The impact of media and information literacy on students' acquisition of the skills needed to detect fake news

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ABSTRACT

This research investigated the impact of media and information literacy (MIL) on education faculty students' acquisition of the skills needed to detect fake news. A one-group experimental design was employed with a randomly selected sample of 100 Jordanian undergraduate students. The participants completed one pre-test and two post-tests, each of which consisted of 10 closed-ended questions and one open-ended question on how to detect fake news. The results indicated that studying MIL has an impact on students' acquisition of the skills needed to detect fake news. The findings also suggested that the methods students employed to identify and detect fake news after studying the MIL course were scientific and well-reasoned. Based on the results, several recommendations are made that will be of value to researchers and workers in this field.

Keywords: *media and information literacy (MIL), fake news, educational faculty students, Jordan.*

INTRODUCTION AND BACKGROUD

The outbreak of the COVID-19 pandemic in 2019 was followed by an unprecedented and rapid dissemination of rumors and fake news on social media that exploited the public's fear of the disease. For example, social media users described methods of prevention and control that lacked scientific and medical evidence in order to benefit economically or improve the follow-up and visibility of a particular website (CNN, 2020). An official expert on social media platforms at the World Health Organization claimed that this led to a wave of fear and anxiety that spread faster than the virus itself. He reported that the emergence of COVID-19 at the end of 2019 had brought with it a dangerous phenomenon known as an infodemic. This is defined as:

> The difficulty of individuals in accessing reliable sources and credible advice when needed, and this phenomenon, in turn, leads to the ease and speed of fake news especially on social media (World Health Organization, 2020, p. 2).

Social media allows information to be easily shared and can serve to promote half-facts and rumors, particularly when a large volume of people obtain their news from such outlets (Mitchell et al., 2020; Talwar et al., 2019). Ascoott (2020) asserts that the persistent menace of fake news on the Internet requires real solutions as web-based news and social media have grown in popularity over the past few years, a consequence of which is that a whole new genre of information has entered the lexicon: fake news. Acceptance of false news has recently been found to pose a risk during the COVID-19 pandemic. Although awareness of the issue is widespread, preventing the dissemination of fake news requires fast action from social media outlets, reporters, and fact-finders. Figure 1 presents a fake photo of COVID-19 (an alleged micrograph of the coronavirus) that was shared on WhatsApp and Facebook in March 2020.

Figure 1. *False micrograph of the coronavirus (AFP, 2020)*

Rumors and fake news are loosely linked terms that are often employed interchangeably. Fake news refers to deliberately false facts, while rumors are unverified and questionable information distributed without the intent to deceive. The motives of those spreading fake news on social media platforms can be difficult to deduce; consequently, any false or misleading content is commonly branded as fake (Sharma et al., 2020). Locally, reports by the Jordanian Media Credibility Monitor (Jordanian Media Credibility Monitor (Akeed), 2020) found that the number of rumors began to increase in tandem with the spread of the coronavirus in March. In January, 30 rumors were detected, while in February there were 31 rumors and in March there were 43. The coronavirus was the subject of 24.1% of all rumors sourced from various social media platforms (Facebook, Twitter, and WhatsApp). July witnessed a drop in rumors with 29 reported, compared with 43 in June, 51 in May, and 49 in April. The significant decrease in rumors was attributed to the government's policy of banning the media from publishing on some sensitive topics; those who violated this rule were held legally accountable. Regrettably, social networking sites continued to take the lead in spreading and promoting rumors, which increased steadily from August to December, comprising 60-70% of all fake news (as indicated in Figure 2).

