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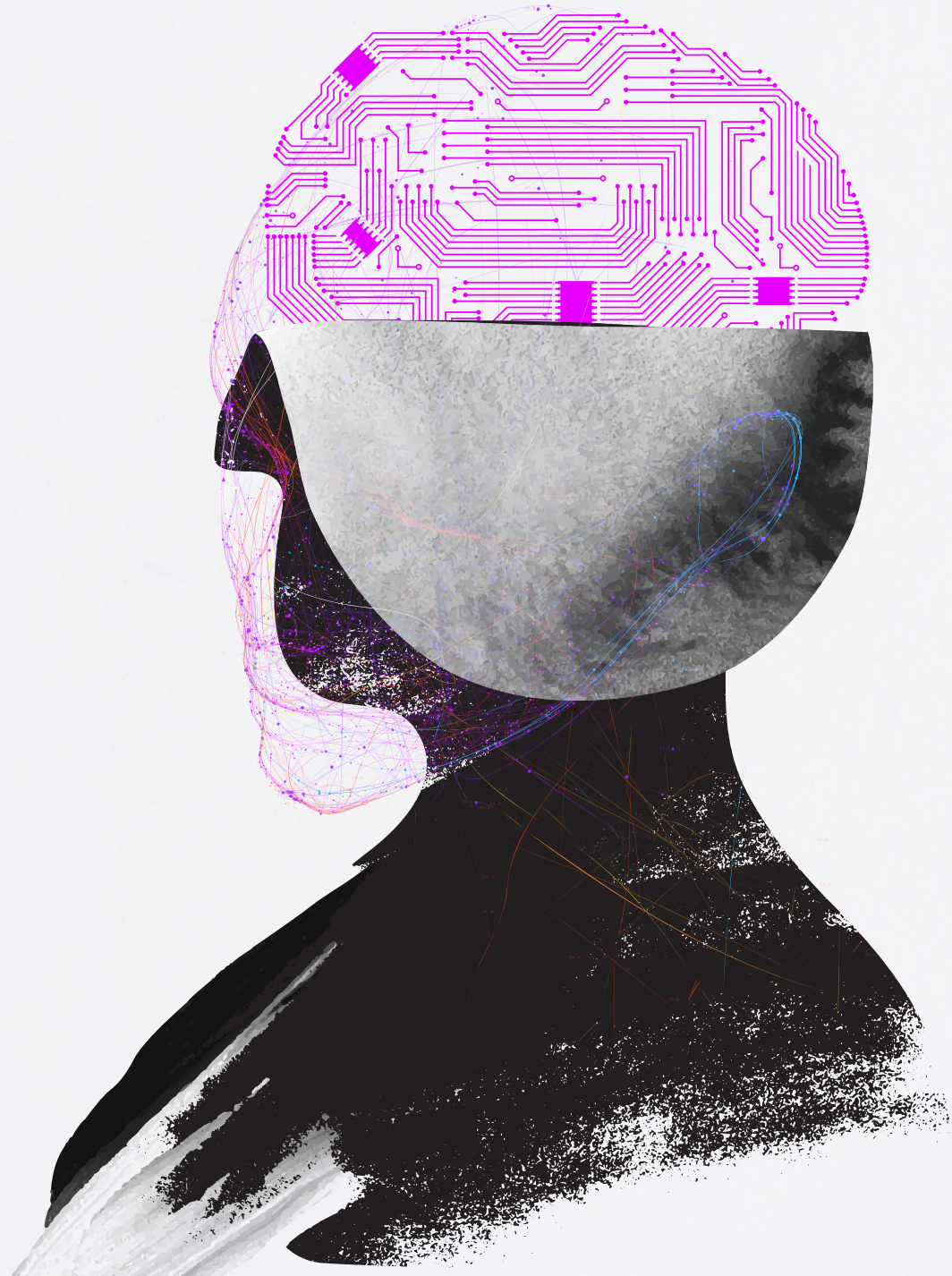

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The journal is devoted to addressing contemporary issues and future developments related to interdisciplinary academic discussion, the results of empirical research, and the mutual interaction of expertise in media and information studies, media education as well as their sociological, psychological, political, linguistic, and technological aspects.

Apart from these areas, other interesting articles and contributions offering new perspectives and solutions relevant to media, communications, education, strategic management, and business, are welcome and will be considered for publication in the journal.

All articles are double-blind reviewed. Internationally renowned experts from the academic and research community are involved in the process of anonymous double-blind reviews. Thus, the journal offers authors an opportunity to improve their texts using anonymous reviews in accordance with the best academic and research standards.

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CONTENT

THE USE OF ARTIFICIAL INTELLIGENCE - ENIGMA FOR MACEDONIAN MEDIA

Maja Blazevska Evrosimoska, PhD
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ABSTRACT

In a reality marked by extremely rapid technological progress, the use of artificial intelligence (AI) has permeated numerous fields and professions, including the media industry. At a time when some media outlets use or experiment with the potential of artificial intelligence, additional efforts are needed to increase awareness of its use among media professionals and among the audience. While international institutions are taking steps towards regulating the legal and ethical aspects of using artificial intelligence and possibly preventing its abuse, global media companies are drafting guidelines and deciding on standpoints regarding the use of AI and the need to educate the audience and raise awareness about how a certain media product is created. This paper will analyse how prepared Macedonian media are to respond to the new challenges surrounding the use of AI in their work processes, but also in preparing the audience to receive media products in which AI is used. At the same time, an effort is made to respond to the ethical and moral aspects of that process, transparency, accountability, and other professional principles in the journalistic profession.

Keywords: media, AI, media literacy

INTRODUCTION

Frederick S. Siebert, Wilbur Schramm, and Theodore Peterson in their „Four Theories of the Press" argue that the mass media always take on the shape and the general tone of certain social and political structures and the circumstances in which they operate. The authors believe that the oldest theory is the authoritarian one, which originates from the 16th century, derived from the state's philosophy of absolutism, where the press should support the government's policy and serve the state. Apart from the authoritarian one, they also single out the libertarian theory, the Soviet theory, and the theory of social responsibility of the media. The theory of social responsibility of the media is based on the idea of a free press that is always bound by certain obligations to society. The theory distinguishes six functions : to serve the political system by making information and discussions of public interest generally available, to educate the public so that it is capable of autonomous action, to protect the rights of individuals with the mass media assuming the role of watchdogs of democracy, to serve the economic system, to offer entertainment and see that financial independence is maintained in order to avoid dependence on special interests and influences of special sponsors [1]. The media are shaped by the social and political circumstances in which they operate. They especially reflect the system of social control, which also includes the relationships between individuals and institutions. Understanding those aspects of society is the basis for any systemic understanding of the press [2].

The critical theory of society arose as a criticism of civic civilization, the alienation of man in the capitalist industry system. Its foundations were laid by the pioneers of the so-called Frankfurt School, Theodor W. Adorno and Max Horkheimer, who advocated for the vision of a humane society. They criticize mass, especially electronic media for presenting a partial picture of the world and structuring information in a manner that impoverishes the complexity of events, abandons analytical information, minimizes the quantum of knowledge, and maximizes entertainment and economic propaganda. Thereto, the audience is deprived of the right to speak and object. The products of the culture industry are leading people into conforming to mediocrity, to that which is general than what they previously experienced as incompatible with their interests [3]. The authors of the critical theory of society label the culture industry as „anti-enlightenment" or „mass fraud".

The media intrusion theory speaks of the fact that the media have taken the place and role of politics. This theory is not a neatly articulated set of ideas, it exists as a series of loosely connected assumptions from political science and communication research. The theory rests on the assumption that the political system works best when a responsible and informed political elite mediates between the public and the elected leaders. Many social groups from which leaders originate are losing membership and influence, a phenomenon called „declining social capital," and theorists accuse the media for this situation. They state that people are staying at home to consume media content at the expense of participating in local groups. The argument goes so far as to consider that television has replaced the parties in the election process, and the candidates do not need the support of the parties. The political process is seen as a game

1 Kunczik M., Zipfel A. (2006) Uvod u znanost o medijima i komunikologiju, Zagreb, Zaklada Friedrich Ebert p . 39.
2 Hallin, D.; Mancini, P. (2004) Comparing Media Systems, Three models of media and politics, Cambridge: University press, p . 9
3 Vreg, F. (1991) Demokratsko komuniciranje, Sarajevo: FPN, p. 199.

of opposing groups, while the main stars are the politicians. The media does not systematically inform its audience about the problems and solutions of the candidates, instead, it encourages its consumers to be political observers while the stars perform [4].

Critics of this theory argue that journalists are given a minor role in the election process, while the media are given more power than the audience. The development of AI among the professional public is considered the third wave in technological development. The first is the emergence of the Internet and the abandonment of traditional forms of media product preparation, and the second is the emergence of social media. As a relatively new phenomenon, anything related to AI is considered a new skill. It has led to a significant improvement in numerous areas of society, for example in the operation of news aggregates or the automatic translation of content into different languages, and it inevitably leads to changing perspectives in the work of newsrooms.

In addition to informing, the role of the media is to educate and entertain. That is why it is important that issues regarding AI and knowledge about its use are part of the education of future journalists, as well as people who work on media literacy. In the context of media literacy, it is necessary to quickly adapt to new circumstances, the development of technology, and, in that context, AI[5].

On a global level, AI is already being used in the process of creating media content, as one of the tools for collecting data and information about journalistic stories or identifying fake news. At the same time, there is a legitimate concern that AI can be used to create fake news, misinform, disinform, and mislead the audience.

According to the UNESCO recommendation on the ethics of AI, "AI systems are information processing technologies that integrate models and algorithms that produce a capacity to learn and perform cognitive tasks, leading to results such as prediction or decision-making in material and virtual environments. AI systems are designed to operate with varying degrees of autonomy by modelling and representing knowledge and by exploiting information and computing correlations[6]." In the context of journalism, AI is defined as a set of ideas, technologies, and techniques related to the capacity of a computer system to perform a task requiring human intelligence (Brennen et al., 2018).

UNESCO's "Handbook for Journalism Educators – Reporting on Artificial Intelligence" outlines several key postulates that students should be aware of when reporting on topics related to AI. In that context, it is stated that it is necessary to keep abreast of the latest developments in the field, understand the ethical and social implications of AI and its impact on various sectors and industries, critically analyse the statements and views by experts, check and verify facts before publishing a story, be aware of the possible bias and limitations of the technology that creates AI and take them into account when informing about them or using them[7]. Regarding the regulation of the area, it is necessary to emphasize the responsible and

4 Baran, J. Stanley; Davis, K. Dennis (2010) Mass Communication Theory: Foundations, Ferment, and Future, Boston, USA: Wadsworth Cengage Learning, p. 310

5 A handbook for Journalism educators, Reporting on Artificial intelligence UNESCO 2023 стр.6 https://unesdoc.unesco.org/ark:/48223/pf0000384551/PDF/384551eng.pdf.multi

6 Ibid , p. 29

7 https://unesdoc.unesco.org/ark:/48223/pf0000384551/PDF/384551eng.pdf.multi, Ibid p. 7

ethical approach to the use of AI, especially how data is generated and shared. The centralization of power over the development of AI requires deeper media attention, as it is important for humanity, democracy, human rights, environmental sustainability, and development. Among the questions that journalists should additionally answer while following topics related to AI are what ethical protocols were used during the creation of data, their storage, and preservation, what checks were made, as well as whether any incidents occurred, and what can be learned to improve the system. New technologies can improve the effectiveness of work, but the question that is most often asked by the public is whether they can replace the work of journalists.

GUIDELINES ON THE USE OF ARTIFICIAL INTELLIGENCE

There is an awareness in the European Union that how artificial intelligence will be approached will define the future world we live in, help build a resilient Europe, and people and businesses will reap the benefits of AI and feel safe and protected.

The European Commission has proposed three legal initiatives that should lead to the construction of a trustworthy AI: a European legal framework for AI that addresses fundamental rights and security risks, a framework for civil liability, adaptation of liability rules in the digital age and the era of AI, and revision of the sectoral security legislation[8]. In June 2023, the European Parliament adopted the negotiating position on AI, ahead of the talks with member states over the content of the law. The rules should ensure that AI which is developed and used in Europe, is fully compliant with EU rights and values, including human supervision, security, privacy, transparency, non-discrimination, and social and environmental well-being[9].

Some media companies in the UK have already announced that their content was created with the help of AI, but the editorial team was involved in the process[10].

Generative AI will not change the role of journalists, according to the editor-in-chief of Germany's Deutsche Welle, Manuela Kasper-Clidge. During the seventy-year existence of this media outlet, journalists have had to adapt to rapid technological changes, however, the quality standards remained unchanged. Deutsche Welle already uses some AI-based applications, for example, to analyse large databases for their research or translate articles from one language to another, but it is crucial that journalists exercise quality control[11]. The editor's view is that AI can be used to better find content on search engines or to identify hate speech, but journalists should always check the quality of these applications. Particularly important is her view that journalists must learn to recognize the biases that are part of the files on which AI operates.

8 https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence accessed 8/10/2023
9 https://www.europarl.europa.eu/news/en/press-room/20230609IPR96212/meps-ready-to-negotiate-first-ever-rules-for-safe-and-transparent-ai accessed on 8/10/2023
10 https://www.theguardian.com/business/2023/mar/07/mirror-and-express-owner-publishes-first-articles-written-using-ai published on 07/03/2023
11 https://www.dw.com/mk/kakov-e-stavot-na-dojce-vele-kon-generativnata-vestacka-inteligencija/a-66874278 published on 20/09/2023

A policy introduced by the Associated Press (AP), one of the world's largest news agencies, states that AI tools cannot be used to create content for publishing or images on its news services. AI-generated content should be carefully examined, just like material from any other news source, because it is important to protect their integrity[12]. The AP, however, has been experimenting for a decade with some simpler forms of AI to make short news stories out of sports scores or business reports.

Reuters has a tool that, with the help of AI and special algorithms, is used to spot news on social media, especially in cases of breaking news[13]. Algorithms look for clusters of tweets that refer to the same event and generate a newsworthiness rating. Nevertheless, Reuters journalists independently verify the news through their channels, before publishing it. This tool has given Reuters a head start in breaking news over other news agencies.

BBC director Rhodri Talfan Davies outlined the three principles that will underpin their approach to the use of AI: to work in the best interests of the audience to deliver greater value;, to give priority to talent and creativity, to the authentic and humane presentation of stories and to be open and transparent with the audience about the use of AI[14]. This media company will soon start several projects that will explore the use of generated AI in the content they create and the way they work.

MACEDONIAN MEDIA AND AI

To investigate to what extent the use of AI has penetrated the work of Macedonian media and whether they have prepared guidelines and recommendations regarding the method of use, we contacted several editors-in-chief working in television media, traditionally the most popular type of media in Macedonia, as well as editors-in-chief working in online media (web portals) considering their presence on social media and the use of innovative technologies in interacting with the audience.

The answer we received from the heads of eleven media outlets is that Macedonian media do not use AI and that they have not prepared instructions and recommendations for their journalists and other media workers regarding their editorial position about the use of AI in the creation of content and the functioning of newsrooms.

"AI does not think creatively and intuitively, it is a system that cannot make human decisions. AI is a tool that is fast, and accurate, but never goes beyond the given code. It is constantly learning and gathering information that is accurate and relevant. Therefore, this tool can be used to control and detect fake news or images in the media, but it is not capable of independently creating news from everyday life without human factor verification. Nonetheless, this tool cannot be used in Macedonia yet, due to the language barrier. It will take a long time for these systems to start functioning in Macedonian"[15], says the editor-in-chief of one of the Macedonian web portals.

12 https://apnews.com/article/artificial-intelligence-guidelines-ap-news-532b417395df6a9e2aed57fd63ad416a published on 17/08/2023

13 https://www.reutersagency.com/en/reuters-community/reuters-news-tracer-filtering-through-the-noise-of-social-media/ published on 15/05/2023

14 https://www.bbc.co.uk/mediacentre/articles/2023/generative-ai-at-the-bbc/ accessed on 13/10/2023

15 From a discussion with the editor-in-chief of a web portal on 5/10/2023

Although they do not have guidelines and recommendations, the editors say that they are analysing the benefits of using AI in the media and that they are aware of the importance of the topic and are thinking about how to train themselves or train representatives of their newsrooms on the operational segments in which they could include it. "We are aware that we are becoming aware"[16]. Following world trends, most of them think that they will have to adopt editorial guidelines and recommendations regarding this issue in the near future. "We do not use it and have received a recommendation not to use it," says one of the editors-in-chief[17].

"We are discussing the use of AI in the archiving process, we are aware that these are expensive processes, but they will prove useful. However, we think that it should not be used in the creation of media content"[18].

The Media Information Agency, the main news agency in Macedonia, is staying up-to-date with digital and technological innovations related to journalistic and media trends. They are currently working on providing training for editors, journalists and other media professionals on the safe and correct use of AI. "The trust of our users matters the most to us, that is why we carefully approach the introduction of innovations in our work, which requires more comprehensive training. MIA publishes daily texts about new technologies and their application, including AI. In this way, we want to contribute to the entire community (not only the media), to be better informed about digital and technological innovations, their use and protection of citizens from misuse"[19].

The founder of a Macedonian portal says that, apart from text generation tools, he also uses many more, such as grammar check tools.

"This process came about naturally, as it is with most people. With the ever-increasing development and trend of AI tools, my curiosity was piqued. In the beginning, I merely wanted to explore the options and play around with them, see how far their possibilities extend, and then integrate them in some way and, at least a little, make my daily work easier[20]." He argues that AI tools should be used in the daily work of journalists, but with great caution and without complete reliance on them. "I find the positive side in the increased productivity and the help they offer, but in the meantime, because some of them are still in development, they often provide wrong information or point in the wrong direction, so it is necessary to be cautious when working with them. I use it more often to check the grammar and language of the content I've created, to expand my horizons about some topics I have covered, possible profiles of interviewees, questions, to help me with ideas on some topics and the like"[21]. He adds that AI itself is not the future of journalism, but an accompanying tool that will make the work of journalists easier. "The sooner this reality is accepted and the doubts that old-school journalists and editors have and the general suspicion towards them are put aside, the easier it will be for them to immerse themselves as soon as possible in today's digital society that is in the midst of the inevitable development of AI. What AI will never achieve is to bring emotions to the surface, to tell the story through a human lens, only people can do that."[22].

16 From a discussion with to the editor-in-chief of a web portal on 5/10/2023
17 From a discussion with the editor-in-chief of a web portal on 5/10/2023
18 From a discussion with the editor-in-chief of a television channel on 16/10/2023
19 Announcement of the Media Information Agency 6/10/2023
20 From a discussion with the editor-in-chief of a web portal on 7/10/2023
21 Ibid
22 Ibid

CONCLUSION

Macedonian media still do not use AI in their daily work. In the newsrooms, there is still no concrete, editorial position regarding the possible use of AI tools, nor recommendations and guidelines for how journalists and other media professionals should behave about this issue. The editors-in-chief in most of the influential Macedonian media outlets are aware that the topic of using AI in the creation of media content will become more and more relevant, given the global trends and the process of regulation of this area which is ongoing in the European Union. Some of the employees in Macedonian media are involved in trainings about the use of AI, however, for the time being, their numbers are low. Macedonian media report on issues related to the development of AI, in line with the type of content they create.

In the next period, Macedonian media will inevitably have to consider the perspective of AI both in terms of the functioning of the newsroom, as well as in terms of content production. In this process, it is necessary to monitor the development of other industries, as well. Taking into account the fact that these are tools that require significant financial resources, smaller newsrooms will face greater challenges in navigating and staying afloat in the new reality. Journalism schools will play a special role, future journalists will have to be trained to use the AI tools, to follow ethical principles and the principles of responsible journalism. Apart from the fact that the subject of AI is an enigma for the Macedonian media, the general public, also is not sufficiently informed about its effects, especially how the media operate, therefore additional effort will be needed to transparently explain these changes to the audience.

REFERENCE LIST

- Kunczik M., Zipfel A. (2006) Uvod u znanost o medijima i komunikologiju, Zagreb, Zaklada Friedrich Ebert
- Hallin, D.; Mancini, P. (2004) Comparing Media Systems, Three models of media and politics, Cambridge: University press
- Vreg, F. (1991) Demokratsko komuniciranje, Sarajevo: FPN
- Laughey, D. (2009) Media studies Theories and Approaches, Harpenden: Kamera Books.
- McQuail, D. (2010) Mass Communication Theory, (6th edition), Los Angeles/ London/ /New Delhi/ Singapore/Washington DC: SAGE
- Baran, J. Stanley; Davis, K. Dennis (2010) Mass Communication Theory: Foundations, Ferment, and Future, Boston, USA: Wadsworth Cengage Learning
- Horkheimer, M. and Adorno, T. (1989) Dijalektika prosvjetiteljstva, Sarajevo: Logos.
- Kečo Isaković, E. (2006) Kritička teorija društva u istraživanju mas-medija, Godišnjak, Sarajevo: FPN
- Media laws and Ethics, Normative Theories – Four Theories of the press
- A handbook for Journalism Educators, Reporting on Artificial intelligence, UNESCO (2023) https://unesdoc.unesco.org/ark:/48223/pf0000384551/PDF/384551eng.pdf.multi

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AWARE AND CRITICAL NAVIGATION IN THE MEDIA LANDSCAPE: (UN)BIASED ALGORITHMS AND THE NEED FOR NEW MEDIA LITERACY IN THE ERA OF ARTIFICIAL INTELLIGENCE AND DIGITAL MEDIA

Aneta Risteska

ABSTRACT

As technology advances rapidly, media literacy education plays a crucial role in supplying individuals with the skills and knowledge to navigate the complex media landscape. The article examines the ethical implications of AI algorithms highlighting the importance of critical awareness among users. AI-driven recommendation systems have considerable influence over individuals' information consumption and worldview, which requires media literacy education to foster a deep understanding of biases, limitations and potential risks associated with these algorithms. This paper points to the need for ethical behaviour to govern AI algorithms, ensuring transparency, accountability and fairness in content curation. Additionally, the article brings examples that indicate how algorithms work and what consequences they can leave in our social life and actions if we do not create them according to certain ethical values, or if we consume their messages without critical awareness. New media literacy education should empower individuals to make informed decisions about their privacy and develop a critical stance toward data collection practices. Concepts such as informed consent, data anonymity, and the implications of targeted advertising should be addressed in media literacy education. Furthermore, the paper emphasizes the responsibilities of media literacy educators themselves. Teachers and institutions must ensure that media literacy programs promote inclusivity, diversity, and a global vision. By incorporating ethical frameworks into the curriculum, educators can cultivate responsible digital citizenship and encourage critical thinking about the social impact of AI and digital media. Media literacy education in the context of AI and digital media must address the ethical dimensions inherent in these technologies. By equipping individuals with the necessary tools to critically analyse algorithms, navigate data privacy concerns, and foster responsible digital citizenship, media literacy education can facilitate an informed and ethical engagement with AI and digital media.

