UDK: 004:316.472.4-057.875
004.738.5
DOI: https://doi.org/10.46763/BSSR2321199s

SOCIAL MEDIA ALGORITHMS AND DATA MANAGEMENT

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Abstract
Although the audience in the digital media space has more power than in the traditional media environment, as indicated by their ability to create, reshape and share content, media users' behavior is shaped by the use of algorithms and big data management. Taking into consideration the fact that students use the internet and social media platforms daily, this paper aims to examine their perceptions and viewpoints on the operation of algorithms and data management on the Internet. According to a survey conducted by the authors, which consists of 200 respondents, two-thirds of students notice the results of the algorithmic personalization, filtered selection of content and news, and the customized display of content on social media. Even though 70% of them realize that user activities are continually monitored and that control over personal data online is taken over by large companies and/or a third party, most respondents express only moderate concern for their data online (82%), which further confirms the fact that only a small percentage of students (18%) almost always read the terms of use on a website, application, or internet service.
***Keywords**: social media, big data, algorithms, students*

Introduction

In the modern communication environment which relies on advanced technology, people become the captives of the interests of "surveillance capitalists" (Zuboff, 2020), due to their actions in the digital domain. Despite the optimistic predictions that digital technology and the introduction of new communication platforms will encourage the formation of a new democratic zone and civic activism, there are increasing attempts to control, monitor and direct individuals and groups toward particular commercial and political goals. Such pretensions are demonstrated by companies and institutions, which collect, store and analyze "every trace of human activity" while having some benefit from big data (Vaidhyanathan, 2018, p. 74). The use of big data observed as the next level of datafication and described as the "transformation of social action into online quantified data, thus allowing for real-time tracking and predictive analysis" (Van Dijck, 2014, p. 198), is linked to algorithms involved in the organization, classification, and categorization of digital content. "Algorithms contain a series of digital instructions programmed into computerized systems so that they recognize patterns and enable data mining and collection" (Chayko, 2018, p. 103). Simultaneously with finding and displaying relevant, customized information to network users, a database containing a personal archive and profile about the user is created for the future exploitation of their personality and behavior shaping. These processes are mostly carried out without the knowledge and awareness of the users of digital services, and the effects reach deep and touch the most hidden level of their personality - "The greatest change happens when using new media becomes our routine, when we accept new media to the extent that we neither think about their functioning mechanisms, nor their consequences on our behavior (Aleksić & Stamenković, 2018, p. 104). Needs, feelings, attitudes, affinities, interests, and other segments of the lives of networked people become available and visible to the trading elite that exchanges the data to successfully sell political ideas, and ideological beliefs, as well as necessary and redundant commercial products to users. Any use of digital media and smart devices leads deeper into a surveillance experiment in which privacy, autonomy, and freedom of choice are lost so that users become the captives of other people's interests, decisions, and recommendations.

In addition, every online activity becomes a trace that is monitored, analyzed, and used for different purposes, such as creating algorithmic profiles based on a user's online activity which is valuable for various companies from a commercial point of view. These traces provide data about the identity and lifestyles of users, who, almost entirely unaware of such manipulative games, supported by artificial intelligence in recent times, continue to participate in the modern forms of totalitarian surveillance. Based on the people's previous online experiences, algorithms select, filter and display content that is personalized and customized to the individual, by the existing attitudes, opinions, choices, and emotions. Also, it can produce a distorted image of reality, and hide a different world, rich with alternatives, from the digital

universe users. On the other hand, the level of criticism towards the algorithmic programming of social reality can vary among media users, which depends on numerous factors, such as user behavior, the degree of participation online, the level of education, as well as the knowledge of the methods of functioning of modern, digital communications based on the principles of algorithmic organization of information space. Moreover, the unpredictability of content that differs from the media users' preferences and interests, may cause skepticism of young people towards a social media platform as a provider of information, specifically the awareness of the reciprocal relationship between user behavior and algorithm-dependent decisions (Swart, 2021). If users can detect latent forms of manipulation carried out by organizations, institutions, groups, and individuals on the internet analytically and critically, the belief that the benefits of the digital world are easily accessible, with plenty of knowledge available and social barriers removed, becomes a delusion.