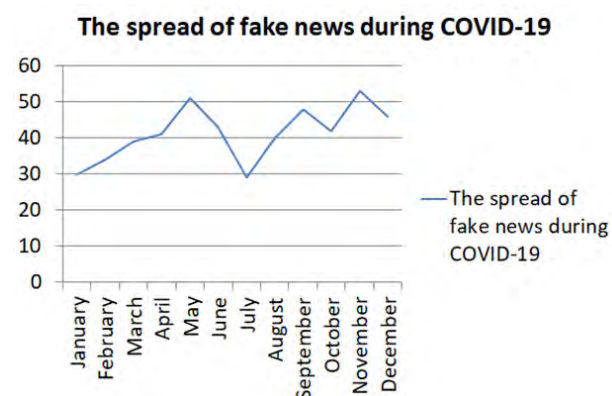

Figure 2. *The spread of fake news in Jordan in 2020*

Several researchers (Celliers & Hattingh, 2020; Qiu et al., 2017) have identified the following reasons for the spread of fake news:
- Decreased cognitive abilities of individuals.
- The poor quality of media content makes it more popular.
- The difficulty of controlling misleading news shared widely on social media. This was confirmed by

Facebook when it declared that its failure to distinguish fake news through its red flag policy had led to the consolidation of false beliefs, exactly the opposite of what it was seeking (Italiano, 2017).

- The spread of fake news is also influenced by the so-called "Placebo effect", which involves thinking positively about fake news and treating it as if it was true. (Andelová, 2018).
- Fueling fear: fake news spreads quickly when people become emotional and afraid.
- The "third person" influence, namely our tendency to believe that others are more likely to be influenced by the media than we are (Boudhn & Bouzid, 2018).

Why is media and information literacy a need rather than a luxury?

Media and information literacy (MIL) has become a social necessity owing to the massive development of modern media resources such as social media, digital channels, and electronic news sites, which together confront individuals with a vast amount of information, headlines, new technologies, and different opinions. Making the next generation aware of how to interact with different forms of media is crucial because they will convey the news and information they encounter and are often responsible for producing it. According to reports, almost 300 million new social media users are added each year, which equates to 550 new users per minute (Schultz, 2019).

MIL has evolved gradually since 1960, a time when it was referred to as "media literacy" where the focus was on teaching diverse segments of the public (children, young people, and adults) to consume mediated information critically and deliberately in both formal and informal contexts (Ciurel, 2016; Goodman, 2003). In 1972, the concept of media literacy became more concerned with educating and informing individuals as a "defense project", the aim of which was to protect children and young people from the dangers created by the media, and to encourage them to reject and overcome "false" messages and "inappropriate" values. Early in 1982, Grunwald's declaration recognized the need for political and educational systems to promote a critical understanding among citizens of "communication phenomena" from childhood to university. This was achieved by providing training workshops for teachers to master media education skills (Al-Omari & Al-Assal, 2017). Supporting UNESCO's global initiative to disseminate

MIL concepts was an early step toward the development of today's composite concept of media literacy (Muratova et al., 2019).

Wright (2015), Galán (2015), and Hadžialić (2018) contend that media education is the theoretical and practical paradigm for MIL. They argue that MIL is a scientific discipline situated within the realm of education sciences that resulted from the emergence of mass communication media. Forming a society with the ability to be critical when confronted with the power of techno-media messages – in all their current forms – in the 21st century is one of the essential tasks in any educational context. This should not be confused with education through media, which denotes the use of media as resources or didactic auxiliaries to enhance teaching-learning processes. MIL is primarily intended to promote the adequate use and consumption of media products so that citizens develop the capacities to analyze, use, and even express, in different ways, the messages presented to them. In terms of differentiating between the two terms ML and MIL, ML is related more to media content, media industry, and social effects (Lee & So, 2013), whereas MIL addresses questions we all have at some time in our lives: How can we gain sensible access to, search for, critically evaluate, consume, and contribute material both online and offline? What are our online and offline rights? What are the ethical concerns around information access and use? (UNESCO, 2021).

