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The Impact Of Risks Associated With Excessive Mobile Phone Use And Their Light On The Health Of Young Learners At The Mokengeli Pedagogical Institute In Lemba, Kinshasa, Democratic Republic Of Congo

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Abstract: Excessive use of mobile phones and screens impacts the lens of the eye and contributes to myopia. Smartphones remain dangerous devices because the harmful effects of electromagnetic waves and their consequences on the brain and eyes are highlighted by scientific research. The study took place at the Mokengeli Pedagogical Institute in Lemba. We conducted a cross-sectional and descriptive study with analytical scope from September 10 to December 9, 2025. Of the 380 students surveyed, 320 were interviewed. This survey aimed to determine the dangers of excessive smartphone use and to provide support for limiting exposure to blue light emitted by phones. The results showed that 48% of girls and 43% of boys are familiar with at least one social network, while 6% of boys and 3% of girls are not. 38% say that social media has a mixed impact, 34% a negative impact, and 28% reported a positive impact on health and scientific literacy.

Keywords: health, scientific literacy, excessive use, phone, eye, light.

1. Introduction

The deployment of fifth-generation (5G) communication infrastructures aims to foster the development of innovative services for both individual and business users in diverse fields such as healthcare, media, transportation, and the industries of the future. Two important trends are highlighted by mobile technology manufacturers to develop a next-generation communication network: firstly, the significant increase in the supply of wireless services, which requires faster networks and greater capacity to deliver content-rich services such as video; and secondly, the growth prospects of the Internet of Things, which fuel the need for massive device connectivity, as well as highly reliable and very low-latency connectivity for applications such as connected cars, industrial automation, and certain healthcare applications [1].

Every day, we are exposed to electromagnetic fields and waves through sunlight, radiological examinations, proximity to electrical cables, and mobile phone use [1].

Overexposure to screens can affect eye health, causing headaches, eye strain, itching, dry eyes, and sometimes blurred vision. Excessive use of mobile phones and screens in general impacts the lens of the eye and promotes myopia [1].

One of the effects of mobile phones that has been repeatedly demonstrated is the harmful impact of blue light on sleep. As we know, the blue light from our screens is bad for our health, both through its direct and indirect effects on the eye, particularly on sleep [1].

Some publications, however, suggest a possible increased risk of brain tumors in the long term for heavy mobile phone users, which is why the International Agency for Research on Cancer (IARCC) has classified radiofrequency radiation as "possibly carcinogenic," reports the Agency [1].

In adolescents, remaining hunched forward is very bad, especially during periods of rapid growth, and can cause neck pain associated with tension or muscle spasms in the neck. Therefore, doctors who have noticed an increase in this problem related to poor posture have dubbed it "text neck" [1]. All experts agree that exposing very young children to screens offers no benefit and even exposes them to certain dangers. Therefore, the American Academy of Pediatrics and the World Health Organization (WHO) advise against any screen time before the age of two, as screens can affect cognitive functions, memory, attention span, and coordination, and can lead to fatigue, sleep disturbances, stress, and anxiety [1].

A new study confirms that smartphones carry numerous allergens and toxins; it is therefore essential to clean them regularly to limit the risks. This also means using hands-free kits or speakerphone, avoiding excessively long conversations while holding the phone to the ear, choosing areas with good reception, selecting a mobile phone with a low specific absorption rate (SAR), and avoiding carrying the device near sensitive tissues such as the abdomen for pregnant women and the gonads for men [1], [2].

The International Agency for Research on Cancer “IARC” has classified radiofrequency electromagnetic fields, including those from mobile telephony, as possibly carcinogenic to humans [4].

Social networks adapt to all possible themes: job searching or business development, meeting people, exchanging information around a common interest, sharing multimedia content or music, etc. However, social networks present numerous challenges, such as managing one's online identity and reputation; they offer significant visibility [5].

Mobile phone use has increased considerably since its emergence in the early 1980s. This growing use of technology has been accompanied by a number of concerns related to the health of its users, and in the late 1990s, several groups of experts reviewed the available data on the health effects of low-intensity exposure to radiofrequency electromagnetic fields and recommended that research be undertaken on the possible adverse health effects of mobile phone use [6].