In a world free from hierarchical forms of influence of traditional and official news sources, social media platforms and search engines, together with the companies that own them, have become the dominant distributors of information and programmed consciousness. These groups are taking over the role of information gatekeepers and social agenda editing, thus suppressing the former information masters. In addition, the difference is that instead of the human factor, in the domain of social media and search engines, the editorial function is taken over by an algorithm, under the influence of the criteria of those who created and implemented it (Presuel & Martinez Sierra, 2019). Taking into account that students use the Internet and social media platforms daily, this paper aims to examine their perception of and attitudes toward the operation of algorithms and data management on the Internet.

Data Trading on the Internet - Circumstances and Consequences

Contrary to the expectations that the internet will enable greater freedom and autonomy of users, that they will be connected with others, eliminate spatial distance and facilitate learning, obtaining information, and providing entertainment, the reality framed by digital experience reveals its negative side. Although the internet provides various possibilities for civic engagement, whether of social, political, or entertainment nature (Obradović & Mitrović, 2019)[1], every time an individual accesses the online space, is the beginning of their activity being tracked based on the content of their search, the websites they visit and the action they take, such as clicking on news, selecting a product of purchase, or liking on social media. The digital world has evolved into a stage where network users are permanent participants that attract all the attention, particularly interested institutions, advertisers, organizations, and social media owners. However, digital technology itself cannot be the cause

[1] All translations of quotations made by non-English authors were made by the authors of the article.

of the current situation; its use is always influenced by social, political, and economic factors.

Commercial imperatives dictate the further direction and cannot be equated and justified by technological inevitability. For this reason, according to Shoshana Zuboff, we should look for puppeteers "who secretly, behind the scenes, control the machines and tell them what to do" (Zuboff, 2020, p. 27). Zuboff also pointed out the modern form of capitalism, the so-called surveillance capitalism, which claims unilateral ownership of the human experience and behavioral data. While one part of the data is used to improve services and products, the other part - a private behavioral surplus, is used to predict future behavior thanks to machine intelligence. Additionally, these data are transformed into prognostic products and become key items on the market of ideas (Zuboff, 2020, p.18). An insight into these data enables the prediction of future behavior and directs millions of people around the world toward acceptable choices dictated by surveillance capitalists. Behavior modification is becoming a goal, and how it is achieved is becoming more hidden, perfidious, and complex. Through simple decisions such as purchasing a product, watching a certain movie, or visiting a restaurant, to forming a lifestyle or a political or ideological orientation, a new market project is imposed and is managed from the shadows by the most intimate part of our personality, and cannot be avoided. Data mining has become a lucrative strategy that ensures a long-term impact on the user and their behavior. It is easy to influence people's future activities with filtered content if it is known what they want, their personal and professional interests, plans, and habits. Therefore, based on the extracted data, one can assume the structure of an individual's personality, character, affinities, what they want to have, buy, do, or what they want to be. It has become generally accepted that personal data that users leave online is used, classified, and grouped and this process is carried out with the help of search tools, the most popular of which is *Google*. Also, these search tools serve users by providing information they consider relevant based on individual user's previous online activities, while at the same time collecting, sorting, storing, and selling data to advertisers and other third parties. Only a small number of users are aware that their privacy has been violated, and the issue emerges as the result of the unread terms of use, which are complex, incomprehensible, and changeable. One of the problems is the insufficient critical potential of users to understand how they can protect themselves and share as little personal data as possible.

Taking into consideration that surveillance is a constant phenomenon in the world (Zuboff, 2020) and that its tentacles are expanding and multiplying in the circumstances of digital communication, Mary Chayko distinguishes between vertical (asymmetric) and horizontal (social) surveillance (Chayko, 2019, p. 100-109). Online surveillance relies on the use of the internet to track or observe someone's behavior. In the case of a "solid hierarchical structure of power", the surveillance that is carried out for commercial, political, or legal purposes is called vertical. It involves the government with its institutions and various corporations, which possess the power to influence, direct, shape, and

