Acta Scientiarum

http://periodicos.uem.br/ojs/acta
ISSN on-line: 2178-5201
Doi: 10.4025/actascieduc.v44i1.52736
CC BY

Algorithms, engagement, social networks and education

Rodrigo Otávio dos Santos

Programa de Pós-Graduação em Educação e Novas Tecnologias, Centro Universitário Internacional, Rua do Rosário, 147, 80020-110, Curitiba, Paraná, Brasil. E-mail: rodrigoscama@gmail.com

ABSTRACT. This article aims to discuss questions about Education permeated by the new social networks that are permanently in contact with students. Therefore, our main objective is to analyze how algorithms, engagement and social networks affect individuals and, more specifically, students. To do so, we first checked the characteristics of the algorithms, discussing what they are, what their influence on daily life, the problem of arbitrary judgment and its undecipherable black box format. Ahead, we analyze social networks and the engagement process. We discussed what these networks are, their influence in the contemporary world, the lack of filtering in posts and the feature of opaque screen. We also analyzed the capitalist question that only one network of each type can survive in the market, in addition to the consequences of forced engagement, the effects of interactions and relationships with false news or conspiracy theories, as well as the hierarchy between man and machine in that configuration. Finally, we discuss the educational process, in which we present issues such as the difficulty of students' concentration, the difficulty of sorting the correct information and the teacher's healing function. Our methodological basis consists of bibliographic and exploratory research, with the purpose of broadening the discussion. Our main result is precisely the debate around the theme, seeking to present elements for a better understanding of the phenomenon, thereby trying to foster new possibilities for understanding these elements and a better teaching-learning relationship in the world connected by social networks and their algorithms. The main conclusion that we can draw is that the social networks that are interwoven in society influence too much education and the ways in which young people learn, changing some elements at the heart of education, and that there are many challenges posed and to come, and that it is up to the professionals of education to know the machine so as not to be overpowered by it.

Keywords: teaching; technology; algorithm; teacher; internet; community.

Algoritmos, engajamento, redes sociais e educação

RESUMO. Esse artigo pretende discutir questões acerca da Educação permeada pelas novas redes sociais que estão permanentemente em contato com os estudantes. Portanto, nosso objetivo principal é analisar de que forma os algoritmos, o engajamento e as redes sociais afetam os indivíduos e, mais especificamente, os estudantes. Para tanto, primeiro verificamos as características dos algoritmos, discutindo o que são, qual sua influência no cotidiano, o problema do julgamento arbitrário e de seu formato de caixa preta indecifrável. Adiante, analisamos as redes sociais e o processo de engajamento. Discutimos o que são essas redes, sua influência no mundo contemporâneo, a falta de filtro em postagens e a característica de tela opaca. Também analisamos a questão capitalista de que apenas uma rede de cada tipo pode sobreviver no mercado, além das consequências de um engajamento forçado, os efeitos das interações e as relações com notícias falsas ou teorias da conspiração, bem como a hierarquia entre homem e máquina nessa configuração. Por último, refletimos sobre o processo educacional no qual apresentamos questões como a concentração dos discentes, a dificuldade de triagem da informação correta e a função curadora do professor. Nossa base metodológica consiste em pesquisa bibliográfica e exploratória, com a finalidade de ampliar a discussão. Nosso principal resultado é justamente o debate em torno do tema, buscando apresentar elementos para uma melhor compreensão do fenômeno, tentando com isso fomentar novas possibilidades de entendimento desses elementos e uma melhor relação ensino-aprendizagem no mundo conectado por redes sociais e seus algoritmos. A principal conclusão que podemos tirar é que as redes sociais imbricadas na sociedade influenciam por demais a educação e as formas como jovens aprendem, modificando alguns elementos no cerne da educação, e que são muitos os desafios postos e vindouros, e que cabe aos profissionais da educação conhecer a máquina para não ser sobre pujado por ela.

Palavras-chave: ensino; tecnologia; algoritmo; professor; internet; comunidade

Algoritmos, compromiso, redes sociales y educación

RESUMEN. Este artículo tiene como objetivo debatir cuestiones relacionadas con la educación que están impregnadas por las nuevas redes sociales que están en contacto permanente con los estudiantes. Por lo tanto, nuestro objetivo principal es analizar cómo los algoritmos, el compromiso y las redes sociales afectan a las personas y, más específicamente, a los estudiantes. Para hacerlo, primero verificamos las características de los algoritmos, discutiendo cuáles son, cuál es su influencia en la vida diaria, el problema del juicio arbitrario y su formato de caja negra indescifrable. A continuación, analizamos las redes sociales y el proceso de participación. Discutimos cuáles son estas redes, su influencia en el mundo contemporáneo, la falta de filtrado en las publicaciones y la característica de la pantalla opaca. También analizamos la cuestión capitalista de que solo una red de cada tipo puede sobrevivir en el mercado, además de las consecuencias del compromiso forzado, los efectos de las interacciones y las relaciones con noticias falsas o teorías de conspiración, así como la jerarquía entre el hombre y la máquina. Configuración. Finalmente, discutimos el proceso educativo, en el cual presentamos temas como la concentración de los estudiantes, la dificultad de clasificar la información correcta y el papel de curador del maestro. Nuestra base metodológica consiste en investigación bibliográfica y exploratoria, con el fin de ampliar la discusión. Nuestro principal resultado es precisamente el debate sobre el tema, buscando presentar elementos para una mejor comprensión del fenómeno, tratando de fomentar nuevas posibilidades para comprender estos elementos y una mejor relación de enseñanza-aprendizaje en el mundo conectado por las redes sociales y sus algoritmos. La principal conclusión que podemos extraer es que las redes sociales que se entrelazan en la sociedad influyen en demasiada educación y en las formas en que los jóvenes aprenden, cambiando algunos elementos en el corazón de la educación, y que hay muchos desafíos planteados y por venir, y que depende de los profesionales de educación para conocer la máquina para no ser dominada por ella.

