Facebook. Major areas of investigation were **how often participants were exposed to climate information, the reliability of sources trailed, level of engagement (e.g., liking, sharing, commenting), Facebook as a source of early warnings for climate catastrophes, and a comparison with other social media sites**. By structuring the questionnaire with **precise and simple questions**, the research guaranteed that the data gathered was both **pertinent and easy to analyze**.

Data Analysis

After all the survey responses were gathered, the information was processed employing descriptive and inferential statistical methods. Descriptive statistics, for example, frequency distributions and percentages, were applied to summarize overall patterns in the data. This gave insights into how many students were aware of climate change details on Facebook, how many times they accessed it, and their attitude towards its effectiveness.

Additionally, inferential statistical methods were employed to identify any patterns or significant relationships within the data. For instance, correlations were analyzed to determine if students who spent more time on Facebook were more likely to be aware of climate change issues. The statistical analysis was conducted using SPSS (Statistical Package for the Social Sciences), a widely used



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software for quantitative research. The utilization of SPSS enriched the precision and understanding of the data that was collected, making sure that the conclusions of the study were established on robust empirical evidence.

Ethical Considerations

Throughout the research, tight ethical standards were adopted to safeguard participants' privacy and confidentiality. Prior to administering the survey, participants were offered an explanation of the purpose of the research and promised that their responses would be confidential and anonymous. Students had a right to withdraw from the survey at any moment without incurring any consequences (Easwaran et al., 2025). Voluntary participation in the study was upheld throughout. Moreover, the study followed the ethical principles of informed consent in the sense that all the participants had to consent prior to providing their responses to the questions in the survey. The information gathered was used for academic purposes alone and was stored securely to avoid any unauthorized access. These ethical protocols saw to it that the research was carried out with honesty and integrity and respect for participants' rights.

Results

The results of this study highlight the central role of Facebook in disseminating information about climate change and how reliant individuals are on it for climate change information. The demographic findings indicate that **98% of the respondents were female students** of **The Women University, Multan**, with **87.8%** of them being bachelor's students table 1. This means that the sample had a good educational background, particularly in mass communication, and therefore were well-educated participants to study media-related trends. Further, **100% of the respondents used social media**, pointing out that online media are strongly integrated into their everyday lives. Considering usage of social media, the findings show that **28% of respondents use 1-2 hours of their time each day on social media, 32% use 3-4 hours, and 30% use over 4 hours** table 2 . This suggests that most segments of the population utilize social media for extended durations, making it a reliable channel for information dissemination, such as climate change information.

Table 1 demographic characteristics

Question	Response	Frequency (n)	Percentage (%)
Gender of Respondents	Female	49	98%
	Prefer not to say	1	2%
Institute Details	Women University Multan	47	95%
	NUML & BZU	3	5%
Qualifications	Bachelor's Degree	44	87.80%
	Intermediate	6	12.20%

Table 2 Social media usage

Question	Response	Frequency (n)	Percentage (%)
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Do you use social media?	Yes	50	100%
Time spent on social media	Less than 1 hour	5	10%
	1-2 hours	14	28%
	3-4 hours	16	32%
	More than 4 hours	15	30%

Concerning climate change awareness and perception, **76% of the participants perceived themselves to be well-informed** and **86% regarded climate change as a real and pressing concern** table 3. In addition, **85% saw climate change currently affecting the world or will affect the world at some point** . These are evident signs of having high awareness among participants in reference to climate change as a threat. Still, despite this awareness, **50% attested to the fact that Facebook is disseminating information on climate change** , and **40% remained neutral** . This neutrality speaks volumes about how despite the significance of Facebook as a source of information, users may remain unsure of the reliability or effectiveness of the content being disseminated to them.

