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Global Knowledge Inequality from AI-driven Media: A Study Based on Knowledge Acquisition Dilemmas in Developing Countries

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Abstract: In the era of rapid globalization and informatization, AI-driven media is profoundly transforming how information is disseminated. However, using AI algorithms in the media has introduced new disparities in knowledge access, especially impacting developing countries. To recognize these challenges, the paper aims to explore the global knowledge inequality in the age of AI-driven media: challenges for developing countries. The study focused on AI-driven media users in developing countries and adopted a qualitative analysis approach based on literature review. The article commences with a definition of AI-driven media and knowledge, examines the status of knowledge inequality under AI-driven media, and discloses the potential factors of knowledge inequality in developing countries under AI-driven media from three aspects: (1) capital control and AI technology monopoly in developed countries, (2) conflict between mainstream consciousness and social and cultural diversity, and (3) the impact of algorithms on individual self-awareness. This paper finds that AI-driven media often exacerbate existing inequalities of information and knowledge access in developing countries due to capital controls, cultural dominance, algorithmic bias, recommendations in developing countries, etc. Without key interventions, AI-driven media could further exacerbate the knowledge gap.

Keywords: AI-driven media, Knowledge inequality, Developing countries, AI algorithm.

1. Introduction

The rapid development of artificial intelligence has penetrated various fields, and the media industry is no exception. From content creation and distribution to audience interaction and engagement, AI has revolutionized how media content is produced, and distributed, and how users access information [1]. In an age where artificial intelligence (AI) is used across many media platforms, AI-driven media has become more critical than ever in shaping global knowledge dissemination. While these technologies have facilitated knowledge sharing on media platforms, they have created new gaps, particularly in developing countries where systemic restrictions often hinder equal access to knowledge. The current research is mainly focused on analyzing the impact of the use of AI in media, including the influence of algorithm bias, recommendation systems, etc. on user information acquisition and the positive role of AI in media use. However, there is a gap in research on the unequal

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access to knowledge caused by AI-driven media, especially in developing countries. This paper aims to examine the current state of AI-driven media in developing countries and analyze potential systemic factors contributing to knowledge inequality resulting from AI-driven media in these regions. The research question of this paper is how AI-driven media contribute to global knowledge inequality, specifically affecting the ability of developing countries to access and acquire knowledge. To explore these issues, this research adopts a qualitative analysis of existing literature. This study not only provides a clear understanding of the challenges facing developing countries in accessing information and knowledge, especially the use of AI-driven media but also reveals the potential factors facing these challenges, filling the research gap in this part of the research, and providing theoretical support for future researchers to study specific solutions.

2. The Concept of AI-driven Media to Spread Knowledge

2.1. Concept of AI-driven Media

In general, AI-driven media refers to the use of artificial intelligence on media platforms to produce, disseminate, and customize information. Scholars Tsalakanidou and Alam both believe that unlike the traditional media industry, which relies heavily on human creativity and manual labor for its labor-intensive content creation process, AI-driven media utilizes artificial intelligence technologies such as natural language processing (NLP), machine learning, algorithm recommendation, and so on, to quickly generate content and revolutionize the way users consume media [1,2].

The key distinction between AI-driven media and traditional media is the incorporation of artificial intelligence, which is essential for understanding AI-driven media. Chan-Olmsted concludes that AI applications in media are mainly concentrated in eight areas: audience content recommendation /discovery, audience engagement, enhancing audience experience, message optimization, content management, content creation, audience insight, and operational automation [3]. These areas collectively represent the core features of AI-driven media.

2.2. Definition of Knowledge and Research Perspective

In this study, knowledge is understood as information that is accessible, accurate, and suitable for users to understand and make decisions. It can be categorized in many ways, such as from the perspective of media, knowledge can be both knowledge production and audience interpretation. In this paper, the main division is explicit knowledge (EK) and tacit knowledge (TK) [4]. Haque et al. and Mohajan's research state that TK accounts for about 80% of the total knowledge and represents a direct experience that cannot be easily recorded in artifacts and EK accounts for the remaining 20%. EK can be conveyed in language, compiled using various data forms, and recorded in detailed documents [5,6]. This information is factual and logical, expressed in words, numbers, or formulas, allowing for processing and dissemination through technology. [7]. This kind of knowledge, which can be transmitted through technology, is available for users to use and learn on major AI-driven media.