Keywords: ethical aspects, algorithms, human rights, artificial intelligence, new media literacy education, digital media

INTRODUCTION

Never closer to information, and never further from the truth. At a time of unstoppable growth of the adoption of digital technology in all pores of life, it becomes inevitable to conclude that with the growth of the availability of information, the need for suspicion and skepticism towards every consumed information grows in direct proportion. If we do not check its quality today and absorb the false information, tomorrow we may have consequences, an information hangover that produces fog and uncertainty about the contexts for us, and for the senders of the message - an accomplished goal or manipulation.

All this points to the urgent need for a new role of media literacy among all generations. Its main intention is to create the ground and conditions for a critical reflection of the information consumed and an awareness of the labile ethical legs of the algorithms that can nurture different aspirations and biases. The purpose of this article is to consider the reasons for the need for a new approach to media literacy that will be in harmony with the current development of power, but also the dangers that artificial intelligence can present, and at the same time offer opportunities through which the impact that unfiltered information can cause will be amortized, being an unwanted reflection in daily activities.

For this purpose, a qualitative review of part of the existing findings and knowledge will be shown, through publications, articles, studies, and research that refer to the need and importance of integrating media literacy in different layers of our lives, in order to be closer to a reflection that will manifest objectivity. Primarily, we would underline the need to integrate digital, or even more narrowly, algorithmic literacy, as an important part of media literacy.

This paper explores the necessity of cultivating new responsible aspects of media literacy education in the context of artificial intelligence (AI) and digital media, emphasizing the need for responsible and informed engagement with these technologies. AI-driven recommendation systems have a significant impact on individuals' information consumption and worldview, requiring media literacy education to foster a deep understanding of the biases, limitations, and potential risks associated with algorithms. Therefore, the paper emphasizes the importance of vigilance and critical awareness among users. Next, this article explores ethical considerations related to privacy and data security in digital media. Media literacy education has a crucial role in preparing individuals to make informed decisions about their privacy and to develop a critical attitude toward data collection practices.

This article will examine some aspects of algorithms and suggest why it becomes necessary for teachers to be aware of the impact of algorithms and work to promote algorithmic literacy in their students. The digital landscape of fake news increasingly requires new literacy skills and critical awareness to read, write, and use media and technology to empower civic participation and social transformation. It is becoming increasingly important for educators to teach students how to think critically about the media and technology that surrounds us.

The curriculum for media and information literacy and teacher training for media education is constantly updated around the world. It becomes crucially important to create and develop a critical response to the new information and communication technologies that are embedded in all aspects of society. Only through the application of a critical media literacy framework can students at all grade levels learn to critically analyse messages. As long as we use our critical thinking and media literacy skills, we can continue to enjoy the media landscape, as long as we protect ourselves from being manipulated and targeted by it.

HOW MUCH DO WE KNOW ABOUT ALGORITHMS?

With the rapid development of technology, algorithmic literacy is becoming an extremely important segment of digital media literacy. It can help us understand how algorithms work and how they affect our lives. Currently, numerous studies point to the fact that a relatively small number of people have a satisfactory knowledge of algorithms. This creates digital inequality, and therefore it is important to start as soon as possible with a greater adoption of information and knowledge about algorithmic literacy.

But at the same time, we should be aware that computer algorithms constantly (will) change and we will all have to be ready for lifelong education, for upgrading. Only in this way will we be able to become more aware of the work of algorithmic formulas that have the power to change our behaviour and our relationship with each other, which in turn is significantly reflected in the creation of strongly opposed social groups that find less and less points of commonality and cooperation.

Algorithms represent finite sequences of rigorous instructions that have an input and an output. Most commonly, algorithms recommend (e.g. YouTube suggestions) or filter (e.g. Twitter feed) content. They use individual and aggregated behavioural data to personalize a wide variety of content, such as news, information searches, advertisements and videos to maximize engagement (and revenue) for the provider and/or platform.

But algorithms also passively spread misinformation and other forms of false or misleading content. They are, very often, proactively manipulated by highly media-literate people to amplify this content through coordinated engagement (e.g. commenting or sharing). ”The nature of algorithms in digital media is thought to enhance cognitive biases, which can generate new biases, reinforce existing beliefs, and make critical thinking more difficult. The uneven distribution of algorithmic awareness must be addressed directly by media literacy initiatives, not seen as an”optional extra“ (Jordan Hill, Organization for Economic Co-operation and Development (OECD), Unpacking Algorithmic Literacy).

Hill argues that algorithmic literacy is an essential skill for citizens in the 21st century. He defines algorithmic literacy as the ability to understand how algorithms work, to critically evaluate the outputs of algorithms, and to use algorithms responsibly.

He argues that algorithmic literacy is important for several reasons. First, algorithms are increasingly used in a wide range of areas, such as decision-making, social media, and advertising. Second, algorithms can have a significant impact on people’s lives, both positive and negative. Third, the way algorithms work is often complex and opaque, which can make it difficult for people to understand how they are being affected.

Hill identifies four key components of algorithmic literacy.

Understanding how algorithms work: This includes understanding the basic concepts of algorithms, such as loops, conditionals, and functions. It also includes understanding how algorithms are used to solve problems and make decisions.

Critically evaluating the outputs of algorithms: This includes being able to identify potential biases and errors in algorithms. It also includes being able to assess the reliability and validity of the outputs of algorithms.

Using algorithms responsibly: This includes being aware of the potential risks and benefits of using algorithms. It also includes being able to use algorithms in a way that is ethical and fair.

Creating algorithms: This includes being able to design and implement algorithms. It also includes being able to evaluate the effectiveness of algorithms. Hill argues that algorithmic literacy can be taught through a variety of methods, such as formal education, informal learning, and professional development. He also argues that there is a need for more research on how to best teach algorithmic literacy.

During the research he also came across two main definitions of "algorithm literacy" from Shin, Rasul and Fotiadis (2021), who define it as "a set of capabilities used to organize and apply algorithmic curation, control and active practices relevant when managing one's AI environment," and the second one is from Dogruel et al (2021), who say that algorithmically literate individuals "are able to apply strategies that allow them to modify predefined settings in algorithmically curated environments, such as in their social media newsfeeds or search engines, to change algorithms' outputs, compare the results of different algorithmic decisions, and protect their privacy".

These definitions, he is saying, are complementary and focus on the digital media environment. „They rely on individuals being aware of algorithms, understanding how they work, and being able to critically evaluate algorithmic decision-making. This also means having the skills to cope with, and potentially influence, what algorithms show them. This might include both explicit and implicit actions to curate algorithms, such as the manual personalization of the tools a platform offers, or adjustment of browsing behaviour. Conceptually, there is nothing to prevent algorithm education being integrated as an essential part of digital media literacy, rather than seen as a separate literacy," (The Media & Learning Association (MLA).

Hill urged that three things should be done.

„Firstly, evidence has shown that pre-service teachers often express low levels of confidence in their understanding of social media as a tool to engage in debate, as well as knowledge of the role of algorithms and data. Systematic attention to the content of teacher training is required.

Secondly, research still lacks valid skills scales to design and evaluate robust algorithm education interventions. By now, many media literacy resources and competency frameworks refer to algorithms, and some are specific to algorithm education. Defining valid ways of measuring algorithmic awareness, understanding and capabilities can enhance impact.

Thirdly, one of the unique challenges with teaching algorithm education is the opacity of algorithms themselves. Regulations targeting greater algorithmic transparency are part of ongoing work by policymakers in many OECD countries but must be stepped up. By increasing transparency of algorithms in digital media, children and youth can be truly empowered to critically analyse them".

Naturally, he said, all of the above requires enhancing collaboration between media literacy stakeholders, teachers, librarians, policymakers, researchers and others, to ensure algorithm education is meaningfully integrated into practice. We interpret and interact with algorithms in different ways, based upon our individual awareness of algorithms, our personal technical expertise, whether we have access to the algorithm's code and the complexity of an algorithm's underlying code. Algorithmic culture has become a larger part of our everyday lives and it influences the choices and decisions that we make on an everyday basis (Lloyd, 2019).

For those with a deeper understanding of algorithmic interactions, two definitions emerge. The first definition is given by the individuals who create algorithms. For mathematicians, programmers, engineers and alike, algorithms are viewed as a computer function that provides a desired output based on a series of inputs (Lloyd, 2019).

Algorithms are viewed less positively by media theorists, sociologists and others who study algorithms from an outsider's perspective who believe that algorithms contain inherent cultural biases and that they lack accountability and transparency for the decisions they make whose impact can range from mundane to life-changing (Lloyd, 2019; O'Neil, 2016).

AI algorithms are extraordinarily difficult for external researchers to understand and analyse for several reasons. Algorithms falling under the umbrella of AI have been described as a "black box" because, in most cases, the source code for the algorithm is proprietary and not available to the public (Burrell, 2016; Lloyd, 2019). Burrell (2016) breaks down the opaque nature of algorithms into three distinct categories: intentional opacity, opacity due to technical illiteracy, and opacity due to scale. The prevalence of algorithms demands that we develop awareness, understanding, and opinions about them.

Many college students recognize the role algorithms play in choosing content and targeted ads, however, they are less aware of the use of algorithms in other areas of their lives and the way that data collection affects them; most importantly, they feel helpless to make change (Head et al., 2020).

We also need to teach that algorithms are not neutral. Like other technologies, they are made and used by humans.

They "reflect and promulgate certain ideologies and have impacts and influences in the full range of human society. Cautions about algorithmic decision-making have identified the far-reaching implications for bias, fairness, privacy, and democratic processes" (Ridley & Pawlick-Potts, 2021, p. 2). In some domains, algorithms have the potential to unfairly disrupt lives, sway public opinion, and build divisions between members of society. Although we often "scarcely notice or question these data-based operations, yet they are not neutral, they shape particular social realities for us and should be debated" (Lomberg & Kapsch, 2019, p. 2).

Algorithmic literacy has several dimensions.

The two most important are awareness (knowing that an algorithm is in use, what algorithms are used for, and in what contexts they are used) and knowledge (understanding how they work, their capabilities and goals, and their implications for users) (Dogruel et al., 2021; Hargittai et al., 2020). Other aspects that should also be investigated include attitudes about algorithms and evaluation of their effects including ethics and social and political implications, as well as actions taken in response to the other dimensions.

ALGORITHMS AND HUMAN RIGHTS

What information is most often available on our Facebook newsfeed? What determines a person's risk profile, or what profile gives us the best chance of getting health insurance or employment? Or to be judged as potential criminals or terrorists?

These questions are raised by the Council of Europe Study, entitled "Algorithms and human rights - a study on the human rights dimensions of automatic data processing techniques and possible regulatory implications," published in 2018.

In the pursuit of safeguarding human rights and dignity in the face of rapid technological change, the experts who worked on this study identified a number of human rights issues driven by the growing role of algorithms in decision-making.

"Automatic data processing techniques, such as algorithms, enable Internet users to search for and access information, but they are also increasingly used in decision-making processes that were previously entirely within human competence. Algorithms can be used in preparation for human decisions or make them automatically. In fact, the lines between human and automated decision-making are often blurred," the study's introduction explains.

The authors of the study demonstrate with examples how the use of automatic data processing techniques can threaten the right to a fair trial with the presumption of innocence, the right to privacy, freedom of expression and freedom of association, the right to enjoy all human rights and fundamental freedoms without discrimination, labour rights, the right to free elections, and even governance itself. The study also seeks to identify regulatory options that Member States can consider to reduce harmful effects or promote good practices and suggests measures in the areas of research, due diligence, accountability, transparency, and awareness.

And precisely, one of the conclusions of the study is that it is necessary to raise public awareness and encourage public discourse on these topics. It is necessary, say the authors, to use all available means to inform the general public so that users can critically understand the logic and functioning of the algorithms and react to them.

"This could include, but should not be limited to, media and information literacy campaigns," the study concluded, adding that institutions using algorithmic processes should also be encouraged to provide easily accessible explanations of the procedures the algorithms follow.

Here are a few most important directions from the publication "Algorithms and human rights, Study on the human rights dimensions of automated data processing techniques and possible regulatory implications," related to critical understanding of the algorithms:

"Algorithms are increasingly used in decision-making processes, that were previously entirely in the remit of human beings". This means that algorithms are now making decisions that have a significant impact on our lives, such as whether we are granted a loan, whether we are hired for a job, or whether we are accepted into a school. It is important to have a critical understanding of how these algorithms work so that we can ensure that they are not discriminating against us or violating our human rights.

"The opacity of algorithms is a major obstacle to their critical understanding". This means that it is often difficult to understand how algorithms work, even for experts. This can make it difficult to identify potential biases or discrimination in algorithms and to challenge decisions that are made by algorithms.

There is a need for greater transparency and accountability in the use of algorithms". This means that we need to be able to access information about how algorithms work so that we can understand their impact on our lives. We also need to be able to hold those who use algorithms accountable for their decisions.

Algorithms can be used to manipulate our behavior. For example, an algorithm used to recommend products on a website might show us products that are more likely to appeal to us, even if we don't really need them. This can lead to us making impulse purchases that we later regret. It is important to be aware of the potential risks of algorithms and to demand greater transparency and accountability in their use. We need to ensure that algorithms are not used to discriminate against us or violate our human rights.

Algorithms very often can be used to invade our privacy. For example, an algorithm used to target advertising might collect data about our browsing history and use it to show us ads that are relevant to our interests. This can be a privacy concern, especially if the data is collected without our knowledge or consent.

Another European Commission Study on media literacy and online empowerment issues raised by algorithm-driven media services, (Luxembourg, Publications Office of the European Union), also pays serious attention to the impact of algorithms on the spread of misinformation online.

This Report illustrates this finding with an example from 2018, a period when a YouTube video was published in which several women with headscarves can be seen, who look as if they are drowning in the sea, and all of this was filmed by a television crew. The narrator of the video, in Czech language, suggests that it is a staged scene of "migrants drowning at sea," and rhetorically asks the question: Is this a hoax?

The video was shared on dozens of Czech websites, on Facebook and Twitter, claiming that the migrant crisis is a hoax and that the journalists who cover it are, in fact, engaged in propaganda. The story spread across Europe and had 1.2 million views on various social media platforms. But fact-checkers from the AFP news agency debunked the story and proved that the footage was actually a scene for a documentary about the events in Turkey in 1922.

Algorithm: a computable function that can be implemented on computer systems. Machine learn-ing algorithms can also update their behaviour in response to experience (input data) and perfor-mance metrics (Osoba and Welser IV, 2017).

Echo chambers: the result of selecting a set of friends and information that adhere to one's sys-tem of beliefs thereby forming polarised groups (Del Vicario et al., 2016).

Filter bubble: the results of algorithms that create "a unique universe of information for each of us which fundamentally alters the way we encounter ideas and information" (Pariser, 2011)

Algorithms have brought numerous benefits to consumers, media companies, and advertisers. Traditionally, news and media consumers would be dependent on the generic content selected by media companies (newspapers or TV broadcasting) or they would have to specify precise and unambiguous queries in a media database. Algorithms automate personalisation and enable the targeting of media content. Search algorithms, for instance, such as those used by Google, customise the information based on the recipient's needs, desires, and contacts in online social networks (Bozdag, 2013). Algorithms used for content filters, such as those used to produce Twitter or Facebook timelines, prioritize information based on the history of the user's interaction with similar content by having liked, shared, subscribed, and commented on it (Bozdag, 2013).

The study highlights that amid the concerns about the proliferation of disinformation in the aftermath of the Brexit referendum campaign or the migrant crisis, many have highlighted the negative side effects of algorithms in the consumption and distribution of online news and media. „In the UK, for example, the Digital, Culture, Media and Sport (DCMS) Committee that has investigated disinformation and fake news following the Cambridge Analytica data scandal expressed concern over the "relentless targeting of hyper-partisan views, which play to the fears and prejudices of people, in order to influence their voting plans" (British Broadcasting Corporation, 2018). Much of this attention has focused on the creation of 'filter bubbles' or 'echo chambers', in which, fuelled by strong network effects and human confirmation bias, people may be exposed to an overrepresentation of news or opinionated content aligned with their existing views".

When reviewing the available literature and practices in that context, three approaches have been identified: 1) approaches that aim to increase the transparency of algorithms and awareness of them; 2) approaches aimed at verifying information; and 3) approaches that aim to develop a broader media literacy of individuals in order to effectively interpret media content and information provided to them by using algorithms.

One approach focuses on increasing the transparency of the use and functioning of algorithms in order to increase users' awareness of how information is presented to them on platforms. Despite the fact that algorithmically driven content curation has increasingly become a common feature in search engines and on social media platforms (DeVito et al., 2017), research on this topic to date is rather limited (Hamilton et al., 2014) and was primarily conducted in the US context. It is also possible that recent high-profile debates about algorithm-driven media (such as those relating to the role of social media in the US 2016 election) have increased public awareness since early research has been conducted. The

research that has been conducted to date has presented mixed results. Eslami et al. (2015) performed a qualitative laboratory study of 40 representative (US) Facebook users and find that "more than half of the participants (62.5 percent) were not aware of the News Feed curation". Similarly, a survey of 147 college students conducted by Powers (2017) finds that most did not know whether and how Google and Facebook track user data and apply editorial judgments to deliver personalised results. Further, a survey of 208 Facebook users conducted by Rader and Gray (2015) found that respondents overwhelmingly (75 per cent) believed they did not see everything in their News Feed, implying that the respondents did believe some form of curating was happening.

Reducing the vulnerability of those who use social networks as sources of news and information (and who are potential targets of disinformation campaigns) is a necessary part of the solution to the problems associated with algorithm-based media services, the study points out. This can be done by improving the skills needed by users to critically understand the information they encounter and interact on the Internet, consistent with the traditional understanding of media literacy applied to the Internet environment.

One challenge in this regard also indicated in the conclusions of the study, is that activities aimed at fostering media literacy skills are based on the assumption that users will know when to use these skills. The problem is that users themselves are often unaware of their own cognitive biases, so this is an area where the behavioural sciences need to get involved.

Process	Problems and harms	Sources
Manipulation of the media	Disinformation, growing distrust in the media and further radicalisation	Marwick and Lewis (2017)
Invasive data use	Intrusion privacy violation, decisional interference	Solove (2006)
Attention economy	Distraction, loss of productivity	Marotta and Acquisti (2017)
Computational gatekeepers of media	Lack of visibility, information asymmetry and hidden influence	Tufekci (2015)
AI use in social decisions	Sample size disparity, hacked reward functions, cultural differences, confounding covariates	Osoba and Welser IV (2017)

Typology of concerns and harms around algorithmic decisions for media provision (Study on media literacy and online empowerment issues raised by algorithm-driven media services SMART 2017/0081)

This study teaches us that the "research methods employed so far have also mostly been small scale, e.g. in the form of experiments (Eslami et al., 2016) and target group surveys (Powers, 2017). Making robust inferences about algorithm awareness is therefore difficult, especially since this awareness might differ per user group. Furthermore, current research has overwhelmingly taken place in the US context, and awareness in the EU context might be different. Also, studies on algorithm awareness have mostly focused on Facebook, rather than examining algorithms on other platforms, such as Google. One challenge for future research is the

fact that often neither the user nor the researcher has access to the actual code in order to review and test the effects of different inputs (Hamilton et al., 2014). In light of this lack of clear understanding on the part of the public, there have been a number of calls to increase the transparency of platforms as part of an effort to increase the ability for users to understand the way that information has been filtered and presented to them. The European Commission has indicated that "greater transparency is also needed for users to understand how the information presented to them is filtered, shaped or personalised, especially when this information forms the basis of purchasing decisions or influences their participation in civic or democratic life" (European Commission, 2015).

This point has also been made by stakeholders working in the field (Hildebrandt and Gutwirth, 2008; Hildebrandt, 2012). On the one hand, calls have been made to increase the transparency of algorithms by publishing the code underlying the algorithm. While this is unlikely to be useful to a large part of the user base who lack the technical skills, this may enable greater transparency by allowing independent experts to study and unpack the operations of the algorithms and communicate this to a non-technical audience of users and stakeholders.

On the other hand, "transparency" does not necessarily mean that users are aware of the technical operation of algorithms, but rather cultivating an "informed skepticism" and understanding that algorithmic processes may be determining the outcomes they experience in their daily life (in this case, the media to which they are exposed) (Osoba and Welser, 2017)".

Dimension	Description
Awareness	Users are aware that algorithms are used in a way or another in the provision of media services and that there might be implications for the content they see, even if these are not clear to the user
Understanding	User understands that algorithms are used in the provision of media services and has (basic) understanding of how this shapes the content they see. This would allow for the user to make informed decisions about whether passively using the services in question and at what risk (e.g. navigating with caution, keeping the risk in mind even if not able to detect what is disinformation and what is not)
Knowledge	Users have a sufficient level of understanding/mastery of how algorithms work to act on algorithms by actively adapting their behaviour (inputs) to change the outcome (e.g. actively selecting content to increase their exposure to diverse media sources)
Action	Users are able to actively design, engage with or use algorithms for their own purposes when navigating the media landscape

Example dimensions of algorithmic literacy, Source: RAND Europe.