protect network users. Horizontal or social surveillance, on the other hand, describes surveillance roles assigned to other people online, with whom data is shared. Their power is equal, and the potential difference is related to communication skills. As Chayko indicates, race, gender, age, class, sexual orientation, and social status can produce a difference in the power of communication. "[P] perhaps the most striking difference between horizontal and vertical surveillance is reflected in the degree, type, and expectation of reciprocity in relationships" (Chayko, 2019, p.107). Whether or not there is an awareness of constant surveillance, either vertical or horizontal, the fact remains that in technologically developed societies, people find it difficult to conceal information about their behavior and personality. The methods of collecting and combining data have progressed, and user profiles are now created using algorithms that recognize the patterns of behavior. Users' behavior is predicted based on these algorithms, and users' lives can be impacted and further controlled by knowing various personal data (Chayko, 2019; Vaidhyanathan, 2018; Zuboff, 2020). According to Zuboff, people are no longer "the subjects of value realization", but "the objects from which raw materials are extracted and expropriated for *Google*'s prediction factories" and "predictions about our behavior are *Google'*s products, and they are sold to its actual customers, but not to us; we are the means to other's ends" (Zuboff, 2020, p. 109).

The state of widespread and continual digital surveillance inevitably raises concerns about the right to privacy and its protection. Who protects the right to privacy in modern market conditions? And is it possible to control the data we leave online? The right to privacy encounters an obstacle in the contemporary communication and information environment. There are many ways in which private data can be misused, and one of the examples is the Cambridge Analytica data scandal, which was discovered in March 2018. Namely, the company Cambridge Analytica, which advised then-President candidate Donald Trump in the 2016 election campaign, used illegally private data of more than 50 million users of the social network Facebook, and in this way influenced political campaigns in several countries. The data was obtained through a Facebook quiz to create an algorithm that determined personality traits that are, among other things, related to voting preferences. Facebook learned about data collection at the end of 2015 but did not inform users about it, it was only ordered to remove the application and destroy the collected data (Đukić & Stamenković, 2019, p. 159). Due to the collection and storage of large amounts of data (contact lists, photos, messages, etc) that we leave by accessing websites and applications, our right to privacy is jeopardized. Traces containing data can be visible and clear, such as first names, last names, and email addresses, or invisible and hidden, such as location and time of access. (Mitrović, 2019). Although the right to privacy is protected by numerous international documents, many social media platforms, among which *Facebook* is the leader, define the term privacy differently and interpret it differently. There is a combination of different social contexts on *Facebook,* while the control over shared content is left to users by this social media itself.

Facebook's terms and conditions discourse is dominated by the attitude that the user bears the responsibility and that privacy is a personal matter. According to Siva Vaidhyanathan, "privacy protection is a problem of the environment that *Facebook* approaches as a matter of personal responsibility; for *Facebook*, privacy is a structural problem that can be only solved by the work and insight of users" (Vaidhyanathan, 2018, p.83). In the desire to keep the attention of users and save it, the issues of privacy and dignity become inconvenient and redundant (Vaidhyanathan, 2018).

We depend on how the algorithm determines is based on the data we have consciously or unconsciously left in the digital space. "Data sets are in themselves meaningless. They must be made useful. Therefore, we are "made subject not to our data, but to the interpretations of that data" (Cheney-Lippold, 2017, p. 254). As the author adds, in the process of shaping knowledge about the world and ourselves, the central place belongs to algorithms, databases, and their logic (2017). Another explanation offered by Cheney-Lippold is that the citizen is, for example, the one that currently produces data that the algorithmic logic defines as a citizen. Algorithmic identification begins as soon as an individual enters the online world, and its consequences extend into a future that is becoming increasingly uncontrollable.

Distribution of content on social media is closely related to what Riemer and Peter describe as the algorithmic audience. They use this term "to refer to the automatic and ad-hoc configuration of audiences for speech through algorithmic content distribution, as a by-product of profit maximization (Riemer & Peter, 2021,p. 9). The consequences of algorithmic programming include fragmentation and polarization of the audience, the decline in news quality, and the radicalization of public discourse (due to the presence of misinformation and fake news), as well as uncivilized and hate speech (Stark & Stegmann, 2020, p. 6; Spohr 2017). As it was argued multiple times: "This happens because more extreme, more outrageous and thus more polarising content is often found to be most engaging and thus amplified by the algorithm" (2021, p. 11; Marantz 2020; Edelson et al. 2021; Vaidhyanathan 2021). Many authors consider that these negative phenomena originated from the operation of the algorithmic logic of social media, the personalization of content according to the user, as well as the so-called filter bubbles and echo chambers. Back in 2011, Eli Pariser, a writer, internet activist, and entrepreneur, drew attention to the phenomenon that appeared on social media, driven by market imperatives and the desire to achieve a commercial benefit and called it the "filter bubble" (Pariser, 2011; Vaidhyanathan, 2018). It is about delivering content that is similar that what users searched for and responded to by clicking, liking, sharing, and commenting. In this way, *Facebook* has become a machine that has great power in organizing our information space, our connections and relationships with others, and our perspectives on social reality. As noted by Cetina Presuel & Sierra: "Distributing any type of content that may interest their users means that those users will remain engaged and spend time on their services and that more data will be collected" (Cetina Presuel & Sierra, 2019, p 265). Closely related to this phenomenon is the phenomenon known as the

