Examining the Perceptions of Communication Faculty Students on Algorithm Literacy and Algorithmic Decision Making

İletişim Fakültesi Öğrencilerinin Algoritma Okuryazarlığı ve Algoritmik Karar Verme Konusundaki Algılarının İncelenmesi

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Abstract

The current digital environment is governed by algorithmic technology. While some studies suggest that algorithms unfairly influence human interests and decisions within this digital world, research focusing on algorithm literacy among students and the role of algorithms in decision-making remains relatively scarce. Therefore, this study seeks to reveal students' algorithm literacy to assess their knowledge and experience with algorithms, as well as the influence of algorithms on their decision-making manners. Focus group interviews were conducted, grounded in theories hypothesizing that algorithms are unfair and that the datasets and models applied in algorithmic systems do not provide unbiased representations of reality. A total of 32 communication students participated in this study, sharing their perceptions on the role of algorithms in decision-making. The research also examined students' experiences with algorithm literacy and whether their decisions extend beyond what algorithms offer. The thematically analyzed findings indicate that algorithms play a double role in decision-making, offering both benefits and challenges, and it is clear that algorithms repeatedly exhibit bias and manipulate users, particularly in position with commercial interests. Notably, it was found that students perceived that algorithms can sometimes limit users' choices by prioritising a particular type of content under the influence of adverts and the nature of the media, thereby creating an unfair bias. Therefore, future research should focus on the design and regulation of algorithms to improve their transparency and mitigate the risks of social manipulation.

Keywords: *Algorithms, Algorithm literacy, Artificial intelligence, Algorithm decisions, Manipulation*

Öz

Günümüz dijital ortamı algoritma teknolojisi tarafından yönetilmektedir. Bazı çalışmalar, algoritmaların bu dijital dünyada insan çıkarlarını ve kararlarını haksız bir şekilde etkilediğini öne sürerken, öğrenciler arasında algoritma okuryazarlığına ve algoritmaların karar vermedeki rolüne odaklanan araştırmalar nispeten azdır. Bu nedenle, bu çalışma öğrencilerin algoritmalarla ilgili bilgi ve deneyimlerinin yanı sıra algoritmaların karar verme biçimleri üzerindeki rolünü değerlendirmek için algoritma okuryazarlıklarını ortaya çıkarmayı amaçlamaktadır. Çalışmada, algoritmaların adil olmadığı ve algoritmaya dayalı sistemlerde uygulanan veri kümelerinin ve modellerinin gerçekliğin tarafsız temsillerini sağlamadığı hipotezlerinden yola çıkılarak odak grup görüşmeleri gerçekleştirilmiştir. Bu çalışmaya toplam 32 iletişim fakültesi öğrencisi katılmış ve algoritmaların karar verme sürecindeki rolüne ilişkin algılarını aktarmışlardır. Araştırma ayrıca öğrencilerin algoritma okuryazarlığı ile ilgili deneyimlerini ve kararlarının algoritmaların sunduklarının ötesine geçip geçmediğini de incelemiştir. Tematik olarak analiz edilen bulgular, algoritmaların karar vermede hem faydalar hem de zorluklar sunan çifte bir rol oynadığını ve algoritmaların, özellikle tecimsel çıkarlar söz konusu olduğunda, yeniden önyargı sergilediğini ve kullanıcıları manipüle ettiğini göstermektedir. Özellikle, öğrencilerin algoritmaların reklamların ve medyanın doğasının etkisi altında belirli bir içerik türünü önceliklendirerek kullanıcıların seçimlerini sınırlayabileceğini ve böylece haksız bir önyargı yaratabileceğini düşündükleri tespit edilmiştir. Bu nedenle, gelecekteki araştırmalar, şeffaflıklarını artırmak ve sosyal manipülasyon risklerini azaltmak için algoritmaların tasarımına ve düzenlenmesine odaklanmalıdır.

Anahtar Kelimeler: algoritma, algoritma okuryazarlığı, yapay zekâ, karar verme, manipülasyon

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Introduction

As technology progresses, artificial intelligence (AI) has become prevalent across fields for various tasks. AI is technology that enables machines to imitate human behaviors and actions (Yin, 2021), often performing tasks with equal or more efficiency compared to humans. AI technology is controlled by algorithms which are sequential instructions that dictate the operations of artificial neurons in machines to emulate humans (Katamba & Kayıhan, 2024). Algorithms possess the capacity to generate their own interactions and decisions, overriding human decisions, due to their ability to support machines in stimulating human-like capabilities such as creativity, reasoning, planning, and learning (Jansen, 2022). While algorithms primarily function in networked environments (Archambault et al., (2024), they impact people's lives in areas such as media, healthcare, politics, public administration, social sciences, and engineering (Gran et al., 2021; Dogruel et al., 2022b)

Latzer & Festic, (2019) stated that algorithms are fixed in a system of shared agency, wherein software components and humans shape one another. Despite algorithms' influence on human activities, they rely on human input to complete tasks. Brkan, (2019) and (Yalcin et al., 2022) noted that algorithms depend on data shared by humans during online activities such as content searching, liking, sharing, and watching videos. This implies algorithms depend on human data shared online or inserted into machines during manufacturing (Dogruel, 2021; Dogruel, Masur, et al., 2022). Algorithms also control people's perceptions and online decisions (Latzer & Festic, 2019; Archambault et al., 2024). The influence between people and algorithms is bidirectional (Wegner, 1997), yet algorithms are considered more powerful in terms of online actions (Brkan, 2019; Yalcin et al., 2022). Therefore, algorithms can be conceptualized as powerful commands that influence human digital activities and control human actions and decisions. To increase on the visibility and interactivity of users with digital content, digital platforms such as websites adopted the approach of Search Engine Optimization (SEO). According to Tsuei et al., (2020), Search Engine Optimization aproach increases digital results accessibility and website's search engine rankings by optimizing elements such as keywords, Meta tags, and website design. They added that SEO also play a role of bridging performance gaps to reach an aspirational point that meets user needs effectively. However, SEO's goals can be achieved easily with the influence of algorithmic driven decisions and algorithm literacy (Tsuei et al., 2020), meaning that the combination of effective SEO, algorithmic decision-making, and algorithm literacy forms a complex web that affects how users and digital platforms operate in the digital age effectively.

