

BREEDING GROUNDS OR ECHO CHAMBERS? EXPLORING THE FORMS OF EXTREMISM IN HAIL'S VIRTUAL ENVIRONMENTS

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Abstract

The present study aims at examining the forms of extremism present in the virtual environment of Hail. The study offered insights into the virtual environment, serving as a breeding ground for new beliefs or echo chambers that reinforce extremist beliefs. The study employed a qualitative research approach. Interviews were conducted with 20 individuals who were at some point engaged with extremist content in the virtual environment. The responses of the individuals identified the five most prevalent forms of extremism in the virtual environment of hail: Political extremism, Religious extremism, Racial and Ethnic supremacism, Gender-based extremism, and Anti-government and conspiracy theories. The results of the finding revealed five key themes: The prevailing nature of extremist content, the Driving force behind engaging with extremist content, the Mechanism for the distribution of extremist content, the Effect of extremist content on individuals, and Strategies for effective countering of extremist content. Consequently, based on the analysis, the virtual environment of Hail possesses features of both the breeding ground and the echo chamber. Even though such areas can foster and strengthen new radical ideas and sentiments, they help sustain previously existing ones, resulting in a rather diverse environment of the radicalization process. The findings support the call for better content filtering, campaigns to raise general media literacy, and the creation of more open online social sites to counter the effects.

Keywords: Virtual environment, online extremism, radicalization, breeding grounds, echo chambers

INTRODUCTION

With the advent of new technology, the world has now opened up to new frontiers that have enhanced the exchange of information and interaction. Social networking sites, from social sites to posts and blogs, have become a crucial part of present-day existence and are serving as a medium for intercontinental communication and communal formation. Virtual environments in the 21st century have led to the evolution of places wherein people from different areas and countries around the globe connect with each other (Asif et al., 2020). These environments are accessible by all to every individual everywhere because globalization has paved the way for them. Virtual environments include various platforms; among them, the most commonly used are Facebook, Instagram, LinkedIn, and Twitter. These virtual environments indulge individuals in sharing information related to their name, age, gender, and phone number and are used by individuals to express personal experiences, beliefs, and views; this leads to the spread of hate speech in the virtual environments (Barnidge et al., 2019, Gaikwad et al., 2021). According to a survey conducted in a recent year, 4,74,000 tweets are uploaded on Twitter, and around 2,93,000 statuses are uploaded on Facebook. The spread of hate speech become a part of extremism in virtual environments. Extremism in virtual environments is used to exploit these platforms for a variety of reasons, including spreading hateful narratives and propaganda, recruitment, and sharing personal information (Ganesh and Bright, 2020, Gill et al., 2017, Gaikwad et al., 2021). However, this evolution has also made plenty of room for Extremists to make their presence felt in the global stage. It is therefore important to identify how these ideologies spread in online space, setting the understanding of whether or not these spaces are Breeding Grounds or Echo Chambers for extremism.

Some studies looked into the social media spread of extremism as it became a staple for extremist organizations. When ISIS attacked Mosul in Iraq in 2014, Farwell recorded 44,000 tweets from ISIS sympathizers every day on average

(Farwell, 2014). Milton examined nine thousand visual materials, including pictures, videos, and reports on images on Twitter about ISIS between January 2015 and August 2016 (Milton, 2016). According to Bill S-894, which was introduced to the US Congress in March 2019, since September 12, 2001, radical right-wing extremist groups have been linked to 73% of domestic violent incidents in the USA, while radical Islamists have been linked to the remaining 27% of incidents. Numerous scholars have provided data regarding the prevalence and expansion of right-wing extremism on the Internet (Congress, 2019). Berger on the Alt-Right According to the 2018 Twitter Census, there are around a million Twitter users that back the alt-right movement. The number of followers of the influential Alt-Right members can reach 40,000. The fanatics of the Christchurch Mosque Attack New Zealand broadcast their live attack on Facebook (Berger, 2018). Just 200 people, according to Facebook, saw it live. Approximately 1.2 million re-uploads of the film were forced to be stopped by Facebook, while 3,00,000 re-uploads went unnoticed (Craig Timberg, 2019).

According to Davies, extremism is sparked "When you do not allow for a different point of view; when you hold your own views as being quite exclusive and when you do not allow for the possibility of difference" (Davies, 2008). The extremist behavior of people is influenced by the changing environmental, political, and social situations. As a result of these changing behaviors, people or individuals become the cause of violent extremism (Asif et al., 2020).