Palabras clave: enseñanza; tecnología; algoritmo; profesor; internet comunidade.

Received on March 23, 2020.
Accepted on April 27, 2020.

Introduction

The contemporary world is permeated by distractions, intrusions, alienation and other elements that make our students' ability to concentrate more and more difficult, as well as it seems to be increasingly complex to find out whether or not information is true on the world wide web, in addition to the difficulty promoted by the radicalization of points of view in society. A good part of these urgent problems around us are promoted in part or in full by the dissemination of computational social networks, which through their algorithms and their engagement strategies bring about a change in human relationships.

This bibliographic article proposes an exploratory research, as explained by Moreira and Caleffe (2008), in order to broaden the discussion of a topic as comprehensive and as current in contemporary Western society as the relationship between computational algorithms, engagement of social networks and education. This article, therefore, aims to present some questions and seek to promote reflection on the subject, bringing to light not only definitions of elements, but also their imbrication for what we can consider as a new wave of cyberculture, in which the performance of technical objects and human agency permeate our daily lives in different ways and, in the case specified here, the difficulties faced by students due to this new technological facet that, while caressing us, attacks us daily.

Algorithms

Algorithms, according to Medina and Fertig (2005), are sets of perfectly defined logical rules and procedures that lead to the solution of a problem in a finite number of steps, according to a definition formalized in 1936 by mathematicians Alonzo Church and Alan Turing. The word algorithm, in turn, derives from the name of the Persian mathematician Muhammad ibn Mûsâ al-Khowârizmi, who, according to Leavitt (2011) wrote one of the most important mathematical texts of the ancient world, the Kitab al-jabr wa'l- muqabala.

In the contemporary world, however, algorithms are the rules for a given computer program to work. This is true both in supercomputers such as those at CERN and in the small chip used in credit cards. However, the focus of this research falls on the two devices most commonly used by students in general: personal computers and smartphones[1].

1 We know that many students also use tablets, but as the operating system is strictly the same as smartphones and the latter are more prominent, we chose to use only smartphones as a reference to Android and iOS systems.

Algorithms are a key part of today's world, and all students are immersed in this world where they use these complex mathematical parts daily without even knowing it. The daily life of schools and colleges is full of the use of algorithms, and not just within the school environment. From the alarm clock to the way to school, from lunch to dinner, in our work activity or in our moments of rest, we live, as Sumpter (2019) explores, surrounded by these mathematical formulas.

And these instruction sets are not random or neutral. As stated by Vieira Pinto (2005), all technologies are created and maintained by more or less explicit interests of more or less visible groups. Anyway, these mathematical structures that promote the use of applications and, more specifically, of social networks, exist to capture as much information as possible from the individual who uses them, promoting a marketing network whose final objective is the profit of the shareholders of such networks.

The problem, however, is that students are being exposed daily to these mathematical formulas that possibly no human being can fully understand, such as the black box already explained by Flusser (2011, p. 26, author's emphasis): "[.. .] this is because the 'device-operator' complex is too complicated to be penetrated: it is a black box and what you see is just the input and output. Those who see input and output see the channel and not the encoding process that takes place inside the black box". Thus, it is evident that we are just users of the complex mathematical machine that proposes that we hand over all our data to it, as explained by Lanier (2018).

More than that, as Sumpter (2019) reveals, these algorithms are the best kept secrets of the computer industry, since their formula is not explained anywhere in the world and such formulas are changed from time to time for reasons of security. performance or when there is an investigation, whether journalistic, academic or criminal (Sumpter, 2019).

These secrets, in turn, obey the decisions of groups that end up becoming hegemonic and whose tentacles extend across a large population swath, indistinctly in the west and east, in the northern or southern part of the globe. Where there is a cell phone device, there will be several algorithms at work. As Castells (2018) informs, in the current world, the predominance of companies such as Alphabet (owner of Google), Twitter and Meta (owner of Facebook) threatens national sovereignty, putting in check several pillars of democracy built over centuries.

These institutions are so large, and know so much about individuals, that their algorithms are called by O'Neil (2016, p. 1) "weapons of math destruction" . Alphabet, through Google's set of algorithms, is not only able to know what we search for on the internet, but also can predict our next purchase decisions, travel or who we will vote for in the next elections. While this is close to the science fiction of Isaac Asimov and his psycho-historian character Hari Seldon, it is currently happening in the world. And, as O'Neil (2016) explains, promoting inequality in communities. The Meta company is also able to influence individuals regarding their political choices, as was evident in the Cambridge Analytica case, also analyzed by Sumpter (2019).

