# The Role of Cybersecurity in Confronting Intellectual Security Threats

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*Abstract:* - The rapid development of digital human communication platforms and the globalization phenomenon have led to exposure to massive amounts of information every day. Furthermore, social media networks become mature platforms for social participation in information and interests exchanges, news, and highlighting events. This in turn can inevitably lead to various types of intellectual influences among people of different ages. This study aims to identify the role of cybersecurity in confronting intellectual security threats, such as extremism and terrorism. The study sample consists of 500 male and female students at Qassim University.

## 1 Introduction

In the digital area, there is an exponential increase in the digital platform's users for information, entertainment, and communication. Furthermore, the widespread of social networks attracts a massive number of users to intact with each other through them. According to Global Digital statistics, more than 4.5 billion users use the Internet in their daily life in 2020, [1]. Users from different ages and cultures become exposed to massive and unrestricted amounts of information over the internet, especially on social networks, such as Facebook and Twitter, where they are considered extensive platforms for the exchange of ideas, beliefs, and opinions, [2].

Social media platforms have witnessed a great turnout in the last ten years, especially among young people due to their services with the digital revolution that allows users to exchange opinions and ideas and discuss their social concerns and events. These social media platforms support several advantages which cannot be available in traditional communication means, [3]. However, this has negative effects such as psychological and social problems that threaten their self-stability and feelings of isolation, depression, and anxiety, [4]. Furthermore, social media platforms are one of the main threats to intellectual security, especially for young people. Intellectual security is defined by the emptiness of the minds of individuals from ideas associated with misunderstanding and perception that may be part of the threat to the security and stability of members of society, [5]. It can also be clarified that intellectual security is one of the modern concepts whose importance has been linked to both terrorism and extremism. In this regard, intellectual security has been linked to the protection of societies because of its association with the human mind and its transmission of thought and culture to societies where its protection leads to the achievement of comprehensive societal security. The existing literature discussed intellectual security concerns from different perspectives, [4], [5], [6], [7], [8].

### 1.1 Motivation

Being keen on confronting intellectual threats, intellectual security will have an effective role in protecting the identity of individuals from penetration or containment and nurturing the approach of moderation considering the tremendous momentum of intellectual means and cultural invasion in all technical means such as social media, [9]. Social media networks play an unprecedented role in threatening the principles of intellectual security and promoting extremist ideas. Several studies indicated a direct relationship between the use of electronic means of communication and its impact on intellectual security, [10]. Therefore, there is an essential need for ensuring the intellectual security of members of society and making efforts to achieve this by using appropriate

means in various courtesies, including the use of cybersecurity in the face of threats to intellectual security. This study aims to explore the awareness level of Qassim University students towards the existing intellectual security threats and their cultural level of how cybersecurity can play a vital role in confronting these threats. Knowing the extent of Qassim University students' awareness of these challenges will provide enough knowledge to prepare a package of educational tools to develop exploration skills and awareness of appropriate technical tools.

## 1.2 Research Objectives
The research revolves around the following research objectives:

1- To understand the level of cybersecurity awareness among the students of Qassim University?

2- To understand the level of intellectual security threats in social networks awareness among the students of Qassim University?

3- To investigate the awareness knowledge of the relationship between cybersecurity and intellectual security threats among the students at Qassim University

## 2 Literature Review
Intellectual security can result in serious effects on the security and stability of countries such as extremism and terrorism. Furthermore, it leads to destabilizing societies, influencing their conditions, and political affairs, striking its national economies, and putting an end to the general chaos. The study, [11], stated that intellectual security is one of the main national security cores where people assure that everyone complies with regulations and principles. The existing literature discussed the importance of intellectual security from various perspectives. The concept of intellectual security can be represented by a set of methods and procedures that the countries need to consider through the construction of mind and intellect. Attention must be paid to promoting appropriate values for members of society, which help in improving behaviors and protect the mind to discriminate against all thoughts and beliefs, [5].