All this points to the need to constantly update the definitions of media literacy in order for users to build their skills for treating media content in the most appropriate way. The study also says that a more holistic understanding of the media environment is necessary.

Media literacy has been posited as a way to help users become more sophisticated (news) "consumers" when encountering false or misleading information (Anderson and Rainie, 2017; Allcott and Gentzkow, 2017). Hobbs has identified this as the "need to move beyond tool-oriented focus, which conflates having access to media and technology with the skilful use of it" (Hobbs, 2010).

No standard definition of media literacy is in use across the sector, and those proposed in the literature will often differ, involving elements such as information literacy (for example, finding and sourcing information online and library skills) and critical media (social justice) perspectives (Huguet et al., 2019).

To illustrate this, there are some definitions below.

According to Bulger and Davison (2018), media literacy is traditionally "conceived as a process or set of skills based on critical thinking" and is commonly operationalised as a set of skills that enhances and enforces critical engagement with messages produced by the media and other senders of information. The EU Media Literacy Expert Group (MLEG) defines media literacy as including "all technical, cognitive, social, civic and creative capacities that allow a citizen to access, have a critical understanding of the media and interact with it" (European Audio-visual Observatory, 2016). Frau-Meigs (2017), in accordance with UNESCO (2007), uses a composite definition of media literacy as "Media and Information Literacy" (MIL), which sees media literacy as being grounded in the multidisciplinary fields of education, information, and communication sciences. In the same vein, a recent report published by the European Audiovisual Observatory identified five main categories of media literacy skills (European Audiovisual Observatory, 2016: 41):

- creativity: such as creating, building, and generating media content;
- critical thinking: such as understanding how the media industry works and how media messages are constructed; questioning the motivations of content producers in order to make informed choices about content selection and use; recognising different types of media content and evaluating content for truthfulness, reliability, and value for money; recognising and managing online security and safety risks;
- intercultural dialogue: such as challenging radicalisation and hate speech;
- media use: such as the ability to search, find and navigate, and use media content and services;
- participation and interaction: interaction, engagement, and participation in the economic, social, creative, and cultural aspects of society through the media and promoting democratic participation and fundamental rights

The study shows us the results of the consultation in the following areas: challenges stemming from the use of algorithm-driven media services, issues associated with the use of these services, and possible responses to address the identified challenges.

Related to challenges stemming from the use of algorithm-driven media respondents were asked whether they agreed that the use of algorithm-driven media may lead to a series of negative consequences. These consequences were selected on the basis of a literature review conducted by the research team earlier in the project.

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree	N
Limited exposure of users to alternative or competing views	23	20	4	2	0	49
Ideological polarisation	21	24	3	0	0	48
Reinforcement of people's existing biases with which they interpret or process information	22	24	2	0	0	48
Mistrust of the media and institutions	11	18	14	5	0	48
Weakening of the traditional media model (and/or associated functions such as fact-checking)	12	22	8	5	1	48
Suppression of a large diversity of voices or opinions	11	14	13	9	1	48
Pressure on people to engage with and share content that 'performs' well irrespective of quality/veracity (such as inaccurate news stories or clickbait)	16	15	11	4	1	47
Easy dissemination of disinformation	21	22	5	1	0	49
Increased acceptance of disinformation	13	18	13	5	0	49

The results show that the majority of respondents agreed that each of the proposed consequences may result from the use of algorithm-driven media. In particular, the vast majority of respondents agreed that the use of these media can give rise to the following: 1) reinforcement of people's existing biases with which they interpret or process information; 2) ideological polarization; 3) easy dissemination of disinformation; and 4) Increased acceptance of disinformation.

The report says that the respondents also offered additional examples of the consequences of the use of algorithm-driven media. These included 1) increased difficulty for small-scale community groups to be visible and share their ideas, 2) increased inequalities as "hard-to-reach" audiences may not get the same opportunities or information, 3) decreasing cultural diversity in audio-visual consumption and less chance of "stumbling upon" something on the Internet, 4) undermining of local content, and 5) intrusions of people's privacy.

THE POWER AND BIAS OF ALGORITHMS (ALGORITHMIC IMPACT ASSESSMENT)

It is becoming clear that algorithms are playing an ever-increasing role in the way that we understand and interact with our world.

Every one of us can testify the situation when we have been communicating with a friend about a very specific topic and shortly afterward we have found ourselves inundated with related ads on Facebook, Gmail, and YouTube. Algorithms are everywhere. We use an algorithm when we are finding the fastest path to work. Smart speakers, email accounts, and chat programs are listening in on our conversations so they can advertise to us. Netflix and YouTube aim to maximize our viewing time and have little concern about whether or not we like the content.

Due to insufficient research, but also due to insufficient interest, we are taught to think that algorithms are complex and beyond our control. Changing this reality will mean the synchronization and partnership of many serious social actors, because it becomes essential to understand the processes of designing algorithms, and how we are affected by them.

The era of artificial intelligence and algorithm demands it from us. And this is a confirmation that the field of media literacy will have to be constantly expanded, in order for the young people, as well as all other target groups, to be ready for the present moment, but also for the future.

That will mean looking for answers to questions like: How do we assess the impact of algorithms? How can we stop their unethical use? How will algorithms change the world, that is, will justice, fairness, objectivity, truth - be values that will dominate the pedestal?

Understandably, ethical concerns will increasingly arise from how AI programming affects the individual to how the individual can affect the AI. A more pronounced use of artificial intelligence will bring situations that will mean controlling or manipulating both technological and non-technological spaces.

It is becoming more and more certain that information can be manipulated so that the user can happen to see no ideas other than those dictated by the coder. To eliminate bias in algorithms, all stakeholders from developers to elected officials need to work together to identify, mitigate and fix the impacts on our lives.

A WIRED article points out the increasingly common flaws and biased nature of algorithms, citing several examples. The opacity within AI algorithms can mask biases and make it difficult or impossible to establish accountability (O'Neil, 2016). This creates many moral and ethical ramifications.

The researches point out examples as: A Michigan man wrongly accused of fraud had to file for bankruptcy; automated screening tools disproportionately harm people of colour who want to buy a home or rent an apartment; Black Facebook users were subjected to more abuse than white users. Other automated systems have improperly rated teachers, graded students, and flagged people with dark skin more often for cheating on tests.

But the defiance towards this spontaneity or nature of algorithms does not rest. The text by author Khari Johnson states that efforts are now being made to better understand how AI works and to hold users accountable. For example, New York's City Council adopted a law requiring audits of algorithms used by employers in hiring or promotion. The law, the first of its kind in the nation, requires employers to bring in outsiders to assess whether an algorithm exhibits bias based on sex, race, or ethnicity. Employers also must tell job applicants who live in New York when artificial intelligence plays a role in deciding who gets hired or promoted.

In Washington, DC, members of Congress are drafting a bill that would require businesses to evaluate automated decision-making systems used in areas such as health care, housing, employment, or education, and report the findings to the Federal Trade Commission; three of the FTC's five members support stronger regulation of algorithms. An AI Bill of Rights proposed last month by the White House calls for disclosing when AI makes decisions that impact a person's civil rights, and it says AI systems should be "carefully audited" for accuracy and bias, among other things.

Elsewhere, European Union lawmakers are considering legislation requiring the inspection of AI deemed high-risk and creating a public registry of high-risk systems. Countries including China, Canada, Germany, and the UK have also taken steps to regulate AI in recent years.

Julia Stoyanovich, an associate professor at New York University who served on the New York City Automated Decision Systems Task Force, says she and students recently examined a hiring tool and found it assigned people different personality scores based on the software program with which they created their résumé. Other studies have found that hiring algorithms favour applicants based on where they went to school, their accent, whether they wear glasses, or whether there's a bookshelf in the background.

Some proponents of greater scrutiny favour mandatory audits of algorithms similar to the audits of companies' financials, says Stoyanovich. „Others prefer "impact assessments" akin to environmental impact reports. Both groups agree that the field desperately needs standards for how such reviews should be conducted and what they should include. Without standards, businesses could engage in "ethics washing" by arranging for favourable audits. Proponents say the reviews won't solve all problems associated with algorithms, but they would help hold the makers and users of AI legally accountable".

A forthcoming report by the Algorithmic Justice League (AJL), a private non-profit, recommends requiring disclosure when an AI model is used and creating a public repository of incidents where AI caused harm. The repository could help auditors spot potential problems with algorithms, and help regulators investigate or fine repeat offenders.

The Wired text points out that UCLA law professor Andrew Selbst was one of the first to suggest impact assessments for algorithms.

In a paper forthcoming in the Harvard Journal of Law & Technology, Selbst champions documentation because we do not yet fully understand how AI harms people. Research into algorithmic harm is only a few years old, and very little is known about AI's impact on different groups.

"We need to know how the many subjective decisions that go into building a model lead to the observed results, and why those decisions were thought justified at the time, just to have a chance at disentangling everything when something goes wrong," the paper reads. "Algorithmic impact assessments cannot solve all algorithmic harms, but they can put the field and regulators in better positions to avoid the harms in the first place and to act on them once we know more."

Khari Johnson is saying that „throughout the past year, people with experience documenting how AI can cause harm have highlighted the steps they feel are necessary for audits and impact assessments to succeed and how they can fail. Some draw lessons from initial efforts to regulate AI around the world and past efforts to protect people or the environment from dangerous technology".

According to Greenlining Institute Report (2021), "Algorithmic bias occurs when an algorithmic decision creates unfair outcomes that unjustifiably and arbitrarily privilege certain groups over others." Based on the big data, AI could predict our life expectancy based on our zip codes and economical status. The report outlined how algorithms are used to decide who gets "access to affordable credit, jobs, education, government resources, health care and investment" (Greenlining Institute Report, 2021).

„Schools use algorithms to grade student's essays or to check for plagiarism. Colleges use algorithms to identify at-risk students or to determine the likelihood of a student accepting an admission offer. The Problem Algorithms that predict student achievement can punish students at low-performing schools and reinforce educational disparities.

Grading Algorithms in the UK Gives Lower Grades to Lower-Income Students (дали ова е наслов?) In 2020, the COVID-19 pandemic forced schools in England to cancel final exams nationwide, making it difficult to give out final grades and determine college placements. As a result, England's Office of Qualifications and Examinations Regulation (Ofqual) turned to an algorithm to calculate student grades. To calculate grades, the algorithm relied on teachers' prediction of that student's final grades, their academic performance and, critically, a school's historical performance data.

The algorithm lowered 40% of teacher-provided grades in calculating the final results. An analysis of the algorithm found that the algorithm was more likely to give lower grades for lower-income students and those who did not attend smaller private schools. After a large public outcry, Ofqual scrapped the algorithmic grades and students received their teacher-assigned grades.

The Ofqual algorithm is another example of a mismatch between the outcome an algorithm is supposed to predict and what it actually predicts. Ofqual's algorithm did not really determine a student's actual achievement throughout the year but rather predicted how well students in a particular school "should" do. The algorithm's focus on historical school performance as a predictor meant high-achieving students in poorly performing schools were more likely to have their grades lowered. Ofqual's grading algorithm also raises questions about the ethics of assigning grades to students based on their school quality rather than more personal measures of achievement. In addition, the algorithm gave greater weight to teacher grades in schools with small class sizes, giving students at private schools an unfair leg up".

The Conclusion of this Report is that Algorithms and automated decisions are powerful, pervasive, and often unfair, inaccurate, and discriminatory. Even tech giants like Facebook, Microsoft, and Google have joined privacy and consumer advocates to ask state legislatures to establish new rules and regulations for algorithms and AI.

This push for legislative action presents an opportunity to not only develop policies that minimize unfair algorithmic discrimination, but also to create a system where decision-makers optimize algorithms for equity and inclusion, design them in ways that drive investments to the most vulnerable communities, and use them to build a better and more equal society.

THE IMPORTANCE OF PREPARING YOUTH WITH TOOLS FOR CRITICAL ANALYSIS OF ALGORITHMS AND NAVIGATION

"The increasing use of algorithms in decision-making raises a number of ethical concerns, including concerns about the quality and fairness of the data used, the transparency of the algorithms, the accountability for their actions, and the potential for bias and discrimination" (p. 1, "The Ethics of Algorithms: Mapping the Debate").

The perception we have of the world never stops being influenced by media discourse, broadcasted ideas, and published thoughts in a constant social, political, or economic construction of reality.

There is a consensus in the literature that the purpose of education, specifically media literacy education is to provide people with the habits of inquiry and skills of expression they need to be critical thinkers, effective communicators, and active citizens in the world.

But traditional media and information literacy is becoming inadequate, and the algorithmic literacy is necessary to effectively navigate and participate in the complex information environment.

Algorithms create a media environment that calls for different or at least additional media literacy skills, what Nichols and LeBlanc calls "non-local, non-representational, and non-human relations" understanding (2021, p. 395). Literacy practices must address the entire media environment, which includes the algorithm itself, the technology/platform, user behaviour, and the sociocultural influences and effects.

"Digital literacy involves understanding the social and cultural contexts of digital media, and the ways in which these media are used to construct and represent identities, relationships, and values. Digital literacy also involves understanding the ethical implications of digital media use, and the potential for these media to be used to harm or exploit others" (p. 2, Buckingham David).

Sayifa Noble (2018), author of Algorithms of Oppression, found that algorithms perpetuate and reflect the bias of their programmers. There is a cyclical relationship between the user and the algorithm, in that they influence and feed each other. As a code-based program, however, "control is held by those who build and deploy algorithms, not those who use them" or are affected by them (Ridley & Pawlick-Potts, 2021). Case

in point, as a human construct, algorithms cannot predict all outcomes, thereby resulting in unanticipated consequences that can and do have disastrous results, particularly when used as predictive analytics (Nichols & LeBlanc, 2021).

Therefore, the need for critical media literacy becomes a priority. Educators, on the other hand, will need to expand their knowledge to prepare young people to take bolder and more active actions to eradicate social injustice that algorithms can reflect or worsen when it already exists in the actions of some actors in the communities themselves.

Media literacy education should not just be about teaching people how to critically analyse media, but also about teaching people how to use media effectively and ethically, (Renee Hobbs and Amy Jensen, (p. 3).

Advancing algorithmic literacy among young people will mean creating solid ground for responsible digital citizenship. Thus, a new type of literacy needs to be added to media and digital literacies – algorithmic literacy. Information literacy education must be adopted across the curriculum because improved information literacy will strengthen student's engagement with technology academically and socially. To retain this knowledge, student learning must be scaffolded and iterative.

To practice literacy in the 21st century is to be able to understand the interconnected nature between text, technology, social structures, economic, and political influences, and the role of digital communication in our online (and offline) lives. Digital literacy requires people to be able to consume and create, but also requires people to be critical of what they are consuming... the next phase in technological literacy is to incorporate the role of algorithms and algorithmically-run platforms, (Koenig, 2020, p. 2).

Awareness of algorithmic decision-making is fundamental to contemporary information literacies, which is understood as critical engagements with information. Yet...there is a need to go beyond awareness in order to connect individual responsibilities, collective responsibilities and corporate interests and to facilitate an understanding of information as co-constituted with the socio-material conditions that enable it, (Haider & Sundin, 2021, p. 140).

Algorithms like those used by Google and Netflix are designed to take in our queries and observe our actions, using this data to answer our questions, anticipate our needs, and recommend items or media we might enjoy. Because search engines are the "public face" of algorithms, we tend to think of them as tools and evaluate them primarily based on their usefulness. A good algorithm returns the information we want or expect, while a bad one does not. This perception, however, sidesteps the rhetorical dimension of algorithms. In spite of their neutral appearance, algorithms "take their forms from the builders and makers as well as the social systems out of which those people produce their algorithms. Algorithms are machinations of human beings' intentions and the equations designed to achieve those intentions, (Gallagher, 2020, p. 2). As a result of this human connection, even the best intentioned "builders and makers" produce algorithms that reflect values and beliefs, including racial, economic, sexual, etc. biases. With respect to search engines, such biases often take the form of search results that promote misinformation, exploit women and marginalized groups, or perpetuate stereotypes, as a result of foregrounding the most profitable content.

When we teach students about information literacy we must also prepare them to consider how algorithms function as rhetorical actors. Haider and Sundin (2021) explain "[i]nformation literacy today inherently implies the creation of meaning from information shaped in relation to and by algorithmic systems that employ different forms of predictive analytics" (p. 131), suggesting that central to any discussion of information literacy is also attention to algorithmic awareness and the ways that algorithmics are also rhetorical. As "our world (online and off!) is increasingly mediated, filtered, personalized, and predicted by algorithms" it is necessary to teach students how to "appraise, interrogate, and analyse the roles algorithms play in structuring our information seeking and use" (Gardner, 2019). Moreover, "if we define information literacy as the ability to critically and reflectively locate, evaluate, and incorporate information–something we ask students to do in nearly every writing class–then the role of algorithms in that process must not be overlooked" (Bakke, 2020, p. 2). We know that engagement with technological information is shaped by past usage and response to this usage, therefore it is important for students to develop not simply information literacy skills, but also algorithmic literacy skills–or awareness. Much of this awareness lies in metacognition, self-reflection, and meaning-making: acts that enable students to make sense of their own lived experiences with technology. Moreover, these are skills that students need in order to succeed academically, professionally, and socially.

The prevalence of artificial intelligence, biased algorithms, surveillance capitalism (Zuboff, 2019), and disinformation amplify the need for students to develop critical skills regarding how digital media influences their lives. Low algorithmic awareness makes one more susceptible to data-driven manipulation, more likely to spread misinformation and more accepting of stereotypes (Mohamed, 2020; Pariser, 2019).

This article has intention to boost educators to respond to this information literacy deficit. Having youths critically engage with the seen and unseen impacts of algorithmic bias, discrimination, and harm must be centralized and validated across multiple learning spaces if we are to prepare students to be ethical users of technology. Ultimately, future pedagogical research in information literacy must expand beyond the walls of the general education curriculum, and infiltrate all levels of life and, like the boundlessness of the internet has infiltrated all aspects of our daily lives. Young people are already cognizant of the ways technology can be helpful, but there is also a need to educate them on the ways that technology, particularly algorithms, are harmful, discriminatory and biased.

CONCLUSION: NEED FOR NEW DIGITAL AND CRITICAL MEDIA LITERACY

Better teacher training has been found to improve the benefits that students receive from the use of technology reducing the digital divide (Starkley et al., 2016; Warcheauer et al., 2016). Reich (2020) recommends that educators immerse themselves in new technologies and teach students how to use new technologies, rather than continuing to teach in old ways and using technology as a tool. A similar strategy is recommended for increasing artificial intelligence literacy among students. To increase artificial intelligence literacy, Reich (2020) advocates that students learn about how AI functions and ethical considerations when working with AI rather than just learning how to use AI-based programs (Ng et al., 2021). In order to prepare students for a world filled with algorithms and AI educators will first need to understand these technologies so that they can provide effective artificial intelligence literacy instruction.

The impact of algorithms and artificial intelligence will continue to grow. They have the ability to make our lives easier, but algorithms have also been shown to reflect the worst human qualities, including callousness when making life-impacting decisions, and the pursuit of profit above all else. Educators will need to adapt to the changing climate brought on by algorithms and also teach students the algorithmic literacy skills that are necessary to understand the influence of algorithms.

The prevalence of algorithms in daily life and the expanding role of algorithms in societal decision making and governance has led to a call for teaching algorithmic literacy as a specific part of media and digital literacy.

Teachers and instructors need to develop lesson plans that inform about algorithms and engage critical thinking and discussion about their role in our lives. Nevertheless, this is a challenging topic.

The need for algorithmic literacy arises from two key and equally important perspectives: control and empowerment. Building algorithmic literacy "is needed to acknowledge both the technology's power (control) over people and power (empowerment) for people" (Ridley & Pawlick-Potts, 2021, p. 5). On one hand, this literacy can help us embrace the possibilities and promises, and on the other, to exercise control over where and when they act upon us. Importantly, current digital and information literacy does not provide algorithmic literacy (Ridley & Pawlick-Potts, 2021, p. 1). Yet this is key, write Gran et al. (2021), because "knowing more about the structural forces that shape the Web is not just an online navigational skill, but a necessary condition managing information as an informed citizen" (p. 1790). Informed citizens will recognize and be able to articulate that "what is at stake then with the rise of 'algorithm machines' is new forms of algorithmic power that are reshaping how social and economic systems work" (Kitchin, 2017, p. 16).

Teaching algorithmic literacy, like media literacy, becomes an urgent matter of preventing digital divides and halting the enculturation of bias into applications that potentially impact many lives cognitively, emotionally, and yes, even physically. Zarouali et al. (2021) speak directly to the concerns of media literacy researchers:

On the one hand, being aware of algorithmic recommendations on online platforms might encourage online users to make more critical reflections and decisions regarding the content they are being presented on these platforms. On the other, a lack of algorithmic awareness might contribute to major societal problems, such as the spread of mis- and disinformation, the proliferation of filter bubbles, an increased susceptibility to data-driven manipulation, and the reinforcement of stereotypes, inequalities and discrimination. (p. 2)

Ridley and Pawlick-Potts (2021), summarize why this particular literacy is so important in an educational context: "Algorithms are not a technology like AI or, more generally, computers. Algorithms provide a structure that frames—and constrains—how we express ourselves. They are a way of seeing and acting in the world", (p. 18).

What is needed is curricula and practices that address the sociocultural and ethical aspects of algorithms. Just with intentionally designed instruction that moves beyond traditional literacy practices, students will gain the reflectivity necessary to be active, socially aware, and social justice-minded individuals in society.

