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Significance of Net Neutrality on Education and Health Care

The internet today plays a huge role in modern society. Most of the time we are in contact with people from around the globe, connected through our own devices that are constantly sending and receiving information to other devices via the internet. Email, social media, news outlets, and other websites are only a few of the sources on the internet that manage to keep people informed of what is relevant throughout the world. Most of the population in the U.S. is connected through broadband connection, a form of internet service used for telecommunications, which is provided by internet service providers, called ISPs. According to a survey in 2015 done by Pew Research, 79% of all households in the U.S., including 96% in urban areas, have internet access in their homes (Connolly et al. 538). The increasing usage shows just how important these companies are in our society.

Since internet usage is so common in the U.S., especially in urban areas, ISP companies were able to profit from the consumers' overwhelming demand for content and to stay connected to the internet. ISPs formed a market where internet access is needed and accessed for a fee as a way to obtain content that is relevant to each individual consumer. But content consumers are not the only ones that seek internet service from these vital companies. The actual content distributed is not produced by the ISPs, rather the ISPs serve as a content distributor for the consumer to access content produced from parties classified as content service providers, called CSPs. In short, ISP companies serve as "middlemen" by providing a method for the consumers to obtain content, which is not made by the ISPs, but by the CSP (Baltatescu 114). As a result, two sides of the internet service market form, the content consumer and the CSPs, with ISPs at the center.

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Net neutrality, an idea first referenced by Lawrence Lessig in 2001, is the idea of a regulated internet. For an regulated internet to exist, regulations were imposed upon ISPs, which controlled the internet service market as previously stated with CSPs on one side of the market and content consumers on the other. Assuming there are no net neutrality policies, ISPs can charge additional fees to CSPs to have prioritized access on the ISPs internet service, making it easier to access for the content consumer. ISPs could also block content or decrease the quality of service for selected content if the consumer does not pay an additional fee to access said content. In terms of content accessibility, an open internet would be beneficial for consumers and smaller CSPs. However, equal distribution of all content regardless of importance and size could result in service congestion and an overall drop in quality of service. ISPs would benefit the most from a repeal of net neutrality regulations and therefore can charge both the consumer and CSP for prioritized content and delivery (Baltatescu 116).

In 2015, the Federal Communications Committee officially put into place the Open Internet Order, establishing net neutrality regulations upon ISPs. These regulations prohibited ISPs from using price discrimination practices against CSPs and end recipients. The basic structure of this Order consisted of 3 main concepts. These principles were that ISPs could not block legal content, discriminate service based on company or content, or accept paid prioritization of content over others (Koning and Yankelevich 37). As of 2018, the FCC voted 2-3 to repeal the Open Internet Order, reversing Title II regulations imposed on ISPs, effectively dismantling net neutrality (Haselton). Policies which were prohibited by net neutrality such as price discrimination were now free to use.

Issues such as unethical medical prioritization and educational content suppression were feared to arise without net neutrality to prevent these outcomes. Without net neutrality, ISPs

could block medical research and content that are not in line with the ISPs' affiliations and desires. Pharmaceutical companies have the freedom, without net neutrality, to pay ISPs extra fees to have their research and products prioritized over other medical resources that could also be blocked if they do not have the same financial impact needed to be seen on the same network (Cuk and Robinson 1655). Such content that is prioritized slows down other content, such as legal documents. Criminal defendants need legal information and net neutrality rules provide an unbiased ISP network that distributes all content equally. However, net neutrality was also believed to cause a disparity of internet usage, called a digital divide, as a result of internet network congestion costs. The digital divide is an accumulation of locational, financial, and ethnic barriers that impeded the ability of one to obtain internet service. Geographic, ethnic, and financial demographics all correlated with the likelihood of someone having internet accessibility (Sylvain 467). Open internet rules where believed to increase the digital divide by increasing the cost to maintain quality of service of internet service, with the end users subject to extra fees because of increase in cost. Net neutrality regulations in 2015 promoted online, medical, and legal education despite creating internet service congestion and a digital divide among the population.