This company, in possession of billions of user data, promoted algorithms capable of targeting advertisements in such a specific way that the voter was motivated to vote for one or another candidate in the electoral race. A part of this advertising was done in the form of commercials, another part was promoted by targeting posts from other individuals, that is, the algorithm made posts from ordinary people be directed to other ordinary people, creating a bubble of targeted information, so that the voter could not see the bigger picture. Basically, as Lanier (2018) argues, the user was isolated, bombarded by information that came from only one side of the political spectrum. And, more than that, he was bombarded with advertisements tailored to him, reinforcing, at the most sensitive point of the individual, what the candidate wanted. For Castells (2018), this was one of the main reasons that led Donald Trump to power in the US: The fake news[2] that was implanted in voters' social networks through algorithms.

Thus, unlike other moments in human history, where machines changed employment status, as in the industrial revolutions, the algorithmic mathematical machine promotes changes not only in labor relations, but also in political and human relations, in the coexistence between two or more individuals. And, in addition, they promote an arbitrary judgment.

Sumpter (2019) tells us that one of the biggest problems of current algorithms is that, because they are automatic and automated, human action at a given moment ceases to have a reflective and critical view to become a purely technical view. It is a phenomenon related to that of the doctor who no longer examines the patient, only reads the exams and through them takes an attitude, practically ignoring the human figure in

[2] "fake news is the deliberate presentation of (typically) false or misleading claims as news, where claims are misleading by design" (Gelfert, 2018, p. 108).

front of him. So we let the algorithms judge us. And they do it arbitrarily, coldly and that never forgets a slip. Therefore, now following the reasoning of O'Neil (2016), we can say that for an algorithm, a bad student will always be bad, with little or no chance of redemption. Now, we all know that we can make mistakes throughout life, and a teenager, for example, is more prone to make mistakes than children or adults. The algorithm, however, ignores the psychological issue involved in the adolescence process. And judge the individual anyway.

There is a difference between the moral sense and the mathematical sense, and the justice of men does not derive from logic or cold data alone.

To make life even more difficult for our students, thanks to social networks and the engagement promoted by them – which we will talk about later in this text – we are increasingly exposed to algorithms. These mathematical pieces keep an eye on us all the time, to the point that Sumpter (2019, p. 84) says that "[...] most of us have had the feeling that Facebook or Google has already read our mind". In the following paragraph, the author clarifies: "[...] the most plausible explanation is that data alchemists are discovering statistical relationships in our behaviors that help them target us" (Sumpter, 2019, p. 84).

This phenomenon occurs precisely because individuals engage in so-called social media.

Social Media and Engagement

The phenomenon of social media and engagement go hand in hand, as they feed back into each other, and both exert a lot of influence on our students. Recuero (2019) informs that social networks are like webs or ties that interconnect subjects that can be distant in time and space, from traditional levels, such as an intimate conversation only between two people who have known each other for a long time, to levels more complex, in which communities converse in groups of people who have never met in person and in which symbols, images, videos and other media devices are inserted in this conversation. This connection made possible by networks can generate ties of common interests. Although the view on these interests may differ, as we will see.

The first digital social media, or social media promoted by the internet phenomenon, emerged from the initiative of the digital platform called 'Sixdegrees', in 1997. The idea for this initiative, according to Watts (2010) came from the theory of Stanley Milgram, who in 1967 created an experiment to see how people in a large social group are linked together. This experiment consisted of mailing 60 small packages to people in Kansas with instructions to deliver this package to a specific person who lived in Boston. The only rule was that you could only pass through people you really knew. Of the 60 packages dispatched, only 3 of them reached their destination, showing that the theory was not accurate. However, thanks to the play by John Guare and later the film adaptation by Fred Schepisi in 1993, the theory, although not proven, was consolidated in common sense and spread. This is still the basis for many social media justifications across the globe. It was through this idea, already rooted in culture, that plataforms such as Orkut, Fotolog or MySpace were formed, which have not withstood the test of time, or plataforms such as Facebook, Instagram or Twitter that are prevalent on computers and smartphones.

For Modolo (2018), there are basically two elements in each social network: the authors, which can be from ordinary people to large conglomerates, and the connections, which are interactions on the platform mediated by the internet. This type of interaction is the exponentiation of Benjamin's concept (1994), when he says that readers' letters influenced writers in early 20th century newspapers. Now, a person on a social media acts as a writer when they enter a message, text or photograph so that readers can contact and comment. At the same time, this same person is a reader of other people. And in the comments, the individual is, at the same time, a reader and a writer, in a dialogue promoted by the platform and the internet.

One crucial difference, however, is the lack of a filter. Thousands of letters arrived in the editorial office of a major newspaper every month. But in the 'letters from readers' section of the periodical, only a hundred or two hundred would be printed, that is, a very low percentage reached the eyes of other readers. And they arrived filtered, that is, those that the newspaper considered relevant.