However, Shin (2020) challenged algorithmic effectiveness of algorithms, noting that internet users respond to algorithmic decisions based on their perceptions of accuracy and transparency, with some users rejecting these decisions while others accept them after analysis. Wegner (1997) argued that algorithms are blind and rely on human digital behaviors or actions and initial implementation commands. While this suggests that algorithms influence users basing on their technological knowledge or level of algorithm literacy, Dogruel, Masur, et al., 2022) noted that few digital users possess awareness regarding algorithms and critical skills, making it difficult to resist algorithmic directives due to inability to evaluate their influences and functions. Gran et al., (2021) emphasized that beyond algorithmic literacy

knowledge and awareness, a critical approach to the algorithmic systems' underlying mechanisms is crucial.

Given this misunderstanding of algorithm literacy, algorithmic influence, and possible difficulty in resisting algorithms online, this study examines Algorithm Literacy and Algorithmic-driven Decisions of students. While literature addresses algorithmic systems and societal impacts (Burton et al., 2020; Gran et al., 2021), there is limited knowledge regarding conditions influencing algorithmic decisions among internet users, as well as students (Dogruel, Masur, et al., 2022). Also, literature is scarce about users' ability to reject or accept algorithmic decisions and recommendations (Dogruel, 2021).

Therefore, as students are not exempt from these poorly understood algorithmic decisions and operations, this research used qualitative approach to determine how algorithmic decisions impact students academically and their algorithm literacy knowledge and experience. Focus group interviews were conducted, based on theories that algorithms are unfair and that algorithmic systems' data sets do not provide unbiased reality representations, students from Journalism, Radio, Television and Cinema and Public Relations and Advertising departments were interviewed to achieve the objectives of this study.

1. Algorithm Literacy and the role of Algorithmic-driven Decisions in Digital Experience

Algorithm literacy has become important in the digital world, as various aspects of our lives are shaped by algorithmic systems daily which also influence people's perceptions of the world (Moylan & Code, 2024). This implies that algorithms not only control our thinking but also our actions in societies. Since algorithms have become part of us, the need to understand algorithm literacy is inevitable. This literacy includes knowledge and awareness of algorithm actions, their use, and the ability to critically evaluate algorithms when interacting with digital algorithmic systems (Dogruel, Facciorusso, et al., 2022; Moylan & Code, 2024). Therefore, algorithm literacy involves the need for an understanding of algorithms, their responsibilities, and their challenges and benefits among individuals.

The rise of algorithm personalization, which uses data basing on user beliefs, behaviors, interests, and actions to provide targeted advertising and filtered content has shifted the landscape of 21st-century literacy practice and research (Hobbs, 2020). This shift requires a comprehensive understanding of how algorithms work and their influence on digital culture, mainly on social media platforms (Low et al., 2025; Oeldorf-Hirsch & Neubaum, 2023). However, understanding algorithms is not a one way channel, Dogruel, (2021) stated that algorithm literacy includes various dimensions through which users can become largely familiar with this developing technology. She mentioned two primary algorithm literacy dimensions including reasoning dimensions that are based on reasoning or mental; and behavior change dimensions that are based on practical frameworks. Reasoning dimensions are built on knowledge and awareness, and critical evaluation while behavioral change dimensions are built on copying behaviors and creation and design.

Considering the general meaning of the reasoning dimension terminologies, the awareness dimension focuses on recognizing the presence of algorithms and their application in different digital environments, whereas the knowledge dimension involves understanding how algorithms function and their various implications. According Abrams et al., (2015), these two

reasoning dimension structures align with acquiring knowledge concerning algorithms and familiarity with algorithmic terminologies, which leads to acquiring factual knowledge about algorithms and developing skills about them. On the other hand, behavior-related dimensions capture users' algorithmic-related skills in interacting with algorithms, leading to the formation of creative and design -related algorithm literacy. This explanation of both categories of dimensions indicates that each can exist independently, implying that behavior-related dimensions are directly or indirectly connected to reasoning dimensions, meaning that it should be considered vital for the digital users to understand the entire algorithmic process to derive maximum benefit.

In addition, research has revealed that algorithm literacy is multi-faceted, covering attitudes, knowledge, and behaviors (Oeldorf-Hirsch & Neubaum, 2023). However, there are important differences in how algorithm literacy is measured and theorized across studies, partly due to the opaque nature of algorithms themselves (Oeldorf-Hirsch & Neubaum, 2025). This implies that algorithms might differ basing on their nature and probably the systems in which they operate. Furthermore, sociodemographic factors such as education, age, and frequency of digital platform use have been acknowledged as key predictors of algorithmic awareness, with important differences observed between nations (Estrela et al., 2023).