Several studies have indicated the importance of social networks and how they can affect people's

intellectual security. The study, [12], identified the intellectual security features for students provided by the internet in Mankato City in the United States. The results of the study show that the intellectual security features are achieved by 81% of the students. In [13], the authors examined the social networks' impact on young people's education. The study shows that they can affect the students' study performance. However, they are more attracted to social networks that have a positive influence on young people. In [14], the authors identified the social networks implications on the intellectual security of undergraduate students. The study was conducted on 104 students at the Gulf University in the Kingdom of Bahrain. The study found a medium degree effect of social networks on the student's intellectual security. This indicates the need for more focus on educating students on how they can use social networks. Furthermore, there is a need to improve the student's critical thinking skills to make sure they can understand and assess what they are exposed to in social networks. In [15], the authors studied a relationship between intellectual security and a set of personality factors among 203 male and female students from King Abdulaziz University in Jeddah. The results showed a significant relationship between intellectual security and the selected set of factors among the sample under study. In [16], the authors studied the relationship between mental defeat and intellectual security in Saudi Arabia and Egypt for 620 students. The study showed a negative correlation between mental defeat and intellectual security.

It is shown there is evidence of social networks' impact on the social and psychological lives of individuals, especially young people, [17]. It also extends to the impact on national security through extremism and terrorism, [18]. Moreover, one of the most important concerns of social networks is their misuse in the rapid spread of rumors and provoking conflicts and strife in society, or between sects, which leads to destabilizing the security and stability of society, [19]. Based on these concerns, it is significantly important to study the impact of social networks on intellectual security where it is closely linked as an integral part of societal intellectual security and national security. This is essential to maintain stability and national unity, belief, and culture. It is also noted that previous studies have shown that the youth is the most vulnerable age to social network concerns due to their often use of social media for long periods as well as their tendency to adopt new and often different ideas and beliefs, [20]. Therefore, a great responsibility and efforts need to be considered by

educational institutions to understand the nature of the links between social networks and students, and how to be used conveniently and safely. Appropriate cybersecurity methods should be taken into consideration as a defense layer for intellectual security protection.

Unlike existing literature, this study focuses on a unique and varied study sample at Qassim University. Furthermore, the study aims to provide a deep insight into the student's knowledge level of intellectual security threats and how cybersecurity mechanism can overcome their obstacles. This study discusses intellectual security and how it is linked to cybersecurity from different perspectives. This is raised due to the concern of the knowledge explosion and excessive use of social networks by students which make them vulnerable to intellectual security concerns. The study intends to provide a practical insight into how cybersecurity can apply in practice to provide a convenient protection layer for students from social network threats.

# 3  Study Tools and Procedures

This section aims to present the tools and procedures of the study as follows. A questionnaire is built to investigate the awareness of university students about the relationship between cybersecurity and intellectual security threats. The questionnaire consists of 15 statements. The Likert five-level measure is applied to Strongly Agree, Agree, neutrally Disagree, and Strongly Disagree.

## 3.1 The Purpose of the Questionnaire

The questionnaire is designed to identify to what extent Qassim University students are aware of the relationship between cybersecurity and intellectual security threats by identifying the extent of their awareness of threats to intellectual security and what is being promoted by terrorist organizations and misguided thought groups through technical means, the most important of which is social media, and then suggesting mechanisms to activate the role of cybersecurity to overcome the intellectual security threats. The questionnaire items were collected and limited through studies, literature, and lists that dealt with cybersecurity concepts and intellectual security threats.

## 3.2 The Questionnaire Content

The questionnaire is built to include suitable declarative statements related to the extent of Qassim University students' awareness of the relationship between cybersecurity and threats to

intellectual security. The questionnaire is classified under three domains:

**The first domain**: The awareness of cybersecurity concepts.

**The second domain**: The awareness of the intellectual security threats in social networks.

**The third domain**: The awareness of the relationship between cybersecurity and intellectual security.

The description of the questionnaire according to the domains and the number of statements for each domain are shown in Table 1. There are statements in each domain to measure the awareness of the concepts and issues related to each domain as shown in Table 2. The statements under each domain can be classified by the audience into three categories, highly important, medium important, and not important.