Table 3 Awareness and Perception of Climate Change

Question	Response	Frequency (n)	Percentage (%)
Well-informed about climate change	Agree	38	76%
	Neutral	10	20%
	Disagree	2	4%
Climate change is a real problem	Agree	43	86%
	Neutral	6	12%
	Disagree	1	2%
Climate change is affecting or will affect the future	Agree	42	85%
	Neutral	5	10%
	Disagree	3	5%

Table 4 Climate Change and Social Media

Question	Response	Frequency (n)	Percentage (%)
Social media platform used for climate change info	Facebook	16	32.70%
	Instagram	13	26.50%
	Twitter	9	18.40%
	TikTok & Others	12	22.40%
Facebook is spreading awareness	Agree	25	50%
	Neutral	20	40%
	Disagree	5	10%
Facebook helps in early warnings	Agree	22	44%
	Neutral	24	48%



Disagree	4	8%
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Furthermore, table 5 describe the public opinion on cause and effect of climate change when asked if Facebook has been serving a purpose in providing early warnings of climate catastrophes, **44% concurred, 48% did not have a view, and 8% disagreed**. These findings suggest that although Facebook helps create climate awareness, its effectiveness as a medium for sending out important climate warnings is debatable. The study also looked at the emotional and behavioral impact of climate material on Facebook as shown in table 6. **51% of the respondents admitted that Facebook climate change posts frightened them**, while **64% admitted they felt compelled to act upon being exposed to such posts**. This would be an indication that Facebook posts instill extremely vivid emotional responses which could also influence public opinion and drive citizens toward climate action. The fact that the social media platform among many of the surveyed, however, requires more engaging as well as credible messages.

Table 5 Public Opinion on Climate Change Causes and Effects

Question	Response	Frequency (n)	Percentage (%)
Climate change is caused by human activities	Agree	38	76%
	Neutral	8	16%
	Disagree	4	8%
Climate change is linked to fossil fuel burning	Agree	36	72%
	Neutral	9	18%
	Disagree	5	10%
Climate change posts on Facebook frighten me	Agree	26	51%
	Neutral	17	34.60%
	Disagree	7	14.40%

Table 7 describe the government and climate change actions, **59% of participants indicated Facebook is effective in hooking large crowds to climate change while 50% believed that Facebook campaigns performed better than on other social websites**. This means that Facebook has the potential to target and influence many people, but its effectiveness compared to other platforms is yet to be determined. Finally, attitudes towards government policy and climate responsibility were also mentioned in the study. **74% agreed that urgent action should be taken to combat climate change, and 56% believed that developing countries are more affected by climate issues**. Besides, **54% of the respondents agreed that governments use Facebook to implement climate change campaigns, while 30% were not sure**.

Table 6 Role of Facebook in Climate Change Awareness

Question	Response	Frequency (n)	Percentage (%)
Facebook encourages people to act	Agree	32	64%



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	Neutral	16	32%
	Disagree	2	4%
Facebook can grab a large audience's attention	Agree	29	59%
	Neutral	14	28%
	Disagree	7	13%
Facebook campaigns are more effective than others	Agree	25	50%
	Neutral	17	34%
	Disagree	8	16%

This implies that although Facebook has been recognized as a government tool for climate campaigning, there is uncertainty regarding whether the campaigns are effective. Furthermore, most **82% of the respondents agreed that everyone should participate in environmental conservation activities**, affirming the issue that public action is central to addressing climate change. These findings show that awareness exists but there is a need for more coordinated and efficient climate action on social media to have actual impacts in reality. The results underscore the demand for **more credible, science-based climate content on Facebook**, enhanced government engagement, and better efforts to combat climate change using digital media.