The present study seeks to advance knowledge and understanding of a particular online community by focusing on Hail, a community that operates online and whose users share a rather diverse pool of topics for discussion. Consequently, this study aims to establish the typology of extremism that is present in Hail's virtual environments, as well as identify the process that supports the growth of extremism-related content and the interactions between the users participating in the spread of such content. Finally, this study makes a useful contribution to the study of online extremism by presenting findings that can be used to counter the discussed pathology. Thus, it is easier to define what has to be done to stop the further growth of dangerous ideologies as well, and it will help officials, researchers, and platform administrators understand where further spreading of healthy ideas is necessary to focus.

LITERATURE REVIEW

Hate speech is an essential part of extremism in virtual environments. It is one of the processes from where extremism evolves and emerges (Gaikwad et al., 2021). In a study conducted by (Fernandez and Alani, 2021), three forms of extremism have been detected: understanding, detecting, and predicting. The researchers of the study aimed to identify the challenges and opportunities present for the spread of online extremism. The study provided an overview of the use of AI in dealing with online extremism. Their review focused on the absence of validated data, cooperation between researchers, the evolution of extremist terminology, and lack of ethical perspective in online extremism detection.

Abdallah tani, 2023 Conducted a study on Violence in digital communication social media through the of installing technique; among the most important risks that threaten social life and social communication in virtual societies; Violence in all its forms circulated in the virtual space. Social, communicative and psychological studies in this field showed the negative effects that society is witnessing as a result of the increasing phenomenon. These spaces have become a platform for violent and hate speech, instead of raising awareness in combating and preventing it. Manifestations of violence and hate speech have become entrenched in social networks as a result of lack of awareness on the one hand, and on the other hand, due to the user's lack of reservation to use phrases or publish pictures or contents offensive to individuals and institutions through the technique of installing photos and videos ..., as a matter of taking into account the reasons, identities have become Anonymous or borrowed default uses verbal violence to pass its agenda and tear the social and emotional fabric of society. Hate speech that is disseminated through social networks usually leads to intolerance and generates hateful speeches. Before it multiplies, it spreads and amplifies through social media channels, and sometimes these echoes resonate. Contents through TV channels and newspapers alike, and have a special capacity for existing tensions between different groups and ignite violence among their members, as they may raise new concerns about the association of inflammatory discourse through these spaces with acts of violence. It may be a motive for accidents that contribute to psychological, social, economic, emotional, material and physical harm to people. The use of social networks has become aimed at distorting facts, spreading falsehood, and seditious violent discourse, As for the methods of preventing violence, it requires addressing the factors leading to violence and treating them in a scientific way, and preventive efforts must focus on the stages of childhood and adolescence and the role of educational institutions in this, given that the behavior of violence consists mostly of early childhood, according to psychological studies (Abdallah Tani and Alrasheed, 2023)

Since hate speech is one of the components of virtual extremism, it is important to detect the use of hate speech in the virtual environment. Fortuna et al. (2018) conducted a systematic literature review on the automatic detection of hate speech in virtual or online environments. The study also showed that extremism in virtual environments is caused by using hate speech, and these extremists also demonize the government and social media, recruiting new members and persuasion (Fortuna and Nunes, 2018). Furthermore, the concept of radicalization is also linked with online extremism and uses hate speech in radical discourses (Agarwal and Sureka, 2015b).

Among the studies conducted on the new media and communication environment in the city of Hail is a study conducted by Abdallah Tani, 2023 on The quest for creating a new media and communication environment is at the core of the competitive advantages, merits, and marketing strengths of the so-called city economy, especially that the effectiveness of new media and institutional communication is reliant on interaction with existing or potential customers or stakeholders as well as maintaining a strong electronic reputation. Interaction can take various forms, such as trade fairs, marketing promotions, customer relation initiatives, and other efforts through which organizations interact with the public using electronic means in order to meet customer needs more effectively. As many large companies have dedicated departments for managing investor relations, a question arises: is the new institutional media and communication environment in the Hail region appropriate for promoting digital reputation and attaining local and international competitiveness in the region's development? (Abdallah Tani and Ysaad, 2023).

A study conducted on violent extremism detection on social media platforms proposed unique methodologies for detecting the use of extremism on the popular social media platform Twitter in the Islamic State of Iraq and Syria (ISIS). The study proposed a three-step method, including the identification of the usernames, profiles, and textual content to identify whether the account belongs to an extremist user. The study used a semi-supervised approach and tenfold cross-validation of the collected data. It proposed that extremists are highly likely to be identified using the proposed framework (Alvari et al., 2019).