"echo chambers", which refers to the formation of a group of like-minded people, where there is an echo of similar opinions and beliefs. The "filter bubble" refers to an individual around whom the information world is built based on algorithmic recommendations, independently separate from social connections and discussions, whereas the "echo chamber" refers to an individual being paired with like-minded people and participating in social contacts and discussions (Stark & Stegmann, 2020). If users are constantly guided cognitively and emotionally, then the power of this social media action takes on immeasurable proportions and can have severe consequences on an individual and society. The narrowing of the field of vision due to the effect of the "filter bubble" and "echo chambers" decreases the possibility to see the wider information spectrum and to develop grounded attitudes and long-term beliefs. Communication in the so-called "niches" (Livingstone, 2012) of like-minded people is opposite, in terms of effects, to open communication where different opinions and feelings meet. The starting point of such discussions, "unpolluted" by different opinions, creates the preconditions for the fragmentation of the audience into subgroups that rarely come into contact with one another. This also makes it difficult for people to reach an agreement on important social issues, which can affect the stability of democratic societies. Polarization is often interpreted as the division of society into different political camps, although it can refer to divisions in viewpoints, such as ideological or thematic divisions, as well as divisions in effects or polarization of experiences (Stark & Stegmann, 2020, p.15). Existing beliefs are strengthened and the affective public produced on *Facebook* further secures its position, whereas people are divided into polarized groups, without achieving mutual communication. Increasing polarization, political segregation, the lack of civic dialogue, and distrust towards public institutions represent the greatest problem of the modern, digitally networked society (Vaidhyanathan, 2018; Chitra & Musco, 2019). Dialogue and tolerance are powerful barriers to the rule of one-sidedness (Šušnjić, 2007, p.104). Experiencing a difference brings a new quality and value to the development of society and the personality of individuals, while the echo of identical, cognitively harmonized, emotional tones leads individuals into spiritual poverty, intolerance, and animosity towards others. Although the discussion in like-minded enclaves can lead to a liberated and positive communication between marginalized communities in real life (Sunstein, 2018), such "deliberative enclaves" (Barbera, 2020) lead to a homogenized view of social reality and radical attitudes and opinions (Sunstein, 2001), enabling extreme attitudes and extremist groups easy to form in social media spaces. In addition to filter bubbles and algorithm operations, which contribute to the affirmation of existing opinions, and attitudes and the emergence of polarization, homophily, a tendency to associate with people who are similar to them, has been noticed among people. This can be interpreted as personalization led by an individual. The combination of these factors, technologies used for modern forms of surveillance, and people with natural tendencies to turn to ideologically like-minded people, creates a fertile ground for the development of various forms of manipulation (Vaidyanathan, 2018).

Due to structural changes in the media market, where information intermediaries such as *Facebook*, *Google,* and other social media platforms are becoming the leaders in providing information to people, traditional media are gradually conforming to economic imperatives and new business conditions. One of the consequences of the market pressures and the actions of the algorithmic logic of social media, which have become important actors in the online space, is reflected in the softening of news, adapting to tabloid principles, becoming sensational, spectacular, and shocking. Provoking emotions is the most common instrument of ensuring that the news will be read, shared with others, or commented on by a user. While the effects of echo chambers and filter bubbles are overestimated (due to "weak connections" with people online), the risks of political polarization and social fragmentation remain (Stark & Stegmann, 2020; Barbera, 2020). Echo chambers and polarization can occur if there are more homogenous groups, when topics are effective or controversial, and there are clear political predispositions. At that point people are easily divided into opposing groups with such affective polarization being based on stereotypes and negative assessments of others, non-belonging (Stark & Stegmann, 2020). Polarization on social media is frequently a result of very active individuals spreading political ideas, and their influence encouraging others to engage in online party agitation. Barbera and Rivero obtained evidence for this viewpoint after analyzing the hyperproduction of pro-party content on *Twitter* ahead of the presidential elections in 2012. An active, visible, and pervasive minority encouraged the majority to participate in the production and distribution of ideological ideas (Barbera & Rivero, 2015). Furthermore, although people tend to connect with others who have similar beliefs and attitudes when it comes to the social media space, they may be exposed to opposing political tones, different news, and disagreements, to a much greater extent than in the physical environment (Fletcher & Nielsen, 2017). The disparities in the findings of the research on the scope and effects of polarization on social media can be explained by pointing out the difference between ideological and affective polarization (Barbera, 2020).