MIL can be described as a set of skills that enable users to understand, objectively assess, and respond wisely to media content. This helps them to raise awareness of human rights on the Internet, fight hate speech, false news, and online bullying, and utilize media technology to foster equity and self-expression. (Al-Hamadani, 2015; Al- Shamameri, 2014; Gallagher & Magid, 2017; Jordan Media Institute, 2018). Welsh and Wright (2010) define MIL as the ability to decode, encode, analyze, evaluate, and produce media content in its various forms. Lee (2010) believes that MIL refers to the acquisition of the skills that help individuals understand, produce, and criticize media content. Finally, UNESCO defines MIL as follows

the basic competencies that allow citizens to interact with the media effectively, and develop critical thinking and lifelong learning skills for socialization that makes them active citizens (cited in Al-Tawisi et al., 2016, p.5).

The researcher believes that these previous definitions combine three basic elements: understanding media content, the ability to produce it, and the ability

to employ critical thinking. Therefore, it is considered one of the optimal methods to stop the spread of fake news as it enables the public to become better educated so that they can critically and constructively evaluate the stories they see on social networks. It assumes that fake news can be addressed by being extra careful when publishing or sharing news that receives a multitude of comments and "likes." The recipient must be aware that their constant presence on a particular media platform will substantially limit their perceptions of fake news and they will become more receptive to accepting and passing on false stories. Accordingly, the recipient must diversify their preferred trusted media outlets. When they detect a fabricated story or false news, they must inform others about it. Simply refraining from publishing the story is not sufficient; they must be proactive in stopping the spread of false news (Devlin & Pohjola, 2020; Parikh & Atrey, 2018). Al-Zubidi (2018) advises checking elements of the image or video of the news such as timing, location, visible signs, sound, the language used, and the general appearance of people; he also suggests checking the name of the publisher or the website that published the item and checking the URL or the comments.

Study problem & questions

The generation that was born and raised in the digital age is authentically empowered with digital competence to reformulate knowledge and produce information in order to express themselves creatively and appropriately in a digital environment (Drewish et al., 2019). Young people use social media platforms in large numbers to stay updated on what is happening, post content, and engage with others, which can increase their vulnerability to fake media posts. Manfra and Holmes (2019) argue that the young are becoming "technology addicts" as they spend over 10 or 11 hours a day in front of the screen "passively consuming media content. They are also unable to evaluate, critically think, and solve problems" (p. 95). Melki's (2015) research identified the level of MIL among Arab youths in the era of digital media. His findings suggest that Arab youths trust online media outlets and use social media as secure entertainment tools. His results demonstrated that youths could not properly use technology. The significance of MIL has been brought to the attention of Jordan, as a result of which it became the first Arab nation to propagate MIL as a university course. Al-al Bayt University has since become the first Jordanian university to deliver this course as an elective at the

Faculty of Education in 2018 (Al-Mashagbah, 2018). The most significant contribution proposed in this paper is to assess the impact of MIL on undergraduate students in enabling them to detect fake news as several studies have noted that MIL helps young people to understand media content correctly, critically dissect media forms, and consequently benefit from media in an intelligent way (Al-Zou'bi, 2021; Suminas & Jastramskis, 2020; Tettey, 2013). To the best of the researcher's knowledge, no study in the MENA region to date has addressed this topic. To elucidate this uncharted area and fill a gap in the existing literature, the researcher addressed the following questions:

1. Does MIL have a statistically significant impact on students' acquisition of the skills needed to detect fake news?
2. What are the most common methods employed by students to detect fake news before and after studying media and information literacy (MIL)?

Literature review

The majority of studies, past and present, have aimed to assess the effect of MIL in enabling people to develop the skills needed to identify false news. For instance, Guess et al. (2020) devised an intervention based on the largest campaign for media literacy in the world. This campaign provided people in 14 countries with advice on methods to identify false news. They applied this to elections held in the U.S. and India. The results indicated that those who received this intervention were far less able to determine the veracity of false news headlines and headlines presented in mainstream news, with this effect being more marked for the former.