Frequent, usually prolonged exposure to radiofrequency waves can lead to some short, medium or long term health effects such as headaches, insomnia, changes in the electroencephalogram with significant consequences on memory, reduced reaction time, disruption of the pineal gland or epiphysis which can lead in the long term to cancers, cellular degeneration, possible cases of high blood pressure, disruption of the pineal gland or epiphysis which can lead in the long term to cancers [7].

In the Democratic Republic of Congo, legislation on electromagnetic fields is primarily defined by Law No. 20/017 of November 25, 2020, concerning telecommunications and information and communication technologies, as well as by Framework Law No. 013/2002 of October 16, 2002. These texts regulate the establishment and operation of telecommunications networks and services, including aspects related to the emission and reception of electromagnetic fields. Furthermore, a decree concerning classified installations for environmental protection also addresses the environmental aspects related to electromagnetic emissions (https://www.primature.cd, 2020).

What are the potential impacts of these fields on our health? Can they also have consequences for animal health? And can we limit our exposure, and if so, how?

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2. Materials and Methodology

Scientific work lacks a logical foundation if it is devoid of methods that offer general guidelines on how to approach the object of study, and techniques that specify how to access information, thus constituting the methodology [3].

A descriptive and analytical cross-sectional study was conducted from September 10 to December 9, 2025, in which 320 interviewees participated in our sample. The data collected using a questionnaire were processed and then analyzed using Excel software to create the figures. The calculation of the proportions of the qualitative variables allowed us to perform the descriptive analyses and determine the sociodemographic characteristics of the learners.

2.1. Presentation of the Study Site

The study took place in Kinshasa, the capital of the Democratic Republic of Congo, specifically in the Lemba district at the Mokengeli Pedagogical Institute. This district

is home to a large number of schools, including the one targeted. Demographically, the Lemba district has a population of 349,838 inhabitants (2005) with a density of 14,761 inhabitants/km². The average altitude is 351 m, with a minimum of 288 m and a maximum of 500 m. This secondary school has 24 classrooms and approximately 1,300 students enrolled during the 2025-2026 academic year.

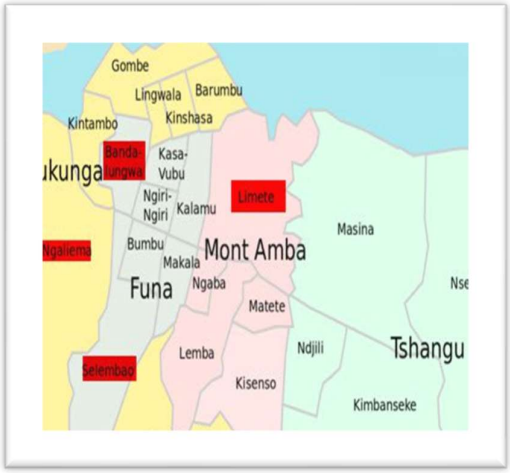

Fig. 1: Map of the city-province of Kinshasa (www.wikipedia.org)

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Fig. 2: Personal illustration from the Mokengeli Institute of Lemba

2.2. Data Collection and Processing Methods

For data collection, we used documentary research, structured interviews, and a pre-established survey questionnaire. Our data were collected from a representative random sample. The study population consisted of students from the Mokengeli Institute in Lemba, Kinshasa, Democratic Republic of Congo. Given the difficulty of surveying all students, we created a representative random sample of 320 students, regardless of gender. The collected data were processed and analyzed using Microsoft Word and Excel 2013 for the presentation of tables and figures.

To implement the chosen method, we combined the following techniques:

- Documentary research, which allowed us to consult various documents related to our research topic;
- Survey questionnaires, which helped us collect verifiable responses to the questions posed;
- Direct observation, which enabled us to conduct direct field observations to discover the different realities of social networks among learners.

2.3. Strengths of the Study and Future Directions

The study was conducted in the city-province of Kinshasa with a representative random sample to address the lack of existing literature on the topics covered at the Mokengeli Pedagogical Institute.

3. Results

Table 1: Distribution of respondents by age group

Variables	Boys	%	Girls	%
10-12 years	32	21,1	36	21,4
13-15 years	42	27,6	46	27,4
16-18 years	54	35,5	52	31
18 years and over	24	15,8	34	20,2
Total	**152**	**100%**	**168**	**100%**

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Out of a total of 320 respondents, 152 are male and 168 are female.