3. The Status of Knowledge Inequality under AI-driven Media

In an AI-driven media environment, knowledge inequality has increased globally, especially in developing countries. Many developing countries currently do not even have access to knowledge through AI-driven media. Externally, some developing countries do not have supporting infrastructure. UNESCO reports that 89% of learners in sub-Saharan Africa do not have a computer at home and 82% do not have an Internet connection at home [8]. While learners in developed countries use AI-driven media to gain knowledge, such as news, technology, finance, and health

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knowledge, learners in some developing countries do not even have access to these sources, reflecting the current situation of AI-driven media exacerbating knowledge inequality. Internally, the adoption of AI technology is low in many developing regions. In the news media sector, the use of AI reveals significant geographical disparities worldwide. Approximately 43.01% of AI applications are concentrated in the Americas, followed by 39.78% in Europe. In contrast, only 5.38% of AI applications are found in Asia, 2.15% in Oceania, and there is very limited use in African news organizations. [9]. Although the knowledge disseminated by AI-driven media is not always positive and accurate, the inability of media in developing countries to take advantage of AI technology leads to a disadvantage and narrow access to knowledge.

Moreover, although with the continuous dissemination of technology, more and more developing countries can access and use AI-driven media, the status of knowledge inequality under AI-driven media is not optimistic. Firstly, in developing countries, algorithmic bias can exacerbate existing inequalities. Researchers have documented AI systems' bias against a variety of demographics, including race, social group, cultural background, age, and gender [10]. AI algorithms used in media can create biases that mislead users in developing countries, hindering their ability to gain knowledge. Secondly, scholars Domke, Feezell, Bojic, and others state that the recommendation system is akin to the "priming" of mainstream media, which highlights a limited number of stories and establishes key topics for society as a whole. [11, 12, 13]. Compared with Western developed countries, some developing countries have disadvantages in culture, social status race, etc. The use of AI in media has placed user knowledge acquisition in some marginalized developing countries under the shadow and control of mainstream national media.

4. Potential Factors for the Systematic Disadvantage of Developing Countries in Global Access to Information

4.1. Capital Control and AI Technology Monopoly in Developed Countries

The knowledge gap hypothesis states that groups of people with greater socioeconomic advantages gain access to information normally disseminated through mass media at a faster rate than others [14]. In the age of AI-driven media, the effects of unequal access to information are becoming increasingly clear in developed countries. Technology monopolies in these nations have resulted in a troubling situation often termed "knowledge slavery." Centralized AI systems enable these countries to control and monopolize both historical and newly generated knowledge. [15]. Due to the centrality and monopoly of AI technology, AI-driven media platforms are mainly controlled by developed countries. These platforms produce, disseminate, and distribute knowledge through algorithms designed and controlled by developed countries. This one-way output makes it impossible for developing countries to independently grasp information sources. For example, most of the applications using AI in the news industry rely on funding from large tech companies, such as Google and Facebook. This presents a serious challenge to the development of technological innovation in news media, as these organizations control the allocation of funds, determining who receives support, the timing of funding, and its specific destinations. [9]. Most of these large technology companies and organizations are from developed countries, such as Open AI, Google, etc. Developing countries do not have these resources and capital, so it is difficult to participate in the technological innovation of AI in the media, and are subject to the monopoly of developing countries in terms of technology.

Moreover, the suppression of developing countries by capital and technology is understood at a deeper level as a relationship between power and knowledge. Christensen's interpretation of Foucault's power and knowledge suggests that although power and knowledge are inextricably linked, it does not mean that "knowledge is power". Power and knowledge are still considered two separate domains, but in any field of knowledge, there is always a field of power, and the two are interrelated

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[16]. As mentioned in the previous paragraph, since the capital and resources tend to the developed countries, these countries hold the right to create and use AI technology, behind the AI-driven media is the control of the developed countries, resulting in the disadvantage of developing countries in acquiring knowledge through these platforms. Because knowledge and rights are interrelated, this inequality in access to knowledge and low rights can create a vicious circle, leading to a widening knowledge gap between developing and developed countries.

4.2. Conflict between Mainstream Consciousness and Social and Cultural Diversity

Although the media is now delivering more diverse information worldwide, its use of AI has disadvantaged local cultures, resulting in the impact of cultural diversity, and affecting the acquisition of regional cultural knowledge in some developing countries. The cause of this conflict between collective consciousness and socio-cultural diversity is algorithmic bias in AI-driven media. Firstly, AI-driven media often favor mainstream culture in producing knowledge and information, marginalizing the diversity and knowledge specific to developing regions. Scholars like Kay and Okoronkwo both agree that some voices control the media, while others struggle to gain recognition. For example, media creators from underrepresented communities or low socioeconomic backgrounds often lack the means to create the high-quality material that algorithms prefer, which reduces their engagement [17,18]. This not only affects some creators with poor economic and social conditions but also makes it impossible for local cultures to be effectively disseminated, reducing the diversity of information available to people in developing countries.