A second study by Jones-Jang and Jingjing (2019) attempted to determine whether higher levels of media, news, information, and digital literacy meant people were more able to identify false news and, if so, which type of literacy had the strongest effect. The findings indicated that false news was much more likely to be identified by those with high levels of information literacy; however, this effect was less evident for other forms of literacy. The authors concluded that online media has helped to diversify how knowledge is disseminated, which raises an urgent need for methods that can help increase levels of information literacy and enable people to evaluate the authenticity of online information.

Funded by the United States Embassy in London, a study by McDougall (2019) further endorsed the need for young people to receive education on media literacy

to enhance their ability to engage critically with online news. This project elicited input from US and UK researchers, leaders, and a multitude of important stakeholders such as information experts, journalists, librarians, students, and teachers. Collectively, they concluded that critical media literacy should be dynamically taught and made compulsory in schools. This would build within young people a degree of "information disorder" resilience, as opposed to resources that are simply reactive (i.e., verification tools). They also recommended engaging young people in small-scale projects aimed at developing relevant competencies.

Another notable study was conducted in 2018 by IREX and the Ukrainian Ministry of Education and Science. In conjunction with teachers in 50 schools, this pilot study strove to determine the effect of including lessons on media literacy in courses for 8th and 9th-grade students on culture, art, history, and Ukrainian language and literature. The researchers found that after just one semester, these young people were able to identify and analyze information presented to them on both traditional media and social networking platforms. Most notably, they were able to discern facts from opinions and misleading information.

However, some research findings are inconsistent regarding how students identify and distinguish fake news from that which is true. For instance, a study by Abbasi and Huang (2020) on young people's perceptions of fake news on social media in Pakistan indicated that they were poor at identifying this, primarily because they did not seek to establish where the information had come from. This suggests they cannot deal with fake news. Moreover, young people stated that their main source of information was the Internet and social media. The results also suggested that media literacy education in Pakistan has not adequately addressed the consumption of news on social media.

Stewart (2019) formed two focus groups to derive insights into how 18-24-year-old college students made assessments regarding which news they should trust on social media. The findings indicated that these students dismissed news stories on Instagram and Snapchat to a greater extent than stories on Twitter and Facebook. Irrespective of the platform, the students stated that it was important to verify news presented on social media by referring to alternative sources they deemed more trustworthy. This has become a vital component of the process of verifying information and identifying false news. The extent to which young people perceived the news as trustworthy was also dependent on the social media platform on which it was found and how convenient it was to source the news.

Vosoughi et al. (2018) examined the varying distribution of 126,000 false and true news stories that were tweeted more than 4.5 million times by more than 3 million people from 2006 to 2017. Stories were classified as true or false if a 95%-98% agreement on their status was reached by six independent fact-checking organizations. The results indicated that false stories were distributed further, more quickly, and more widely than true stories, irrespective of the type of information. Furthermore, the outcomes were more prominent for false news about political issues than false stories concerning urban tales, science-based issues, natural disasters, terrorism, or financial data.

An article by Goodfellow (2017) reported the findings of a survey conducted for two days by Channel 4 with a sample of 1,684 adults. The key finding was that just 4% of the sample was able to tell whether a news story was true or false. Almost 50% believed that one or more of the false stories were true. Notably, 66% felt that Facebook or Twitter should do more to address the issue of fake news, with 50% calling for an increase in the number of fact-checking sites. It was reported that the UK Government has had covert meetings with newspapers to address the issue but no public comments on progress have yet been made.

Viewing these findings as a whole, their relevance to the current research is clear as they highlight the urgent need to learn the valuable skill of being able to identify false and deceptive news. Although young Arab students may be technically proficient in the use of smartphones and the Internet, they lack the MIL skills needed to detect the credibility of media news. Such studies therefore constituted an important resource for the literature review and data collection. However, this represents only the first stage in developing a more comprehensive grasp of MIL across different fields. As far as the researcher is aware, this is the first study conducted in an Arab country to assess the effect of MIL in determining whether and how students acquire the skills needed to detect false news items.