While the first implies diverse political viewpoints, the second refers to the affective level, to the perception of difference and distance towards the other group, in short, to the sense of belonging and identity. The blending of social and political contents, feedback, political identity profiling, and the use of "incendiary" speech on social media contribute to the creation of affective, psychological polarization. As a result of this process, political and social identities are strengthened, and the distance from the members of other political parties becomes greater (Settle, 2018). This may indicate the absence of a real ideological difference, well-founded and solid political ideas, or the fact that the real political dispute is driven by effects and investing in a manipulative game of playing with identity recognition (Barbera, 2020). Although the algorithmic logic of the functioning of social media is susceptible to the distribution of misinformation and fake news, the scope of such impact is overestimated. This is likely the case with echo chambers and filter bubbles as well. Their effects are limited, whereas the gap between groups with opposing

viewpoints is widening. Groups with right-wing attitudes, in which already distorted opinions are intensified, are particularly vulnerable to the effects of misinformation (Stark & Stegmann, 2020). Political ideology has a substantial impact on polarization on social media with numerous studies confirming the finding that conservatives are less open to communicating with political dissidents than liberals (Barbera et al., 2015).

Method

The modern media environment has undergone significant changes, and as a consequence, the audience's relationship with the media has changed. Even though the audience has gained more power in the digital media space, as evidenced by their ability to create, reshape and share content, media users have become the subjects of surveillance experiments by global capitalists hoping to sell ideas and products. A "software culture" (Manovich, 2013) has emerged, in which algorithms play a central role in tailoring the world of information and news to the individual's needs. Also, all of this occurs with media users' selective awareness or the lack of awareness concerning the algorithmic programming of their cognitive, emotional, and behavioral spheres.

Taking into account that young people and students are important social actors who should be able to responsibly create and share content in the new communication environment, the subject of this paper is students' attitudes toward the operation of algorithms. This paper aims to examine how students view and understand the function of algorithms and data management on social media platforms.

The main research question is: Is there a difference in the perception of the mechanisms of the algorithm in an online environment between students of journalism and communication and public relations on the one side and students of social policy and social work on the other? These groups of students were taken as a sample to determine the difference in perception between those who acquire certain competencies in the field of digital and media literacy during formal education and those who do not develop these competencies in their study programs. Accordingly, students of journalism and communication, and public relations are expected to demonstrate a greater degree of knowledge regarding algorithmic mechanisms.

In this research, a survey was used as the method of data collection. The questionnaire includes questions related to the knowledge of basic terms about the algorithms mechanisms, privacy problems, and protection of personal data. In addition, through the questionnaire we collected data on how students interpret the content obtained through the action of algorithms, that is, whether they understand the principles of the functioning of algorithmic programs on social networks. The research sample consists of 200 students at the Faculty of Philosophy, University of Niš, Serbia both from the Department of Communication and Journalism and the Department of Social Policy and Social Work - 150 students from the first department and 50 students from the second department (Table 1).

The responses of the students from both departments have been compared to determine whether there were any differences between them in their understanding of the algorithmic reality on the platforms, as well as to determine whether the students were able to deal with the mechanisms of algorithm operations in the shaping of information flows.

Table 1: The sample according to the department

Department	Number of students	
	N	%
Communication and Public Relations/Journalism	150	75
Social Policy and Social Work	50	25
Total	200	100

All respondents who participated in the research are social media users. Most of them (93%) use them daily, while 6.5% tend to access social media several times a week. Only one respondent has the habit of accessing them only several times every month. According to the frequency of accessing social media, the students of these departments do not differ.