The social, economic, political and ideological dimensions of algorithm literacy are also important. Pasquale (2015) reveals that algorithms are powerful entities that influence social, economic and political decisions, often without our knowledge. For this reason, the inner workings of systems such as reputation, search and finance need to be made transparent. Data brokers, for example, should be required to disclose what data they collect, trade and sell. Kalır (2023), on the other hand, discusses the ideological effects of data production in the context of political and social injustice through the concept of data colonisation. According to Kalır (2023: 1497), data must be transformed into uncontrolled information and squeezed out of its role as a transcendent means of definition to become merely one of many means of representation. The transcendent modernism of technocracy must be rejected, algorithms and technologies must be de-centralised, and non-white algorithms subject to subaltern data must be produced. Only in this way will it be possible to produce the non-colonial data of others. Beyond that, Karakoç Keskin (2024: 340) emphasises algorithmic surveillance. For her, it is important to examine the surveillance practices related to data monitoring and reporting processes in the digital platform ecosystem inherent in the algorithms of today's smart machine systems, in light of the nature of platform capitalism.

So, algorithms continue playing a vital role in determining our digital experiences, and developing algorithm literacy has become important for navigating life in the current digital world (Moylan & Code, 2024). According to Dogruel, Masur, et al., (2022), algorithm literacy involves understanding the technical aspects of algorithms, the ability to critically use algorithmic systems, and their societal implications, meaning that general theorization should be applied in the study of algorithms, as its general utility as a tool that can be leveraged to encourage and build improved algorithmic understanding through an extensible literacy to increase in algorithmic knowledge and to make people aware about the new normal (DeVito, 2021). It can clearly be noted that algorithm literacy can be a ground on which the capacity and opportunities of a person to navigate online can be determined.

In line with algorithm literacy and algorithm-driven decisions, much effort is need by the internet users to understand algorithms to avoid their total control over their lives because,

like individuals plan and prepare for their journeys, they also make plans and decisions before engaging with the internet and technology and their knowledge of algorithms can determine their online outcomes in decision makings such as when to access the internet, what to search for and why, and the duration of online presence among others. These preliminary online or offline decisions by technology users are also made to optimize time and costs, and to enhance efficiency and objectivity (Köchling & Wehner, 2020). However, while some individuals adhere to their written or mentally drafted pre-plans, others deviate from their initial decisions and instead modify their programs upon going online due to the power of algorithms that automatically make decisions on behalf of users (Dogruel, 2021). These unintentional and automated algorithmic decision-making processes cause individuals to alter their online plans, which subsequently changes their online programs and activities, ultimately leading to a failure to achieve their intended objectives both online and sometimes offline.

Möhlmann, & Zalmanson, (2017) defined algorithmic decision-making as "automated decision-making and remote control, as well as standardization of routinized workplace decisions". This definition indicates that algorithmic decisions occur at personal and organizational levels through automated computer generation, but not human desires. The automatic nature suggests individuals may not have knowledge or awareness of the nature or origin of algorithmically influenced decisions. This calls for understanding and acquiring knowledge of algorithm literacy. In this context, Dogruel, (2021) explained that knowledge refers to understanding algorithms' scope and functions, while awareness captures users' ability to recognize algorithmic operations. Algorithmically influenced decisions appear as programs on users' screens through displayed links, pages, and content that influence decision-making (Dogruel, 2021; Gran et al., 2021). According to Şenyüz, (2023), algorithmic decisions are linked to users' websites visited and search history.

This tells that computer-generated algorithms may not effectively identify or differentiate individuals using the same devices at different times particularly in public spaces like internet cafes, banks, and universities and libraries. Consequently, algorithm decisions may appear on the screens of devices currently used by different individuals who may not have any knowledge about the search history of previous users. Shin, (2020) noted that users respond to algorithm decisions emotionally, with some rejecting them while others prioritize algorithmic over human decisions. Users make decisions based on their personal perceptions of systems' accuracy and transparency, considering accurate systems useful. More importantly, as Karakoç Keskin and Demirel (2025: 249) point out, users generally have low awareness of algorithms. Furthermore, users' awareness of automated decision-making across all platforms is lower than their awareness of other dimensions. Additionally, the aforementioned literature indicates that algorithm decisions are both favorable (e.g., acceptances) and unfavorable (rejections) to varying degrees (Yalcin et al., 2022), impacting users differently based on social, recreational, commercial, and political factors (Latzer & Festic, 2019).

(Latzer et al., 2016) asserted that algorithmic decision-making is associated with numerous potential risks, including privacy infringement, political and economic manipulation, biases, censorship and discrimination in computing outputs. Furthermore, algorithm decisions, particularly forceful ones, can lead to implicit discrimination, perceived unfairness, and inequitable treatment of certain groups of internet users (Dogruel, 2021; Archambault et al., 2024).This occurs probably because technology cannot differentiate between young and old,

students and business people, literate and illiterate individuals, and sports enthusiasts from non-sports persons, among others. Additionally, while discussing algorithmic decision-making and the cost of fairness in court proceedings where algorithms were used to determine whether defendants awaiting trial were too dangerous to be released back into communities, (Corbett-Davies et al., 2017) stated that this system involves algorithmic unfairness because they observed that in some cases, black defendants are more likely to be incorrectly classified as high risk than white defendants. Although this unfairness caused by algorithm decisions pertained to legal proceedings, similar issues can be found in other domains.