METHODOLOGY

The researcher adopted a quasi-experimental approach using time-series data, a method in which one group of participants is observed repeatedly both before and after an intervention (Bloomfield, 1976). The study population comprised all (160) undergraduate students at Al al-Bayt University (AABU) enrolled on the MIL

course for the academic year 2020-2021. The researcher selected a random sample of (113 students) to participate, although 13 students were later excluded for not taking the pre-test or the post-tests. The final sample therefore comprised 100 students, consisting of 19 male students (19%) and 81 female students (81%). Overall, 61% of the sample were third year students and 39% were in fourth year. Based on a thorough review of the literature (Allen, 2017; Knapp, 2016), the researcher designed the final forms of the tests which included two demographic questions and 10 closed-ended questions (true-false items). The latter consisted of true and fake news headlines published on Facebook, Instagram, Twitter, or Arab news sites before and during the COVID-19 pandemic. One open-ended question on how to detect fake news was added to determine the methods that students employed to verify fake news, the responses to which were analyzed and classified in terms of percentages (see Appendices A, B and C).

Study procedures

Due to the COVID-19 pandemic, the final form of the pre-test was distributed to the sample on March 3, 2021 via the Google Forms app (see Appendix A). Four lectures on how to detect fake news were presented to students on March 6, 8, 10, and 13, 2021. Each lecture described one or two different methods for detecting fake news with extensive training on each. These methods were suggested by Page (2019) and are as follows:

- *Verify the source*: Students were directed to examine the site URL for the page they are viewing. Fake news sites may occasionally have spelling mistakes in their URLs or utilize unconventional domain suffixes.
- *Verify the authors*: Students were taught how to investigate authors to determine whether they are trustworthy.
- *Look at other sources*: Students were taught how to check whether other reputable news or media outlets are reporting the story, or if credible sources are cited within the story. Professional global news agencies have editorial guidelines and extensive resources for fact-checking; therefore, if they are also reporting the story, this is a good sign.
- *Keep a critical mindset*: A considerable amount of false news is purposefully crafted to elicit feelings such as fear or rage. Students were therefore taught to adopt a critical mindset by asking themselves

Lasswell's (1948) five questions: Who? Says What? In Which Channel? To Whom? With What Effect?

- *Confirm the facts*: Facts − data, figures, expert statements, and so on − will be abundant in credible news articles. If any of these are lacking, students were taught to inquire as to why. Reports featuring false facts sometimes contain wrong dates or timelines; thus, students were also advised to double-check when the item was written. Is it a recent or outdated piece of news?

Two post-tests were then designed and distributed to the same sample electronically using the Google Forms app on March 15 and 17 (see Appendices B and C). The researcher received the responses electronically via e-mail. The following correction standard for the closed-ended question was then applied. The minimum score shall be zero if the answer is wrong and the maximum score shall be 2 if the answer is correct. The maximum total score is 20.

Tools validity and reliability

The validity of the tests was established by a jury of five educational academics and six MIL experts, whose percentage of agreement reached 92%. In line with their comments, the researcher deleted two closed-ended questions and one open-ended question. The reliability of the tools was calculated by measuring the percentage of agreement and disagreement between the 11 arbitrators for each tool. The reliability coefficient was then calculated using the Holistic method (Holistic = M/N) where M represents the number of items agreed upon by the jury, and (N) represents the number of all items (see Table 1).

Table 1. *Reliability of tools*

Tool	Agreement	Disagreement	Percentage of agreement
Pre-test	8	2	80%
Post test	9	1	90%
Post post-test	7	3	70%
Total	25	8	80%

Table 1 indicates that the overall reliability coefficient was .80, which is above .75 and therefore considered high.

Data distribution

The researcher used the Kolmogorov-Smirnov Z test to assess whether there was a moderate distribution of data (Table 2).