Table 1. Description of the questionnaire according to the domains and the number of statements for each domain

| # | Domain | From | to |
|---|--------|------|-----|
| 1 | The awareness of cybersecurity concepts. | 1 | 5 |
| 2 | The awareness of the intellectual security threats in social networks. | 6 | 10 |
| 3 | The awareness of the relationship between cybersecurity and intellectual security. | 11 | 15 |

Table 2. Description of the questionnaire according to the domains and the number of statements for each domain

| # | Statement |
|---|---|
| **The first domain:** The awareness of the cybersecurity concepts | |
| 1 | Cyberattacks are aimed at obtaining banking information or private information to be used for extortion later. |
| 2 | I use antivirus and spyware software to protect my devices from cyber-attacks. |
| 3 | Ensuring the security of the websites that I visit or deal with financially. |
| 4 | Certified antivirus and spyware programs often succeed in protecting my devices from cybersecurity risks and threats. |
| 5 | There are many cyber security measures taken by the Kingdom to counter cyber-attacks. |
| **The second domain:** The awareness of threats to intellectual security in social networks | |
| 6 | The Kingdom of Saudi Arabia always blocks websites and private platforms used by terrorist organizations and extremist ideology groups. |
| 7 | Terrorist organizations and extremist ideology groups use social media platforms as hidden means to spread their ideologies everywhere. |
| 8 | Terrorist organizations and groups aim to create confusion and cast doubt on the Kingdom of Saudi Arabia's achievements and goals. |
| 9 | Terrorist organizations and groups use social media networks to destabilize national security by spreading rumors, hate speech, and deviant thoughts. |
| 10 | Terrorist organizations and groups seek, through accounts and hashtags, to distort national and ideological constants. |
| **The second domain:** The awareness of threats to intellectual security in social networks | |
| 11 | Many tools can monitor abusive accounts that spread ideas that incite hatred and violence and remove them automatically. |
| 12 | Some social media networks provide mechanisms for blocking suspicious accounts and submitting reports to stop them. |
| 13 | Intelligent software such as antiviruses and spyware cannot automatically detect or identify threats to intellectual security. |
| 14 | It requires finding a legal supervisory body to receive reports about accounts that provide content that threatens intellectual security, whether from inside or outside the country. |
| 15 | It requires the development of smart software that helps detect and warn beginners of content that threatens intellectual security. |

The study is vital in dealing with intellectual security concerns as a part of national security and community stability. It is significant in shedding light on how exposure to social networks can lead to intellectual security concerns as a part of psychological changes.

### 3.3 Questionnaire Validity

To be assured of the validity of the questionnaire, the initial version of it presented to a group of experts who unanimously agreed that the items in the questionnaire are suitable for what they were designed for, after making some initial amendments that some experts referred to by replacing some words and phrases that may be confused in meaning, as well as amending drafting some items commensurate with the nature of the domains of the questionnaire.

### 3.4 Questionnaire Stability

The reliability of any tool is related to obtaining the same results when applied to the same individuals at different times; Modal probability is used to measure the stability of the questionnaire. The modal probability test shows a stability coefficient at the significance level (0.01) which indicates the results showed a high stability coefficient by the questionnaire.

### 3.5 Study Population and Sample

The population of the study is all male and female students at Qassim University with a total number of 500 students. The questionnaire was presented electronically to reach a random sample of university students, including (166) female students and (334) male students. The sample covered various theoretical and scientific colleges. Table 3 shows the frequencies and percentages of study participants.

Table 3. Frequencies and percentages of the study's participants

| Variable | Classification | Frequency | Percentage |
|---|---|---|---|
| Academic level | First - Fourth | 172 | %34.4 |
| | Fifth - Eighth | 170 | %34 |
| | Ninth - Twelfth | 158 | %31.6 |
| College Specialisation | Scientific | 383 | %76.6 |
| | Humanitarian | 117 | %23.4 |
| Age | 18 -22 | 299 | %59.8 |
| | 23 - 26 | 140 | %28 |
| | 27 - 31 | 61 | %12.2 |
| Educational level | Bachelor | 447 | %89.4 |
| | Master | 44 | %8.8 |
| | Doctor of Philosophy | 14 | %2.8 |

It is noted in Table 1 that the participants from scientific colleges represent %76.6 compared to %23.4 from humanitarian colleges. Moreover, it can be noted that the majority of the sample is represented by bachelor students with %89.4 for the total sample compared to %8.8 and 2.8 for master's and doctor of philosophy students respectively.