Origins of the Internet

The origin of net neutrality is related to the creation of what is today known as the internet. The internet as we use it today has no clear inventor. From what we know, the earliest form of internet was used initially during the Cold War by the United States as a form of communication between scientists and researchers to save data with one another (Dennis and Kahn). The idea of an "internet" came from the fear that came from the launch of the fist man made satellite into orbit by the Soviet Union named Sputnik. There was a fear of a soviet attack

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on telephone lines in the U.S. because of the technological advancements the communist nation was accomplishing. In response, the 2 MIT scientists proposed a way of communication that connects networks of computers using a method named “packet switching” in 1965, which was a method of breaking down data from computers and send each piece of data individually. This idea of a network of computer communication through packet switching was an alternative to telephone communication and was less vulnerable to missile attacks where if telephone lines where attacked, large communicational areas could be affected as a result (Dennis and Kahn).

The network was called the Advanced Research Projects Agency Network, or the ARPAnet, and connected only 4 computers. It was not until 1991 that a computer programmer from Switzerland named Tim Berners-Lee created a network of information where anyone can pull information from. This was different form packet switching, where one computer sends information to another, since Lee created a network called the “World Wide Web”, which is not exclusive to 2 parties like packet switching. The World Wide Web is what the internet is known as today (Dennis and Kahn).There is no clear-cut person that founded or invented the internet rather it was an accumulation of developments of forms of communication between computers connected through networks.

Start of Net Neutrality

The development of net neutrality consequently results from the present form of the internet known as the World Wide Web. The FCC was created in 1939 through the Federal Communications Act of 1939 to regulate national and foreign radio communication. The same FCC would later be responsible for regulating ISPs as they fall into Title II of the Federal Communications Act and labeled these internet companies as “common carriers” (Kamal, 332). The first instance that we hear of the concept of net neutrality was not until 2003, when a law

professor named Tim Wu introduced the term in his academic paper, "Network Neutrality, Broadband Discrimination". Net neutrality at the time was a concept that aimed to regulate the ISP market through non-discrimination rules. ISP could not practice price discrimination towards CSPs where different CSPs are prioritized over other content on the ISPs' networks based on how much they pay ISPs for prioritization or because of other external influences such as investments (Wu, 114). In theory, net neutrality would promote competition among CSPs, since smaller CSPs cannot pay ISPs for prioritization over larger content, and end users of the content will not have to pay extra for internet content as a result of the increase cost of internet service from CSP's while having a consistent quality of service (Wu, 149). The year 2003 was the beginning of the network neutrality theory which would later be implemented in the U.S.

While network neutrality was being introduced, ISPs where still not considered common carriers under Title II of the Federal Communications Act and thus where not regulated like common carriers under net neutrality rules just yet. The first step the FCC took to enforcing network neutrality among ISPs started in 2005, when FCC chairman at the time, Kevin Martin, established a "Policy Statement" that were based on net neutrality ideas. This policy statement included 4 principles that ISPs had to abide by:

> "To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet,
>
> 1. Consumers are entitled to access the lawful Internet content of their choice;
> 2. Consumers are entitled to run applications and services of their choice, subject to the needs of law enforcement;
> 3. Consumers are entitled to connect their choice of legal devices that do not harm the network; and
> 4. Consumers are entitled to competition among network providers, application and service providers, and content providers." (Policy Statement)

These policies were not official rather they were policies from the FCC, so the enforcement of these polices where limited. In summary, these 4 principles were meant to protect the quality of

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service of the end user and the competition among CSP of distribution of content to the end user without ISP gaining too much market power where either the end user or CSPs is restricted from these principles.

It was not until December of 2010 that the net neutrality rules where officially introduced as apart of FCC regulations through a vote among members of the FCC. These regulations where named the Open Internet Order and prevented ISPs from hindering the quality of service from CSP towards consumers. The Order also required ISPs to be transparent, which meant they had to inform CSPs and consumers of how they were managing their network (Reardon). Transparency was mandated so that ISPs could not prioritized certain content over others. However, it did not prohibit the use of price discrimination from ISPs, one of the ideas Wu initially proposed in his paper of net neutrality (Wu 114). Since ISPs were not considered common carriers under Title II of the Federal Communications Act, the FCC did not have the authority to regulate ISP price discrimination and prioritization practices. In February of 2015, the members of the FCC voted to pass the Open Internet Order of 2015. The new policies were revised from the Order's predecessor in 2010 to include the re-categorization of ISPs as Title II, common carriers (Cuk and Robinson 1655) This move to Title II gave the FCC jurisdiction to enforce net neutrality regulations on ISPs including prohibition of price discrimination and prioritization.