(Chouldechova et al., 2018) also noted that there were numerous inconsistencies in the administrative data created based on algorithmic predictive analytics, as well as problems faced by welfare workers in accessing the data to make systematic use of information about adults and children which leads to the possibility that some people from certain ethnic groups or particular racial communities, such as those from impoverished backgrounds, are likely to be disadvantaged by relying on analytics tools. This implies that algorithm decisions are biased in many ways, possibly as a result of poor technological usage due to limited knowledge about algorithms by the users, or as a consequence of directives given to algorithms during their initial design and manufacturing process stated to achieve the intended objectives of their developers (Latzer et al., 2016; Şenyüz, 2023:177).

According to Chouldechova et al., (2018), various techniques have been proposed to achieve algorithmic fairness in decision-making, which can maximize public safety by addressing fairness issues to reduce racial disparities. They asserted that fairness in algorithmic decision-making can contribute to equality within communities, ensuring all individuals are held to the same standard regardless of factors like gender, religion, race, region, ethnicity, and political affiliation. Corbett-Davies et al., (2017) proposed that such techniques could establish algorithmic decision rules, increasing accuracy in algorithmic decisions. This suggests human decisions are sometimes negatively influenced by algorithmic decisions. Dogruel, (2021) and Gran et al., (2021) posited that algorithm literacy is necessary to educate individuals on algorithm operations, enabling them to identify transparency in decisions. This can foster trust and minimize users and technology (Gates, 2013).

Furthermore, Burton et al., (2020) noted that there is limited knowledge regarding conditions that lead to rejection or acceptance of algorithmically recommended decisions by internet users. Students are likely to be influenced by automated decisions during learning activities, such as discussions, revision, and research. Unlike human decisions, algorithmic decisions impact both reality construction and social order in societies (Latzer & Festic, 2019), influencing activities in institutions such as schools, banks, factories through favorable decision-making processes that simplify online information discovery.

Since literature indicates that algorithms primarily rely on personal data inserted into their systems by users to operate, their capacity to distribute personal information can threaten privacy and violate users' rights (Latzer et al., 2016). This presents a potential security risk to individuals, institutions, and countries regarding sensitive information. To ensure privacy protection measures regarding algorithms, Dogruel, (2021) proposed that privacy literacy should be employed in the digital world. Park, (2013) also emphasized privacy measures as a strategy for understanding digital control and data flow, enabling users to protect their identities online. Mahmud et al., (2022) and Woods et al., (2020) suggest that the primary factors influencing algorithmic decision-making are time and cost savings, increased

confidence in algorithmic decisions, risk minimization, and productivity enhancement. This means that despite individuals approaching online platforms with diverse choices and predetermined decisions, numerous factors influence their online decision-making processes.

In an academic context, institutions may employ algorithms potentially through bots to ensure equitable and objective information dissemination to online users. However, this approach may not guarantee positive algorithmic influence on academic services, as individuals retain autonomy over their online activities, and decisions are influenced by preference and emotions (Shin, 2020). It means personal preferences may lead to unequal impact of algorithm decisions on users. On the contrary, Lepri et al., (2018) said that algorithmic decision-making is likely more impartial than human decisions.

Additionally, differences can also arise from users changing their decisions based on age, gender, or online ethnicity. Online ethnicity functions as a 'filter bubble system,' where algorithms disseminate information based solely on users' search history (Şenyüz, 2023). Burton et al., (2020) stated that determining algorithm hatred requires research emphasizing theory integration. This is because algorithms can produce biased outcomes when trained inaccurately, particularly when input data are biased (Köchling & Wehner, 2020). Consequently, algorithms can be capable of replicating or producing biased decisions if their input (or training) data are biased.

However, algorithmic decision biases are obvious in algorithmically controlled technology outcomes and are recognized after decision-making (Lee, 2018). The lack of transparency in input data and algorithms originates from algorithm design and implementation, suggesting algorithms exert greater influence than human decisions. For instance, using some applications, websites, or software often requires accepting 'cookies' without rejection options. According to Gran et al., (2021), this forces users to accept unknown 'algorithm forced decisions,' which they have no knowledge about demonstrating algorithms' influence over human decisions. Archambault et al., (2024) also stated that algorithmic systems can surpass human decision-making due to their alleged neutrality.

These compulsory decisions can lead to disparities in what may be termed '*artificial human intelligence*,' meaning the integration of both artificial and human intelligence. This may result in bias in both algorithmic and human decision-making. Köchling & Wehner, (2020) identified the main causes of algorithmic biases as historical, representational, quality of data input, emergent bias, and technical. Although individuals occasionally express dissatisfaction with algorithm decisions that contradict theirs, they respond positively when advantageous decisions are made by algorithms over human decisions. Conversely, users react negatively when disadvantageous decisions are made by algorithms against human decisions, however, this does not deter them from utilizing technology and adhering to algorithm decisions.

2. Methodology

This study is grounded on theoretical frameworks evaluating algorithmic fairness. Elish & Boyd, (2018) argued that datasets and models in algorithmic systems fail to offer neutral representations of reality as a result of being influenced by individuals, tools, and power structures that prioritize certain perspectives. Longhofer & Winchester, (2023) state that while 'data sharing' in online environments might appear beneficial for streamlining governmental processes, an individual labeled as 'risky' can face persistent marginalization,

online data is two faced. Algorithms spread prevailing assumptions, and inaccurate information circulation may lead to erroneous decisions. Therefore, the study examines communication students' algorithm literacy and their ability to go beyond algorithmic decision limitations. Focus group discussions, defined as 'an informal discussion among selected individuals about specific topics' (Beck et al., 1986:73), were conducted within the scope of the research. These discussions were recorded, written, and analyzed by qualitative methodologies, typically involving content or thematic analysis (Wilkinson, 1998). Data was thematically grouped and analysed basing on the study themes centered on the objectives and the content gathered such as; algorithm literacy knowledge, students' perceptions, impacts, algorithmic guidance etc. Permission for the research was received from Ankara Hacı Bayram Veli University Ethics Committee on 05.02.2025 with the number 328418.