Currently all comments are posted immediately on the page/post relative to the original text. With this, the only filter can be done *a posteriori*, after the individual has already written and this text has already been read by some people. Even though the original post writer may delete the comment, it has already been read by someone. More than that: on large-view pages, this control is virtually impossible. A message can be seen by 500,000 people per minute. If only 1% of people comment, we will have 5,000 people commenting per minute, making human treatment unfeasible. In this case, pages and platforms make use of algorithms, which

will try to separate the most coherent messages. Which doesn't always work because, as we said, algorithms take cold attitudes and arbitrarily judge, in addition, they always seek our engagement.

Social media, in this way, give rise to a new structure in society, as stated by Bertoletti and Camargo (2016). In this new configuration, which lives in parallel with life outside the screens, the main focus is to make the individual spend most of their time connected to the platform. This is called the engagement process. Lanier (2018) says that the main function of social media is to promote engagement, that is, to keep the individual increasingly connected.

This is because, still according to Lanier (2018), what these tools want is the profit of the companies that support them. And that profit comes from advertising. A social media makes money by showing ads to advertisers with a much more defined profile than a radio or television station, for example. There is a consensus in the market, as explained by Vietri (2019), that when a service is free, the product is the consumer. The business of social media, therefore, is done by capturing the information of its users and selling that information to advertisers.

Every movement of the mouse on our computers, or every swipe of our fingers on our smartphone devices sends data to the controllers of these social media, and these algorithms begin to decide which commercial advertisements individuals should see to maximize the effectiveness of those advertisements. As an example, let's think of a woman who discovered at that moment that she was pregnant. After seeing the positive result for pregnancy on the internet, she starts looking for a name for her future child, as well as looking for information about the size of cribs and clothes for newborns. The algorithm records all this information and starts showing ads for diapers, which the mother-to-be in question did not look for. Sumpter (2019) informs that, as the algorithms watch over us at all times, it is clear to these complex mathematical calculations our next attitude.

For the advertiser, it is much more effective to advertise diapers on a social media, only for mothers or fathers whose children are still in diapers, than to advertise on a large television network, where it will reach these likely consumers, but also children, the elderly, or people without children. , wasting the ad with this audience that will not be interested in the advertised product.

The more time we spend on the social media, therefore, the more information about our profile we leave to its algorithms. The algorithm is able to catch each of our manifestations on the plataform. Not only what we write and what we like, but also what pages we browse, what we do research, what facts we dwell on the longest and which are the most elusive. According to Lanier (2018), the algorithm is able to know more about us than we know about ourselves, and this understanding of individuals leads to greater revenue, because, as we have already said, the more the plataform knows about us, the better the ads and, therefore, more companies will be interested in placing their commercial advertising there. This fact leads to a conclusion, explained by Lanier (2018), that the longer we stay on the plataform, the better for its owners. Hence the need to always increase engagement, that is, the time we remain connected.

These tools then use different strategies to increasingly retain the individual in front of them. The first of these, as we have already said, is the predominance of algorithms. The biggest financial and personnel investment in technology companies that own social media is precisely in the predictive capacity of the algorithms. It is their duty, according to Lanier (2018), to try to hit which content or interaction makes the individual more glued to the screen.

Here we must open a parenthesis, as Levy (2020) does, who reports that much of the popularization of current social media is due to the massive use of smartphones. Before this kind of phones, a person needed to access social media by computer. Therefore, this contact was only possible at home or at work. In the second, still, to a lesser extent, since the company's computer cannot always be used to travel on social media. Currently, however, with all the plataforms present in cell phone devices, contact is increasing, as the smartphone has become, for many people, as Bridle (2019) explains, an extension of their body. Thus, upon waking up, the individual turns off the cell phone alarm and enters social media and stays there until he leaves the house. When he is heading to work he is still attached to them, as well as at lunchtime and in his leisure time. Thus, we can say that much of the citizen's time is spent in direct contact with the smartphone. It is not an unknown fact that a good part of the current car accidents happen by texting, that is, by exchanging messages by text in social media applications. Levy (2020) states that the boom in social media was due to smartphones, and Lanier (2018, p. 12) adds that "[...] being able to delete your account is a privilege".

Thus, algorithms are designed to retain our attention on smartphone screens. In order for us to realize how much of this is true, one of the five most accessed social media in Brazil, Instagram – which belongs to

Mark Zuckerberg's Meta group – was designed to be used by smartphones and, moreover, in conjunction with the phone's camera.

Always remembering that the algorithm's ultimate intention is to promote engagement and, with it, sell ads for the platform's owners to make more profit, these mathematical formulas explore what Sam Parker (apud Lanier, 2018) calls social validation, that is, the human need to be accepted by the community that is part. People, especially younger people, are particularly sensitive to the impact their posts have on the community. Lanier (2018, p. 22) says that "[...] when they receive a flattering response to a post on social media, people get into the habit of posting more". This reaction can be to a greater or lesser degree, but either way, it affects the individual. There is undeniable social pressure to be part of a social media, and humans in the 21st century are especially sensitive when it comes to social judgment and competition. The creators of the algorithms know this and encourage this type of behavior by promoting platforms that, in the words of Lanier (2018), try in every way to addict their users. For the author, social emotions are the engine behind social media engagement. In particular, the fear of being rejected and the desire to be loved, which can cause social anxiety, especially in younger individuals, as attested by Lira et al. (2017).