Abdallah tani, 2021 Conducted a study on Information Society, the term spread in the West and USA, primarily it served as a continuation of the theories that spawned the terms of the industrial society and post-industrial, as is evident from the "title" At the basis of the label technological optimism of capacity to resolve many social problems which are intractable by using the information, other than the descriptive, which codifies and inaugurates the objective spread of "computing" and "media" that interspersed with the social fabric as a whole. And often draws attention to focus on the Japanese experience, which provides an example of the information society in Japan, an ambitious program that aims to create and develop the social structure - Computers distinct include production, distribution and transportation services and management, education and livelihoods, and this social structure - Computer permeate networks télé-computing (télé in Greek meaning away and dimension) so that people can through them to solve their own professional problems by direct contact, and there is a national policy in Japan for the creation and establishment of "industry knowledge" as well as projects to reform the country's social development, including the systems of rehabilitation workforce and of re-distribution, so that the community becomes in its Supreme stages "j - Masuda," who is one of the leaders of that program - to a consumer society and prosperous of high class, and then going to solve all personal problems - according to this belief - and its requirement of creativity and self-realization through the global use of planetary information, so they attaches a great hopes on the "globalization" and "internationalization" of the trends of new information - that is for "computing" the society and its global planetary "medias" (Abdallah tani, 2021).

Hiaeshutter-Rice and Hawkins (2022) conducted a study analyzing the use of language on one of the forms of social media platforms: Reddit. The study focused on the events that occurred in 2020 and early 2021 in the United States (Zoumpourlis et al., 2020). The results showed a major shift in the language used by the users. These shifts were identified in the form of negativity, incivility, and specific use of words surrounding non-white out-groups. This showed that the use of extremist language is influenced by the social and political conditions surrounding the individuals, and language become a tool for the people to engage, recruit, and radicalize with those present in the virtual environments (Hiaeshutter-Rice and Hawkins, 2022).

Among the most important risks that threaten social life and social communication in virtual societies; Violence in all its forms circulated in the virtual space. Social, communicative and psychological studies in this field showed the negative effects that society is witnessing as a result of the increasing phenomenon. These spaces have become a platform for violent and hate speech, instead of raising awareness in combating and preventing it. Manifestations of violence and hate speech have become entrenched in social networks as a result of lack of awareness on the one hand, and on the other hand, due to the user's lack of reservation to use phrases or publish pictures or contents offensive to individuals and institutions through the technique of installing photos and videos ..., as a matter of taking into account the reasons, identities have become Anonymous or borrowed default uses verbal violence to pass its agenda and tear the social and emotional fabric of society. Hate speech that is disseminated through social networks usually leads to intolerance and generates hateful speeches. Before it multiplies, it spreads and amplifies through social media channels, and sometimes these echoes resonate. Contents through TV channels and newspapers alike, and have a special capacity for existing tensions between different groups and ignite violence among their members, as they may raise new concerns about the association of inflammatory discourse through these spaces with acts of violence. It may be a motive for accidents that contribute to psychological, social, economic, emotional, material and physical harm to people. The use of social networks has become aimed at distorting facts, spreading falsehood, and seditious violent discourse, As for the methods of preventing violence, it requires addressing the factors leading to violence and treating them in a scientific way, and preventive efforts must focus on the stages of childhood and adolescence and the role of educational institutions in this, given that the behavior of violence consists mostly of early childhood, according to psychological studies (Abdallah Tani and Alrasheed, 2023)

Studies focusing on online extremism are scarce; therefore, the present study focuses on the distinct forms of extremism present in Saudi Arabia, particularly in the city of Hail. The study aims to analyze virtual environments as 'breeding grounds or echo chambers' for online extremism. The study incorporates a qualitative research design to explicate relationships between these concepts in Hail's virtual environments. The study provides valuable insights for policymakers on effective counter-extremism strategies in the online landscape. The study will provide specific interventions for the policymakers to address the specific breeding grounds or echo chambers in the virtual environment of Hail. Extremism is different for different cultures and is affected by the political and social environments of the city. By examining Hail's case, this work attempts to add to the picture of how online extremism is embedded in the Saudi Arabian context of social relations, religion, and tribes. Such understanding can be useful for counter-extremism measures throughout the region.