The study sample comprises communication students from Ankara Hacı Bayram Veli University (HBV). Four groups of eight students each from Journalism, Radio, Television and Cinema, and Public Relations departments participated on the grounds of personal consent, totaling 32 participants. The interviews were held between 05 February 2025 and 05 April 2025. Given the participants' homogeneous age and educational background, the analysis was conducted collectively rather than individually. To achieve the aims of the study, the following main questions were asked to shape the discussion;

R.Q.1: How much knowledge and awareness do Communication Faculty students have about algorithms?

R.Q.2: What knowledge, skills, and experiences do students have in questioning the content and decisions presented by algorithms?

R.Q.3: What is the algorithms' guiding role in students' decision making process?

R.Q.4: Are algorithms fair or biased according to students' perceptions?

R.Q.5: What are the positive and negative aspects of algorithm decisions?

R.Q.6: What are Communication Faculty students' perceptions (positive or negative) of the role of algorithms in their academic lives?

2.1. Limitations of the study

Given the developing nature of algorithm literacy and its decision-making processes, students possessed limited knowledge on the subject, which obstructed the study to dig deeper into the topic due to a scarcity of technical data. The complexity involved in measuring algorithm literacy among students was a limitation, resulting in difficulties in selecting suitable participants. Another limitation encountered in the study was the insufficiency of existing literature, as there is currently a shortage of scholarly work on this topic. The interdisciplinary nature of the topic also presented a limitation. Algorithm literacy includes various fields such as advertising, ethics, media, and communication theory, requiring an interdisciplinary approach that complicated the research design.

3. Findings of the study

3.1. Algorithm Literacy: Participants' knowledge and experience with algorithms

During the focus group interviews, participants were asked about their understanding of algorithms and their evaluation of the role algorithms play on digital platforms. The findings indicated that participants' knowledge of algorithms was generally shaped around personalized content and advertising experiences. A majority of participants stated that algorithms shape content based on users' previous interactions and preferences, thus customizing their experiences on digital platforms. For instance, Participant P1 stated that algorithms try to introduce users to new areas of interest, possibly exposing them to content they have not previously encountered. This means that algorithms not only guide users according to their known preferences but also influence new discoveries.

In discussions regarding the role of algorithms, the focus group mentioned the importance of arrangements based on user preferences. Participants such as K2, K7, K15, K19, K20, K23, K24, K28, K30, and K31 emphasized that algorithms analyze users' content interactions and highlight the content that attracts their attention, thus keeping user engagement with the platform. In addition, various participants stated that algorithms are not only influenced by individual preferences but also by commercial interests and social trends, showing that algorithms have a wider sphere of influence beyond user experience. Participants including P3, P5, P7, P10, P16, P18, and P22 stated that algorithms also affect user experience by personalizing advertisements on digital platforms. While advertisements are shaped to align with user interests, algorithms might sometimes present unwanted content and advertisements to the users. Participant K10 noted that algorithms force users to view even 'unwanted ads' and that platforms try to manipulate users through advertisements.

Table 1. Findings of the Focus Group Interviews

	Opinions and Experience	Positive Aspects	Challenges / Negative Aspects	Role of Algorithms
Use of algorithms in digital academic life	Participants state that algorithms are important in terms of providing access to accurate and fast information.	Time saving, rapid access to accurate information, acceleration of academic research	Directing the user, manipulation, Surveillance Shaping by media bosses, disinformation, limited access, unwanted content	Orientation, quick access to information, increased efficiency of research
Evaluating the decisions of algorithms	Genrally, algorithm decisions are correct, but they can sometimes be misleading.	Fast decisions, easy access to information	Misleading information, credibility problem	Participants generally find the algorithms' decisions useful, but note that they may provide inaccurate or incomplete information.
Questioning and modifying the content and decisions presented by algorithms	Participants talk about their ability to interact with content and recommendations, query and make changes through techniques such as SEO.	Questioning content, changing rankings with SEO	Limited impact in some cases, incomplete understanding of algorithms	Participants can question and, in some cases, change the content suggested by the algorithms. However, there are some limitations.
Benefits of algorithms	The benefits of algorithms are concentrated in	Time saving, fast information access, big data,	-	Participants emphasize that algorithms save time, especially in

	saving time, finding the right sources and speeding up research.	personalized and tailored content		academic research, and provide accurate information quickly.
Challenges and downsides of algorithms	Disinformation, standardization,	-	Misleading information, credibility issues, need for research and inquiry	Participants also point out that algorithms can provide inaccurate or misleading information, and content from unreliable sources.
The role of algorithms on objectivity and decisions	Decrease in critical thinking skills, decrease in diversity	Impartial flow of information (in some cases), fair outcomes	Biased decisions, compulsion to consume, restriction of choices	Participants state that algorithms are sometimes impartial, but often lead the user to certain preferences.

Source: Primary data

P8 stated that algorithms are shaped by 'media moguls,' suggesting that the impact of these powerful actors on algorithmic processes are much greater than that of individual user preferences. This reveals that algorithms are not solely influenced by individual preferences but are also shaped by the interests of the media and advertising industries. This indicates the power of the media even in digital environment. The influence of media proprietors on algorithms highlights wider societal and commercial dimensions beyond ordinary user experiences. However, some participants lacked a clear understanding of how algorithms work and the data used in content shaping, and how it does it. Especially, K4, K9, and K25 recognized a deficiency in knowledge regarding algorithmic functioning and emphasized that users do not fully understand these processes.