To make life worse for young people, it is known and described by Bauman (2009), that people find bad news a greater force than good news. Fear is a feeling that trumps hope, and in many cases, it trumps common sense. As social media algorithms are always looking for engagement, that is, they are always looking for people to spend more time browsing and interacting within their platform, it is to be expected that social media will promote more and more bad or discouraging news. This is in line with what Sumpter (2019) tells us, who states that algorithms will privilege what the person interacts with the most, that is, bad news or clashes with disaffected people are much more valued mathematically than good news or bad news. healthy conversations, as they engage less. As Sumpter (2019, p. 152) puts it, "[...] the more we click on something, or someone, the more prominently they are shown to us, and the more likely we will continue to click on them".

So what really counts for engagement is the amount of interactions, not whether that interaction is positive or negative. For example, the use of the 'like' or 'dislike' button on YouTube matters little to the algorithm. For the mathematical excerpt, what matters is the amount of people who interacted with that video. That's how conspiracy videos get such projection. Sumpter (2019) says that a video with this proposal is twice as likely to be engaged, as there are a small number of people who believe in that conspiracy and a large number of detractors. However, the detractors are engaged, because they comment, curse, establish relationships. Lanier (2018) says that when these conspiracies are more or less innocuous, such as the belief in extraterrestrials or the idea that the Earth is flat, it does little to affect the community. But when the conspiracy is that the measles vaccine causes autism, we have a much more serious problem, which directly impacts the lives of most people in the community, since the measles virus has returned to circulate in our cities.

Castells (2018) points out that politically, this issue of algorithmic indifference can cause serious shake-ups in democracy, privileging a candidate who has a lot of rejection over another whose acceptance is greater, simply because the detractors of the candidate with greater rejection help to increase his view in the media. world Wide Web. In 2016, every time an enemy of Donald Trump wrote something against him on social media, the algorithms understood that the candidate was an important issue, and his presence on the platforms increased. The same happened in Brazil in the 2018 election.

Based on this reasoning, it is more or less clear why so-called fake news travel so virulently through social media. Remembering, as Sumpter (2019) does, that fake news is false, forged with the deliberate intention of deceiving the reader. As they are distortions of the truth, or, in most cases, inventions without any kind of proof, they provoke on both spectrums: People who believe comment, share, like such news. Those who are more sensible and do not believe, end up having the same behavior, that is, they also comment, also share and also move the news. The algorithm then understands that that news is relevant. For the algorithm, it doesn't matter if the news is true or a big lie. What really matters is people engagement. If more people engage with the news, even fake, it is more valuable than news with less engagement, even if true.

To further aggravate the situation in which our society finds itself and, in particular, our students, the devices we use (computers, tablets, smartphones, etc.) are what Denise Schittine (2004, p. 31, author's emphasis) explains. as an opaque screen, that is,

> [...] the computer screen appears as an opaque glass through which people can exchange ideas and opinions without being seen. On the other side of it, there is an audience that can 'hear' what the author has to say and give their opinion (contrary or not). All this without the constraint of face-to-face relationships.

With this phenomenon, individuals feel freer to express themselves, which, over time, turned into something complex and with great dilemmas to be faced. Bauman and Lyon (2014) explore this theme by stating that people are less and less concerned about who is on the other side of the opaque screen on which they write. The lack of empathy seems to be a constant in the dynamics of social media, where we do not see the reaction of the other. For people who are especially sensitive to outside scrutiny, this lack of affinity can be very damaging, particularly at times like adolescence or early adulthood. The virtual, but not personal, presence of the recipient of messages can lead to serious distortions in the dynamics of a simple conversation. Exasperations become greater, dramas intensify and the lack of understanding is constant. Souza and Cunha (2019) state that digital social media can cause conflicts and, more than that, tend to create superficial relationships, which also favors a lack of empathy. In addition, the researchers also point out that in many cases young people even verbally attack people just because they have ideas that disagree with their own. Many of these disagreements would not exist if the dialogue were not carried out by people behind opaque screens. Because, on an opaque screen, the sender does not have the translucent possibility of seeing the interlocutor, nor the feeling of a mirror, so that he can reflect on what he is saying.

Another characteristic of social media is what Godin (2004) calls *The Winner Takes All Game*, an economic concept that suggests that, in technology markets, rapid innovation and technological changes promote a frantic race for the consumer/product. The company that manages to reach first place in public satisfaction gets all the consumers/product. At the beginning of this race, competitors invest to create a product that develops a new category of service in order to be leaders in this newly created category. Due to market volatility, companies that arrive first are rewarded with high profits and numerous investors. At least until a new product comes along. In some cases, this monopoly lasts for a short time, as in the case of the MySpace website, which for a few years was the company responsible for broadcasting music on the Internet, but which was shipwrecked in the rise of streaming. In other cases, such as Facebook, the monopoly is lasting and increasingly capillarized by computers and smartphones.