Under the revisions of the Open Internet Order of 2015, the FCC sought to protect consumers and CSPs from an unregulated market of ISPs at the time. The FCC implanted Title II regulations for, "consumer protection, promoting competition, and advancing universal access to internet" (Kamal 338). Without these regulations, the FCC feared that prioritization rates would reduce competition since smaller ISPs could not compete with larger CSPs. This would result in

less content for the consumer as well as less end users since some might not be able to afford the increased rates in internet service.

All of this work towards building net neutrality as part of the internet was brought to a halt on December 2017, when the FCC chairman, Ajit Pai, helped in the repeal of net neutrality regulations in a vote of 3-2 in favor of repealing the Open Internet Order of 2015 (Cuk and Robinson 1655). Part of the worries that internet consumers and CSPs had after the repeal of net neutrality were that the overall quality of service would drop for end consumers not willing or unable to pay extra fees for their content that might be blocked by their ISPs. Smaller CSP just breaking out in their competitive market could also have a difficult time competing for content exposure since larger CSPs have the means to prioritize their content over smaller competitors on the ISPs' network in the absence of net neutrality rules. Fears of price hikes for content services on ISP networks and lack of interaction with smaller content companies failing to compete with larger CSPs that pay to be prioritized are some of the reasons why the repealing of net neutrality signified a loss of internet freedom for the average consumer.

Internet Disparity among Consumers

With the repeal of net neutrality, concerns arose that prices from CSPs might start to increase with potential price discrimination and prioritization from ISPs. But in fact, some speculate that the Open Internet Order in 2015 actually increased the cost and efficiency of ISPs' networks with the prohibition of price discrimination. The limitation of ISPs would start to grow a present digital divide among rural, urban, and Native American settlement areas in the U.S (Connolly et al. 541). A digital divide is simply defined as, "the disparity in access to and/ or use of digital technology across households based on urban versus rural locations and on socioeconomic differences across households" (Connolly et al. 540). As of 2016, more than 39%

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of Americans in rural areas lack access to telecommunications and 41% of Americans living in Native American tribal lands also lack access to telecommunications (Connolly et al. 538). Internet disparity arises between these populations and urban areas, where only 4% of Americans do not have access to telecommunication services (Connolly et al. 538). The impact of the Open Internet Order aimed to create a free internet that fostered innovation while reducing the digital divide among the population. But these net neutrality regulations are believed to in fact worsen the digital divide by limiting the freedom of internet providers (Connolly et al. 540).

Internet service congestion of ISP networks increased the ISPs' cost of service because of the net neutrality regulations in 2015. As there was no price discrimination allowed by the ISPs towards service for CSPs, CSPs with large volumes of data were not prioritized and not put into a separate lane on the ISPs' networks to avoid congestion. For example, Netflix and YouTube, video streaming services that falls into the category of being a CSPs, were both estimated to have occupied over 52% of all downstream traffic in 2015 through video streaming. No prioritization of large CSPs resulted in network congestion problems as they share the same network with CSPs that occupy significantly lower volumes of the network such as Facebook, which required only 2.65% of downstream internet traffic of ISPs (Connolly et al. 540). In order to maintain a sustainable and consistent quality of service from all CSPs to the end user, which is obligated by net neutrality regulations as ISPs are not allowed to hinder legal content service over others, the cost of network management rose and so did rates for internet service (Connolly et al). This increase in price showed how a location demographics as well as increases in price can contribute to a digital divide in the U.S.

Financial influences can affect the accessibility to internet a group of people have. Unsurprisingly, financial standing effects how likely a person is to acquire general internet

access, whether it is in a public space such as a library, or personal access to the internet. (Sylvain 464). When internet service is available in the area of a household, internet adoption is directly correlated to financial standing and income. People who tend not to purchase internet service earn less than $30,000 a year (Sylvain 465). As stated before, where someone resides is also correlated in how likely someone has internet, for instance people living in rural areas or Native American settlements. With a digital divide already being driven by low income and location, an increase in internet service price consequently from net neutrality regulations could continue to decrease the number of people have access to internet.