It should be pointed out that the sample is not representative, but it gives us insight into students' perception of algorithms' understanding. The survey was conducted by the authors. All the questionary sessions were conducted face-to-face.

Results

Of the total number of respondents, 21% of them answered that during their studies, they dealt with the problem of privacy and the mechanisms of algorithmic operations online, 18.5% were not certain, while 60.5% answered that they had not dealt with that issue. By comparing the students of the departments of Communication and Public Relations, Journalism, and Social Policy and Social Work, and after applying the chi-squared test, it was confirmed there was a significant statistical difference between these two groups (X^2 (2, N = 200) = 8.54, p = .013914.). It was determined that the students of the Department of Communication and Public Relations, as well as the Department of Journalism, have dealt with this issue to a significantly greater extent.

Table 2: During your studies so far, have you dealt with the issue of privacy and algorithmic operation mechanisms online?

Department	Number of students									
	Yes			No			Not certain			Total
	Empirical	Theoretical	Deviation	Empirical	Theoretical	Deviation	Empirical	Theoretical	Deviation	
Communication and Public Relations / Journalism	36	31.5	0.64	82	90.75	0.84	32	27.75	0.65	150
Social Policy and Social Work	6	10.5	1.93	39	30.25	2.53	5	9.25	1.95	50
Total	42			121			37			200
X^2 (2, N = 200) = 8.54, p = .013914.										

Almost a quarter of students (23.5%) were familiar with the definition of the concepts "filter bubbles" and "echo chambers", 13.5% were not certain, while 63% of students did not know the meaning of these concepts. When the two groups of students were compared on this issue, there was no statistically significant difference between them (X^2 (2, N = 200) = 0.03, p = .985102).

When asked whether they read terms of use before accessing a website, an application, or social media, 18% responded affirmatively, and 55.5% stated they read it sometimes, which was noticed between the two groups (X^2 (2, N = 200) = 2.891, p = .235632).

A total of 12% of respondents believe that all users receive the same content through social media, 65.5% think the opposite, while 22.5% responded that they were uncertain. In this regard, the difference between the two examined groups of students was not statistically significant (X^2 (2, N = 200) = 0.2488, p = .883027).

The belief that social media are a reflection of reality was held by 6.5% of the respondents, while there is a slightly higher percentage of those who are not certain (10%). However, most of them (65.5%) consider that what they see on social media does not represent reality. There is no statistical difference between the two groups of students (X^2 (2, N = 200) = 2.045, p = .359691). Only 8.5% of respondents expressed a lack of concern for personal data they leave on social media, while 10.5% were deeply concerned. However, most of them (82%) expressed moderate concern. The students of the two surveyed departments did not differ statistically regarding this issue (X^2 (2, N = 200) = 2.045, p = .359691).

Seventy-eight percent of respondents believe that it is difficult to have control over personal data once they are shared on social media and 6.5% believe the opposite, while 15.5% remain uncertain. In this sense, the difference between the two groups showed no statistical importance (X^2 (2, N = 200) = 1.7833, p = .40998).

Most respondents (69.5%) believe it is unacceptable that social media or some third party use their personal data, 23.5% are uncertain, while 7% of them consider this practice acceptable. Regarding this issue, the students of the departments do not differ in the statistically significant measure X^2 (2, N = 200) = 2.6182, p = .270062).

According to 66% of the respondents, content published by social media users is used to adjust and personalize information and to gain profit. Somewhat less than a third of respondents (31%) are not certain, while 3% hold the opposing view. The departments had no impact on this question (X^2 (2, N = 200) = 0.2437, p = .885269).

By being presented with similar content, conditioned by previous experiences and interests, 67% of respondents believe they can be denied different opinions and viewpoints, though 22.5% are uncertain, while 10.5% of respondents believe that is not the case. After comparing the two groups of respondents and applying the chi-square test, a statistically significant difference between the students of the Department of Public Relations and Journalism and the Department of Social Policy and Social Work was confirmed (X^2 (2, N = 200) = 6.3271, p = .042276) (Table 3). In this regard, the students of the Department of Social Policy and Social Work express greater concern on the matter of being denied different viewpoints, while the students of the Department of Communication and Public Relations express uncertainty on this issue.

Table 3: Do you think that by being presented with similar content, conditioned by previous experiences and interests, you can be denied different opinions and viewpoints?