### 3.6 Study Hypothesis

The level of Qassim University students' awareness about cybersecurity and intellectual security issues

and the relationship between them reaches %85 which implies that 85% of the students have the awareness related to cybersecurity and intellectual security issues and the relationship between them. This hypothesis represents the statistical criterion for accepting the results of the experimental sample participating in the conduct of the study, and the value of 85% determines the basic cut-off point, as the lack of awareness of intellectual security issues at a rate of 85% implies that there are more than 15% of the sample population can be influenced in the topics under study which has a direct impact in the security of society.

# 5 Results and Discussion

Given the study nature and its objective to understand the awareness level of Qassim University students of the relationship between cybersecurity and intellectual security threats, and to facilitate the interpretation of the results, the responses of the respondents to the phrases that were agreed upon were merged with the responses (strongly agree and agree) into one response indicating awareness of the epistemological meaning of the phrase, while the responses were merging the respondents' responses to the phrases that included the responses (neutral, neither agreed nor strongly disagreed) into one response indicating lack of awareness of the cognitive meaning of the phrase. Table 4, Table 5, and Table 6 show the results after monitoring them for each of the questionnaire domains separately.

Table 4. Average awareness of the concept of cyber security

| Statement number | Awareness of the cognitive meaning of the statements | | | |
| | Awareness | | Unawareness | |
| | Frequency | Percentage | Frequency | Percentage |
| The first domain: The awareness of the cybersecurity concepts | | | | |
| 1 | 375 | %75 | 125 | %25 |
| 2 | 339 | %67.8 | 161 | %32.2 |
| 3 | 399 | %79.8 | 101 | %20.2 |
| 4 | 271 | %54.2 | 229 | %45.8 |
| 5 | 389 | %77.8 | 111 | %22.2 |
| The awareness average | 342.6 | %70.92 | 145.4 | %29.08 |

Table 5. Average awareness of intellectual security threats in social networks

| Statement number | Awareness of the cognitive meaning of the statements | | | |
| | Awareness | | Unawareness | |
| | Frequency | Percentage | Frequency | Percentage |
| The second domain: The awareness of threats to intellectual security in social networks | | | | |
| 6 | 393 | %78.6 | 107 | %21.4 |
| 7 | 380 | %76 | 120 | %24 |
| 8 | 387 | %77.4 | 113 | %22.6 |
| 9 | 401 | %80.2 | 99 | %19.8 |
| 10 | 392 | %78.4 | 108 | %21.6 |
| The awareness average | 390.6 | %78.12 | 109.4 | %21.88 |

Table 6. Averages of awareness of the relationship between cybersecurity and intellectual security

| Statement number | Awareness of the cognitive meaning of the statements | | | |
| | Awareness | | Unawareness | |
| | Frequency | Percentage | Frequency | Percentage |
| The third domain: The awareness of the relationship between cybersecurity and intellectual security | | | | |
| 11 | 318 | %63.6 | 182 | %36.4 |
| 12 | 364 | %72.8 | 136 | %27.2 |
| 13 | 351 | %70.2 | 149 | %29.8 |
| 14 | 398 | %79.6 | 102 | %20.4 |
| 15 | 396 | %79.2 | 104 | %20.8 |
| The awareness average | 365.4 | %73.08 | 134.6 | %31.29 |

## 5.1 The Awareness of the Cybersecurity Concepts

The results of the participants in the domain that focuses on Qassim University students' awareness of cybersecurity concepts show an arithmetic mean with %70.92. This indicates the existence of awareness of cybersecurity concepts among a large sample of male and female students of cybersecurity concepts. However, this does not fulfill the hypothesis of the study as there are %29.08 of students have a lower degree of awareness in the domain under study. The study shows that %32.2 are not fully aware of the importance of using antivirus and malware protection programs to protect devices from cyber-attacks and %20.2 of students are not keen to ensure the safety of the sites they visit using over the Internet or deal with them financially. In addition, there are about %22.2 of students do not know what the procedures that the authorities of the Kingdom of Saudi Arabia are performed to confront cyber-attacks. The previous study indications show the need to pay more efforts to be taken to improve the awareness level of the students.