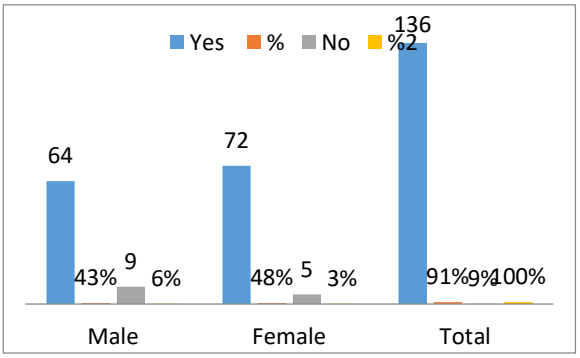

Figure 3: Frequency of mobile phone use per day

This graph shows that, out of 100% of respondents, 48% of girls and 43% of boys know at least one social network, and 6% of boys versus 3% of girls do not know any.

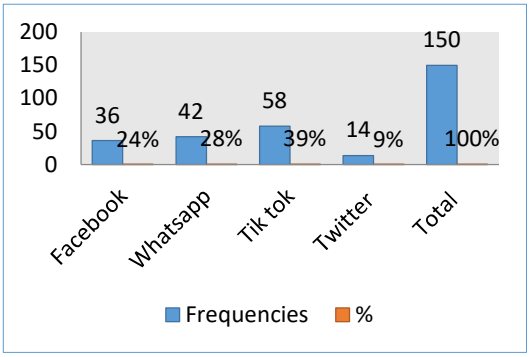

Figure 4: Reasons for use

This graph shows that the most used social network is TikTok at 39%, followed by WhatsApp at 28%, then Facebook at 24% and Twitter (X) at 9%.

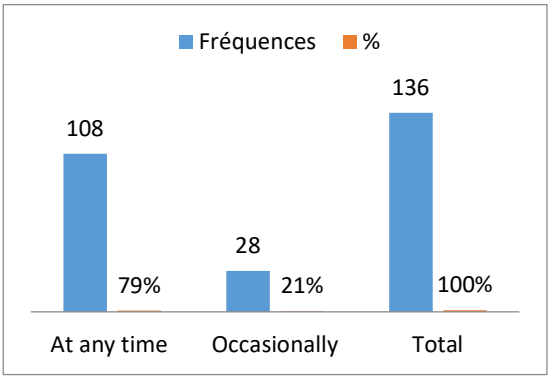

Figure 5: The consequences of smartphone use

This graph shows that 79% of subjects use social networks at all times and 21% occasionally.

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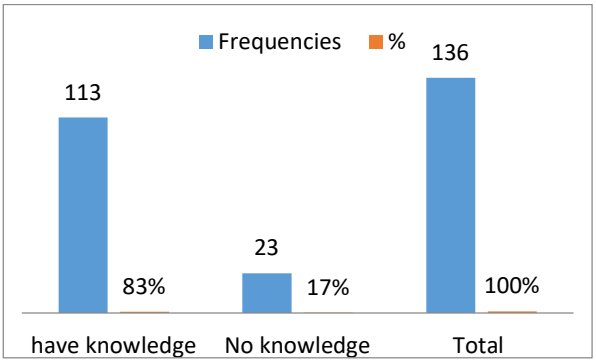

Figure 6: Knowledge of the role of a social network

This figure shows us that 83% of individuals stated that they were aware of the role of social networks and 17% were not.

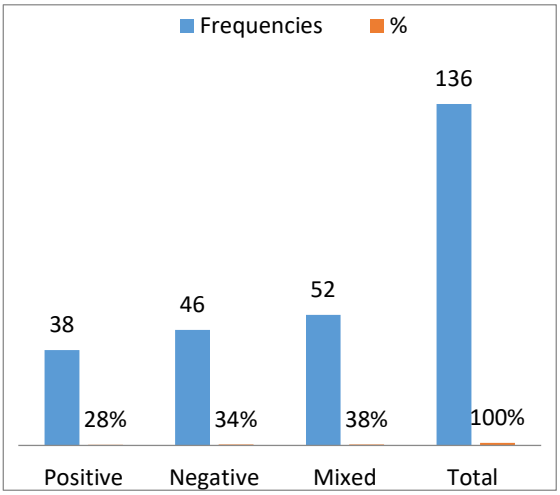

Figure 7: The impact of social media on their scientific culture

This figure shows that among the respondents, 38% say that social media has a mixed impact, 34% a negative impact, and 28% reported a positive impact on their scientific culture.