The problem with *The Winner Takes All Game* is that people have virtually no choice. As reported by Lanier (2018), leaving Facebook is not possible for some individuals. Or because their work is developed there, or because their professional contacts are there, or because they have no other way of contacting their families. The point is that there is no alternative, there is no other social media with the same characteristics as Facebook, because all the similar ones (Orkut, Friendster or Hi5, for example) are not supported by the economic model *The Winner Takes All Game* that prevails in digital economy. Thus, the plataform user is bound to follow the rules imposed by Facebook executives who, again according to Lanier (2018), only care about profit. The same happens with Twitter, Instagram, LinkedIn or Youtube, all plataforms that have no competitors. Thus, students not only from Brazil, but from all over the world end up being at the mercy of these few social media.

Educação

The consequences of these characteristics of plataforms are intertwined with education today. Although we can highlight that in the poorest regions of Brazil students do not have smartphones and the internet is still shaky, we can also say that in a good part of the country most students use this type of device, as highlighted by Siemens (2004) when promotes connectivism, stating that the device (computer, smartphone, etc.) is already so fused with our daily lives that it can be treated as a part of our being, and that learning can also occur on non-human devices, endowed with artificial intelligence .

However, the harmful effects of the equipment and, mainly, of the new social media, was not discussed by Siemens (2004). Let's, however, try to see the benefits of this plataforms before looking at their problems. Vygotsky (1991) talks about social learning, and the individual's ability and need to learn in society, not only in interaction with teachers, but also in interaction with other colleagues. When we transfer this social perspective to social media, it would seem that they help students thanks to the hyper-scale and instantaneous communication facility. After all, if a student has a question, he or she can post it on the net and expect that several people will respond with several interesting considerations.

Furthermore, plataforms can help the more shy to stand out from the crowd, as well as being able to run errands faster or more efficiently. Cunha, Santos, and Machado (2019) in their research, reached the amount of 78.9% of teachers who say that social media can effectively help in the classroom, reinforcing that there may be good uses for these technologies.

However, there are numerous problems that the use of this technology in particular can bring. Perhaps the damage that we can more easily perceive in a classroom concerns the concentration of students. Dal'agnol et al. (2019) conducted a survey with higher education students and found that 97.7% of students used social media during face-to-face classes. Dal'agnol et al. (2019, p. 135) also say that

> The survey results indicate that students are increasingly involved with virtual social networks during face-to-face classes. This can change the way students interact with the teacher and classmates, also interfering in the teaching-learning process. [...] The students interviewed are aware that when they make use of virtual social media for non-didactic purposes, the assimilation of content becomes more difficult, as it diverts concentration.

The students themselves, therefore, recognize the difficulty of concentration. This is a problem also tackled by Lanier (2018), when he reports that people are increasingly dispersed from the real world, and increasingly fragmented in the virtual world. Time itself is fragmented, as the student sometimes pays attention to the teacher, sometimes to WhatsApp, sometimes to Facebook, sometimes to Instagram... each of these tools has a design and a proposal. Concentration is fragmented, making it difficult to absorb the information that comes from the teacher, as it competes with other stimuli coming from their computers or smartphones.

The cognitive load, already explored in the work of Carr (2011), can be excessive in an environment as disturbed as the student's smartphone. Dividing attention between the teacher and the four or five social media at the same time is, in many cases, more complex than the student realizes. Thus, he cannot obtain focused attention on the teacher, which causes a superficial understanding of the information passed. We must not forget, however, that young students have always been somewhat scattered or disinterested. Boethius of Dacia had already spoken about them in the thirteenth century, as reported by Varneda (2008). There have always been side conversations, games in notebooks or the habit of passing notes and jokes without the teacher knowing. The difference, in this moment of social media, is that the stimulation of plataforms on the smartphone is practically irresistible, and the time spent on it during class seems to be much greater. Lanier (2018) even talks about people who are addicted to their social media. As we have already seen, the use of algorithms for engagement can compromise individuals and Lanier (2018 p. 26) says:

> When an algorithm provides someone with experiences, the randomness that facilitates algorithmic adaptation can fuel human addiction as well. The algorithm tries to capture the perfect parameters to manipulate a brain, which in turn changes in response to the algorithm's experiments to seek deeper meanings; is a cat and mouse game based on pure mathematics. As the stimuli from the algorithm mean nothing and are truly random, the brain is not adapting to anything real, but a fiction. This process – of being hooked by an imprecise mirage – is addiction.

This behavior of the algorithms makes it difficult to "leave" the cell phone in the classroom. The student seems to get stuck in his technological apparatus. And even when the teacher orders the devices to be put away, there is a sense of anxiety on the part of young people. There is a need – driven by the strength of engagement algorithms – to check equipment as often as possible. Adiele and Olatokun (2014) specify that individuals addicted to the internet have great anxiety when away from their equipment, to the point of not being able to 'disconnect' from the plataforms, even when the technical devices are turned off. Thus, it is useless for the teacher to ask that the equipment be turned off, since the student's mind is attached to the device. Even turned off.