Table 2. *Kolmogorov-Smirnov Z test results*

Kolmogorov-Smirnov Z	Degrees of freedom	Significance level
Pre-test	98	.000
Post test	98	.000
Post post-test	98	.000

Table 2 indicates that the distribution of data for all measures was non-moderate as the level of significance in each case was less than 0.05 (Ghasemi & Zehedias, 2012). Therefore, non-parametric tests such as the Mann-Whitney U and the Friedman test were employed to analyze the data for the closed-ended questions. For the open-ended question, the researcher coded the responses and then calculated the percentages.

FINDINGS

To answer the first research question: *Does media and information literacy have an impact on students' acquisition of the skills needed to detect fake news*, the Friedman non-parametric test was applied to test the difference between the means of the research sample in the pre-test, post-test, and the post post-test regarding the degree to which students acquired the skills needed to detect fake news (Table 3).

Table 3. *Friedman non-parametric test results*

Study tools	Study sample — Average of ranks	Chi-Square	Degrees of freedom	Sig.
Pre-test	1.12	136.8	2	0.000
Post-test	2.45			
Post post-test	2.43			

As indicated, statistically significant differences ($p < 0.05$) were observed between the averages of the three measures in favor of the post-test and post post-test), the average of ranks for which were 2.45 and 2.43, respectively, far exceeding the average of ranks for the pre-test (1.12). This indicates a positive effect of MIL on students' acquisition of the skills needed to detect

fake news. To ascertain the effect size, the researcher applied Cohen's D effect size test (Cohen, 1988) (Table 4).

Table 4. *Cohen's D effect size test results*

Tool	Post-test		Post post-test		Effect size
	T	N	T	N	
Pre-test	-13.8	98	-15.8	98	
Cohen's D effect size coefficient	1.4		1.6		Strong

Table 4 indicates that the Cohen's coefficient values for the post-test and post post-test were 1.4 and 1.6, respectively. These values are greater than 0.8, indicating that the effect of the independent variable (MIL) on the dependent variable (students' acquisition of the skills needed to detect fake news) was strong.

As for the second research question: *What are the most common methods employed by students to detect fake news before and after studying media and information literacy (MIL)?,* the percentages of the methods used to detect fake news in the pre-test and post-tests were calculated.

Table 5. *Percentages of methods used to detect fake news in the pre-test*

#	Method	Percentage
1	Doubting it	65%
2	Inner intuition	23%
3	I do not know	12%

Table 5 indicates that two methods were employed to detect fake news before studying MIL: "doubting it" was employed the most (65.4%), followed by "inner intuition" (22.6%) and "I don't know" (12%).

Table 6. *Percentages of methods used to detect fake news in the post-test*

#	Method	Percentage
1	Googling it	70%
2	Checking the name of the news agency reported in News	18%
3	Using the critical thinking skill to answer the 5WS	7%
4	I don't know	5%

Table 6 indicates that students followed three methods to detect fake news after studying MIL, the most common of which was: "Googling it" (70%), followed by "Checking the name of the news agency reported in News" (18%), "Using the critical thinking skill to answer the 5WS" (7%), and "I don't know" (5%).

Table 7. *Percentages of methods used to detect fake news in the post post-test*

#	Method	Percentage
1	Googling it	56%
2	Checking the name of the news agency reported in News	21%
3	Using the critical thinking skill to answer the 5WS	16%
4	I don't know	7%

Table 7 indicates that students again followed three methods to detect fake news after studying MIL, the most common of which was "Googling it" (56%), followed by "Checking the name of the news agency reported in News" (21%), "Using the critical thinking skill to answer the 5WS" (16%), and "I don't know" (7%).

DISCUSSION

The results of this research highlighted the impact of MIL on students' acquisition of the skills needed to detect fake news. It thus serves as a tool that assists the user in analyzing the material they are exposed to and increases the possibility of verifying the news, photos, and videos they are watching.