REFERENCE LIST / LITERATURE:

- Study on media literacy and online empowerment issues raised by algorithm-driven media services, Luxembourg. Publications Office of the European Union, 2019
- Algorithms and human rights, Study on the human rights dimensions of automated data processing techniques and possible regulatory implications", published by the Council of Europe in 2019. The study was commissioned by the European Commission to understand the challenges posed by algorithms and automated decision-making to human rights and to explore possible regulatory solutions
- Johnson, K. (2021, December 2). The movement to hold AI accountable gains more steam." Wired. Retrieved: https://www.wired.com/story/movement-hold-ai-accountable-gains-steam/.
- Greenlining Institute. (2021). Algorithmic Bias explained. Retrieved: https://greenlining.org/wp-content/uploads/2021/04/Greenlining-Institute-Algorithmic-Bias-Explained-Report-Feb-2021.pdf
- Koenig, A. (2020). The algorithms know me and I know them: using student journals to uncover algorithmic literacy awareness. Computers and Composition, 58, 102611
- Gallagher, J. R. (2020). The ethics of writing for algorithmic audiences. Computers and Composition, 57, 102583
- Bakke, A. (2020). Everyday googling: results of an observational study and applications for teaching algorithmic literacy. Computers and Composition, 57, 102577
- Haider, J., & Sundin, O. (2021). Information literacy as a site for anticipation: temporal tactics for infrastructural meaning-making and algorhythm awareness. Journal of Documentation
- Gardner, C. C. (2019). Teaching algorithmic bias in a credit-bearing course. International Information & Library Review, 51(4), 321-327
- O'Neil, C. (2016). Weapons of math destruction: How big data increases inequality and threatens democracy. Broadway Books
- Lloyd, A. (2019). Chasing Frankenstein's monster: Information literacy in the black box society. Journal of Documentation, 75(6), 1475–1485. https://doi.org/10.1108/JD-02-2019-0035
- Burrell, J. (2016). How the machine 'thinks': Understanding opacity in machine learning algorithms. Big Data & Society, 3(1), 205395171562251. https://doi.org/10.1177/2053951715622512
- Reich, J. (2020). Failure to disrupt: Why technology alone can't transform education. Harvard University Press.
- Kitchin, R. (2017) Thinking critically about and researching algorithms. Information, Communication & Society, 20(1), 14-29. https://doi.org/10.1080/1369118X.2016.1154087

- Ridley, M., & Pawlick-Potts, D. (2021). Algorithmic literacy and the role for libraries. Information Technology and Libraries, 40(2). https://doi.org/10.6017/ital.v40i2.12963
- Dogruel, L. (2021). What is algorithm literacy? In M. Taddicken & C. Schumann (Eds.), Algorithms and Communication (pp. 67-94). SSOAR Open Access Repository. https://www.ssoar.info/ssoar/handle/document/75898
- Lomborg, S., & Kapsch, P. H. (2020). Decoding algorithms. Media, Culture & Society, 42(5), 745-761. https://doi.org/10.1177%2F0163443719855301
- Head, A. J., Fister, B., & MacMillan, M. (2020). Information literacy in the age of algorithms: Student experiences with news and information, and the need for change. Project Information Literacy. https://projectinfolit.org/pubs/algorithm-study/pil_algorithm-study_2020-01-15.pdf
- Nichols, T. P., & LeBlanc, R. J. (2021). Media education and the limits of "literacy": Ecological orientations to performative platforms. Curriculum Inquiry, 51(4), 389-412. https://doi.org/10.1080/03626784.2020.1865104
- Ridley, M., & Pawlick-Potts, D. (2021, June). Algorithmic literacy and the role for libraries. Information Technology and Libraries, 40(2), 1-15. https://doi.org/10.6017/ital.v40i2.12963
- Noble, S. U. (2018). Algorithms of oppression: How search engines reinforce racism. New York University Press.
- Zuboff, S. (2019) The age of surveillance capitalism. Public Affairs
- Mohamed, S., Png, MT. & Isaac, W. (2020). Decolonial AI: Decolonial Theory as Sociotechnical Foresight in Artificial Intelligence. Philos. Technol. 33, 659–684. https://doi.org/10.1007/s13347-020-00405-8
- Pariser, E. (2011). The filter bubble: What the Internet is hiding from you. Viking/Penguin Press.
- Jeff Share, Tatevik Mamikonyan, Eduardo Lopez (2019): Critical Media Literacy in Teacher Education, Theory, and Practice
- Buckingham, D. Defining digital literacy: What do young people need to know about digital media, (2015)
- Renee Hobbs and Amy Jensen, The Past, Present, and Future of Media Literacy Education, (2009)
- Mittelstadt, B. D., Allo, P., Taddeo, M., Wachter, S., & Floridi, L. (2016). The ethics of algorithms: Mapping the debate. Big Data & Society
- Web sites: media-and-learning.eu, ic4ml.org, wired.com

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FOSTERING MEDIA LITERACY IN THE AGE OF AI: EXAMINING THE IMPACT ON DIGITAL CITIZENSHIP AND ETHICAL DECISION-MAKING

Aleksandra Hristovska

ABSTRACT

In today's interconnected and technology-driven world, examining the impact of artificial intelligence and digital media on individuals' understanding and engagement with information is imperative. This research aims to explore the intersection between these mediums and investigate the role of the media literacy education in the context of AI and the digital media. By doing so, the study seeks to understand how promoting critical thinking and ethical awareness can enhance individuals' abilities to navigate the digital landscape responsibly. The research questions explore how the media literacy education contributes to the critical thinking skills and ethical decision-making among individuals interacting with AI-driven media, the potential risks and challenges associated with AI in creating and spreading disinformation, and how the media literacy interventions can mitigate these risks. The methodology for this research will be divided into three parts. The first includes a literature review to examine existing research on media literacy, AI, digital citizenship, ethical decision-making, and analysis of case studies. The second incorporates online surveys with individuals, to assess their media literacy levels, critical thinking abilities, and ethical awareness. The third part employs an experimental approach, involving the creation and dissemination of a simulated fake news article generated by AI. The goal is to observe and analyse the reaction of the individuals, and the extent of fact-checking conducted in response. Expected outcomes include identifying the impact of the media literacy education on critical thinking, ethical decision-making, and digital citizenship in the context of AI-driven media, understanding risks and challenges posed by AI in disinformation creation and spread, highlighting the relationship between the media education and the civic engagement, addressing ethical considerations and proposing AI integration guidelines for media literacy education, and offering recommendations for enhancing and sustaining media literacy initiatives amidst rapid AI advancements.

Keywords: media literacy education, artificial intelligence, AI-driven media, critical thinking, ethical decision-making.

INTRODUCTION

The rise of contemporary media environments heavily influenced by Artificial Intelligence (AI)[23] integration, has heightened the importance of the media literacy education. Due to the significance of the relationship between the Artificial Intelligence, it's essential to highlight how media literacy can act as a driving force in transforming digital citizenship in the context of AI-influenced media environments. For those reasons, this research aims to assess critical thinking skills and ethical decision-making among the individuals interacting with AI-driven media.

The rapid spread of content generated by Artificial Intelligence (AI) has guided a transformative era of information consumption and distribution. As AI algorithms tailor digital experiences to individual users, the authenticity, credibility, and ethical considerations of such AI-driven media have become increasingly important. This study examines the complex nature of the media literacy, with the objective to understand how people's interactions with AI-generated content shape their perceptions and influence their decisions when interacting in the digital world.

The way we used to consume media passively has now changed into a more active and empowering skillset that fits today's information environment. At the core of the media literacy education lies the empowerment of individuals with tools for judiciously evaluating the veracity and contextual essence of online information. This research resolutely positions media literacy as a pivotal agent, instrumental in nurturing responsible digital citizenship, combating the proliferation of disinformation, and supporting ethical decision-making in the age of AI.

The pursuit of comprehending the intricate dynamics linking media literacy, AI-driven media, critical thinking, and ethical decision-making, warrants a multifaceted and rigorous methodology. The study employs both quantitative and qualitative approaches, comprising an online survey and experiment. The notable experimental dimension entails the exposure of participants to a simulated AI-generated fake news article, examining their responses to misinformation their tendency to engage in fact-checking, and their ability to decipher AI-generated media—an encapsulation of the broader challenges posed by AI-propagated disinformation.

23 Artificial Intelligence, abbreviated as "AI", refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving.

LITERATURE REVIEW

We observe a significant interaction, in the vast digital landscape, where technological advancements have given rise to artificial intelligence (AI) and intricate media structures. This interaction signals transformative shifts in our understanding of information, engagement with content, and ethical decision-making. The literature review delves into the realms of AI, media literacy, and ethical decision-making, spotlighting their dynamic intersection and the fresh opportunities they present for contemporary digital citizenship.

Misinformation is rampant in the digital world, highlighting the critical need for digital media literacy. Pennycook and Rand (2018) put forth the concept of the 'implied truth effect'.[24] Their research suggests that adding warnings to fake news articles can increase our perceived accuracy of them. Media literacy becomes our compass on this "journey", enabling us to navigate through the fog of falsehoods and distinguish between authenticity and deception.

AI has become a modern architect of content creation, showcasing impressive capabilities that also raise ethical questions. Zellers et al. (2019) shed light on AI's dual nature. Their work reveals AI's potential to generate neural fake news while emphasizing the need for vigilance. In this challenging landscape, media literacy acts as our beacon, fostering alert minds capable of distinguishing the truth from the manipulated content.

In this changing landscape, the media literacy education is undergoing a significant transformation. We have moved from being passive consumers of media to becoming discerning critics. Hobbs and Jensen (2018) lead us through this evolution, showing the growth of media literacy. Media literacy serves as our tool in this journey, equipping us with the ability to distinguish between AI's truths and fabrications.

AI-generated content introduces creative flair but conceals ethical complexities. Dubose and Havens (2019) underscore the ethical considerations inherent in AI's capabilities. Media literacy serves as our guide, helping us understand and make ethical decisions about AI-generated content.

Critical thinking emerges as the cornerstone guiding us through AI's enchanting yet perplexing creations. Ennis (2011) invites us to embrace the essence of inquiry. In the world of AI, critical thinking helps us understand and evaluate the information we encounter.

AI can create fake information that spreads online. Allcott and Gentzkow (2017) highlight how social media plays a role in spreading false information and stress the need for action. The media literacy helps us tell what is true from what is not, allowing us to engage responsibly with online content.

As we navigate the digital world, we become citizens of a virtual community. Livingstone's (2009) provides guidance on how to be responsible digital citizens. Media literacy helps us understand our responsibilities in this virtual community, preparing us to engage in this virtual democracy and make ethical choices about AI-generated content.

24 *The 'implied truth effect'* is a phenomenon where the presence of warnings on some, but not all, false information can lead people to believe that information without warnings is true.

RESEARCH METHODOLOGY

In essence, the research problem revolves around understanding how media literacy education can empower the individuals to critically engage with AI-generated media, make ethical decisions, and contribute to responsible digital citizenship in an era where AI is increasingly shaping the media landscape.

The participants have their critical thinking abilities checked, but similarly, through questions about their ethical decision-making and digital footprint, this research discovers how people aged 15 - 35, navigate the current digital space. Through the research survey, the participants give insight into their perceptions and behaviours when encountering fake news, AI-generated media, and everything that has to do with the ethics around it.

COLLECTION OF DATA

The data was collected using an online survey, which received 174 responders. from 26 different countries, and 6 continents, Europe, North America, South America, Asia, Africa, and Australia. The ages of the participants are 15- 35. This group of individuals is relevant as they are the ones most familiar with the usage of AI models in modern usages.

The survey was divided into 3 parts:

1) Demographic Questions: Age, Country of Living, and Gender;
2) Questions about assessing Media Literacy and AI knowledge, as well as behaviours when encountering media usage, fake news, and their perceptions of AI-generated content;
3) Experiment - AI-Generated News: Participants are asked to evaluate the credibility and truthfulness of a fake news article, explaining the reasoning behind their assessment. Unaware that the news article they are reading is AI-generated, the aim is to capture their most genuine perceptions of its validity and whether they can discern its AI-generated nature. The news content was created using the application ChatGPT.[25]

25 ChatGPT is an artificial intelligence model developed by OpenAI. It's designed to generate human-like text based on the input it's given.

RESULTS

The research, in response to the significant global influence of AI, has broadened to a global scale, involving 174 individuals from a diverse array of 26 countries across six continents. Given the widespread use of AI, it is crucial to conduct this quantitative research beyond the confines of a single country to gain a broader perspective. The geographical region played a minimal role, indicating that AI is a global phenomenon and should be approached as such.

The survey comprised three separate sections: demographics, questions about AI and media literacy, and an experimental segment. In the second section, participants' responses were systematically classified into five main areas.

SECTION 1: DEMOGRAPHICS

The demographic analysis revealed some interesting statistics, which would later contribute to the type of respondents gained:

- 53.5% of participants were in the 18-24 age group.
- 27.9% were in the 15-17 age group.
- 18.6% were in the 25-35 age group.

In terms of education and occupation:

- A significant 74.3% were involved in education, ranging from high school (32.9%) to university (bachelor's at 35.7%), with a smaller segment (5.7%) pursuing advanced degrees such as a master's or a PhD.
- The remaining 25.7% consisted of individuals who were either employed (including both corporate and self-employment) or seeking employment opportunities.

Following this demographic analysis, the survey also sought to examine participants' familiarity with Artificial Intelligence (AI) and its current applications, providing intriguing insights:

When asked the question, "How familiar are you with AI (Artificial Intelligence) and its modern uses?", the responses showed clear patterns:

- A notable portion, 23.3%, stated they were "Very Familiar" with AI.
- A large majority, 72.1%, indicated they were "Somewhat Familiar" with this technology.
- A small but significant 4.7% admitted they were "Not Familiar at all" with AI.

Further analysis of this data revealed interesting variations related to age. The "Very Familiar" category was mainly composed of participants aged 18 to 24, mostly university students pursuing bachelor's or master's degrees. Interestingly, even within this age group, a small fraction (4.1%) claimed to be "Not Familiar at all" with AI, despite being undergraduate students. In contrast, the participants who were employed or job-seeking stated that they exhibited "Somewhat Familiar" levels of knowledge about AI, highlighting the varied perspectives among the global participants.

The data highlights a positive correlation between age and familiarity with AI and its modern applications. It emphasizes the substantial variation in AI familiarity among the university students, ranging from those who are highly familiar to those with minimal knowledge. This suggests that factors beyond age and educational background, such as personal interest, exposure, and motivation, influence participants' AI familiarity.

Nonetheless, the primary conclusion is that the majority of respondents (72.1%,) fall into the category of "Somewhat Familiar" with AI principles and their modern applications. According to a survey conducted by The Verge (2023), only one in three people have used AI-powered tools, indicating a need for greater awareness about companies and start-ups in this field. This collective "Somewhat Familiar" stance may be attributed to the complicated nature of ethical AI system design, a complex task due to the ambiguity surrounding ethics' definition, implementation, and enforcement.

An interesting pattern emerged from this analysis. The participants aged 18 to 24 who indicated a high degree of familiarity with modern AI applications exhibited a noteworthy trend. Approximately 90% of these individuals responded affirmatively to the importance of media literacy education in decision-making, particularly in discerning AI-generated content. They also displayed confidence in their ability to differentiate AI-generated content from human-generated content, attributing a significant part of this knowledge to media literacy education. This alignment between their knowledge, attitudes, and behaviour forms a central focus of this study.

This observation underscores the significance of prior AI knowledge in shaping individuals' perceptions and behaviours regarding media literacy education and AI-generated content recognition. It suggests that a strong foundation in understanding AI's modern applications can enhance the recognition of AI-generated content and emphasize the role of media literacy in this process.

On the contrary, the participants who self-reported a lack of familiarity with modern AI applications tended to express uncertainty in their ability to discern AI-generated content from human-generated content. This finding aligns with the expectation that a foundational understanding of AI plays a pivotal role in individuals' confidence and competence in identifying AI-generated media.

The second section of the survey focuses on participants' consumption of news and information, revealing intriguing insights into their media preferences and the platforms they rely on.

SECTION 2: AI, MEDIA LITERACY, FAKE NEWS

Group 1: Platform Preferences

The participants were asked about the platforms they primarily use to consume news and information, with the option to select multiple choices, instead of one singular choice. Notably, 86% of respondents indicated "Social Media Platforms (e.g., Twitter, Facebook, Instagram, Reddit...)" as their primary source of news, significantly surpassing other options. The next most selected choice, "News Websites (e.g., New York Times, BBC, Time.mk)," received 41.9% of the votes.

Here it is important to note that 33% of the participants (aged 15-35), relied solely on social media platforms as their primary news source. This data is very important when we take into consideration the type of information people consume on these platforms. Free speech enables social media platforms to freely distribute fake news, including media generated by AI and allows inaccurate news to be widely spread across multiple platforms. A prime example of this is the phenomenon of deepfakes [26].

A notable case is the deepfake video of former President Barack Obama, created by American actor and filmmaker Jordan Peele in 2018. In this video, Peele's voice impersonates President Obama's, while the visuals convincingly depict the President uttering statements he never actually made. This deepfake video was produced as a public service announcement to underscore the dangers of deepfakes and highlight the potential for such technology to propagate misinformation on social media platforms (Peele, 2018).

The survey data suggests that younger individuals tend to favour sources that are easily accessible and familiar, such as social media platforms. This trend aligns with recent studies indicating that young people often opt for sources that are user-friendly and widely available.

A recent study by the Reuters Institute for the Study of Journalism found that social networks have steadily supplanted news websites as a primary source for younger audiences overall, with 39% of social natives (18–24s) across 12 markets now using social media as their main source of news, compared with 34% who prefer to go direct to a news website or app (Reuters Institute for the Study of Journalism, 2022). The study also revealed that social natives are significantly more inclined to access news using 'side-door' sources such as social media, aggregator sites, and search engines than older groups (Reuters Institute for the Study of Journalism, 2022).

26 Deepfake: a video of a person in which their face or body has been digitally altered so that they appear to be someone else, typically used maliciously or to spread false information.

These studies suggest that young people are increasingly turning to social media platforms for their information because they are easy to use and accessible. Given the ubiquity of social media in daily communication, it's unsurprising that young people prefer to consume information from these familiar platforms. Rather than subscribing to paid news services or dedicating time to searching for news on a web browser, they choose the convenience and immediacy offered by social media.

Not only in the context of AI but regarding the spread of fake news, social media platforms, while fostering free expression, can inadvertently become conduits for misinformation and fake news. This issue is especially pronounced on platforms like Twitter and TikTok, where fake news has occasionally permeated mainstream news outlets (Vosoughi et al., 2018).

A study by Vosoughi, Roy, and Aral (2018) found that false news diffused significantly further, deeper, and more broadly than the truth on Twitter. The effects were more pronounced for false political news than for other categories of information. The study also revealed that false news was more novel than true news, which could explain why people were more likely to share it.

Relying on the social media for news consumption presents its own set of challenges. These platforms enable the users to post personal opinions and information, which can sometimes lead to the spread of misinformation and fake news. The key difference between the social media and the traditional news sources lies in the credibility of the source and the author. When it comes to AI-generated media, the content often lacks identifiable authors. This anonymity can inadvertently facilitate the spread of misinformation, as users are not directly held accountable for the content they disseminate. On the other hand, traditional news outlets are obligated to uphold the credibility of their content, providing a layer of accountability that is often absent in the realm of AI-generated media.

Group 2: Public Perception of AI-Generated Content

In response to the question "Do you think that AI technology can generate content, including news articles, images, and videos?", a striking 89.9% of participants firmly believe that AI is fully capable of generating content, encompassing news articles, images, and videos. Only a mere 7.9% expressed scepticism, suggesting that AI may not possess such capabilities. It is noteworthy that these skeptics were a diverse group, spanning from high school students to university students and even employed individuals.

AI-generated content is a rapidly growing field that has the potential to revolutionize the way we consume and produce news, images, and videos. This uncertainty reflects the complex and evolving nature of AI-generated content. AI's capacity to produce content, including news, challenges our ability to discern authenticity from manipulation, particularly in the context of fake news. Nevertheless, it also poses significant challenges to media literacy and trust, as AI-generated content can be easily manipulated and spread through the social media platforms (NewsGuard. 2023). According to a study by NewsGuard, nearly 50 news websites are "almost entirely written by artificial intelligence software". These sites publish hundreds of articles daily that are written by AI, using the app "ChatGPT", and accordingly, many of them contain false information, titles containing clickbait [27], and are packed with ads. (NewsGuard, 2023)

27 Clickbait refers to content, such as headlines or thumbnails, designed to attract attention and encourage clicks.

However, the more important question is whether people can distinguish AI-generated content from relevant and accurate information. This can be observed through the survey question "Can you easily identify content that has been generated by AI (Artificial Intelligence) when you encounter it in media?". The survey data reveals a considerable degree of uncertainty among respondents regarding their ability to identify AI-generated content. According to the data, 57.9% of participants indicated that they can sometimes, but not always, tell if the content is AI-generated. None of the participants claimed the ability to never discern AI-generated content, and only two individuals confessed to rarely being able to do so.

This data points to the pressing need for comprehensive media literacy education. While some participants demonstrated proficiency in identifying AI-generated content, a significant portion remains challenged by this task. This further emphasizes the importance of equipping the public with the necessary skills and knowledge to recognize the hallmarks of AI manipulation.

A subset of the respondents, 17.1%, expressed confidence in frequently identifying AI-generated content. This group unanimously agreed on the necessity of mandatory media literacy education for all students. All of the individuals from this group, when asked another question, answered that they had never been misled to share false information online. This finding further proves the point that media literacy education plays a crucial role in enhancing individuals' ability to recognize AI-generated content and prevent the inadvertent sharing of fake or misleading information online.

The question of whether AI-generated content can be trusted, or even be more accurate than human-generated content, elicited a wide range of responses. In response to the question "Do you think AI-generated media content is less trustworthy than content created by humans?", a substantial 43.1% of participants maintained a neutral stance, neither affirming nor negating the reliability of AI-generated content. This suggests a level of uncertainty regarding the trustworthiness of AI-generated content, which could point to several possibilities.