Department	Number of students									
	Yes			No			Not certain			Total
	Empirical	Theoretical	Deviation	Empirical	Theoretical	Deviation	Empirical	Theoretical	Deviation	
Communication and Public Relations / Journalism	94	100.5	0.42	16	15.75	0	40	33.75	1.16	150
Social Policy and Social Work	40	33.5	1.26	5	5.25	0.01	5	11.25	3.47	50
Total	134			21			45			200
X^2 (2, N = 200) = 6.3271, p = .042276										

Most students (76.5%) agree that the way the algorithm functions can affect the amount of time they spend on social media, 16.5% are uncertain, while 7% state that is not the case. There is no statistically significant difference between the two groups of students (X^2 (2, N = 200) = 3.1237, p = .20975).

Only one respondent (0.5%) believes that algorithms do not allow social media platforms and large companies to manipulate users' personal data. On the contrary, 76% believe that such a practice exists, while 23,5% express uncertainty. In this case, the groups studied did not show a significant difference of opinion (X^2 (2, N = 200) = 0.0054, p = .941425).

Furthermore, 68.5% believe that users' activities on any social media are constantly monitored, 23% express uncertainty and 8.5% think there is no monitoring. In relation to their departments, the students' opinions do not differ in this case (X^2 (2, N = 200) = 5.7224, p = .057201).

According to 85.5% of respondents, appropriate education and information can help users to better understand and control their data on social media. 12.5% express uncertainty, while only 2% believe that is not the case. Regarding this issue, there is no statistically significant difference among the students (X^2 (2, N = 200) = 1.3639, p = .24287).

As far as the analyzed categories are concerned, there is a statistically significant difference between the students of Communication, Public Relations, and Journalism, and the students of Social Policy and Social Work in only two categories. Also, there is an impression that the students are equally familiar with the functioning of social media, algorithms, and potential privacy threats. The reason for this may be found in a critical approach to social media, both by the students who are media-focused and those who are not.

Discussion

Research aimed at understanding the operation of algorithms among the student population is rarely conducted. In addition to the lack of data on the so-called algorithmic literacy among youth and students, another problem is that the knowledge about algorithmic personalization of content remains outside the perview of media education (Swart, 2021; Head, Fister & MacMillan, 2020; Mihailidis, 2018). Given the constant and significant influence of algorithms on the content that young people encounter in the online space, the focus on a critical review of information should be enhanced by training young people to reexamine the mechanisms of content creation and understand the accuracy and balance of information. Here, the main question would be: Do all users receive the same information from different sources, or are they denied a certain part of content, by previous activities and recommendation systems of algorithms? Also, as part of their study programs, young people should be prepared for an independent, critical evaluation of technological and social forces that shape the circulation of information and news at the present moment (Head et al., 2020). Their informal knowledge about algorithms might be achieved through the use of media, but this would depend on the frequency and extent of its usage (Cotter & Reisdorf, 2020). One

of the qualitative studies of students from eight American universities and colleges revealed that among this population there is an awareness of the omnipresence of information and a hidden mechanism of personalization of information and news distributed online (Head et al., 2020, p.27).

The research conducted in this paper confirms these results, showing that 65.5% of students believe that not all users receive the same information and content through social media. However, only a quarter of the surveyed students (23.5%) are familiar with the terms "filter bubbles" and "echo chambers". Also, 67% believe that if they are presented with similar content as a result of an algorithmic operation, they will be denied different opinions and viewpoints. These results are consistent with the research conducted in the United States, which shows that, according to most students, algorithmically organized data can jeopardize "representative democracy and the cultivation of an informed and active community" (Head et al., 2020, p. 27). Many have expressed discontent and indignation over the large impact of algorithms on social life, information, and news, as well as the inability to combat gigantic systems and their control and surveillance mechanisms. Most students expressed concern about the constant control of personal data, which can have immeasurable consequences on existing social inequality. For that reason, many of them apply certain strategies to protect their data and limit the scope of algorithmic control (Head et al., 2020). Our research, however, shows that 78% of students believe it is difficult to have control over personal data online, while most students (82%) express moderate concern on this issue. Only 18% read the terms of use before accessing a website, application, or social media platform.