The results of the first research question identified statistically significant differences between the averages of the measures (pre- and post- tests). The researcher taught a generation with reasonably good digital capabilities (Drewish et al., 2019; Manfra and Holmes 2019; Melki, 2015), but it was relatively ignorant when it came to dealing with and evaluating media news, as evidenced by the pre-test findings. This aligns with the findings of Abbasi and Haung (2020), whose results revealed the ignorance of the digital generation in checking the credibility of news. The previous result changed significantly after the students received extensive training on ways to verify false media news. This demonstrated that studying MIL is necessary to train individuals and empower them with the appropriate skills to criticize and distinguish between truth and

falsehood. This result is fully compliant with the findings of the previous research (Guess et al., 2020; IREX, 2018; Jones-Jang et al., 2019; McDougall, 2019), all of which agreed that MIL helps to equip the digital generation with the appropriate skills needed to confront and respond to fake news.

In response to the second research question, the responses indicated that participants employed two main methods of checking fake news before studying MIL. The first is intuition, which refers to the effect of unconscious emotional information emanating from the body or brain such as instinctive thinking or sensation (Khalifa, 2000). This cannot be considered a scientific method for detecting false media news as it depends more on speculation. The second is doubt, a situation in which the mind is caught between two conflicting propositions and cannot agree with either (Sharpe, 1909). However, this cannot be regarded as a scientific method of verifying fake news as it has no empirical grounding. After studying MIL, the methods became more specific, reasonable, and practical. Students' favored methods were googling the news, identifying the source of the news, and applying the critical thinking method. This can be attributed to the fact that these methods were presented to students who received online training sessions on how to detect fake news for each one.

The previous result demonstrates that what is offered to students in the MIL course strengthens their ability to detect fake news, and is consistent with the methods cited by other researchers (Al-Zubidi, 2018; Devlin & Pohjola, 2020; Parikh & Atrey, 2018). Unsurprisingly, the "I do not know" percentage of the pre-test results was 12%, suggesting that this group were totally ignorant of the right methods to use to detect false news owing to their MIL illiteracy. After studying MIL, only 5% of the sample did not know how to detect fake news in the post-test and 7% in the post post-test. This finding indicates the role of MIL in reducing students' ignorance of the right methods to employ to detect fake news.

CONCLUSION AND IMPLICATIONS

According to the results of this research, MIL's role revolves around combating false news and rumors, exposing false information, and developing and strengthening the capabilities and skills of critical thinking among individuals to identify negative and positive messages. This enables users to distinguish between facts and opinions, and helps stop the spread of

false news and prevent it from reaching larger numbers of recipients. It can therefore be an inspiring method for students as it provides them with powerful immunity to the fake news shared by users of social media platforms and news outlets. In this study, the training students received on the MIL course developed their ability to understand, criticize, and verify the content of media messages, and detect fake content. Thus, the researcher believes that if media literacy becomes a mandatory topic in schools and universities, and is taught as a proactive form of literacy education, it will help empower the young generation to become more resilient towards "fake news".

However, caution is needed when interpreting the results as the small sample size limits the extent to which they can be generalized. Therefore, research on larger samples is recommended and these results need to be tested in multiple universities or schools with different (non-Arab) populations. Nevertheless, the current study plays an important role in highlighting the importance of MIL in combating and countering fake news. Therefore, the researcher believes that integrating MIL into the strategic plans of the Ministry of Higher Education and Scientific Research needs to become a priority in providing the digital generation with the skills needed to deal effectively with all types of media. It is also essential to prepare a guide or a handbook for teachers and instructors to direct them toward the best ways to verify the credibility of the news circulated in the media. Finally, further research on MIL and its methods of fake news checking should be conducted, to obtain valid and comparable findings across the Arab region and beyond.

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APPENDIX A

Electronic Pre-test (translated from Arabic)

Name:

Gender:

Academic year:

Are these news headlines true or false?