Table 7 Government and Climate Change Actions

Question	Response	Frequency (n)	Percentage (%)
Immediate actions should be taken	Agree	37	74%
	Neutral	9	18%
	Disagree	4	8%
Developing countries are more affected	Agree	28	56%
	Neutral	15	30%
	Disagree	7	14%
Governments use Facebook for climate campaigns	Agree	27	54%
	Neutral	15	30%
	Disagree	8	16%

Discussion

This study uncovers the significance of the role of Facebook in contributing to climate change awareness among university students. Vastly majority of the respondents considered themselves quite well-educated on the subject of climate change, and there was a gigantic percentage who considered it to be actual and a cause of concern. These results are in agreement with previous studies that have reported social media as a key platform for the spread of climate information and influencing public opinion (Pearce et al., 2019). Veltri and Atanasova (2017) also established, in their research, that online media, particularly social networking



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sites like Facebook, are significant sources of climate change discourse that allow users to comment, share opinions, and raise awareness. However, while the research subjects acknowledged that Facebook makes people aware, a significant proportion was neutral, reflecting a degree of suspicion in the veracity of information being displayed on the site. This aligns with the findings of Treen, Williams, and O'Neill (2020), who noted that despite the broad coverage of climate change information on social media, misinformation and political narratives easily lead to skepticism and distrust.

Moreover, the study indicates that even with the potential of Facebook as an early warning system of climate disasters, most of the respondents did not trust that it would play that role. This corroborates earlier research on the failure of social media during crisis communication. For example, Spence et al. (2015) in their research created that even though social media platforms are efficient at disseminating information about environmental crises in good time, such information is mostly questioned due to the existence of unverified sources. Similarly, Jones, Hine, and Marks (2017) added that while social media can boost disaster preparedness, its role in providing reliable early warnings comes second to government agencies and conventional news media.

Another major finding of this study is the high emotional and behavioral response provoked by climate change content on Facebook. The majority of the participants admitted to having been frightened by climate posts, and a few reported feeling urged to do something after exposure to such content. This finding is consistent with work by O'Neill and Nicholson-Cole (2009), who hypothesized that affective messages, particularly those evoking fear, are likely to cause initial engagement but do not necessarily create sustained action. Besides, Nabi, Gustafson, and Jensen (2018) found that while fear messaging could be effective in the short term, solutions-oriented messaging leading to a sense of efficacy rather than despair would be more effective for long-term climate action. This present research supports these observations through evidence which indicates that while Facebook has the capacity to evoke strong emotional responses, its ability to convert awareness into concrete action remains questionable.

Besides, the study finds that respondents strongly perceived Facebook as a useful tool for rallying big crowds for climate change, with most people believing that Facebook campaigns were more effective than social media campaigns. This result is complementing the results of Williams, McMurray, Kurz, and Lambert (2015), who determined that Facebook's ability to generate targeted and interactive material is more adept at engaging people with environmental issues than traditional mass media. Nevertheless, this research also indicates ongoing challenges in securing the credibility of climate content posted on Facebook. This is in line with the contention of van der Linden, Leiserowitz, Feinberg, and Maibach (2017), who emphasized the importance of fighting misinformation by using fact-based narratives and building trust in scientific sources.

Finally, findings of the research on government intervention in climate change on Facebook indicate that while the majority of participants believed governments use Facebook in climate awareness campaigns, a significant proportion of them were uncertain of their effectiveness. This corroborates with a study by Mavrodieva et al. (2019), where it was determined that while governments increasingly utilize social media to post about climate, their



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messages are not always harmonized and are not accessed by all target groups. Similarly, Schäfer (2012) noted that although social media provides governments with an unparalleled avenue for engaging citizens on climate issues, the success of these campaigns depends on credible communication and messaging.

Conclusion

In conclusion, this study reinforces the view that Facebook plays an essential role in raising awareness about climate change, mobilizing public opinion, and fostering engagement with climate-related issues. However, the findings also highlight persistent concerns regarding misinformation, the reliability of climate-related content, and the platform's ability to facilitate meaningful action. These insights suggest that for Facebook to serve as an effective tool in combating climate change, it must prioritize credible, science-based content, encourage solution-focused discourse, and promote stronger collaboration between governments, scientists, and environmental organizations.

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