The study aims to answer the following research question:

1. What are the common forms of extremism encountered by the users in the virtual environment?
2. What strategies can be implemented by policymakers to counterfeiting extremism in the virtual environment?

RESEARCH METHODOLOGY

The present study is exploratory in nature, as such it would employ qualitative research methods. In this case, it will conduct a qualitative analysis of the data, as the study aims to identify these forms of extremisms and highlight the forms common among the individuals. The main aim of qualitative study is to analyze and capture the nature of a phenomenon and make deductions from the said analysis (Mohajan, 2018).

Research Approach

Inductive approach is used for the study as the study explores the perception and experiences of the individuals. As, inductive approach is used to drive results from the experiences of the participants (Azungah, 2018).

Population and Sampling

In the context of the present study, the population was defined as residents of the city of Hail and virtual environments' users, regarding personal and/ or professional applications. Since the study aimed at collecting data to fill existing gaps in the research topic with information that would benefit the study's purpose, purposive sampling was employed to recruit participants. Since purposive sampling aimed at selecting the most relevant and useful participant for the study. (Campbell et al., 2020). The participants of the study were 20 people between the ages of 18-30, who at some point in the past became a target of online extremism in the virtual environment. Such people are selected on the basis that in majority of cases, the individuals suffering from extremism effects can be targeted only once, and majority of them are below the age of 18. (CRIME, 2017).

Data Collection

Primary data was collected through in depth interviews from respondents who spent the most time in the Virtual environments. These respondents at some point have come across extremism or hate speech in the online environment. Through a series of interview questions, the study collected primary data from 20 individuals who willingly participated. Five interview questions were asked of the individuals, and the questions aimed to explore the different forms of extremism encountered by the participants and the strategies they implemented to avoid or counterfeit those extremist individuals. Interview questions were planned with reference to the objectives of the present study and these were then verified by the relevant stakeholders in the field.

1. Can you tell me about your experience with online communities? What types of virtual environments do you typically engage with?
2. Have you ever encountered extremist content in these online spaces? If so, can you describe the context and your reaction?
3. How would you define extremism based on your experiences and observations online?
4. In your opinion, what are the most common forms of extremism present in virtual environments today?
5. What do you think motivates individuals to engage with or spread extremist content online?
6. Can you describe any patterns or behaviors you have noticed in how extremist ideas are shared and spread within these communities?
7. Have you ever engaged in or observed discussions attempting to counter or challenge extremist views in these virtual environments? What was the outcome?
8. How do you think exposure to extremist content has impacted you or others you know?
9. What role do you believe online platforms should play in addressing and moderating extremist content?
10. What measures do you think could be effective in reducing the spread of extremism in virtual environments?

Data Analysis

Thematic analysis is used as a technique to identify patterns and trends in the responses of the participants. Through thematic analysis, codes are developed, and themes emerge from the text (Neuendorf, 2019). Thematic analysis is also defined as a process of systematically identifying, organizing, and offering patterns in the data set (Braun et al., 2016).

Themes were identified through the responses of the participants. These themes were then categorized into sub- themes to explore the forms of extremism in the virtual environment of Hail.

RESULTS AND DISCUSSION

The interview findings showed a complex online extremism landscape, underpinned by mixed experiences and perceptions from all participants. Details provided by the participants included types of extremism encountered online, their motivations to engage in them, and challenges related to countering extremist views. The research intended to investigate the types and levels of extremism present in Hail's virtual environments and determine whether social media tools act as breeding ground for emergent radical extremism or as echo chambers.

Participants reported engaging with various online communities, such as social media (Facebook and Twitter), discussion forums such as Reddit (including gaming communities and political activism groups), and special interest groups (Gaming/political activism groups), among others. One participant mentioned:

'I spend quite some time on Reddit -- especially subreddits related to my hobbies/interests... it is quite diverse.'

The findings revealed five types of extremism were established from the study conducted: Political extremism, Religious extremism, Racial and Ethnic supremacism, Gender-based extremism, and Anti-government and conspiracy theories. The findings provide valuable insights, revealing five key themes.

Thematic Analysis

Table 1 lists the identified themes and sub- themes.