## 5.2 The Awareness of Threats to Intellectual Security in Social Networks

The results of the second domain show that %78.12 of the participants are aware of the threats to intellectual security in social networks. Although this shows a high level of awareness among participants, it does not achieve the hypothesis as %21.88 of the students are not aware of the cybersecurity and intellectual security issues, and the relationship between them. The study shows that %21.4 of the students are not aware of the efforts by the authorities in the Kingdom of Saudi Arabia to block websites, private platforms, and accounts on social media that are used by terrorist organizations and misguided thought groups, and %24 of students are unaware of the terrorist organizations activates, and misguided thought groups exploit social media to spread their organizational and partisan agenda in hidden ways to all segments of society. It is found that %22.6 of students have a lower degree of awareness about the actions of terrorist organizations to belittle the Kingdom of Saudi Arabia's achievements and their usefulness or deny them altogether. In addition, %19.8 of the students do not have sufficient awareness of how terrorist organizations and misguided thought groups use social media to destabilize national security by spreading rumors and hate speech, and deviant thought. Finally, there are about %21.6 of the students do not know what the organizations, and deviant thought groups, seek to undermine the national constants and legitimacy through accounts and hashtags on social media, and the previous values refute the imposition of the study, which requires taking adequate measures to develop an awareness of threats to intellectual security in social networks.

## 5.3 The Awareness of the Relationship between Cybersecurity and Intellectual Security

The third domain results show that %73.08 of the sample is aware of the relationship between cybersecurity and intellectual security which does not satisfy the hypothesis. It is found that %31.29 of students have a low awareness of the relationship between cybersecurity and intellectual security. There is 36.11% of the students are not aware that social media platforms can monitor abusive accounts that spread ideas that incite hatred and violence and remove them automatically. Moreover, %27.2 of the students are not aware that there are mechanisms available on social media platforms that allow blocking suspicious accounts and

submitting reports of them. It is found that %29.8 of the study sample did not agree on the ability of cybersecurity software using artificial intelligence to identify threats to intellectual security in communication platforms. Furthermore, %20.4 of the students did not express interest in the need for a legal oversight body to receive reports about accounts that provide content that threatens intellectual security, whether from inside or outside the country. Finally, there are about %20.8 of students do not agree with the need to develop cybersecurity software using artificial intelligence that can detect content threatening intellectual security and warn against it effectively. These results imply the need to further actions to be taken to improve the awareness level of the students in the role of cybersecurity to protect intellectual security.

Overall, the study results suggest that need to provide intellectual security in cultural content that is circulated to university students. Furthermore, a series of intellectual courses, seminars, and meetings that show the nature of intellectual security threats can have a significant impact on improving the awareness level among students. It is important to prepare a specialized program to develop Qassim University students' awareness of cybersecurity requirements. It becomes essential to develop cybersecurity software using artificial intelligence that can effectively detect and warn against content that threatens intellectual security and increase the awareness of its usage for students.

## 6 Conclusion

The study aims to identify the role of cybersecurity in confronting intellectual security threats, such as extremism and terrorism. The study sample includes 500 male and female students at Qassim University. The study results showed the need to improve the awareness of cybersecurity and intellectual security threats for students. This can immunize the students against severe danger and various threats, such as terrorism, extremism and intellectual deviation, terrorism, and departure. Furthermore, the study recommends developing programs to increase students' cognitive awareness, such as a series of intellectual courses, seminars, and meetings that show the nature of intellectual security threats. The study limitation includes the study sample where future work can cover more samples to provide more insights about the awareness level of the Qassim University students and recommend practical cybersecurity solutions to reach an acceptable level of awareness and ensure confronting intellectual security threats. In future

work, It is recommended to perform studies that deal with students' behaviors and how it is related to various intellectual security variables among university students.

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**Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)**

Abdulatif Alabdulatif carried out all research tasks in the present research, at all stages from the formulation of the problem to the final findings and solution.

**Conflict of Interest**

The authors have no conflicts of interest to declare that are relevant to the content of this article.