Firstly, the field of AI is rapidly evolving, and many people may not be fully aware of the capabilities and the limitations of current AI technology. This lack of understanding could lead to uncertainty regarding whether AI can reliably generate accurate and trustworthy content. Secondly, there have been instances where AI has been used to generate misleading or false information, such as deepfakes or fake news articles. These instances could lead to a general scepticism or wariness towards AI-generated content. Lastly, the nature of AI itself, being a non-human entity, might prompt some people to find it difficult to trust content generated by an entity that does not possess human qualities like judgment and ethics.

Correspondingly, a combined 42.1% of participants expressed scepticism towards AI-generated content, indicating that they believe it to be less trustworthy than human-generated content. Conversely, a minority of 13.2% held an opposing view, asserting that AI-generated content is not inherently less trustworthy than that produced by the humans.

These diverse responses underscore the complexity of public perceptions towards AI and its role in content generation. Key takeaways from the data include the critical importance of media literacy education in enabling individuals to identify AI-generated content, the challenges in consistently recognizing such content,

and the prevalent scepticism regarding the trustworthiness of the AI-generated media. The findings further emphasize the urgency of continued research and education on the evolving landscape of AI-generated content to ensure a digitally literate and discerning public.

Group 3: Media Literacy and AI

One noteworthy observation emerges from the survey responses: the connection between individuals' familiarity with the artificial intelligence (AI) and their perceived impact of media literacy education. Participants who claimed to have high knowledge of AI consistently stated that the media literacy education had a high or very high impact on their ability to identify AI-generated content. Contrariwise, the individuals who admitted to being somewhat familiar with AI indicated that the media literacy education had only a moderate impact. This correlation underscores the critical relationship between the media literacy education and the knowledge of AI.

This finding suggests that people who possess a deep understanding of AI are more likely to value their media literacy skills when evaluating AI-generated content. It highlights the importance of integrating the media literacy education with the AI education, as it can significantly enhance individuals' capacity to navigate the complex digital landscape and make informed judgments about the content they encounter.

A significant portion of the survey focused on credibility assessment, looking into the factors that matter most to the respondents when evaluating the credibility of an online news source. Notably, a staggering 80% of participants singled out the reputation of the source as the most influential factor. This insight raises questions about the intersection between credibility and AI-generated media.

One compelling question that arises is whether credible news sources risk losing their reputation and trustworthiness if they publish AI-generated content. The concern here is that the public might perceive AI-generated content as less trustworthy, and potentially impacting the credibility of the news outlet. As noted from the findings, only one-fifth believe that AI-generated media is more (or equally as) trustworthy than human-generated content.

The survey probed participants about what would motivate them to fact-check information before sharing it. A substantial 63% of respondents indicated that having better fact-checking resources would increase their motivation to fact-check news and media. The second-highest vote, 32% favouring "interactive tools," suggests a desire for more engaging and user-friendly fact-checking methods.

This finding signals the need to invest in developing and promoting high-quality fact-checking resources and interactive tools. These resources should be grounded in rigorous research, maintain transparent methodologies, and adhere to ethical standards. In addition, they should also be easily accessible, available in multiple languages and formats, and regularly updated to remain relevant in addressing emerging challenges in the media landscape.

Incorporating AI-based tools and gamified platforms into media literacy education can be a promising approach. AI can be used to automatically detect fake news and deepfakes, while gamified platforms can engage users in fun and educational activities related to media literacy and fact-checking. Such innovations can empower individuals to navigate the digital landscape effectively and make informed decisions about the content they encounter.

Group 4: Dealing with Fake News

A noteworthy 57% of participants consistently fact-check information before sharing it on social media, revealing a commendable dedication to maintaining content accuracy. Contrarily, 4.5% admitted to never fact-checking before sharing, raising concerns regarding the unchecked propagation of information. Is there a correlation between fact-checking habits and news consumption patterns? Interestingly, the data suggests that those who always fact-check are also more likely to read the full article when confronted with a compelling headline, indicating a deeper level of engagement with news content. Likewise, the opposite is true for the group of individuals who never fact-check before sharing any type of media.

The question "What factors matter the most to you when evaluating the credibility of an online news source?" unveils the criteria that participants use to assess the reliability of online news outlets. The majority, at 76.7%, prioritize the reputation of the source, highlighting the immense influence of a news outlet's standing and track record on perceived credibility. In contrast, social media sharing and follower count are given less consideration, suggesting that participants rely more on the traditional markers of credibility rather than social metrics. Despite that, this trend varies by age group: 90% of those who did consider social media sharing as a credibility factor were aged 15 to 24, suggesting generational differences in news consumption and sharing behaviours.

Many responders paired the answer "social media sharing" with factors like the reputation of the source and author. This prompts us to consider whether news shared online should be scrutinized by reputable news sources and whether AI-generated media is more readily disseminated via the social media compared to the traditional news outlets.

In terms of incentives to motivate fact-checking before sharing information, a substantial 62.4% highlight the importance of better fact-checking resources. This implies that participants believe enhancing the availability and accessibility of fact-checking tools could significantly boost their commitment to verifying information. Interactive tools also play a role, with 44% of respondents viewing them as a potential motivator. Surprisingly, incentives and social responsibility campaigns are perceived as less effective, with only 20% of participants selecting these options.

"Have you ever shared information online that you later discovered to be false or misleading?" - This question reveals the prevalence of unintentional misinformation sharing among the internet users. A significant 59.3% of the participants acknowledged having shared information online that they later discovered to be false or misleading. This highlights the prevalence of unintentional misinformation sharing among internet users, emphasizing the necessity for enhanced information verification practices.

What factors influenced their decision to share false or misleading information? According to the data, these include the initial credibility of the source and the content's attention-grabbing nature, suggesting that even individuals with the intention to share accurate information can be swayed by seemingly trustworthy sources or engaging content, leading to the inadvertent spread of misinformation.

Group 5: Media Literacy Education

The question, "Do you think media literacy education should be mandatory for all students?" was posed to address participants' perspectives on the necessity of compulsory media literacy education. The data reveals an overwhelmingly positive response, with 83.7% expressing support for mandatory media literacy education. This suggests a strong consensus among the participants regarding the importance of equipping students with the skills to navigate the complex digital media landscape.

In response to the question regarding the key ethical considerations when incorporating AI into media literacy education, participants highlighted several concerns:

- Misinformation Prevention (82.4%): A majority highlighted the role of AI tools in combating misinformation.
- User Privacy Protection (67.1%): Privacy concerns were evident, with a call for safeguards to prevent misuse of personal data.
- Unbiased Content Creation (61.2%): Participants emphasized the need for impartiality in AI-generated content.
- Transparency in AI Processes (56.5%): Participants expressed a desire for transparency in AI algorithms, meaning they want to understand and trust the mechanisms behind AI-driven media literacy tools
- Promotion of Diversity and Inclusivity (48.2%): Nearly half of the respondents emphasized the need for inclusivity in AI-driven media literacy education.

To address the ethical concerns raised by the participants regarding AI, it is suggested that the educational institutions incorporate modules on responsible AI use within their media literacy curricula. This strategy would not only enhance students' media analysis skills but also deepen their understanding of the ethical implications of AI in media.

The data strongly supports the need for mandatory media literacy education. It further illuminates several critical ethical considerations for integrating AI into media literacy education, including ensuring content impartiality, protecting user privacy, promoting diversity and inclusivity, preventing misinformation, and maintaining transparency in AI processes. These insights could serve as a valuable guide in developing ethical frameworks for effectively integrating AI into education.

SECTION 3: EXPERIMENT

The experiment was conducted with attention to the ethical considerations and potential biases. The participants, who remained anonymous, were informed at the outset of the survey that they might encounter fake news. However, this information was presented in a manner that did not influence their responses or introduce bias, thereby maintaining the integrity of the experiment.

In terms of bias, careful measures were taken to ensure that the experiment did not favour any particular outcome. The prompt given to ChatGPT was neutral and did not lean towards any specific topic or viewpoint. This helped in maintaining a balanced perspective and prevented any distortion of results based on preconceived notions or biases. The participants' responses were analysed objectively, without favouring any particular trend or pattern. This rigorous approach ensured that the findings of the experiment were reliable and free from bias.

For the generation of fake news, ChatGPT was given the following prompt: "Could you please generate a fake news article? Make the article sound believable and use a relevant topic to write the fake news on. Thank you." This approach allowed for an examination of AI's capabilities in generating believable news content while ensuring that ethical standards were upheld throughout the process.

Creation of Fake News with AI

Using the AI generative tool "ChatGPT," a fabricated news article was created, titled **"Researchers Develop Artificial Intelligence Algorithm that Predicts Heart Disease with High Accuracy."** The article presented a ground-breaking development in predicting heart disease using AI algorithms trained on extensive medical data. It claimed an impressive 92% accuracy rate in identifying individuals at risk up to five years before symptoms manifest. The generated text is as follows:

"Scientists have announced a major breakthrough in cardiovascular health with the development of an advanced AI algorithm that can predict the likelihood of heart disease with remarkable accuracy. The algorithm, trained on extensive medical data, examines a range of factors including genetic predisposition, lifestyle, and medical history. Initial tests reveal an impressive 92% accuracy rate in identifying individuals at risk of heart disease up to five years before symptoms manifest. This innovation could revolutionize early intervention strategies and significantly reduce heart disease rates in the future."

Believability and Shareability of the Fake News

Survey participants were asked about their likelihood of sharing the fabricated news article on their social media profiles or with friends. Intriguingly, a significant majority (approximately 85%) chose neutral positions (3 on a scale of 1 to 5), indicating indecision regarding sharing. Only 10.6% of participants leaned towards "very likely" or "likely" to share, while the remaining respondents leaned towards "very unlikely" or "unlikely."

A noteworthy observation is that the participants who leaned towards "very unlikely" or "unlikely" to share (choosing 1 or 2 on the scale) were the same individuals who mostly responded with "Sometimes, but not always" when asked about their ability to identify AI-generated content. In other words, these participants found it challenging to distinguish AI-generated content, and this uncertainty seemed to influence their decision not to share the news.

Assessing the Believability of the Fabricated News

The participants were asked to evaluate the believability of the fabricated news article on a scale of 1 to 5, with 1 being "Not Believable at All" and 5 being "Very Believable." The majority of responses, 55.3%, took a neutral stance with a rating of 3, indicating mixed opinions about the article's believability. Most respondents aged 18-24 gave ratings between 2 and 3. Both extremes of the scale, 1 and 5, received about 2.4% of the votes each, suggesting a broad distribution of responses as most participants' opinions ranged from 2 to 4. Ratings of 2 and 4 each garnered 20% of the responses. This suggests that while AI has become sophisticated enough to generate news-like content, discerning its credibility remains a complex task for many.

The distribution of responses across the scale further underscores this complexity. It shows that opinions on the believability of AI-generated news span a wide spectrum, from outright disbelief to high credibility. Notably, the age group of 18-24 showed a tendency towards lower believability ratings (between 2 and 3), indicating that younger individuals might be more sceptical of AI-generated content. This could be attributed to their higher digital literacy, which is evident throughout the survey, and familiarity with the capabilities and limitations of AI.

Perceptions of Believability

The most crucial aspect of the experiment was the participants' reasoning behind their conclusions about the news article's believability. Those who chose 1 (very unlikely to share) and those who leaned towards 4 and 5 (likely to share) cited different reasons for their beliefs. This aspect provides valuable insights into how people form opinions when encountering news, particularly when it comes to AI-generated content.

A recurring trend was that many participants believed the text because it was well-written and cohesive (56%). This observation underscores the AI's ability to produce content that closely resembles human-generated text, often indistinguishable from it. Some participants acknowledged that they suspected the news might be fake but were uncertain whether it was AI-generated. In response to the question asking them

to explain why they thought the article was fake, the most common answer was "There are no clear sources mentioned (80.6%)," followed by "The details in the article sound too unbelievable (30.3%)" and "The article lacks a personal touch (28.9%)."

Consideration of Fact-Checking

The participants were also asked whether they would consider fact-checking the information in the article before sharing or liking it. Strikingly, individuals who chose 1 on the sharing scale (indicating a strong reluctance to share) were the same individuals who selected options that indicated they would "definitely" or "probably" fact-check the information. This suggests that their scepticism about sharing was linked to a desire for verification, stressing their commitment to information validity.

On the contrary, individuals who chose 4 or 5 on the sharing scale (indicating a strong inclination to share) were more likely to select options that indicated they would "probably not" or "definitely not" fact-check the information. This suggests that their confidence in sharing was based on a lack of critical thinking or a confirmation bias.[28]

This experiment reveals how fact-checking considerations can influence people's decisions to share or like news articles. It shows that participants who were more sceptical of the article's veracity were more likely to seek verification, while those who were more trusting of the article's accuracy were less likely to do so. This finding has implications for how fact-checking tools and initiatives can be designed and promoted to encourage more critical consumption of news content.

28 Confirmation bias is a type of cognitive bias where people tend to seek out and interpret information in a way that confirms their existing beliefs or theories, and they may ignore or reject information that contradicts their beliefs

DISCUSSIONS

The data gathered through this survey provides valuable insights into the interplay between media literacy, artificial intelligence (AI), and the perception of AI-generated content. Several key points can be discussed based on the findings:

One significant observation is the correlation between the participants' familiarity with AI and their perception of media literacy's impact. Those with high AI knowledge believed that media literacy education had a substantial impact on identifying AI-generated content, while those somewhat familiar with AI perceived a more moderate impact. This underscores the importance of integrating media literacy education with AI education to enhance individuals' abilities to navigate the digital landscape.

The majority of participants considered the reputation of the news source as a crucial factor when evaluating the credibility of online news. This finding raises questions about how the credibility of news sources may be affected by the dissemination of AI-generated content. If credible news sources unknowingly publish AI-generated content, it could impact their trustworthiness.

Despite recognizing the importance of media literacy, a significant number of participants identified social media as their primary source of news. This suggests a potential need for more stringent fact-checking and credibility assessment on social media platforms to combat the spread of AI-generated content.

The data indicates that participants are motivated to fact-check information when provided with improved fact-checking resources and interactive tools. This presents an opportunity to invest in the development of high-quality fact-checking resources and AI-based tools to enhance media literacy.

The experiment involving a fake news article generated by AI revealed that participants had mixed opinions about its believability. The quality of the content, often closely mimicking human writing, played a significant role in participants' perceptions. The findings highlight the need for increased transparency about how AI works and the ethical considerations involved in its use. Additionally, it emphasizes the importance of media literacy education in assisting individuals to evaluate critically AI-generated content.

This experiment highlights the complexities of how individuals perceive and interact with news generated by AI. It shows that participants' abilities to identify AI-generated content can impact their willingness to share news articles. The believability of AI-generated content often hinges on the quality of the text, highlighting the AI's capacity to mimic human writing. These findings open avenues for further exploration into the evolving dynamics between AI-generated content, media literacy, and public perception.

CONCLUSIONS

This study sheds light on the complex relationship between media literacy, AI, and the public's perception of AI-generated content. Several conclusions can be drawn:

- Integrating media literacy education with AI education is crucial to empower individuals with the knowledge and skills needed to identify AI-generated content. This holistic approach can better prepare individuals to navigate the digital landscape effectively.
- As news sources rely on AI-generated content, maintaining credibility becomes paramount. News outlets must be vigilant in ensuring that AI-generated content aligns with the ethical standards and does not compromise their reputation.
- Social media platforms play a significant role in news dissemination. Efforts should be made to enhance fact-checking processes and credibility assessment on these platforms to counter the spread of AI-generated content.
- Investing in high-quality fact-checking resources and interactive tools is essential to motivate individuals to fact-check information rigorously. These resources should be accessible easily and regularly updated to address emerging challenges in the media landscape.
- AI's ability to mimic human writing poses a challenge in discerning AI-generated content. The public must be made aware of this capability to foster a more critical approach to the information they encounter.

This study emphasizes the need for a multi-pronged approach involving education, technology development, and media responsibility to effectively address the impact of AI-generated content on media literacy and public perception. By taking these steps, society can better navigate the evolving digital landscape and make informed decisions about the content they engage with and share.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

While this study offers valuable insights into the complex interplay between media literacy, artificial intelligence, and public perception of AI-generated content, several limitations need consideration.

The study relied on self-reported data, which can be subject to response bias and inaccuracies. Combining quantitative data with qualitative assessments, such as interviews or focus groups, could offer a more comprehensive understanding of participants' perceptions.

The study identified correlations between media literacy, AI knowledge, and behaviour. In spite of that, establishing causation would require further investigation. Future research could employ experimental designs to assess the impact of media literacy interventions on AI perception and fact-checking behaviour.

The study provides a snapshot of perceptions at a particular time. Given the rapidly evolving nature of AI and media, longitudinal research could capture how perceptions change over time.

The study did not consider the role of educational institutions in shaping media literacy. Future research could explore the integration of media literacy and AI education in schools and universities.

Future research endeavours should address these limitations to provide a more comprehensive understanding of the evolving dynamics between media literacy, AI-generated content, and public perception. These insights will be invaluable in developing effective strategies for navigating the digital information landscape responsibly and ethically.

REFERENCES

1. Pennycook, G., & Rand, D. G. (2018). The Implied Truth Effect: Attaching Warnings to a Subset of Fake News Stories Increases Perceived Accuracy of Stories Without Warnings. Management Science, 67(11), 4944–4957.

2. Zellers, R., Holtzman, A., Rashkin, H., Bisk, Y., Farhadi, A., Roesner, F., & Choi, Y. (2019). Defending Against Neural Fake News. Advances in Neural Information Processing Systems, 32.

3. Hobbs, R., & Jensen, A. (2018). The Past, Present, and Future of Media Literacy Education. Journal of Media Literacy Education, 10(1), 1–11.

4. Dubose, J. R., & Havens, J. C. (2019). Ethical Implications of Autonomous Systems in Mass Media. In Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society (AIES '19), 160–166.

5. Ennis, R. H. (2011). The Nature of Critical Thinking: An Outline of Critical Thinking Dispositions and Abilities. Educational Philosophy and Theory, 41(2), 139–164.

6. Allcott, H., & Gentzkow, M. (2017). Social Media and Fake News in the 2016 Election. Journal of Economic Perspectives, 31(2), 211–236.

7. Livingstone, S. (2009). Children and the Internet. Polity.

8. The Verge (2023) 'The Verge and Vox Media Release New Consumer Research on Artificial Intelligence', The Verge, 26 June. Available at: https://www.theverge.com/2023/6/26/23773963/the-verge-and-vox-media-release-new-consumer-research-on-artificial-intelligence

9. Peele, J. (2018) 'How To Spot A Deepfake Like The Barack Obama–Jordan Peele Video', BuzzFeed, 17 April. Available at: https://www.buzzfeed.com/craigsilverman/obama-jordan-peele-deepfake-video-debunk-buzzfeed

10. Reuters Institute for the Study of Journalism. (2022). Digital News Report 2022. [online] Available at: https://reutersinstitute.politics.ox.ac.uk/sites/default/files/2022-06/Digital_News-Report_2022.pdf

11. NewsGuard, (2023). The Next Great Misinformation Superspreader: How ChatGPT Could Spread Toxic Misinformation At Unprecedented Scale. [online]. Available at: https://www.newsguardtech.com/misinformation-monitor/jan-2023/
12. NewsGuard, (2023). Funding the Next Generation of Content Farms. [online] Available at: https://www.newsguardtech.com/misinformation-monitor/june-2023/

13. Vosoughi, S., Roy, D., & Aral, S. (2018). The Spread of True and False News Online. Science, 359(6380), 1146-1151.

14. Cao, Y., Li, S., Liu, Y., Yan, Z., Dai, Y., Yu, P.S., & Sun, L. (2023). A comprehensive survey of AI-generated content (AIGC): a history of generative AI from GAN to ChatGPT. arXiv preprint arXiv:2303.04226.

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THE ROLE OF ARTIFICIAL INTELLIGENCE IN THE DEVELOPMENT OF EDUCATION

Maja Mitevska-Poceva

ABSTRACT

The development of technology and the creation of Artificial Intelligence (AI - Artificial Intelligence) progressed. It is a gradual process, which is upgraded with time and technological progress. The continuous research and the development of new methods, algorithms, and techniques lead to achieving machines' desired levels of intelligence. Artificial Intelligence AI is a broad branch of computer science that deals with building smart machines capable of performing tasks that normally require human intelligence. It is a highly innovative area of research and development that permeates many aspects of our society, including education. In recent years, the application of AI in education has seen significant growth and has the potential to change the way we learn and teach knowledge. It can change the way learning is carried out, improving and personalizing the educational process. In this paper, we will look at the role of artificial intelligence in education and some of its most significant aspects. Learning with artificial intelligence aims to improve student learning and teaching. Artificial intelligence in education seeks to reduce the barrier that currently exists between the formal teaching (in class) and the autonomous and independent learning of students. The goal is to promote common methodologies in knowledge building and the stimulation of autonomy. For the purpose of this, personal communication systems (Internet, mobile devices, etc.) are used outside the traditional spaces where the learning process was developed. Artificial intelligence can contribute to the continuous assessment system by monitoring student performance in real-time and predicting possible difficulties that may arise during education.

Keywords: artificial Intelligence, learning, education, intelligence

INTRODUCTION

The development of technology is a dynamic process that takes place continuously throughout human history. Technology refers to the application of scientific knowledge, skills and instruments to solve practical problems and to meet human needs.

The development of technology in modern society is something that takes place at an unwanted speed and deeply affects all aspects of human life. Over the last decades, technology has brought enormous changes in several areas, among which we would mention communication, education, health, production and industry, mobility, energy, entertainment and culture, social changes, etc.

Technology has enabled people from all walks of life to have access to a variety of resources. It is also used to equip people who need some type of assistance to improve their quality of life and help them take advantage of opportunities that would otherwise be unavailable.