S. No	Key words	Main Themes	Sub-themes
1.	Extremism	The prevailing nature of extremist content	Political Extremism, Religious Extremism, Racial Supremacism, Gender-Based Extremism, and Anti-Government Extremism
2.	Online communities	Driving force behind engaging with extremist content	Sense of Belonging, Ideological Conviction, and Influence of Echo Chambers
3.	Radicalization	Mechanism for the distribution of extremist content	Persuasive Narratives, Targeted Misinformation, and Exploitation of Grievances
4.	Social media/ virtual environment	Effect of extremist content on individuals	Emotional Distress, Anxiety and Fear, and Suppression of Free Discourse
5.	Content moderation	Strategies for effective countering of extremist content	Stricter Content Moderation Policies, Use of AI for Detection, and Educational Initiatives

Table 1: Identified themes and sub- themes

The prevailing nature of extremist content

The ease with which extremist material is propagated across a range of virtual environments underlines the extent to which such content is available online. Indeed, it confirms the fact that cyberspace, as an area of social media discussions and bulletin boards, is full of radical and fanatical notions. The existence of political and religious radicalism, racism testifies to the fact that these services can easily turn into a hotbed, a perfect setting in which to formulate and disseminate newer kinds of radical ideas. This fact is also substantiated by the study carried out by Kingdon, (2020), in which he mentioned the rampant spread of extremism due to the glorification of terrorist groups and recruitment done by the right-wing white supremacists by using a variety of themes (Kingdon, 2020). One of the participants put it like this: It is normal to come across some aggressive post that speaks for the supremacy of whites. This means that extremism is a transverse phenomenon in so far as it affects all types of online communities. (Berger, 2016) also highlighted the spread of white supremacy ideologies through social media.

Responses from participants

All participants had, at some point, encountered extremist content online, whether this meant casual exposure or direct interactions. A common theme amongst all of our discussions was the accidental discovery of extremist material, such as when one participant encountered white supremacy-related posts while scrolling their Twitter feed: it came as quite a shock and disturbed him as much as anything. One participant shared, quoting himself:

'When scrolling my Twitter feed, I suddenly came upon an aggressive post that supported white supremacy. It was truly shocking.'

The most frequently identified extremism forms in the virtual environments was political extremism (both far-right and far-left), religious extremism, and racial or ethnic supremacism. One participant noted:

'You see a lot of political extremism these days around election times - either far-right nationalism or far-left radicalism is widespread.'

Driving force behind engaging with extremist content

In addition to giving insight into why people use or disseminate materials that are appealing to the radical fringe, it also allows for determining whether such virtual spaces are breeding grounds for radicals or just reflecting them. The respondents highlighted the features of belongingness, conviction, and echo chambers as the major reasons. Again, the desire to find other like-minded people with extreme attitudes indicates that one can come to such groups with at least some preconceptions regarding such beliefs. This is also highlighted in the work of (Winter and Feixas, 2019), showing that in order to seek validation, people engage with such radical views. This is most common among the youth as extremist and radicalized group approaches the younger generation to promote among them radical views (Gaikwad et al., 2023). This can then be exacerbated in echo chambers where similar viewpoints will be endorsed, thus creating a narrative. Thus, the development of these extreme views can more often occur in these environments, though it is a question of strengthening already existing views and not their emergence. It is also reported that Twitter is the most commonly used virtual platform for promoting extremist activities, as highlighted by (Gaikwad et al., 2023).

Responses from participants

Seeking belongingness, validation, and ideological likeness among others has been identified as the reason for engaging with extremist content in the virtual environment. Other reasons identified as the reason for engaging with extremist content are echo chamber effects, and peer influence. According to one respondent

‘People often look for communities that share their views - no matter how extreme - which gives them a sense of identity and belonging.’

Participants had varied definitions of extremism; generally, it involved radical or fanatical views that deviate significantly from mainstream norms. One respondent described extremism as

‘holding such extreme views that they become intolerant of differing opinions, advocating violent action to support their convictions, or advocating violence as ways of supporting these convictions.’

Mechanism for the distribution of extremist content

The transfer of extremist ideas that happens in the virtual environments contributes to elaborating the breeding grounds versus echo chamber debate. This is where people described coercion in the form of using stories, lies aimed at specific problems, and people’s antipathies. These tactics could imply that the different actors in question are purposively aiming at engaging people further into more radicalization. It is widely accepted by researchers that social media act as the driver of echo chambers where people with like-mindedness meet others and lead to the adoption of extreme opinions and expressions (Geiß et al., 2021). The transition from less blatant suggestions to extreme radicalized views is a process of polarization that can transform a spectator into an active participant. This supports the notion of radicalization of extremism in virtual environments, wherein such environments help develop belief systems and fester the conditions that make them grow (Valentini et al., 2020).