Digital Divide and Race

Race and ethnicity are a significant determinant in the likelihood someone has access to internet. Previously, it was stated the Native American and tribal communities are more common to not have internet coverage in their area. People in urban areas were the most likely to have internet coverage in their area because ISPs have established their infrastructure in these densely populated cities, providing more available internet coverage for more people (Sylvain 467). Even though internet availability has spread in recent years throughout the U.S., an internet subscription disparity is still prevalent among ethnic minorities even in densely packed urban areas (Sylvian 467). Of Hispanics households in the U.S., 65% were estimated to have broadband, internet service, and 60% of non-Hispanic Black households had broadband service in both rural and urban areas together, compared with the 75% of non-Hispanic White households that adapted broadband service (Sylvian 467). The disparity in internet usage and adaptation can be attributed to the fact that minority communities have fewer financial opportunities and resources, which is a different discussion entirely (Kamal 341).

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The small fraction of minority groups supporting de-regulation of the internet service market seem to be influenced directly by ISP contributions (Kamal 349). It is believed that some media groups, such as the Minority Media Telecommunications Council, the MMTC, received more the $700,00 in sponsorships from ISPs, for instance Verizon and Time Warner, who oppose net neutrality regulations (Kamal 348). Media such as this council which represent the community's voice and opinion are subject to bias because of funding from a party directly influenced by net neutrality political decisions. This case is only an example how media that voice community opinion are subject to bias since the initial position taken by this Council supported net neutrality regulations (Kamal 348). Media organizations that represent the Hispanic and African American communities, such as the National Association of African-American Owned Media, or NAAAOM, have also received funding from ISPs and oppose net neutrality regulations (Kamal 349). By influencing media viewpoints of these outlets, the public view of ethnic minorities is swayed to the side of ISPs and against net neutrality because of financial contributions from parties with conflicting interests. In short, the net neutrality opinion of ethnic groups is a result of the media groups' financial incentives, and not on individual opinion. With further research into internet disparity among minority demographics should be studied with caution as it is safer to be aware of the organization's motives and observe possible biases when discussing net neutrality.

Internet usage disparity, or digital divide, correlates with income, geography, and ethnicity. The disparity initially believed to be caused from a non-regulated internet was seen to be caused the net neutrality. Net neutrality forces ISPs to spend more on costs of maintaining a congested network with all content being carried equally to consumers. Since ISPs are not allowed to charge more for content prioritization from CSPs, the ISPs raise the price of internet

access on the consumer end of the market. Financial, locational and systemic boundaries still effect how easy it is for someone to have access to a regulated internet even if the internet is an equal playing field for CSPs with the presence of net neutrality.

Access to Justice

The repeal of net neutrality in 2018 had implication on internet access for criminal defendants in the judicial system by limiting their legal research. Net neutrality is relevant to criminal defendants in that online platforms and databases are on the rise in modern society paired with a decline in print publications (Chase 354). Hence, a defendant is to have access to internet service and online libraries for optimal access to information in modern society. Criminal defendants need access to public, government-law, and even prison libraries if incarcerated for the legal information they want. However, budget cuts upon all of these establishments decreases the amount of access a defendant needs to stay informed. 45 state-penitentiaries in the U.S. provide electronic legal resources, but they do not necessarily all provide internet access to these documents (Chase 358) Lack of internet access means that inmates are denied new legal information not yet updated by the prison's computer system. 40 state prison systems do not have access to any online legal documents and are left with outdated print documents (Chase 359). These prison systems simply do not have the budget to keep their inmates informed, such as Illinois' state prison system, which reduced its budget from $750 thousand to $276 thousand for prison educational programs (Chase 359).

With state prison systems decreasing their budgets, the repeal of net neutrality poses a risk to accessibility of legal information for criminal defendants. The repeal of net neutrality gives ISPs the power to throttle whichever content they like for whoever is willing to pay for the service. Large ISPs can contract with other large companies to throttle their content over others,

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such as legal document access. With state prison systems increasing their inmate capacity and decreasing in budget, the few prisons that still provide internet access are not as willing to pay more for prioritized access to legal documents. Slower internet service poses an obstacle for criminal defendants as some enforce internet time constraints per person, with some prison systems offering only a maximum of 3 hours every week (Chase 360). The repeal of net neutrality in 2018 combined with prison system budget cuts disrupts the access to legal information a criminal defendant has the right to have. Net neutrality regulations have impeded ISPs from prioritizing other content over legal information.