Although P4 stated that algorithms personalize content for user 'convenience,' he lacked enough information about the primary mechanisms of algorithms. This highlights the opaqueness of algorithms on digital platforms and the low level of awareness among users regarding these processes. P9 expressed concerns about the possibility for algorithms to be used manipulatively to influence users. The participant stated that algorithms could affect social media content, especially during election periods, and possibly 'alter the outcomes of national elections.' This shows that algorithms on digital platforms possess the potential for manipulation, not only for commercial interests, but also to involve social and political aspects.

Similar to other technological applications such as bots, algorithms also operate across networks to interact with one another by means of internet-based services, including recommended videos, messaging, information sharing, writing , content creation, and information circulation (Lutkevich & Gillis, 2024). This indicates that algorithmic instructions are based on human data, which they also use to interact with human beings, thus enabling them to imitate human behaviors and address human problems. This also suggests that human-controlled algorithms can support individuals' manipulative or political views.

Algorithms personalize content on digital platforms, making users' engagement with the platform continuous. However, this also places significant control over users' digital experiences in the hands of algorithms. Participants emphasized the consumer-directing role of algorithms. For example, P7 mentioned that algorithms occupy 'a kind of executive position that manages the consumer' on the digital platforms. This highlights the concept that

algorithms guide users as passive consumers, and determining their content choices further. Algorithms control not only users' content consumption habits but also their interactions within the digital world.

Focus group discussions reveal that algorithms on digital platforms not only shape individual user experiences but also have social and commercial impacts. Algorithms function as mechanisms serving the interests of media moguls and advertisers while distributing content and advertisements based on users' interests. Additionally, the lack of transparency and the potential for manipulation of algorithms emerge as an important issue. Participants pointed out that algorithms often manipulate users without their awareness and can impact social events.

3.2. Guidance by Algorithms, Transparency and Manipulation

Most participants (P1, P6, P2, P9, P12, P13, P15, P18, P20, P21, P24, P25, P27, P29, P30, P31, P32) mentioned that they noticed the content directed to them by algorithms on digital platforms, attributing it on users' search history, clicking habits or interests as the evident directions.

P1 expressed his awareness of the effectiveness of algorithms by stating that algorithms occasionally present the topics they want to 'impose' on the user, and do not show unwanted content. P2 stated that algorithms constantly present content, especially about products and advertisements that are of interest to him, and that this may create the feeling of being 'constantly monitored', in other words, surveillance. P6, P18, P21, P25 and P9 also observed that the content they encountered on digital platforms was associated with the topics they had previously clicked on or those that were in their interests, oftenly leading them to them to certain thoughts or products.

Effectively, participants expressed that algorithms' guidance can have not only negative but also positive effects. Algorithms sometimes allow users to access content that they were not previously interested in, while sometimes they can direct the user to certain intended content. AI currently provides several significant benefits that facilitate social interactions as individuals employ technology to address their daily challenges (Katamba & Kayıhan, 2024). Problem-solving in digital environments is a process that requires understanding of the problem, its causes, risks, and potential solutions (Katamba, 2023).

In this context, Tucker, (2018) stated that humans adhere to algorithms when addressing digital problems due to the ability to solve digital problems. Algorithms are defined as instructions or rules that are followed chronologically to resolve specific given problems (Kayihan et al., 2021). This implies that an algorithm is not an outcome, but rather a pathway leading to the result, which can be understood that AI, as a system, depends on other departments to function, with algorithms as one of the primary departments that govern AI systems. According to Katamba & Kayıhan, (2024), AI employs artificial neurons as its cognitive centers to capture data and information from scattered internet sources, which also store data and perform other functions. However, the process by which artificial neurons execute tasks follows algorithmic commands, which are interconnected.

P4 and P19 suggested that they were aware of the impact of algorithms in guiding users, but with no clear information about how and why this was done. This might be as a result of limited transparency and knowledge of the algorithm operations in digital platforms, and low level of users' awareness of these processes. Additionally, P8 emphasized

that algorithms serve the interests of users, advertisers, and media moguls. This raises concerns that algorithms may have the potential to shape public opinion. However, P10 stated that algorithms only work in the interests of the platforms and this leads to an information flow that is "far from reality".

Most participants believed that algorithms deliver content and ads based on personal preferences, although they sometimes restrict personal preferences. Some participants are uncomfortable with algorithms and are overwhelmed by their constant exposure to the same content. P2 and P6 stated that the constant presentations of 'interesting' content can create the feeling of being "constantly watched" and "forced to shop". This is both the potential for algorithms to steer the user according to their own preferences as well as surveilling their online actions. As Evren & Koyuncu, (2024) state, algorithms form a surveillance and control mechanism threaten people's freedoms and security through algorithm domination.

Participants' views clearly demonstrate how algorithms operate on digital platforms, and drive content through search engines and recommendation systems. Algorithms personalize the user's experience by delivering content and ads based on their previous interactions, preferences and interests. However, this personalization can have both positive and negative consequences. Positive effects include more efficient information seeking and ease of market research, while negative effects include lack of transparency and the risk of commercial manipulation. Participants warned that algorithm influence on personal preferences may push users to "consume" more, thus prevent them from accessing different perspectives.