Responses from participants

These extremist ideologies spread through persuasive narratives, targeted misinformation campaigns, and capitalizing on existing grievances. A typical pattern described was,

‘it begins as subtle hints or dog whistles and gradually becomes more explicit as more people get drawn deeper into conversation threads.’

Effect of extremist content on individuals

The analysis of the consequences of extremism exposure on people’s psychological and emotional state helps to understand the effects of such environments on the users. The respondents expressed feelings of anxiety, fear, and distress, hence confirming the huge negative impacts of extremism owing to its ubiquitous nature (Bhui et al., 2020). The influence exerted on individuals’ readiness to share their thoughts and opinions can be considered as a sign of free speech suppression; in such a case, people may become more unified and radical. This is a mental health burden that makes individuals isolate themselves in news feeds and social media platforms to avoid contradictory opinions and ideas. Thus, although virtual environments contribute to the generation of new ideas related to extremism, they also contribute to the stabilization of the ideas themselves since they foster communities largely immune to reason.

Responses from participants

Respondents who were engaged with extremist content shared emotional distress as well as changes to perception and behaviour, as one participant reported,

‘Seeing all this hate online makes me anxious and sometimes fearful about expressing my opinions freely.’

Respondents shared different experiences of engaging with extremist content in the virtual environment. One of the respondents reported it to be unfruitful.

‘I tried arguing against some racist comments online forum, but quickly escalated into an aggressive exchange that felt more like I was speaking directly into an empty wall than talking.’

Strategies for effective countering of extremist content

There is a need to intervene in the spread of extremism because the perceived role performed by participants online was a sign of intervention in moderating the extremist views they have in them. The sentiment was that it was up to the platforms to identify and restrain the consumption of such negative content. This entails anti-abuse policies that

are more severe than those for user-generated content, machine learning techniques for identification of abuse, and extension of user awareness campaigns (Ganesh and Bright, 2020). Moderation can deny two things that are required to sustain extremist ideas: the creation of new ideas that are extreme in nature and the recycling of existing ones. Hence, by managing the online environment to minimize the influence of militant radicalizers, the platforms can succeed in diminishing the attraction and accessibility of extremism (Agarwal and Sureka, 2015a). This enlightens the fact that virtual environments that were once full of hatred and cyberbullying can be changed for the better and become places where good prolific can be shared.

Responses from participants

Following the prevalence of extremist content, majority of the respondents shared that virtual platforms must take responsibility in moderating content in these platforms. They also suggested the use of AI to detect and remove harmful posts. One participant noted,

‘Platforms need better systems in place that enable them to recognize and remove extremist material before its dissemination.’

Participants proposed multiple measures to online extremism, such as an increase in digital literacy, the building of inclusive communities, and the holding on to robust content moderation systems. They further suggested that this can go a long way in reducing the effects, especially if there are educational programs that include teachings on critical analysis

CONCLUSION

The present study analyzed various types of extremism in Hail’s online platforms to understand whether it serves as a breeding ground or a reinforcement of radical ideas. The findings of the study revealed that hail’s virtual environment serves as both a breeding ground and an echo chamber that reinforces already existing beliefs and introduces new ideas. This calls for effective strategies that need to be implemented to counter the extremism present in the virtual environment.

Strengths and Limitations

Through the use of in-depth interviews, the study provides nuanced insights into the forms of extremism prevalent in the virtual environment of Hail. The research adds to the existing knowledge of increasing crimes in the virtual environment of Hail. Through the present forms of extremism and their identified solutions, the study provides valuable insights into how to tackle the problem at hand. On the contrary, the study is limited to only 20 participants and may not represent the broader audience of the city of Hail. The self-reported data by the individuals may have introduced biases and, therefore, might limit the objectivity.

Future Recommendations

Future studies should focus on the emerging trends in virtual platforms and the emergence of extremism. Studies should also look into the use of AI in content moderation. Cross-cultural studies should also be conducted to highlight the prevalence of extremism in different virtual environments.

Credit authorship contribution statement

Mohammed EL Nadir Abdallah Tani, zahia El-ssaid Yssaad: Conceptualization, Methodology, Software, Validation, Formal analysis, Resources.

Arif Juma Biro Trouk, Amira Mohammed Al-Khidir: Supervision, writing – original draft

Nassredine Cheikh Bouhenni , Maha Thaid Al-Shammari : Writing – review & editing, Visualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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