Technology has witnessed an impressive evolution in the past few decades, which in turn has transformed our lives and helped us evolve with it. From roads, railways and planes for smooth travel to making communication effortless from any part of the world, technology has contributed more than anything to help mankind live a luxurious and comfortable life. Moreover, because of technology we know our world and space better. Every field owes its progress to technology, and this clearly indicates its importance in every aspect of our lives.

Technology has become an indispensable part of our daily life. Everything we do from start to finish of the day involves some kind of technology. One of the reasons why technology, no matter what field, is a focus area for the scientists and other professionals and stakeholders is that it adds convenience to our daily activities while saving us time and improving our quality of life.

Right from our smartphones that are useful to us in more ways than we can imagine to various kitchen appliances, computer systems, means of communication, transportation system and online shopping have changed the way we live our lives compared to a decade ago. The enormous benefits that technology contributes to our lives, both on a smaller and larger scale, serve as the driving force for the continuous work towards further advancement in technological innovation.

Technology includes all those tools that require scientific knowledge for their development. For this reason, technology can be defined as a set of scientific knowledge that aims to satisfy the human needs related to economic and social progress; they also make it possible to improve the aspects of everyday life.

LITERATURE REVIEW

The application of new technology in education, facilitated of e-books, online lectures, distance learning and interactive educational tools have allowed a wider and more accessible educational opportunity for people all over the world.

In today's era, technology holds significant importance for the students as it facilitates seamless learning and online education, granting access to up-to-date information.

Technology enhances the learning experience for the students by providing them with the tools and resources necessary for success. From online resources that help simplify complex concepts to interactive learning experiences that keep the students engaged, technology gives the students the support they need to thrive in the classroom and beyond.

Here are reasons why technology is important in education. These include more engaged students, support for multiple learning styles, better collaboration, more instant feedback for the teachers and preparing for the future. It enhances creativity and innovation. Technology has opened up a world of opportunities for the students to be creative and innovative. Via access to a wealth of information and resources at their fingertips, the students can experiment, explore and bring their ideas to life.

This type of hands-on learning is much more engaging and enjoyable for the students and helps them to foster critical thinking skills. For example, students can use graphic design software to create posters, animations, or videos to present their ideas. They can use 3D printing to design and prototype their inventions. They can even use virtual and augmented reality to bring their ideas to life and make them more interactive.

In the publication "The role of Artificial Intelligence in Personalized Education" presents one of the greatest benefits of technology in education, which is personalized learning. By means of the online resources and educational software, students can find information that is tailored to their needs, interests and learning style. They can work at their own pace, repeat lessons if they need to and access information relevant to their studies. This type of individualized learning can help students stay motivated and achieve better results.

The reason for the emergence of artificial intelligence is very rapid development of technology and the improvement of the computer system, through which it is possible to perform various algorithms. The journey of artificial intelligence started with humble roots and has evolved exponentially over the years, becoming an integral part of our daily lives.

The emergence of AI does not happen in one moment, but it develops over decades with technological advances and different scientific conceptions. The very concept of artificial intelligence can be traced back to ancient civilizations, where myths and stories depicted intelligent beings and automatons. Nonetheless, it was not until the middle of the 20th century that artificial intelligence emerged as a scientific discipline. The term "Artificial Intelligence" was coined by the American computer scientist John McCarthy in 1956 during the Dartmouth Conference, which is considered the birth of artificial intelligence as a field of study.

Early research into artificial intelligence focused on symbolic reasoning, with the goal of creating a machine that could mimic human thought processes. The researchers believed that human intelligence could be broken down into a series of logical rules and represented using symbols. The General Problem Solver (GPS), developed by Allen Newell and Herbert A.

In the 1960s and 1970s, the artificial intelligence research faced significant challenges. Initial enthusiasm waned as early AI systems struggled to meet the high expectations set by the researchers. The limitations of computing power and the complexity of human intelligence have posed significant obstacles. This period became known as the "AI winter" as funding and interest in AI research declined.

The development of AI was facing new challenges and opportunity for progress. Artificial intelligence experienced resurgence in the 1980s with the emergence of new algorithms and technologies. The expert systems, which encode human knowledge into a set of rules for solving specific problems, have gained popularity. AI applications have begun to find their way into various industries, such as medicine, finance, and manufacturing. Furthermore, in the 1980s, the neural network simulation method became popular, which stimulated research in the field of deep learning (Deep Learning). Significant advances have been made in language and vision processing, applications that are still of great importance in education and other fields today.

The 1990s marked a significant shift in AI research with the emergence of machine origins. Instead of explicit programming rules, researchers began developing algorithms that allow machines to learn the data and choose their options over time. Neural networks, inspired by the structure of the human brain, have gained strength in solving complex problems.

The 21st century has witnessed a renaissance in artificial intelligence, fuelled by the convergence of big data, powerful computing, and breakthroughs in deep learning. Deep learning, a subfield of machine learning, is revolutionizing artificial intelligence by empowering machines to process vast amounts of data and recognize patterns with unprecedented accuracy. This has led to significant advances in computer vision, natural language processing and speech recognition.

Today, AI continues to advance at an incredible pace, incorporating advanced algorithms, large data sets, and powerful computing resources. Substantial progress has been achieved in areas such as expert systems, data analysis, computer vision, and natural language, introducing AI into every aspect of our lives, including education.

Education around the world is changing at an incredibly rapid pace. Software and devices are as common in classrooms and lecture theatres as whiteboards and projectors once were. The new generation of students is digitally native, swiftly embracing and adopting new technologies.".

The educational institutions globally face three major challenges: Providing quality education, often at scale; making education accessible to all, including in emerging markets, rural communities and children with special needs; and reducing delivery costs to ensure affordable education.

Teachers are burdened with administrative tasks that consume valuable time from teaching. These tasks encompass planning lesson materials for large classes of mixed-ability students; assessment and grading and homework; and fact and source checking for submitted assignments. School administrators and admissions staff, meanwhile, struggle with selecting the best students from a large number of applications and communicating effectively with the students, the staff and the parents.

All of this results in an education system that is under-resourced and inefficient. And where all too often, students can be forgotten and left behind.

A multitude of edtech solutions are emerging every day, but undoubtedly one of the most exciting technologies that has the potential to have the biggest impact on education is Artificial Intelligence (AI). As a result of the increasing sophistication of artificial intelligence techniques such as natural language processing, voice and speech recognition, and machine learning; teaching and education administration can be transformed.

The appeal of educational technology is easy to understand. Classroom teaching is an expensive process full of contradictory theories and frustratingly uneven results. Educators, inspired by the contribution of the machines to modern life, have been using technology to facilitate learning for centuries.

Artificial intelligence (AI) is a revolutionary field of computer science that seeks to create intelligent machines capable of performing tasks that normally require human intelligence and has been developing at an unprecedented pace in recent decades. It has enormous potential to transform various aspects of human society, including education ("Artificial Intelligence in Education: 18th International Conference, AIED 2017, Wuhan, China, June 28 - July 1, 2017, Proceedings" by Zhigo Gong, et al.). AI can change the way learning is done, improving and personalizing the educational process ("Artificial Intelligence in Education: Promises and Implication for Teaching and Learning" by Erik Duval, et al).

Artificial intelligence (AI) represents a technological advance with great potential for the transformation of various aspects of modern society, including education. While traditional education is based on universal standards and curricula, AI enables flexibility and change in the educational process. With the help of AI, the students can learn at their own pace and focus on areas in which they have the greatest interest and potential.

AI also contributes to the development of new educational platforms and tools. Virtual reality, present in some educational systems, enables interactive and experiential learning in real scenarios, which improves students' creativity and innovation.

RESEARCH METHODOLOGY

Artificial intelligence (AI) is the science and technology that enables machines and computer systems to perform tasks that require forms of intelligence. The spectrum of its application is wide, from analysing data and recognizing shapes, to training autonomous vehicles and entrepreneurial tools.

AI enables the improvement of learning through personalized and individualized approaches. AI technologies can analyse data about each student and identify their strengths and weaknesses, interests and learning style. According to these analyses, AI systems can create personalized lesson plans and suggest customized learning content, which increases effective learning and motivates the student.

In addition, AI provides support to teachers in their teaching work. With automated assessment tools, AI can quickly analyse and grade large numbers of tests and assignments, freeing up teachers' time to better interact with the students and adapt the teaching methods to their needs.

Despite all its advantages, the development of AI in education is also met with challenges. Ethical issues related to the privacy and security of students' data, as well as the possibility of dependence on technology, are some of the aspects that need to be bridged.

This scientific paper involves a survey conducted among students and teachers in order to see their awareness of artificial intelligence and its application in education. The research was conducted among the students and the teachers from primary schools. 130 students aged 13 and 14 and 100 teachers from 5 schools from the Republic of North Macedonia were included.

Content analysis combined with qualitative methodology will be used as the method of this scientific paper. By applying content analysis, we will perceive and analyse students' awareness of artificial intelligence as well as its application. Data sources will be from interviews, notes from field research or conversations.

The methodological approach in research is important in terms of focus. In order to explain more reliably and capture the purpose of the research, a combined research method was used. The qualitative method was used, i.e. delivery of questionnaires to the students, followed by analysis of the questionnaires from which relevant data for this scientific paper was obtained.

The research was conducted in the period April - June. The student questionnaire contains 8 questions through which students had the opportunity to express their opinion regarding their knowledge of artificial intelligence. The questionnaire itself gave them freedom to think and express themselves, as the questions were open and no answers were offered. This allowed the students to express themselves independently about the extent to which they are familiar with artificial intelligence, where they have encountered it, and as one of the perhaps more important questions for them, whether and how they would apply it in their education.

The questionnaire designed for teachers comprised eight open-ended questions, allowing them to articulate their opinions on the application of AI in education and which digital tools or platforms they are familiar with, whether they would apply AI in their teaching practices, and whether they would like to be involved in preparation or training for the successful use of AI in education.

The purpose of this survey was to see to what extent are the knowledge and application of AI in education as well as their attitude towards AI. The obtained results will help us in the further steps towards encouraging both the teachers and the students for the correct application of digital tools or platforms in the teaching process and the mastering of teaching content among students.

FINDINGS / RESULTS

Based on the results obtained from the students' questionnaire, we can conclude the following: A small part of the students knew what is meant by the term artificial intelligence (as a term), but about 50% of them had heard about ChatGPT, and some of them already had used the same one and it is simple, easy to use and gives relatively accurate answers. When asked if they thought that the use of artificial intelligence was useful for them, more than 65% agreed that it would be useful for them, and most of them chose the field of education (for preparing compositions for written works, answering questions for homework and fig.).

The attitude of the teachers is different than the attitude of the students. They are familiar with the artificial intelligence, but they believe that its application would be harmful to the students themselves. They believe that the application of the artificial intelligence by the students would lead them to a stage of not thinking and applying a finished product. With the very application of AI, teachers lose control in the school environment to a certain extent. They also believe that they are not familiar with enough tools through which they would direct the students to simultaneously apply AI and be able to think critically. It can be said that the lack of awareness about the application of AI is the reason for the appearance of scepticism and a negative attitude towards it. If teachers are not given enough training and resources to successfully use AI, it can lead to some frustrations and negative attitudes. If a teacher adheres to a conservative teaching style and is accustomed to traditional work methods, the very application of AI in teaching will disrupt their accustomed routine in the school environment.

In order to overcome these negative attitudes and to support the successful application of AI in teaching, it is important to provide adequate training for the teachers, to explain ethical and safety aspects, and to enable change in the education.

In order to protect the students from the negative impact of artificial intelligence, education is needed. It is important for the students to understand how these technologies work as a way to understand the opportunities, but also the limitations and risks, that artificial intelligence brings.

DISCUSSIONS AND CONCLUSIONS

The impact of the artificial intelligence (AI) in education is significant and brings significant changes that allow it to transform and change the way it is taught, learned and communicated in schools. The evolution of AI will contribute to changing the way we are educated, and new and innovative methods will be applied in the learning process itself. The very introduction of AI technologies has introduced numerous benefits, improving the learning experience for both the students and the teachers. The artificial intelligence has the potential to improve both learning and teaching, helping the education industry while evolving to benefit both students and teachers.

As technology advances, researchers are finding new ways to use the artificial intelligence to improve the learning experience and provide the students with personalized attention and support. Although many educational experts believe that the presence of the teachers cannot be replaced by this technology, it will completely transform the way curricula are organized and implemented.

Artificial intelligence in education seeks to reduce the barrier that currently exists between the formal teaching (in class) and the autonomous and independent learning of the students. The aim is to minimize redundancy in the tasks given to young people, to promote common methodologies in building knowledge and stimulate autonomy. In the following text, we will get to know how artificial intelligence is currently used in education, as well as what are the potential benefits and challenges of this technology.

Automation of routine tasks

As artificial intelligence is used to automate routine tasks in various industries, the same application will be found in the education sector. This technique is applied to facilitate or completely replace the performance of tasks that are uniform, routine and repetitive, often with the aim of increasing the efficiency, precision and time economy of work processes.

Instead of spending time and energy on organizational and administrative tasks, the teachers will be able to automate them (grading tests, reviewing homework, submitting documentation, compiling a student progress report, organizing teaching materials, managing and sharing teaching materials), and they will have more time and energy to focus on imparting knowledge, rather than administrative routine tasks.

Personalized learning

Personalization is one of the most prominent educational trends. Students now have a customized way of learning programs that focus on their different experiences and interests, thanks to the artificial intelligence applications. The AI can adapt to each learner's level of expertise, learning speed and desired goals to ensure they get the most out of their learning. Furthermore, AI systems can examine students' previous educational histories, detect gaps and recommend courses more suitable for approval, enabling a highly personalized learning experience.

Artificial intelligence (AI) can ensure that educational software is personalized for individuals. There are already adaptive learning software, games and programs for students. This use of the artificial intelligence is probably one of its most significant in education.

Personalized learning is an educational approach that centres on addressing the unique needs, interests, and learning styles of each student. This methodology is based on the idea that students are not the same and that each student has a different pace of learning and understanding, as well as various ideas about teaching topics.

This system emphasizes the needs of each student, highlighting specific topics in which students are weak and repeating subjects they have not mastered. Artificial intelligence can personalize the education system by enabling the adaptation of learning materials according to the level of knowledge of each student, preparing personalized texts for each student as well as additional resources for students who want to delve deeper into a certain topic, and providing help with tailored materials for topics not well mastered.

This will create an environment where the teachers offer support and help only when students need it.

The basic goals of personalized learning include: fully meeting students' needs, improving interest and motivation, achieving better academic results, developing critical thinking and independent learning, as well as establishing positive relationships between the teachers and the students.

The benefits of personalized learning include improved academic performance, increased student engagement and motivation, and increased critical thinking and problem-solving skills. By meeting the individual strengths and needs, personalized learning can better prepare the students for future success and lifelong learning.

Nevertheless, implementing personalized learning can also present challenges, such as the need for professional development for the teachers to adapt to this approach and concerns about privacy and data security when using technology in education.

Overall, personalized learning is a learner-cantered approach that aims to optimize the educational experience for each student, ensuring they receive the support, challenges and resources needed to reach their full potential.

Flexible learning

Flexible learning refers to an educational model that allows students to have more control over the time, pace and place of their learning. This model focuses on personalized learning and adapts to the needs and preferences of the students. Flexible learning can be realized through various educational tools and technologies, including online education, hybrid learning models, e-textbooks, video lessons, and the like.

Some of the features and advantages of the flexible learning include: Individualized learning, Work on your own time, Adaptability of learning location: With flexible learning, students can study from home, from a coffee shop, at work or anywhere else where there is an internet connection, various educational materials, improvement of communication.

However, flexible learning is not without its challenges. Some of the challenges include the need for self-discipline and motivation among students, the challenges of communication in an online environment, and the need for effective educational tools and technologies.

In any case, the flexible learning has significant potential to transform the education and to facilitate the learning and the access to knowledge for students of all ages and from all parts of the world.

Benefits of the flexible learning: the flexible learning promotes greater engagement and motivation, can lead to better learning outcomes as students receive targeted support and opportunities to master concepts,. It promotes lifelong learning, reduces achievement gaps, increases student satisfaction.

Updated learning content

With the introduction of the artificial intelligence, curricula will no longer have fixed content throughout the school year. Learning content will be able to be regularly updated with the help of artificial intelligence. In this manner, the teachers will be sure that all the information they share with the students is current and verified. Artificial intelligence can help the teachers to create smart content so as to make teaching and learning more engaging for students.

Updated or adapted learning content is a modified and improved version of existing material used in the educational process. New information, methods, and techniques that are significant for the students are included here. The application of this type of content is that they allow a better understanding and acquisition of the material, as well as being in line with the modern scientific discoveries, this content is available in teaching through textbooks, online courses or other types of resources. The adaptation of the contents can be made possible through different learning formats, visual illustrations, various levels of difficulty of the teaching content itself depending on the student's capabilities, the individualization of the content for each student depending on their interest, etc.

24/7 study help

One of the new sensations in the artificial intelligence is the increasing use of chatbots (software applications that can automatically conduct conversations and communications with people via text messages).

Traditionally, students get solutions to their problems only when they meet their teachers or professors and have a chance to ask them questions in the classroom. Fortunately, this problem is solved by chatbots that are available to help the students at any time of the day.

24/7 learning support is a resource or system that allows students to receive learning support and information at any time, regardless of days and hours. This concept of constant availability of educational resources and assistance is made possible thanks to modern technologies, especially the Internet and artificial intelligence.

Some chatbots are specifically built for the education sector. They work as student assistants around the clock to provide answers to their questions at any time.

The artificial intelligence has negative impacts and challenges related to its implementation in education and also in society in general. The increased use of AI can lead to a decrease in teacher-student interaction, as well as between students themselves. This interaction is of particular importance for the development of emotional and social development.

Relying heavily on the artificial intelligence for teaching and learning can lead to a situation where the students become dependent on technology, reducing critical thinking and problem-solving skills.

While AI can improve education, it can lead to a shift away from traditional teaching methods that have proven effective over time, potentially excluding the students who benefit from these methods. In some cases, AI can replace the traditional skills like reading, writing and critical thinking. This can lead to the loss of important aspects of education. AI-driven assessments may not accurately measure all aspects of a student's knowledge, skills, and abilities. They may struggle to assess qualities such as creativity and critical thinking.

Dependence on the technology can result in technical problems or outages. For example, if the AI system crashes, the students may be left without access to the course content. Not all students have the same technical equipment and internet access. This can cause an imbalance among the students and widen the gap between the rich and the poor.

AI systems can dictate learning paths and outcomes for students, limiting their autonomy to explore and learn at their own pace. AI may collect and analyse students' personal information. This can create a risk of compromising data privacy and security. AI can contribute to bias and discrimination if algorithms are trained on invalid or incorrect data. This can affect students' grades, learning decisions and career opportunities.

The even bigger fear lies in the level of information that the artificial intelligence will use as a means to develop to an advanced level. The one who controls the information and data – they will also control the artificial intelligence, and this can lead to unauthorized use of information for improper purposes.

To mitigate these negative impacts, it is important that educators, policy makers, and developers implement AI in a thoughtful and responsible manner. This includes addressing privacy concerns, ensuring equity of access, regularly evaluating the quality and effectiveness of AI tools, and providing adequate training to the learners for effective integration.

AI is a growing trend in education that promises an exciting future for us all. Of course, we need to figure out how to navigate the potential challenges, but the benefits of using AI in the classroom are undeniable. Looking ahead, we see it as the next frontier of learning that will strengthen education and drive its progress.

There are a number of AI tools available to the teachers who want to use AI to enhance the student learning. Examples of tools that can be used in the classroom in STEM (science, technology, engineering and mathematics) subjects include PhotoMath, a free app for teaching mathematics with the help of the artificial intelligence, and Seek by iNaturalist, an app that helps identify species through photography. Language classes can use Verse by Verse, which allows the students to write poems with

the help of the artificial intelligence and to learn about American poets, and Duolingo, for learning foreign languages. Social studies classes and art classes can use Newspaper Navigator, a search tool for millions of historical newspaper photos, as well as MuseNet, for music research and creation. Tools like Socratic and Brainly can be used across all subjects.

CONCLUSION

Artificial intelligence (AI) has the potential to transform the world, but it also has the potential to cause significant harm to society. As artificial intelligence becomes more integrated into our lives, it is important to consider the negative effects it can have, such as job loss, bias and discrimination, privacy concerns, and lack of accountability. By understanding these potential negative effects, we can take steps to mitigate them and ensure the benefits of AI are enjoyed by all members of society.

But according to experts, it is not just about understanding artificial intelligence. An important feature is learning how to deal with it. This includes developing skills such as critical thinking and creativity, which could complement artificial intelligence.

The fact is that artificial intelligence is part of our lives. It has become an inevitable part of most industries and it is only a matter of time before it is implemented in every aspect of our daily lives. We need to teach children never to rely too much on artificial intelligence in their decision-making. Understanding artificial intelligence will become increasingly important in the process of forming responsible, educated citizens, with the ability to make decisions and advocate for themselves in an increasingly automated world.

Children and young people need to understand that artificial intelligence has limitations and can make mistakes. It can be biased and even prejudiced. That is why it is important to teach children to think critically and decide how and how much they can rely on artificial intelligence. It is the only way to take advantage of the technological advances in today's world without succumbing to its downsides.

AI has the potential to transform education and improve learning and teaching. The application of AI in education requires advancement in technology and education as a whole, but with proper management and attention to ethical and social aspects, we can create a more beautiful and better education for future generations.

The application of artificial intelligence (AI) in education represents a significant opportunity to refine and improve the learning experience. Artificial intelligence offers the potential to personalize education, adapt to the individual needs of the students, and provide innovative teaching methodologies. AI offers a lot of opportunities for individualized and customized learning, which can bring significant advantages for students and teachers. Its data analysis capabilities can help identify learning patterns, allowing teachers to adjust their approach and effectively support each student's progress. It allows the students to learn according to their abilities so that each student will progress according to his abilities.