1. After the farmers' sit-in, the Irbid Municipality asked the government to reduce their fees.
2. Dozens of young men and women were surprised on Saturday with the "Zumba" dance, part of a festival program that will continue for 3 days during the opening of the first "health club - preventive". Its aim is to stimulate medical tourism in the Middle East region in Alexandria, with investments totalling 85 million Egyptian pounds.
3. Minister Al-Batayneh launches a "Careers from Gold" initiative, which calls on youths not to wait for government jobs and to join the labor market
4. Al al-Bayt University announces the establishment of the first television station in Mafraq.
5. Marka Military Airport is sold following the approval of the Chairman of the Joint Chiefs of Staff.
6. One of the representatives appointed 100 employees with a blessing from the prime minister
7. A citizen intentionally burned his wife and children in southern Jordan due to their living conditions.
8. The Arab army is involved in the killing of a Syrian woman in the Al-Rukban camp.
9. The actress Ahlam transferred to Petra by a private military plane
10. The army's airbase and lands, owned by the Jordanian Armed Forces in the Tla 'Al-Ali areas, have been sold.

I checked the previous news via: _____

APPENDIX B

Electronic Post-test (translated from Arabic)

Name:

Gender:

Academic year:

Are these news headlines true or false?

1. The spokeswoman for the World Health Organization, Fadela Al-Shayeb, announced that the source of the coronavirus is a bat and was transmitted to humans through an intermediary.
2. The Akeed platform registered 14 rumors in March since the government announced its decision to implement Defense Law No. 13 of 1992.
3. Two non-Jordanian people were arrested after publishing a video of themselves shooting an endangered bird in one of Amman's areas during the COVID-19 ban (According to Petra news agency).
4. Sweden refuses to impose a strict closure on shops and the movement of its citizens to curb the spread of the new coronavirus (COVID-19), and bets on what is known as collective immunity or "herd immunity."
5. The price of a regular mask in Jordan increased from 50 piasters to two dinars during the COVID-19 pandemic.
6. Regarding the Jordanian Tawjihi exam, the Ministry of Education has no intention to merge some majors into one exam paper.
7. The Minister of Supply confirms there are indications of a shortage of stocks of basic and strategic commodities in Jordan due to the coronavirus, according to the Sanaa Jordan news agency.
8. The Minister of Finance stated: The state's general budget plan will be amended and 100 billion JD will be withdrawn to deal with the repercussions of the spread of the coronavirus.
9. North Korea's president, Kim, is dead and his sister will rule after him.
10. The Jordanian Private Hospitals Association became a member of the International Hospital Federation in cooperation with the Health Institutions Accreditation Council and university hospitals. (Al Mamlakah TV site)

I checked the previous news via: _____

APPENDIX C

Electronic Post post-test (translated from Arabic)

Name:

Gender:

Academic year:

Are these news headlines true or false?

1. The President of South Korea receives a "Viber" vaccine against the coronavirus before his visit to Britain to attend the G7 summit.
2. FIFA sets the official date and venue for the football competition in the Qatar Olympics.
3. The Director-General of the World Health Organization, Tedros Adhanom Ghebreyesus, said, "Inequality in access to vaccines against coronavirus, between rich and poor countries, is increasing and becoming scandalous."
4. In the worst floods in half a century: Australia is evacuating thousands of people.
5. Iman Al-Bahr Darwish: I have recovered from paraplegia.
6. The Egyptian Mohamed Ibrahim Abu Senna and the Syrian Shawky Baghdadi won the Ahmed Shawky Prize for Poetic Creativity in its second session, and were presented with the award by the General Syndicate of the Egyptian Writers Union.
7. The Egyptian governorate of Kafr El Sheikh witnessed the opening ceremony of the second point in the path of the Holy Family in Egypt, following the completion of the development project.
8. The Johns Hopkins University of America reported that the total number of coronavirus infections in the world has risen to more than 123 million, and the total number of deaths to more than 2.7 million.
9. The "Times" newspaper reported that the British authorities intend to extend the ban on international travel until July, indicating that violators could be fined 5,000 pounds.
10. The UAE will invest $ 10 billion in the Indonesian Investment Authority, which is an Indonesian sovereign fund according to the Emirates News Agency.

I checked the previous news via: _____