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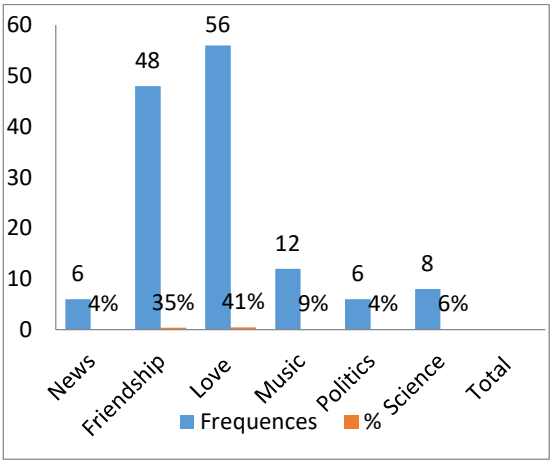

Chart 8: The type of information most often shared on social media

This chart shows that the most frequently shared information relates to love and friendship, at 41% and 35% respectively, followed by music at 9%, science at 6%, and news and politics at 4%.

4. Discussion

Regarding the use of social networks, our results show that 48% of girls and 43% of boys are familiar with at least one social network, while 6% of boys and 3% of girls are not. These results are identical to those found by [5], which demonstrate that the majority of students in the city of Kisangani use social networks.

As for the most used social networks, our results indicate that TikTok is the most used (39%), followed by WhatsApp (28%), Facebook (24%), and Twitter (9%). These results contradict those of [5], which show that Facebook is the most used social network, followed by WhatsApp and Twitter. Regarding the frequency of social network use, our results show that 79% of respondents use social networks constantly, while 21% use them occasionally. These results contradict those of [5], which state that over 80% of the majority connect to social networks at all times.

Regarding knowledge of the role of a social network, our results show that 83% of individuals claimed to know the role of social networks, while 17% did not. These results are significantly higher than those of [5], which show that 55% of respondents claim to know the role of a social network, and significantly lower than those of [5], which found that 45% did not know the role of a social network at all. Given the large gap between knowledge and lack of knowledge about the role of a social network, the risk of its misuse is significant and dangerous.

From the perspective of the impact of social media on their scientific culture, our results indicate that, among the respondents, 38% reported a mixed impact, 34% a negative impact, and 28% a positive impact on their scientific culture. These results are significantly lower for a mixed impact and higher for both positive and negative impacts compared to those of [5], which show that 15% of respondents reported a positive impact on their scientific development, 25% reported a negative impact, and 60% reported a mixed impact.

Regarding the types of information most frequently shared on social media, our results show that the most common topics are love and friendship (41% and 35%, respectively), followed by music (9%), science (6%), and current events and politics (4%). These results are similar to those of [5], which found that the most shared topics on social media are love and conversations between friends, followed by current events. Topics related to culture and music are less frequent, representing only 12% of conversations among students in Kisangani; conversely, topics related to scientific culture are less common, with a frequency of 10%. This suggests that social media contributes less to the development of scientific literacy among students in Kinshasa.

Conclusion

Social networks emerged from the revolution in new information and communication technologies (ICTs) in the late 1980s, driven by the development of information and communication tools. Currently, numerous communication sites exist, including social networks, which have rapidly become essential and popular, aiming to create social interactions among users. This study sought to identify the consequences of social network use by students and to determine whether their use contributes to the development of their scientific literacy. The survey reveals that the majority of students use social networks and spend their time discussing love and friendship, while scientific culture and current events, which are essential for personal growth, receive less attention. Based on the results of this study, we assert that social media contributes less to the scientific literacy of students in Kinshasa. Consequently, IT and digital professionals familiar with the workings of social media, school administrators, parents, and students themselves must take responsibility for ensuring that social media is used effectively.

Given the complexity of this study, we hope that other researchers will address other aspects that we have not covered.

Conflict of Interest

No conflict of interest has been declared; therefore, all authors agreed to the publication of this article.

Author Contributions

- Mulumba Aben: Principal Investigator, responsible for data collection and analysis
- Munenge Mbumba Anderson: Co-investigator, responsible for review and drafting
- Other co-investigators contributed to the review, editing, and approval of the texts.

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