So as to be able to apply artificial intelligence properly, it is necessary to perceive all the advantages and challenges. We should always know that it should not be a substitute for teaching methods, but rather a complement to traditional teaching methods in order to ensure quality teaching for students. Thus, quality teaching will be ensured for the students and the learning and achievements of each student will be improved. As AI is increasingly incorporated into the educational process in schools, it creates a flexible learning environment, allowing access to education beyond any physical limitation.

By simply using the resources offered on online platforms, it is possible for them to make education accessible to all students. But the integration of AI in education requires careful consideration of all challenges. The combination of AI with traditional learning methods is of great importance to preserve human interaction and holistic educational values. However, let's not forget that the potential of AI to change the educational system is huge. Its ability to adapt, analyze and personalize the learning experience will enable a more efficient and engaging education.

The application of AI in education requires advancement in technology and education as a whole, and with proper management and attention to ethical and social aspects, we can create a more beautiful and better education for future generations.

REFERENCES

1. "Artificial Intelligence in Education: Promises and Implications for Teaching and Learning" edited by David Lynch, Council of Europe, November 2022

2. 23 Advantages and Disadvantages of Technology - John Stephens, January 2021, https://mk.warbletoncouncil.org/ventajas-desventajas-tecnologia-2854#menu-2

3. The power of artificial intelligence fascinates, but also frightens - Mirjana Joveska, February, 2023, https://mk.bloombergadria.com/tehnologija/inovacii/21186/mokjta-na-vestackata-inteligencija-voodusevuva-no-i-zaplasuva/news

4. Why we need the psychology of artificial intelligence - Vladimir Davchev, Skopje, 2019, http://periodica.fzf.ukim.edu.mk/psnp/psnp5(2019)/PsNP05-06.04%20Davchev,%20V.pdf

5. What awaits us in the era of artificial intelligence with ChatGPT? – January, 2023 https://faktor.mk/shto-ne-ochekuva-vo-erata-na-veshtachkata-inteligencija-so-chatgpt

6. Artificial Intelligence: A Modern Tool of the Digital Age for the Development of Societies and Civilization – June, 2022 https://meta.mk/veshtachka-inteligencija-moderna-alatka-na-digitalnoto-vreme-za-razvoj-na-opshtestvata-i-civilizacijata/

7. Intelligent Tutoring Systems: How AI Can Improve Student Learning - Adrien Beaulieu, 2023 https://product.house/intelligent-tutoring-systems-how-ai-can-improve-student-learning/

8. Teaching Machines: Learning from the Intersection of Education and Technology (Tech.edu: A Hopkins Series on Education and Technology) Illustrated Edition - Bill Ferster
https://www.amazon.com/Teaching-Machines-Intersection-Education-Technology/dp/1421415402

9. Artificial Intelligence, Global Edition, A Modern Approach - Stuart Russell , Peter Norvig, 2021
https://elibrary.pearson.de/book/99.150005/9781292401171#item-1

10. What is artificial intelligence?
https://bs.eyewated.com/sta-je-vestacka-inteligencija/

11. Artificial intelligence – the way to the future
https://semosedu.com.mk/%D0%9F%D0%BE%D1%87%D0%B5%D1%82%D0%BD%D0%B0/%D0%97%D0%B0_%D0%BD%D0%B0%D1%81/%D0%91%D0%BB%D0%BE%D0%B3/TECHTalks/%D0%92%D0%B5%D1%88%D1%82%D0%B0%D1%87%D0%BA%D0%B0_%D0%B8%D0%BD%D1%82%D0%B5%D0%BB%D0%B8%D0%B3%D0%B5%D0%BD%D1%86%D0%B8%D1%98%D0%B0.aspx

12. Artificial Intelligence and Developing Countries – March, 2023
https://novamakedonija.com.mk/mislenja/kolumni/veshtachkata-inteligencija-i-zemjite-vo-razvoj/

13. Artificial Intelligence - Wikipedia
https://mk.wikipedia.org/wiki/%D0%92%D0%B5%D1%88%D1%82%D0%B0%D1%87%D0%BA%D0%B0_%D0%B8%D0%BD%D1%82%D0%B5%D0%BB%D0%B8%D0%B3%D0%B5%D0%BD%D1%86%D0%B8%D1%98%D0%B0

14. How Technology Is Transforming The Education Sector – August, 2023
https://www.outlookindia.com/website/story/feature-how-technology-is-transforming-the-education-sector/396082

15. The Role of Artificial Intelligence in Shaping the Future of Education: The Potential and Challenges of a New Era of Learning – March. 2023
https://www.alltechbuzz.net/mk/the-role-of-ai-in-shaping-the-future-of-education-the-potential-and-challenges-of-the-new-learning-era/

16. 5 Ways Artificial Intelligence Can Improve Education – February, 2022
https://inovativnost.mk/2022/02/18/5-%D0%BD%D0%B0%D1%87%D0%B8%D0%BD%D0%B8-%D0%BA%D0%B0%D0%BA%D0%BE-%D0%B2%D0%B5%D1%88%D1%82%D0%B0%D1%87%D0%BA%D0%B0%D1%82%D0%B0-%D0%B8%D0%BD%D1%82%D0%B5%D0%BB%D0%B8%D0%B3%D0%B5%D0%BD%D1%86%D0%B8%D1%98/

17. Artificial intelligence of great benefit to students - Dorina Stefanovska, March, 2022
https://goce.mk/veshtachkata-inteligenczi%D1%98a-od-golema-korist-za-studentite/

APPENDICES

Annex 1

Questionnaire for students

1. How familiar are you with the term “artificial intelligence” (AI)?
2. Can you give a brief explanation of what artificial intelligence is?
3. What areas or applications do you think artificial intelligence is being used in?
4. Do you know of any examples of artificial intelligence in everyday life?
5. Have you had the opportunity to use applications or tools that use artificial intelligence in your studying?
6. Do you think that the artificial intelligence can help students improve their academic performance?
7. Have you talked to the teachers about the use of the artificial intelligence in learning?
8. Do you want to learn more about the artificial intelligence and its application in education?

Annex 2

Questionnaire for teachers

1. What is your general idea of what artificial intelligence is?
2. What ways do you think AI can be used in education in?
3. Have you had the opportunity to use tools or resources that include the artificial intelligence in your teaching process?
4. Do you have knowledge about different platforms or applications that are based on AI and what are their capabilities?
5. How do you think AI can impact student success and your teaching practice?
6. Have you become familiar with some of the advantages or risks of using AI in education?
7. Do you think that the educational institutions should integrate AI tools and technologies in the educational process?
8. Would you be interested in participating in preparation or training for the successful use of AI in your teaching context?

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MEDIA LITERACY IN E-COMMERCE AND THE RELATIONSHIP WITH ARTIFICIAL INTELLIGENCE

Hristina Balkanov

INTRODUCTION

Artificial intelligence is currently one of the most trending topics on a global level, both among the professionals from various fields and among everyone else who is familiar with the existence of this notion. However, the question that is arises – why is this so? Is it because the world is afraid of the unknown? It goes without saying that the potential reluctance plays a huge role in this regard. In fact, the testimonies and the experience point to the conclusion that comfort is found in safety. The enhancement and dynamics of the development of needs and wishes result in new forms of their satisfaction, respectively, and one of those forms is precisely the artificial intelligence. However, what happens when the artificial intelligence is mentioned in the context of e-commerce, which, equally as artificial intelligence, is also causing confusion? There is a clash with the fact that the knowledge is the existential assumption in order to have a satisfactory level of readiness to confront. In this case, that knowledge is precisely the media literacy, in the broadest possible sense. In order to have quality communication, it is important to understand the process of communication,. However on the other hand, the understanding of the communication process encompasses several processes that differ from each other, but who also complement each other. This paper analyses the media literacy in the e-commerce in relation to artificial intelligence and aims to define, but also to bring the meaning of each of these terms closer to the readers, and to explain the meaning of their mutual cohesion for the modern society. Finally, the paper aims to provide information on why media literacy is important for the users or the consumers in the context of the e-commerce in the age of artificial intelligence.

Keywords: e-commerce, media literacy, machine learning

E-COMMERCE

E-commerce or e-commerce is the buying and selling of goods and services, or transfer of funds or data, over an electronic network, primarily the Internet. The focus is on digitally enabled commercial transactions between different stakeholders. Digitally enabled transactions include all transactions mediated by the digital technology.

The exchange of value is crucial in comprehending the limits of the e-commerce. Without an exchange of value, no trade can occur.

Thirty years ago, there was no e-commerce as the world knows it today. However, in this relatively short period of time, it has been reinvented several times. The early years of e-commerce, the late 1990s, were a time of business vision, inspiration and experimentation. Nevertheless, it soon became apparent that establishing a successful business model based on those visions would not be easy. A period of downsizing and revaluation followed, leading to the stock market crash of 2000-2001, with the value of e-commerce, telecommunications and other technology stocks plummeting. After the bubble burst, many were quick to write off e-commerce. From today's perspective, the conclusion is that such behaviour was wrong. The companies that survived redefined and refined their business models, and technology became more powerful and cheaper, which eventually led to locating companies that actually produced profits. It is important to understand that the rapid growth and change that occurred in the first thirty years of the e-commerce was just the beginning – what could be called the "first thirty seconds of the e-commerce revolution".

Technology continues to develop at exponential rates. This fundamental fermentation gives the entrepreneurs new opportunities to create new businesses and new business models in traditional industries, and the opportunity to advance old businesses and business models, too. Business changes are becoming disruptive, rapid, and even destructive, while offering new opportunities to the entrepreneurs and resources to invest.

The improvements in the core information technologies and the continued entrepreneurial innovation promise as much change in the next decade as in the last. The twenty-first century will be an era of digitally enabled social and commercial life, the contours of which can barely be discerned at this point.

ARTIFICIAL INTELLIGENCE

Defining artificial intelligence is challenging, primarily because of its mass-scale application in recent times. The attempts to define it have evolved over time, but in order to get a full picture of what AI is, a broader perspective is needed. This is why it is essential to consult relevant sources, starting with the Oxford Dictionary. According to the Oxford Dictionary – artificial intelligence is originally characterized as a creation of computer networks that can perform activities that normally require human intelligence, such as vision, voice recognition, decision making and language understanding. In "What is Artificial Intelligence", author John McCarthy includes the term "artificial intelligence" and simply explains it as autonomous thinking of the machines (McCarthy, 2007). According to McCarthy, artificial intelligence is the study and development of intelligent machines, with an emphasis on intelligent computer programs.

There are researchers who define artificial intelligence as intelligence of a computer or machine that enables imitation of the human abilities. Artificial intelligence uses various technologies to give human intelligence to the machines, allowing them to feel, understand, plan, act and learn. In their most basic forms, AI systems can perceive environments, recognize objects, get involved in decision-making, solve complex problems, recall past experiences, and imitate patterns (Kanade, 2022).

MEDIA LITERACY

The rapid development of the information and communication technologies and the mass media system in the modern world creates fundamental changes in the general philosophy of understanding, posing new challenges and opening new research horizons in the field of media outlets and media education. One of the primary objectives is to create the ability to learn. Globally, the prevailing perspective on this matter involves introducing of the fundamental core of knowledge, upon which a further set of knowledge, skills, inclinations, competencies are built, i.e., the formation of a holistic perception of the world, is the currently dominating narrative.

British scientist A. Hart states that media education should be based on the study of the following six key concepts:

1. “media agencies” (functional system analysis),
2. “media categories” (analysis of the media text types),
3. “media technologies” (analysis of the technological process of creating a media text),
4. “media languages” (analysis of audiovisual means of expression),
5. “media audience” (audience typology analysis),
6. “media representations” (analysis of specific presentation by authors/sources of information/content in media texts) (Hart, 2002).

Elizabeth Thoman, who founded the Centre for Media Literacy in 1989, expanded on these ideas in an article written for the Association for Supervision and Curriculum Development (ASCD) (Thoman, 2002). Thoman stated that “At the heart of media literacy is the principle of inquiry”, where she developed five concepts (Jolls, Willson, 2014: 68 – 78):

1. All media messages are “constructed”.
2. Media messages are constructed using a creative language with its own rules.
3. Different people perceive the same media message differently.
4. The media outlets are primarily businesses driven by profit.
5. The media outlets have their inherent values and viewpoints.

It can be, therefore, said that media education is a process through which individuals become media literate and should acquire the ability to critically understand the essence and impact of media messages.

MEDIA LITERACY AND E-COMMERCE

Media literacy is key in the e-commerce for several reasons:

1. Evaluation of information and discerning of disinformation and fake reviews: Users on the Internet are inundated with a plethora of information, including product descriptions, reviews, advertisements and promotional content, which suggests that disinformation and fake reviews are widespread in the digital realm, and especially in the online markets. Media literacy enables the individuals to critically evaluate information served, determining credibility, spotting red flags, and identifying irrelevant sources of information. The ability to discern accurate information versus biased or false content helps the consumers to make more informed decisions about their purchases, potentially leading to a certain level of satisfaction. On the other hand, by being able to discern authentic product reviews from inauthentic ones, shoppers can gain a more accurate and holistic understanding of the product, which should lead to more enjoyable online shopping experiences.
2. Identifying manipulative techniques: E-commerce platforms often use various persuasive techniques to influence consumer behaviour, such as scarcity tactics and flash sales. Media literacy should enable the consumers to recognize these manipulative tactics and understand in what manner they can influence their decision-making processes. By discerning the above, consumers can avoid impulse purchases based on emotion and instead make rational decisions.
3. Product comparison and analysis: Since there is a huge range of products available online, the choices are endless. It is media literacy that gives consumers the chance to efficiently and effectively compare and analyse various offers. By critically evaluating the product specifications and the prices, the buyers can make decisions based on individual and specific needs and preferences.
4. Discerning sponsored content and influencer marketing: In the age of social media and social media influencer marketing, it is definitely challenging to discern between genuine recommendations and sponsored content. Media literacy helps the consumers to identify what type of content is being marketed, allowing them to approach it with the appropriate behaviour based on the knowledge.
1. Understanding personalization and data privacy and awareness of consumer rights and protection: Many e-commerce platforms use artificial intelligence and data analytics to personalize product recommendations and advertisements. Media literacy helps consumers understand and discern the trade-offs between personalized experiences and data privacy. By researching and understanding the process of how consumer data is used to customize an online shopping experience, individuals can make informed choices about the information they share and protect their rights. In addition, media literacy also includes a very important aspect in society, which is the understanding of consumer protection rights in e-commerce, such as the refund policies, warranties and conditions for use.

In fact, media literacy plays a vital role in the e-commerce by ensuring that the consumers are adept at participating in, and navigating, the digital marketplace. Critical thinking and evaluation of information is the only way in which the consumers can make rational decisions when shopping online. Media literacy encourages the consumers to be discerning and smart shoppers, leading to more satisfying and successful outcomes.

MEDIA LITERACY IN THE E-COMMERCE IN CORRELATION WITH THE ARTIFICIAL INTELLIGENCE

At its core, the media literacy represents the intellectual and the emotional capacity of the individuals to engage with the vast sea of information and digital content that surrounds them in the digital age. It embodies the quest for understanding, truth and wisdom in a globalized world where the flow of information is relentless and at the speed of light. Media literacy expects the individuals to be astute thinkers and reflective consumers, able to navigate the colourful landscape of e-commerce.

In the field of e-commerce, the integration of artificial intelligence introduces a new dimension to research in this field. Artificial intelligence systems, driven by algorithms and machine learning, are now playing a significant role in shaping the online shopping experience.

From a practical perspective, artificial intelligence can be seen as an embodiment of human creativity and rationality, i.e., an attempt to replicate aspects of human intelligence in machines. However, it also raises fundamental questions about the nature of knowledge, autonomy and experience.

The idea of machines imitating human intelligence has been around for thousands of years, even in the ancient Greek mythology. Nonetheless, the field of artificial intelligence research was officially established when Dartmouth College held a workshop on the subject in 1956. At the same time, computer scientists developed programs to compete with humans in checkers and chess. There was great optimism about the future of smart machines, and countries invested billions of dollars in artificial intelligence research. In spite of that, the necessary computing power and capability to turn such visions into reality did not exist back then.

In recent decades, though, and especially in recent years, scientists and engineers have made significant progress in this field. Over the course of this and the previous decade, thousands of companies have emerged to deliver AI-driven solutions. Conversely, there are companies that have successfully integrated AI as a fundamental component of new as well as existing products. Nowadays, artificial intelligence is so present in everyday life that hardly anyone notices it.

Therefore, in order to understand how the exchange of any values works and what specific experiences are due to, literacy in the broadest sense is useful.

It is emphasized that the literacy skills considered necessary for the 21st century are grouped into six groups: information literacy, media literacy, computer literacy, functional literacy, cultural literacy, distance education and e-learning literacy. The concept of media literacy, which is one of the literacy skills, in this context is generally defined by two approaches. According to the first approach, the media literacy is defined as receiving information from media outlets such as television, radio, newspapers and the Internet, and critically evaluating them (Bawden, 2001); according to the second approach, the concept is defined as the ability to understand and use environments in which information is produced, stored and transmitted and types of media such as text, graphics, newspaper, radio, television broadcast, CD and DVD (Yılmaz, 2020). It is undeniable that there is a close relationship between the media literacy and the other types of literacy. As noted above, media literacy, which has become necessary in recent years, is a concept that is confused with information literacy and, in some cases,

is used instead of information literacy. Notwithstanding, media literacy is only a part of the information literacy and is somewhat more limited in scope. Information literacy, in essence, naturally includes media literacy, as it consists of the skills to access, use and critically evaluate all types of information.

Information literacy is the ability to search, evaluate, use and create information in all areas of life to enable individuals to achieve their personal, social, professional and educational goals. This literacy is stated to be a necessary prerequisite for participatory citizenship, social acceptance, production of new knowledge, personal and corporate development and lifelong learning (Bundy, 2004). According to another approach, information literacy is a combination of library literacy, computer literacy, media literacy, technology literacy, ethics, critical thinking and communication skills (Curzon, 1995).

It is crucial at this point to pay attention to several axioms, as follows:

Axiom I

Individuals need to understand the external stimuli. Understanding external stimuli is a condition for an individual to be able to understand the others and to use standard symbols to communicate with them.

Axiom II

If knowledge is considered power, individuals will need different information to achieve meaningful positive change.

Axiom III

The objective of media literacy is to shift control from the media outlets to the individuals (Apak, 2008).

PERSONALIZATION AND RECOMMENDATION SYSTEMS

Each consumer's demand for products and services varies according to their needs and wants, and e-commerce companies can provide users with a wide range of choices, and more importantly, they can recommend product information that meets their shopping habits, thereby reducing the time needed for the user to search for products and services that meet their requirements. Not only that – businesses can use the service to recommend personalized information to the user based on the information preferences of the user. The usefulness is multidimensional – the development of a personalized service in the process of online shopping can serve both for promotion of the specific goods and for a more satisfactory response to the specific request of the user. An important role is also played by the personalized marketing, which is a highly respected marketing method in corporate marketing, because compared to the traditional marketing methods, personalized marketing is more targeted – it is possible to do one-to-one marketing according to the individual needs and specific wishes of the users. A recommendation system is an essential and indispensable marketing tool for personalized marketing.

The providers of information, or more specifically the suppliers of goods, directly publish an unlimited amount of information on the Internet, and the user is expected to find the appropriate information they need and later to process it in an appropriate way. However, this "self-service" mode also means "wasting" the consumer's resources, i.e., investing unnecessary time and effort for conversion between the web pages. Despite that, there is another way in which the information providers market the information, by sending the latest information to the user in the form of a summary, and they can review the information imposed on them and react in accordance with the current needs and wishes. The information posted in this manner is the result of the development of artificial intelligence. The advantage of the latter approach is that it can save time, so that the users do not have to spend too much energy in the search process. Recently, with the increasing number of online transactions and increasingly complex business information, it is challenging for the consumers to complete the exchange process satisfactorily. Still, if the website makes a reasonable recommendation for the user at the specific moment, it can help the user to smoothly complete the desired activity, thereby reducing the possible lack of satisfaction of all participants in the process.

The platforms can comprehensively analyse user purchase intentions and behaviour, provide customized services to the users, and increase website traffic through a process called service personalization. By analysing and designing the factors influencing consumer purchasing, the proposed model is tested and revised, and a personalized information recommendation service model is established. However, there are still significant problems in various fields in terms of the research of the recommendation system, which is due to the severity of the problem itself. Although researchers continue to achieve results in the studying of personalized recommendation systems, the designed recommendation algorithms have more or less limitations. So, this kind of personalized e-commerce recommendation system based on data mining can not only solve effectively the problem of huge and cluttered information in the recommendation system, but it can also realize the personalized presentation of goods, and it also has large value for research of applications.

There is not any doubt that personalization and recommendation systems powered by artificial intelligence are useful and can save resources for both consumers and service providers – businesses. Still, media literacy, in a broader sense, is important in order to avoid manipulations and abuses. It is very important for the users to be aware that the ultimate objective for businesses is to convert the users into customers and loyal customers. In order to achieve this objective, there are relevant tactics, including the above-mentioned personalization, and therefore awareness and vigilance ensures the protection of the person, integrity and budget, while avoiding impulsive purchases and reckless decisions regarding the choice and knowing the real reason why the user makes a decision in general for purchase.

VIRTUAL ASSISTANTS AND CHAT-BOTS

It is quite obvious that businesses are incorporating artificial intelligence and machine learning into their operations increasingly. By using a virtual assistant or chatbot powered by artificial intelligence, businesses can not only increase revenue, but they can also save money and provide superior customer service. According to Gartner, chatbots will save $8 billion in business costs by 2022. So it is no wonder that the virtual assistants and the chatbots are becoming more and more popular.