3.3. Questionability and influence of Algorithms and the Role of Education Level

The literature shows that educational background can be a determining factor in algorithm literacy. For instance, Karaman and Yiğit's (2024: 173) study found differences in algorithm knowledge among Turkish high school graduates. Additionally, differences were observed between regular education students and second-shift students at undergraduate level. Although this study assumed that Communication Faculty students would have basic knowledge of algorithms, it was found that students' algorithm literacy levels differ according to their department and course selection.

Many participants (P1, P11, P6, P16, P18, P20, P21, P14, P27, and P28) reported having skills in questioning and influencing algorithmic selected content. However, it was observed that the expertise required for these skills differed among participants; for some, it was a more straightforward process, while others found it more challenging. This indicates that some students have knowledge and awareness of algorithm literacy compared to others who found challenges in using them. P1 expressed her capability to influence algorithms and influence content rankings through search engine optimization (SEO), highlighting the significance of SEO knowledge as a tool for influencing content ranking. P11 stated that after examining algorithm-generated content, he reported unsatisfactory suggestions, causing their influence. His understanding of SEO further enabled him to manipulate content rankings. P6 also stated her ability to question algorithmic suggestions and alter unsatisfactory information, attributing her skills to her expertise in an advertising agency, where she aligns content with user preferences.

The participants' ability to influence algorithms mainly depended on their levels of education and knowledge, particularly in SEO and algorithm literacy, which increase their capacity to influence content. P8 stated that training they receive fostered a conscious approach to

algorithmic impositions, helping collaboration with artificial intelligence to access correct data. This shows a sensitivity to the accuracy of algorithm-offered content and a deliberate effort to find preferred data. P10 mentioned his strong command of SEO infrastructure, which enabled his better understanding of algorithms and a more confident approach to manipulating content rankings. SEO knowledge plays an important role in participants' ability to shape and change digital content.

From a communication standpoint, Lomborg & Kapsch, (2020) apply the communication theory of decoding to boost understanding of algorithms. This approach aims to address knowledge gaps needed to be interpreted for effective communication, especially relating to algorithms. As algorithms are not directly understandable, users try to understand them through processes of knowing, feeling, and interacting. Knowing an algorithm involves being aware of its existence and basic operation, which differs among individuals and is shaped by formal education, personal experiences, and information from media and discussions with others (Marmolejo-Ramos et al., 2025; Oeldorf-Hirsch & Neubaum, 2025). In this study, it was found that participants' knowledge of functioning of algorithms enabled them to question algorithmic decisions.

Many participants emphasized the importance of questioning algorithm-suggested content, seeing it as an important strategy. Additionally, the view that algorithms do not guarantee content accuracy and can sometimes be misleading was also prominent. P2 stated that algorithms constantly suggest different content and that he thinks that the variation of social media posts helps algorithms to change. This shows that algorithms evolve according to user interactions and content preferences and that users have an influence in this process. P9 stated that although he questions the content provided by the algorithms, he does not have the ability to make direct changes to the algorithms. This shows that although algorithms provide a certain degree of control over users, some participants have limited influence in this regard.

Lutkevich & Gillis, (2024) stated that the data used by algorithms for interactivity and decision-making is represented in form of words or numbers, which operate on instructions such as decision-making processes and arithmetic. Therefore, algorithm literacy and technical knowledge play an important role to influence participants on the use of algorithms. Knowledge and experience with algorithms provides a powerful tool for influencing content and guiding users more effectively on platforms. P5 and P14 believed that they usually have the ability to change the content offered by algorithms, however, P14 worried that this is not much of a skill and is more at the level of questioning. P31 noted that he could change the suggested content by complaining or hiding it. This shows one of the limited interventions that users can take against unsatisfactory content offered by the algorithms.

The level of participants' ability to intervene in algorithms directly affects their experiences on digital platforms. Participants with SEO knowledge and algorithm literacy stated that they generally had more opportunities to influence content. P1 and P11 stated that having SEO knowledge gave them a significant advantage in changing the ranking of content by algorithms. This knowledge makes it easier for them to intervene more and direct digital content. P8 emphasized the ability of intervening in content management using training and artificial intelligence skills. This suggests that a knowledge-based approach to the content presented by algorithms enables a more informed intervention.

Participants indicated that they have significant knowledge and skills in influencing the algorithmic-suggested content. So, SEO knowledge and algorithm literacy provide powerful tools to change the ranking of content and influence user referrals. However, the capacity to question and change the content suggested by algorithms varied across participants; some participants were very competent in this regard, while others were only able to intervene in a limited way. While questioning and critique of algorithms can enable users to have a more informed digital experience, there is often limited control over the content provided by the platforms' algorithms.

3.4. Students' perception of whether algorithms' Decisions are Fair or Biased

Focus group discussions explored how participants perceived decisions that are made by algorithms and whether they thought these decisions are generally fair or biased. The study also examined how algorithms influence and shape participants' choices and perceptions. According to participants' views, algorithmic decisions are often perceived as both biased and fair, basing on certain situations. For instance, P1 stated that he generally perceived the decisions of algorithms as fair, he did not indicate any bias. P11 significantly noted that algorithms are more neutral than humans in the flow of information although they impose unfair impositions on issues such as advertising and consumption. Participants' views are in line with Airoldi & Rokka, (2022:5-10)'s view that algorithms lead to consumption.

P3 stated that algorithms make egalitarian decisions in terms of academics, but that these processes can be biased from time to time because they give too much guidance on social media and consumption issues. P6 added on others' views that algorithms can be weak in objectivity and impartiality, thus being biased towards certain views, especially in areas such as ideological issues and news. This supports the idea that algorithms can often be pro-Western. P9 stated that he finds algorithmic-generated decissions both biased and fair depending on the topic, user, and content interpretation skills. Other views indicated that algorithms can make one lose feelings of making a choice. Participants also stated that algorithms help in internet management.