Another problem is the difficulty of sorting the correct information. A student, at the beginning of his journey, is ignorant of the subject to be treated. So, a certain instruction on the part of the teacher is necessary in directing this path. In most subjects, one cannot do what Prensky (2006) advises, that is, let the child research alone. While young people can indeed learn some very interesting things through games or YouTube videos, they cannot be left unsupervised.

Young people usually believe that the computer will give them the answers they need, and they usually do not make a critical filter regarding the information contained therein. This comes directly from what Lanier (2018) comments in his work, highlighting that people do not bother to do two or three checks on the information they obtained with the first click. Normally, what is in evidence on the first of the search pages is accepted. Rare are the times when individuals go beyond the second page of the search engine. Caldeira (2015) says that more than half of the users of the Google search engine do not reach the second page of searches, they are content only with what is in the first ten results. Moreover, in the same survey, the author says that only 10% of all users of the platform have their search extended to the third page. That is, 90% of

users only read the first and second pages. This fact, when it comes to mere entertainment, is not a big problem. After all, if the answer is wrong, but it's just a search for a momentary curiosity, it won't cause much harm. However, no serious research is developed only on the first page of a search engine whose algorithm hides flaws and intentions, as highlighted by Sumpter (2019). It is up to the teacher to point out to the students that there are numerous pages, and that he should not be satisfied with the first information, since it may be wrong.

The danger of unsupervised ignorant youth is sorting out the right information. Although we understand that there are different points of view in the sciences, we cannot accept that students believe in conspiracy theories such as that the Earth is flat, the pyramids in Egypt were made by aliens or the AIDS virus was produced as a biological weapon. However, when searching on the main video platform 'emergence of the AIDS virus', the fifth video presented is titled *HIV was created in a laboratory for extermination*, and when searching for the words 'pyramids of Egypt' appears as the third video presented *Finally they discovered the real purpose of the pyramids of Egypt* in which the speaker says that the pyramids were built to be great electrical conduits for the house of the ancient Egyptians, contradicting any and all scientific basis for the actual construction of these monuments.

These delusional, unscientific, and dangerous realities can do a lot of harm to students. Furthermore, we cannot forget that there is a huge spread of false information with the deliberate intention of confusing young people. Strategy that is part of the fake news previously mentioned. Videos, audios and texts saying, for example, that 'Nazism was left-wing', 'the Brazilian election was rigged' or 'vaccine develops autism' are found by the thousands on the Brazilian internet.

We are not, however, supporting the thesis that the internet cannot be consulted, quite the contrary. The World Wide Web may have been the greatest human invention in the last fifty years, and ignoring its presence would not be smart. What we are advocating is that the teacher takes an active part in this process of searching and consulting students. It is up to the teacher, as already explained by Correia (2018), to be a curator of the material that can be researched by the students. If not a curator in the strict sense, as one who restricts sources, at least as an educational curator, who directs the student to credible types of sources. Perhaps the main role of the current professor, in the midst of the whirlwind of algorithms and social media, is that of curation, as Garcia and Czeszak (2019) point out. The teacher/curator is the reliable link that links the student to the information. The process of curation, that is, of looking for good sources of research, seems to be much more important, in the 21st century, than that of the speaker or the motivator. The role of avoiding the harmfulness of algorithms and restricting social media to a pedagogical and beneficial use for learning is essential for students, and a teacher/curator, more than passing correct information to his students, is the person responsible for teaching to learn, and above all, to avoid the ills of a connected world.

Final considerations

At the end of this exploratory article, we seek to highlight the relationship between the mathematical algorithms that make up the schedules of all social media that are used by the population, their capacity for engagement and the way in which individuals react to such involvement. Furthermore, we seek to present some characteristics of students who are immersed in this conjuncture. This triad between algorithms, engagement and social media seems to be modifying some elements at the heart of education. And while there are beneficial characteristics in its use, there are also challenges to be faced with regard to the influence of these elements in our educational system. Arbitrary judgment, the indecipherable black box, the non-neutrality of the web, the supremacy of only a few possibilities, the opaque computer screen, the dissemination of mobile and connected devices at all times of the day, submission to the machine, the forced engagement, the poor quality of the information, the extremely capitalist nature of the responses, among other problems, are faced daily by teachers throughout Brazil.

It would be interesting, then, to reflect on these issues, and seek, if not solutions, at least palliative strategies, so that these influences and dependencies do not affect our students so strongly. Knowing the processes is resisting, it is fighting against the predominance of the machine. Knowing how human-machine relationships work can help a lot to promote a more critical education, more capable of promoting better learning and a better citizen, more attentive and less susceptible to the yoke of algorithms and the forces that command communication plataforms.

Referencies

Adiele, I., & Olatokun, W. (2014). Prevalence and determinants of Internet addiction among adolescentes. *Computers in Human Behavior, 31*(1), 100-110. DOI: https://doi.org/10.1016/j.chb.2013.10.028

Bauman, Z. (2009). *Confiança e medo na cidade.* Rio de Janeiro, RJ: Zahar.

Bauman, Z., & Lyon, D. (2014). *Vigilância líquida*. Rio de Janeiro, RJ: Zahar.

Benjamin, W. (1994). *Obras Escolhidas. Magia e Técnica, Arte e Política*. São Paulo, SP: Brasiliense.