While virtual assistants are designed to handle a wide range of requests, chatbots typically provide specialized services, but both aim to improve and to develop the provision of individual assistance. The virtual assistant uses artificial intelligence to understand the user's request and respond to it in real time. This digital assistant can work alone or together with a live customer service representative. Concomitantly, a chatbot is a specific technology that allows consumers to establish and maintain communication - a conversation with a machine or computer. One of the specificities of chatbots is the fact that they can learn to answer questions, make suggestions and express reservation just like a human. All of these chatbots and virtual assistants use natural language processing to understand what the user wants or thinks when they ask a question or make a request, and then respond conversationally (Aws 2019).

Today's consumers demand, and are accustomed to, a personalized shopping experience. Customers are more likely to feel a connection to a company's brand if they are treated as individuals with specific needs. Getting a service tailored to their needs will make them feel heard and understood, which in turn will increase the likelihood that an exchange of value will occur. Accenture found that when consumers are comfortable and given the right advice, they are 75% more likely to make a purchase. On the other hand, Forbes research findings suggest that 80% of the consumers are more likely to buy from a company that tailors its offerings to the individual needs of its users. Furthermore, according to the Epsilon report, 80% of the consumers are more inclined to engage in communication with a company that offers them a personalized experience. (Clark, 2021). Virtual shopping assistants or e-commerce chatbots can guide the consumer through the purchase process and provide a high level of individualization of the purchase suggestions. In virtual sales, AI-powered virtual assistants and chatbots can replicate the in-store shopping experience, interact with the customers in original ways, increase loyalty, improve brand experience and sales process efficiency.

A perfect example is Netflix. Instead of letting users choose from thousands of content titles on offer, Netflix provides a much more targeted approach, narrowing down the selection of specific content based on subscribers' individual tastes. This feature not only improves the user experience, but also saves time. Finally, apart from the usefulness on the user side, there is also a reciprocal usefulness on the other side, so this company has managed to reduce annual unsubscribe costs by about a billion dollars thanks to this feature. (Simplilearn, 2022).

Moreover, using virtual assistants or chatbots in business means less manual work for the users, while ensuring uninterrupted service availability 24/7. In the world of online commerce, AI systems work around the clock. With the help of the machine, the business can give the impression to its customers that it is available on all channels at all times to meet the enquiry. This is especially useful if the business operates globally and its users are spread across multiple time zones. However, what if users have questions or requests that are beyond the scope of chatbots and AI assistants? Those same virtual assistants and chatbots help the users to get the human help they need as soon as possible.

For example, the response time WhatsApp is nine times faster and easier than a phone conversation. Most users prefer to send a text instead of a phone call. WhatsApp's direct messaging features are useful for the consumers and help the businesses to cut costs. Approximately 70% of all WhatsApp messages are opened. A large number of consumer service calls can be easily diverted to WhatsApp. The two most common support use cases - order tracking and refunds or cancellations - are handled easily and quickly via WhatsApp. (Ashta, 2020).

Virtual assistants and chatbots continue to convince humanity that they are welcomed in today's world which, among other things, is characterized by speed, recklessness and impulsiveness. On the one hand, the world is in a phase where everyone wants to be heard and understood, while on the other hand, the essence is often overlooked– and it is from this neglect that needs arise. That is why media literacy plays an essential role in preventing or possibly avoiding manipulation, so the need for acceptance should not prevail over the awareness of power over decision-making.

AI-GENERATED CONTENT

AI-generated content is a new form of content creation and includes: AI painting, AI writing, AI music composition, AI video generation, AI voice synthesis, AI programming and much more. This technology creates a new form of digital content, offering huge potential for providers to create unique and personalized content for users.

The rise of artificial intelligence in the e-commerce is upheld by impressive statistics. The size of the AI-enabled e-commerce market is projected to reach $16.8 billion by 2030. Furthermore, the customer service analytics is the most common implementation of AI in marketing and sales, with 57% of all respondents in developing countries declaring their adoption of AI. Notably, 78% of e-commerce brands have already implemented AI in their stores or plan to do so.

In this sense, the use of artificial intelligence in the marketing area is trending, where the artificial intelligence offers the possibility of analysing large data sets as well as so called user segmentation, in this fashion enabling targeted and personalized marketing. This approach not only improves the user engagement, but also increases conversion and sales rates.

In parallel, for HR employees, AI-powered recruiting tools streamline the process and increase the likelihood of making the right decisions.

These developments highlight the importance of leveraging technology and automation in today's e-commerce landscape. As businesses, regardless of size and industry, try to stay competitive in the digital age, technology and automation are no longer just desirable—they're essential. Actually, it is becoming apparent that companies that embrace modern solutions will lead the way in defining the future of e-commerce.

It is crucial for retailers to leverage predictive analytics, a type of artificial intelligence technology, to enhance their inventory management systems for better inventory control. This can significantly help with volume management, improving customer satisfaction.

In logistics, artificial intelligence technologies such as machine learning and robotic process automation can streamline operations, reduce delivery times and improve service.

The future of e-commerce is undoubtedly digital, but it is also more than that. The future is intelligent, dynamic, personalized and engaging. It is a future where technology not only supports business, but also drives them. The future of e-commerce is here, and it's brighter than you could ever imagine.

The content generated by the artificial intelligence is clearly and unequivocally present in the online space, and increasingly in e-commerce. Nevertheless, media literacy or, ultimately, reason is the key to distinguishing humanity from machines or computers. The unassisted discovery, systematization, analysis of information and drawing of conclusions helps the humanity not to be consumed by the artificial intelligence. Therefore, it is crucial that knowledge is constantly updated, expanded or replaced with new and current ones, in order to ensure and stabilize the position of the human abilities and knowledge.

DIGITAL MANIPULATIONS AND FAKES

Digital manipulations and fakes that represent artificial but hyper-realistic video, audio and images created by algorithms are one of the latest technological advances in artificial intelligence. Fuelled and amplified by the speed and scope of dissemination via social media, they can quickly reach millions of people and result in an unimaginable and uncontrollable spectrum of fraud in the marketplace. Notwithstanding, the existing understandings of the implications of the fake products on the market are limited and fragmented. Against this background, there is a development of knowledge about the importance the fakes have for the businesses and the consumers, specifically the threats they pose, how to mitigate those threats and the opportunities they open up. The findings show that the main risks for the companies include damage of the image, reputation and reliability and as well as the obsolescence of the existing technologies. On the other hand, the consumers may suffer blackmail, harassment, defamation, harassment, identity theft, intimidation and retaliatory practices.

Advances in artificial intelligence - especially machine learning and deep neural networks - have contributed to the development of fakes (Chesney and Citron, 2019, Dwivedi et al., 2021, Kietzmann et al., 2020, Mirsky and Lee, 2021). They look very believable to the extent that distinguishing them from the authentic media can be a difficult challenge for humans. Thus, they can be used for the purposes of widespread market fraud, with various consequences for both businesses and consumers (Europol, 2022; Luca and Georgios, 2016). Indeed, a recent study by the scientists at University College London ranks fake audio or video content as the most worrisome use of AI in terms of its potential applications for crime or terrorism (Caldwell et al., 2020). Concurrently, this nascent technology has the potential to create great business opportunities for content creation and engagement (Etienne, 2021, Farish, 2020, Kietzmann, 2020).

Marketing fraud is ubiquitous, making it a fundamental issue in research and marketing (Boush et al., 2015, Darke and Ritchie, 2007, Ho et al., 2016). In general, fraud refers to a deliberate attempt or act to present false or incomplete information in order to create a belief of truth (Darke and Ritchie, 2007, Ludwig et al., 2016, Xiao and Benbasat, 2011). Hence, it is the deliberate manipulation of information to create a false belief, all of which can be further developed through the creation of counterfeits, simultaneously harming both the consumers and the businesses (Xiao & Benbasat, 2011). Fraud permeates the marketplace and damages overall well-being and financial resources, undermining the confidence in businesses and the marketplace as a whole.

Another critical factor that makes the fakes relevant is their spread via the Internet and social media, at a time when both have become an integral part of people's personal and professional lives, allowing the consumers access to the easy-to-use platforms for discussions in real time, ideological expression, dissemination of information, and sharing of emotions and feelings (Perse & Lambe, 2016). Consequently, the volume and speed of distribution of fakes, combined with the increasing penetration of digital technologies in all areas of society, will have profound positive and negative implications on the market (Kietzmann et al., 2020, Westerlund, 2019).

Digital manipulations and certificates currently stand as a stark warning about the impact of the artificial intelligence on the quality of the humanity's existence. It is obvious that these types of technology can and should be used in another direction - however, what dominates is their utilization with unethical implications. Media literacy should certainly have a milestone task here, which means that the educated people do not allow themselves to be victims or they do not allow the humanity to be the victim. Apart from prevention, which basically involves being careful when sharing data, taking action to help victims is also key. Thus, awareness should be spread about such malicious use of artificial intelligence, but also not to spread such use of the artificial intelligence. However, responsible and conscientious behaviour does not always mean acting only, but also not acting sometimes, and media literacy should ensure awareness of this.

ETHICAL CONSIDERATIONS

It's clear that the need to use AI in e-commerce is on the rise, with more and more businesses turning to this powerful technology to improve user engagement and drive and grow sales. Despite that, as with any new technology, there are important ethical considerations to be aware of when it comes to using AI in e-commerce. One of the key ethical concerns surrounding the use of artificial intelligence in e-commerce is the issue of bias. AI algorithms are only successful against the data they are trained on, so if the data is biased in any way, so will the algorithms being created. This may lead to unfair or discriminatory treatment of certain users, which is not only unethical but can also damage the reputation and the main value of the business. So as to avoid bias in AI-powered e-commerce, businesses should take steps to ensure that the data they use to train their algorithms is as diverse and representative as possible. This means collecting data from a wide range of sources and regularly checking and cleaning the data to remove any potential biases.

Another ethical concern for artificial intelligence in e-commerce is the issue of transparency. The users have the right to know how and why they are being targeted with certain information, and businesses have a responsibility to be clear and transparent about their use of AI. This means providing specific and concise explanations of how AI is used and giving to the consumers the opportunity to opt-out of AI, particularly in marketing, if they so choose. With a view to ensure the responsible and problem-free use of AI in e-commerce, the businesses need to prioritize ethics in their approach. This means regularly consulting and updating AI use policies and practices to ensure they are fair, transparent and in accordance with industry standards and regulations. It also means being willing and creating the space to listen to user feedback and continuously make the necessary changes to ensure that the use of AI is responsible and ethical.

When discussing ethical considerations ethical considerations, the role of media literacy can be most prominently be identified. It is valuable for the users to know that, as the consumers, they have the opportunity to reach out if they suspect that they are potentially threatened by AI. What's even more important is the knowledge that they not only can, but should reach out. So, although it cannot be denied that artificial intelligence is a global present and future, nor can the development that contributes to the spread of AI use in all areas be prevented, it is still possible for users to protect themselves to a certain level. Thereupon, if the user suspects there is a risk of manipulation, there is room to act and ensure that decision-making is less the result of external assistance, and more on personal calculations and setting priorities. Because of all this, it should be understood that humanity must not lose the need to react to pleasure, but also to displeasure, and to be literate enough in order to be aware of the manner to achieve the objectives.

CONCLUSION

The media literacy in the age of e-commerce is no longer just what is stated in the definitions. Media literacy is challenging to define when e-commerce is augmented by artificial intelligence. Making critical conclusions based on the messages published by the media outlets is a relevant basis for understanding what media literacy is and why it is important, but it is precisely the changing of the meaning of all the mentioned terms that is problematic. Critical inference as an expression does not simply mean the process of thoughtfully making logical judgments based on available data, evidence, and information. It requires general identification, analysis, evaluation, counter-argumentation and synthesis of knowledge, but also a willingness to replace existing knowledge with completely new ones. The messages placed by the media outlets are not the only thing that is known so far, but it is much more than that.

People are constantly targeted by messages, i.e., information, ideas and perspectives, which have different goals, often reflecting the values of the content creators. They can be in the form of notifications; editorials; columns; entertainment, educational, social, cultural, but also propaganda content. That is why it is crucial to understand that almost everything that surrounds individuals is the result of careful and causal placement. Finally, the development of the media involves a transition from traditional to modern or trendy media. This dynamic calls for caution in enumerating what are media outlets, as it is not accurate to say that today's trends are digital media. It is not accurate, because new technologies, user-generated content, interactive and gamified media outlets and ephemeral and disappearing content that increasingly function as classic media must also be taken into account.

The dynamics of today requires an open mind, readiness for efficient and effective knowledge acquisition and appropriate skills for applying the acquired knowledge. All of this is important to ensure successful coping with the challenges of communicating with other entities, as well as a certain level of quality of being. Howbeit, it is not only important whether individuals are sufficiently literate, i.e., media literate, but whether society is literate, i.e., media literate. Selflessness is therefore crucial in making joint efforts to eradicate old habits of lack of interest and to build new, stronger foundations of shared knowledge that will benefit everyone individually and at the same time all together.

REFERENCES

1. Apak, Ö. (2008). Türkiye, Finlandiya ve Irlanda ılköğretim programlarının media okuryazarlığı eduğı ıncelensemi, Yayımlanmaşım Yüksek Lisans Tezi, Kocaeli Üniversitesi Sosyal Bilimler Enstitüsü, Eğitim Bilimleri Anabilim Dalı, Kocaeli
2. Ashta, K. (2022). How Ai Chatbots and voice assistants are driving the e-commerce growth, Haptik
3. AWS Amazon. (2018). Amazon Personalize
4. Bawden, D. (2001). Information and digital literacies: A review of concepts, Journal of Documentation, 57(2), 218-259
5. Boush DM et al. (2015).Deception in the marketplace: The psychology of deceptive persuasion and consumer self-protection
6. Bundy, A. (2004). Australian and New Zealand information literacy framework: Principles, standards and practice (2nd ed.), Australian and New Zealand Institute for Information Literacy
7. Campbell, C., Plangger, K., Sands, S., & Kietzmann, J. (2022). Preparing for an era of deepfakes and AI-generated ads: A framework for understanding responses to manipulated advertising, Journal of Advertising, 51(1), 22-38.
8. Chen, C., & Lyu, L., (2023). A pathway towards responsible AI generated content
9. Chesney B. et al. (2019)Deep fakes: A looming challenge for privacy, democracy, and national security, California Law Review
10. Clark, S. (2021). 6 ways AI-based personalization is improving the customer experience, CMSWire.com
11. Curzon, SC (1995). Information competencies final report: A report submitted to the Commission on Learning Resources and Instructional Technology Work Group on Information Competence CLRIT Task 6.1. 29
12. Dangi, H., & Malik, A., (2017). Personalization in marketing: an exploratory study, International Journal of Internet Marketing and Advertising, 11(2), 124-136.
13. Darke, PR, & Ritchie, RJB (2007). The Defensive Consumer: Advertising Deception, Defensive Processing, and Distrust, Journal of Marketing Research, 44(1), 114–127
14. Dwivedi, YK et al. (2020). Setting the future of digital and social media marketing research: Perspectives and research propositions, International Journal of Information Management, 59
15. Etienne, H. (2021).The future of online trust (and why Deepfake is advancing it), AI and Ethics

16. Europol. (2022). Facing reality? Law enforcement and the challenge of deepfakes, an observatory report

17. Farish K. (2020).Do deepfakes pose a golden opportunity? Considering whether English law should adopt California's publicity right in the age of the deepfake, Journal of Intellectual Property Law & Practice

18. Geru, M., Micu, AE, & Capatina, A.. (2018). Using artificial intelligence on social media's user generated content for disruptive marketing strategies in eCommerce, Economics and Applied Informatics, 24(3), 5-11

19. Giovannella C. (2010). Beyond the Media Literacy: Complex Scenarios and New Literacies for the Future Education, The Centrality of Design

20. Gupta, A., Hathwar, D., & Vijayakumar, A. (2020). Introduction to AI chatbots, International Journal of Engineering Research and Technology, 9(7), 255-258.

21. Hart A. (2002). Media education in 12 European countries a comparative study of teaching media in mother tongue education in secondary schools, E-Collection of the Swiss Federal Institute of Technology Zurich

22. Ho SM et al. (2016).Computer-mediated deception: Strategies revealed by language-action cues in spontaneous communication, Journal of Management Information Systems

23. Jolls T., & Wilson C. (2014). Journal of Media Literacy Education, 6, 2, 68–78

24. Kalakota, R., & Robinson, M. (2001), E-business 2.0: Roadmap for Success, Addison-Wesley

25. Kanade, V. (2022). What is Artificial Intelligence (AI)? definition, types, goals, challenges, and trends in 2022, Spiceworks

26. Kietzmann, J., Lee, L., McCarthy, I., & Kietzmann, T. (2019). Deepfakes: Trick or treat?, Business Horizons, 63

27. Lewis, J., & Jhally, S., (1998). The struggle over media literacy, Journal of communication, 48(1), 109-120

28. Luca, M., & Georgios Z. (2016). Fake It Till You Make It: Reputation, Competition, and Yelp Review Fraud, Management Science, 62, no. 12

29. Ludwig, S., Van Laer, T., De Ruyter, K., & Friedman, M. (2016). Untangling a web of lies: Exploring automated detection of deception in computer-mediated communication, Journal of Management Information Systems, 33(2), 511–541

30. Caldwell, M. et al.(2020)AI-enabled future crime, Crime Science

31. McCarthy, J. (2004). What is Artificial Intelligence?

32. Mianzhu P. (2017). Research progress and application overview of artificial intelligence, Science and technology square

33. Minsky M. (1961). Steps toward Artificial Intelligence, Proceedings of the IRE, 49, 1, 8-30

34. Mirsky, Y., & Lee, W. (2021). The Creation and Detection of Deepfakes: A Survey, ACM Computing Surveys, 54 1-41

35. Perse, EM, & Lambe, J. (2016). Media Effects and Society (2nd ed.), Routledge

36. Rakhra, M., Gopinadh, G., Addepalli, NS, Singh, G., Aliraja, S., Reddy, VSG & Reddy, MN (2021). E-commerce assistance with a smart chatbot using artificial intelligence, 2021 2nd International Conference on Intelligent Engineering and Management (ICIEM) 144-148)

37. Rayport, JF, & Jaworski, BJ (2004), Introduction to e-commerce, McGraw-Hill Irwin MarketspaceU

38. Rossi, F. (2016). Artificial intelligence: Potential benefits and ethical considerations

39. Simplilearn. (2022). Netflix recommendations: How Netflix uses AI, Data Science, and ML, Simplilearn

40. Thoman E., Jolls T., & Share J. (2002). Literacy for The 21st Century: An Overview and Orientation Guide For Media Literacy Education, Center for Media Literacy

41. Westerlund, M. (2019) The Emergence of Deepfake Technology: A Review, Technology Innovation Management Review, 9, 40-53

42. Xiao, B., & Benbasat, I. (2011). Product-Related Deception in E-Commerce: A Theoretical Perspective, MIS Quarterly, 35(1), 169–195

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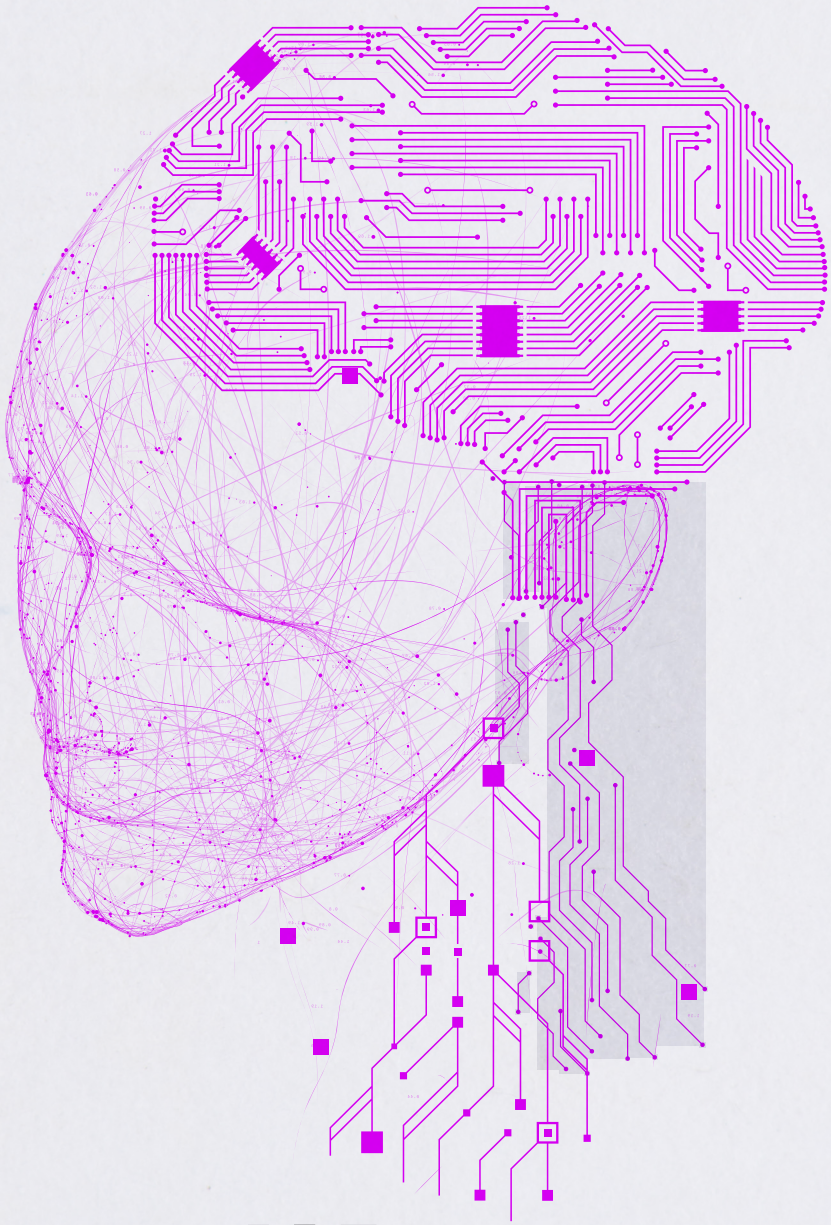

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