Participants offered a variety of views on how algorithms influence their choices and behavior. Generally, algorithms are thought to have the potential to guide participants and change their consumption habits: P3 mentioned that algorithms constantly suggest similar content after product searches and advertisements on social media, leading to overconsumption. P14 emphasized that although algorithms manipulate people's minds, they are not direct impositions. P5 stated that algorithms make biased decisions that can affect people's choices in favor of algorithms, according to literature, this happens especially to the users who have little or no knowledge, awareness or skills on algorithm literacy hence giving giving space to algorithms to impose ideas by force as agreed by participants. Additionally, P7 noted that algorithms limit users' online activities by constantly showing the same content, thus repeating the same actions and probably same results. However, he suggests that algorithms are fair in terms of social events and dissemination of accurate information. P9 emphasized that algorithms direct their decisions to advertisers, meaning that users make their choices based on the imposed content.

Also, participants expressed concerns about how algorithms can impose ideas and divert users into certain directions: P10 considered it as abnormal and wrong for algorithms to impose external ideas into people's thoughts, and P11 said that this can confuse people by giving

priority to algorithmic decisions above human ideas which constitutes ethical violations. He emphasized that algorithms direct people to unnecessary content and forceful consumptions.

The participants' views continued to differ on whether algorithms are fair or biased. P7 mentioned that algorithms are fair for the content that affects the entire society, but not on personal basis. This is probably because the society involves alot of people and they first agree on societal changing decisions, considering only the important ones. This shows that algorithms can be effective for social events where accuracy is verified, as well as creating problems for personal preferences. P6 emphasized that algorithms are often not objective on ideological issues, advising that algorithms should not fully be trusted, especially on sensitive topics such as news, conflicts, and war. Marmolejo-Ramos et al., (2025) agreed with this findings stating that trust in algorithmic decision-making depends on factors such as statistical literacy, which influences trust negatively in risky situations but positively in situations where there is high similarity with the algorithm

There are two main themes that stand out in terms of how participants perceive the decisions of algorithms; positive views about fairness and impartiality, and concerns about bias:

1. Fairness Opinions: Some participants believe that algorithms are fair in certain situations and facilitate access to accurate information. This is particularly perceived in areas such as social events, and in situations where users are algorithmically leterate.

The views of Communication Faculty students on the fairness of algorithms highlight the necessity of Karakoç Keskin's (2024: 345) recommendation that algorithm literacy courses should be designed for all levels of education. According to Karakoç Keskin, these courses should cover the conceptual framework of critical algorithm studies and focus on internet users' control over their own data. They should also raise awareness of the manipulative effects of algorithms. It is understood that, although Communication Faculty students are knowledgeable about SEO and other processes, they may not realise that algorithms are not always fair.

2. Bias Concerns: Most views pointed out that algorithms make biased decisions and that the constant recommendation of consumption-oriented content creates the effect of forced guidance and imposition of opinion. It was stated that algorithms can be biased especially on ideological and political issues.

In the focus group discussions, it was observed that although the power of algorithms to influence users' choices through content manupulation is important, this power sometimes leads to unfaireness and biase whice causes both positive and negative impacts of algorithmic-driven decisions. Ttherefore, participants argued that more attention should be paid to the ethical issues that arise as a result of algorithm control if we are to maintan impartiality, objectivity, and fairness of algorithms.

Conclusion

Algorithms on digital platforms have become important tools for facilitating quick and easy access to information and resource discovery, especially within academic settings. A majority of participants pointed out that algorithms provide the efficiency of information access and accelerate research processes. In addition, algorithms offer a more personalized experience by customizing content in line with users' interests. However, besides these advantages, some challenges connected to algorithms have been discovered. Particularly,

issues such as manipulation, media mogul influence, Western bias, disinformation, incomplete data, and restricted access raise concerns regarding the reliability of algorithms. Participants noted that algorithms can occasionally disseminate inaccurate and false information, and restrict access to diverse information sources.

Another striking finding of the research relates to the algorithmic influence on users' decision-making processes. Participants stated that recommendation systems on digital platforms direct users towards certain content, frequently prioritizing the interests of advertisers. In particular, platforms such as social media and search engines, while offering content based on user preferences, primarily display content associated with advertising and commercial interests. This practice can limit users' freedom of choice and reinforce perceptions of algorithmic bias. However, participants can apply various strategies to ease the impact of algorithms on their choices, such as critically examining content or altering preferences using tools like SEO. This ability is largely related to the training received by participants. Therefore, it is evident that having skills, particularly algorithm literacy, into undergraduate and pre-undergraduate education is vital for developing the ability to critically evaluate and change algorithmic decisions, especially the negative ones.

In conclusion, the role of algorithms in the digital setting includes both advantageous and problematic aspects. It has been observed that algorithms frequently show bias and manipulate users, particularly in position with commercial interests. It was also emphasized that, under the influence of advertisers and media moguls, algorithms can sometimes narrow users' choices by highlighting specific content, possibly leading to an unfair orientation. On the other hand, it was stated that algorithms also offer content associated to users' preferences and offer more personalized experiences, this is often driven by consumption behaviors and shaped by certain interests. This raises questions about the fairness of algorithms and may limit users' freedom of choice. So, enhancing the transparency of algorithms on digital platforms would be an important step towards shaping users' experiences in a fair and more informed way. Future research is recommended to examine into algorithm design and regulation to increase transparency and mitigate the risks of social manipulation.

Explanations

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