Furthermore, bias in access to diverse cultures also contributes to the disadvantage of access to knowledge in developing countries. Shaffer and Okoronkwo both claim that recommendation algorithms play a key role in determining the content displayed to users on media platforms, such as YouTube, Facebook, and Netflix. These algorithms often prioritize popular, highly engaging content, which frequently aligns with dominant cultural narratives [18,19]. This leads to a conflict between the collective consciousness represented by the dominant culture and the diverse cultures of developing countries. Some users in developing countries cannot interact with the knowledge content created by marginal groups. For example, Taylor observed that Black artists on social media platforms like Instagram and TikTok have raised concerns that, even when they produce content that matches or surpasses that of non-Black creators, it receives fewer views and interactions. This underrepresentation reinforces dominant narratives and also limits audiences' exposure to diverse perspectives and cultural expressions. [20]. Due to the bias of algorithms in AI-driven media towards mainstream consciousness, marginal culture, knowledge, and information are at a disadvantage in terms of access. As a result, the influence of mainstream consciousness continues to expand, marginalizing diverse voices and further diminishing the visibility of unique cultural knowledge in AI-driven media landscapes in developing regions.

4.3. The Impact of Algorithms on Individual Self-awareness

The impact of algorithms on the consciousness of individuals in developing countries also puts them at a potential disadvantage. The "filter bubble" phenomenon, in which media users tend to be exposed to information that agrees with their views [21]. Algorithmic recommendation leads to echo chambers, environments in which individuals primarily encounter beliefs or opinions that are consistent with their own [22]. This environment limits the opportunities for users to be exposed to more knowledge in the media. In the context of developing countries, where the creation and access to information of all kinds is already limited, algorithmic recommendation techniques used by such media platforms further limit the access of individual users in developing countries to knowledge.

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In addition, as mentioned in the previous paragraphs, the algorithm recommendation mainly considers the narrative of mainstream culture, but also affects the personal consciousness of users in developing countries, and the excessive expression of foreign culture may make the knowledge of local culture ignored in the use of AI-driven media in developing countries. Putting their knowledge at a disadvantage at the level of individual consciousness, thereby jeopardizing their access to information.

Furthermore, the impact of AI on individual self-awareness extends to the shaping of values. The researchers evaluated cultural bias across five widely used large language models (OpenAI's GPT-40/4-turbo/4/3.5-turbo/3). They found that all models exhibit cultural values resembling English-speaking and Protestant European countries [23]. The penetration of mainstream cultural values will gradually affect individual values, potentially reinforcing existing knowledge disparities in developing regions by prioritizing perspectives rooted in Western norms over diverse, localized knowledge.

5. Conclusion

Unlike traditional media, AI-driven media utilizes AI algorithms for content creation, distribution, and acquisition across media platforms. Ai-driven media dissemination can be documented using the explicit knowledge disseminated by technology. The current situation of knowledge inequality in AI-driven media is not optimistic. On the one hand, due to technological and infrastructural limitations, developing countries struggle to access AI-driven media and implement AI technology in their media. On the other hand, users who have access to AI-driven media also face the challenge of algorithmic bias and algorithmic recommendations for marginalized and minority groups to acquire media knowledge. Based on the context of the use of AI-driven media, this paper systematically analyzes the systematic disadvantages of developing countries in global information access. Since AI technology is created by large technology companies in developed countries and applied to the media, technology monopoly and power oppression are formed. Based on the relationship between rights and knowledge, it is analyzed that the inequality of knowledge acquisition from AI-driven media in developing countries is affected by capital control and AI technology monopoly in developed countries. Also, AI-driven media is influenced by algorithmic biases and recommendation systems, biased towards the production, dissemination, and acquisition of marginal cultures, and algorithms tend to reinforce mainstream knowledge and culture, causing adverse effects on other cultures and impacting multiculturalism leading to conflicts between mainstream consciousness and socio-cultural diversity, and reducing exposure of users to diverse and local cultural knowledge. It is not conducive to local and multicultural learning for users in developing countries. The use of AI in media also affects individual self-awareness and values, making AI-driven media users in developing countries inclined to access mainstream culture and narrow access to knowledge content. Without critical interventions, AI-driven media will likely exacerbate the existing knowledge gap. Therefore, effective reform and policy adjustment for AI-driven media to promote equitable AI technology access and culturally inclusive algorithm design is very necessary. The study of this paper also has some limitations. This paper does not use empirical research and the number of literature used is limited. Future research can focus on empirical research to verify the theoretical conclusions of this paper. Researchers can also expand the literature review by including a wider range of sources to improve the comprehensiveness of the analysis. Meanwhile, this paper analyzes the disadvantages and causes of developing countries' access to knowledge in AI-driven media but does not propose specific solutions. Future research can be guided by the theoretical research in this paper to explore practical solutions to help developing countries solve this problem.

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