The research *Experiencing Algorithms: How Young People Understand, Feel About and Engage with Algorithmic News Selection on Social Media*, which included 22 respondents aged 16-26, focused on the three dimensions of users' algorithmic experience: cognitive, affective, and behavioral. The analysis of the first dimension sought to discover how young people understand the operation of algorithms. The data showed that context has an impact on how algorithmic operations are perceived, particularly when the user's expectations are not fulfilled, or when the content is confusing, and there are clear indications of content personalization. In addition, the research showed that, in some cases, the respondents easily noticed the impact of algorithms, while on certain platforms it was more complicated to do so. In summary, context affects the understanding of algorithms, which is determined by a platform, its characteristics, and the type of content (Swart, 2021, p.5). Research into the affective dimension of algorithmic experience showed what types of moods, effects, and sensations are caused by algorithms. They range from a neutral interpretation of algorithms, used for achieving a certain goal, to a positive view of algorithms as useful filters of information chaos, to a negative perception of algorithms used for controlling and censoring information. The scope of user action about algorithms is thought to be quite limited and the respondents believe that algorithms are beyond their control. Also, young people's knowledge of algorithms does not persuade them to participate in

algorithmic decisions (Swart, 2021). These findings lead to the observation that young people are, to a certain extent, aware of the impact of algorithms on information daily, but they have no control over the process of selection and editing, or personalization of content. Young people do not withdraw from social media or limit the amount of time they spend online and on various platforms, according to the research conducted by Head, Fister, and MacMillan, despite knowing that their activities are monitored and their data traded, because they find application services useful (Head et al., 2020).

Conclusion

Issues that arise in an algorithmically shaped society, can be roughly divided into two levels: individual and social. The consequences are visible at the level of an individual, their understanding of their personality, and their being, as well as in terms of their relationship to society. Many users are unaware that the content they receive has already been filtered, processed, and matched to their previous wishes, needs, aspirations, and intentions. As a consequence, the boundaries of existing beliefs, attitudes, opinions, and feelings are strengthened, allowing people to enter a self-affirming zone where the same or similar thoughts and emotional tones resonate. At the level of personality, there can be a significant discrepancy between who we are and what algorithmic systems say about us. In addition, personal data has become the most valuable product on the market, while the knowledge of ourselves is built on what algorithms say about us. Generally viewed, the impact of algorithms on society and the democratic climate becomes even more prominent, with consequences such as polarization, social fragmentation, the decline in news quality, the explosive growth of fake news, misinformation, and the deformation of public discourse. In a transformed social and communication reality, shaped by the omnipresent branches of artificial intelligence and algorithmic programs, only those who have developed appropriate critical potential and who understand the actual situation in algorithmic culture can function. The research showed that two-thirds of students of Journalism /Communication and Public Relations, and students of Social Policy and Social Work from a Faculty of Philosophy, University of Niš, Serbia, notice the results of algorithmic personalization, filtered selection of content and news, and the customized display of content on social media platforms.

Despite the fact that over 70% of students from both departments comprehend there is constant surveillance of user activities and that control over personal data online is taken over by large companies and third parties, for profit, most respondents (82%) express moderate concern for the data they leave online. This is further confirmed by the fact that only a small percentage of students (18%) almost always read the terms of use of a website, application, or internet service. Also, there is a statistically significant difference between the students of Journalism, Communication, and Public Relations and those of Social Policy and Social Work regarding their knowledge of privacy issues and

mechanisms of online algorithms during their studies. Students of Journalism, Communication, and Public Relations become more familiar with these concepts and social phenomena that occur as a result of algorithm operations, so that understanding the algorithmic logic online, which is recognized by the majority of respondents from both departments, can be linked to experience on multiple social media platforms. Another significant difference between the respondents from the two departments is in their attitudes toward being denied different opinions, views, and interpretations of reality. which is more prevalent among the students of Social Policy and Social Work. Although a certain number of respondents lack theoretical knowledge about the concepts most frequently associated with algorithms, most respondents (85.5%) agree with the viewpoint that appropriate education and information can create conditions that will help individuals and society to control their data online, instead of being controlled by the network.

As indicated in the methodological part, this sample is not representative, but it is relevant, and a proposal for future research may be a larger sample that will include respondents from various fields of study. Also, future research should include information on the number of social networks on which respondents have accounts, as this data would speak to the breadth of experience they gain using these platforms. This can be reflected in the understanding of the operation of algorithmic practice. In addition, it would be significant to examine members of different age categories, to examine and compare approaches to the issue from a different age perspective.

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