Bertoletti, A., & Camargo, P. (2016). *O ensino das artes visuais na era das tecnologias digitais.* Curitiba, PR: Intersaberes.

Bridle. J. (2019) *A nova idade das trevas: a tecnologia e o fim do futuro.* São Paulo, SP: Todavia.

Caldeira, F. H. (2015). O mecanismo de busca do Google e a relevância na relação sistema-usuário. *Revista Letrônica, 8*(1), 91-106. DOI: https://doi.org/10.15448/1984-4301.2015.1.19616

Carr, N. (2011). *O que a Internet está fazendo com nossos cérebros: a geração superficial*. Rio de Janeiro, RJ: Agir.

Castells, M. (2018). *Ruptura: a crise da democracia liberal*. Rio de Janeiro, RJ: Zahar.

Correia. A. P. (2018). As múltiplas facetas da curadoria de conteúdos digitais. *Revista Docência e Cibercultura, 2*(3). DOI https://doi.org/10.12957/redoc.2018.36884

Cunha, J., Santos, F. C., & Machado, J. B. (2019). *As redes sociais como ferramentas de ensino na educação básica*. *Anais do 11º Salão Internacional de Ensino, Pesquisa e Extensão da UNIPAMPA, 11*(2), 28.

Dal'agnol, S., Lino, R., Gollo, S. S., Silva, A. F., & Bottoni, J. (2019). Uso de redes sociais virtuais na sala de aula: um estudo exploratório com estudantes (p. 121-137). In M. P. Silva (Org.), *Comunicação, mídias e educação 3*. Ponta Grossa, PR: Atena.

Flusser, V. (2011). *Filosofia da caixa preta*. São Paulo, SP: Annablume.

Garcia, M. S. S., & Czeszak, W. (2019). *Curadoria educacional: práticas pedagógicas para tratar (o excesso de) informação e fake news em sala de aula*. São Paulo, SP: Senac.

Gelfert, A. (2018). Fake News: A Definition. *Informal Logic*, *38*(1). DOI: https://doi.org/10.22329/il.v38i1.5068

Godin, B. (2004). The new economy: what the concept owes to the OECD. *Research Policy Journal, 33*(5), 679-690.

Lanier, J. (2018). *Dez argumentos para você deletar agora suas redes sociais*. São Paulo, SP: Intrínseca.

Leavitt, D. (2011). *O homem que sabia demais: Alan Turing e a invenção do computador*. Ribeirão Preto, SP: Novo Conceito.

Levy, S. (2020). *Facebook: the inside story*. EUA: Blue Rider Press.

Lira, A. G., Ganen, A. P., Lodi, A. S., & Alvarenga, M. S. (2017). Uso de redes sociais, influência da mídia e insatisfação com a imagem corporal de adolescentes brasileiras. *Jornal Brasileiro de Psiquiatria, 66*(3). DOI: https://doi.org/10.1590/0047-2085000000166

Medina, M., & Fertig, C. (2005). *Algoritmos e programação: teoria e prática*. São Paulo, SP: Novatec.

Modolo, A. D. R. (2018). *Formas responsivas do Facebook: curtir, compartilhar e comentar a divulgação científica em rede social* (Tese de Doutorado em Filosofia, Letras e Ciências Humanas). Universidade de São Paulo, São Paulo.

Moreira, H., & Caleffe, L. G. (2008). *Metodologia da pesquisa para o professor pesquisador*. Rio de Janeiro, RJ: Lamparina.

O'Neil, C. (2016). *Weapons of math destruction: how big data increases inequality and threatens democracy*. New York, NY: Broadway Books.

Prensky, M. (2006). *Don't bother me, mom. I'm learning!: How computer and video games are preparing your kids for 21st century success and how you can help*. EUA: Paragon House.

Recuero, R. (2009). *Redes sociais na internet.* Porto Alegre, RS: Sulina.

Schittine, D. (2004). *Blog: comunicação e escrita íntima na internet*. Rio de Janeiro, RJ, Civilização Brasileira.

Siemens, G. (2004). Connectivism: a learning theory for the digital age. *International Journal of Instructional Technology & Distance Learning*, *2*.

Souza, K., & Cunha, M. X. C. (2019). Impactos do uso das redes sociais virtuais na saúde mental dos adolescentes: uma revisão sistemática da literatura. *Revista Educação, Psicologia e Interfaces, 3*(3). DOI: https://doi.org/10.37444/2594-5343.v3i3.156

Sumpter, D. (2019). *Dominados pelos números: do Facebook e Google às fake news, os algoritmos que controlam nossa vida*. Rio de Janeiro, RJ: Bertrand Brasil.

Varneda, P. V. (2008). De arte addiscendi. *Revista Internacional d´Humanitats, 14*.

Vieira Pinto, A. (2005). *Conceito de tecnologia* (Vol. 1). São Paulo, SP: Contraponto.

Vietri, M. (2019). *Community manager: social media marketing (Spanish Version)*. EUA: Amazon Press.

Vygotsky, L. S. (1991). *A formação social da mente*. São Paulo, SP: Martins Fontes.

Watts, D. (2010). *Seis graus de separação*. São Paulo, SP: Leopardo.