Net Neutrality Supports Education

With the repeal of net neutrality and an unregulated internet, prioritization of content over others can pose a problem in education in online learning specifically. If CSPs are selectively prioritized while other content is delayed or even suppressed, online learning of a student becomes effected consequently since they are not exposed to the full spectrum on the internet. If net neutrality is not maintained, consumers fortunate enough to purchase internet access but not full access are deprived of online resource (Yamagata-Lynch et al. 255). While some might be able to pay extra mile fees for more internet service, communities restricted by location, systemic, or financial obstacles are not as fortunate to access all content without net neutrality regulations are restricted to the minimum quality of service. (Yamagata-Lynch et al. 254). Although net neutrality promotes equal access of internet content for consumer, it could also make it more difficult depending on consumer circumstances as stated in the previous section. A non-regulated internet gives ISPs the opportunity to suppress internet content as they please.

When discussing the relevant obstacle that is socioeconomic status, it causes a worse and bias internet experience with the repeal of net neutrality. An example of how status effects

affects education is seen in what is called the homework gap. The homework gap is generally the digital inequality in learning resources among students and has been proven to be even more prevalent in low income households in rural areas. The section in this paper discusses the difficulty for people in rural areas to have access to internet service. Net neutrality regulations impede on ISP traffic and cause congestion management prices to rise and thus do not have incentives in building the infrastructure needed for internet service in these areas. In summary, net neutrality is both good and bad for education. Net neutrality is good for people with enough financial means and internet availability since they can experience content and learn in on an uncensored internet. Net neutrality is bad for people with low economic status and in rural areas since ISPs cannot afford to establish an internet service in rural areas due to regulation impeding them from gaining more profit than if they were unregulated by the FCC (Yamagata-Lynch et al. 255).

Net Neutrality and Medical Field

There is concern from the medical community of having relevant medical research censored by ISPs. Net neutrality regulations allowed for free communication in an ISP network without the throttling of select content over others by the ISPs. An unregulated ISP will find it more beneficial to prioritize other content that align with the ISP's interests over medical research and journals (Griner 209). The internet is used by doctors for research on new types of treatment, virtual visits from home, and online scheduling (Griner 210). Without a free and open exchange of healthcare information, patients and their health are at risk and as doctors cannot use the full potential of internet service with the net neutrality repeal of in 2018. A pharmaceutical company can pay to have their product and research prioritized exposure to health care professionals, regardless if the company and its research are trust worthy. (Cuk and Robinson

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1655). ISPs can also limit exposure or even hide access to other types of medication on the internet that did not pay for prioritized exposure, or do not have financial ties with an ISP (Cuk and Robinson 1655). Without net neutrality, ISPs have the market power to undermine the importance of online health care and negatively impact a person's health as a result.

Net neutrality prevented the unethical prioritization of medical services and treatments over others. Under net neutrality, health care professionals were free to explore research of new methods and advancements in their field of medicine. With the repeal of net neutrality however, ISPs can prioritize and block medical content to accommodate the ISPs wants. This creates an unethical system where a pharmaceutical company is prioritized not because it is effective, but because the company had more resources to prioritize their product and distribute it.

Another problematic aspect of rolling back net neutrality is the decline of health literacy among patients. "According to the Centers for Disease Control and Prevention, only 1-in-9 Americans can read and interpret basic health information" (Early and Bustillos). A bias network managed by ISPs without net neutrality limits reliable health information. Proven and reliable information could be censored by ISPs to make way for bias content that was paid for to be prioritized. The net neutrality repeal worsens health literacy by censoring information for those who are able to pay for internet access.

Conclusion

There are positive and negative sides to debate about net neutrality. Negative standpoint surrounding internet regulation is that it will increase the cost of internet service and develop an existing digital divide. With all CSPs being treated equally, no matter the volume they output into the network, the ISPs become congested with information. Congestion of the network in a greater cost for maintenance of the network. Consequently, this would be paid by the customers

since ISP are not allowed to prioritize CSPs by charging them more per the amount of volume the CSPs use on the network. With an increase in price, less people will be able to purchase internet service. Geographical, ethnic, and financial demographics correlate with internet attainability and an increase in cost will make it harder for underprivileged communities to have internet access under net neutrality regulations.

Positive aspects of net neutrality include better quality online, medical, and legal education. With net neutrality in effect, both small and large CSPs can distribute their content and leave it to the consumer on what they want to see without the worry of bias censorship based on market power of the CSP. Criminal defendants need the protection that came from net neutrality to be able to access legal information on an unbiased ISP network. Quality of medical research could be affected by censorship and unequal service of content based on financial power of medical companies alone. Online regulation of ISPs could ensure that health care professionals are getting unbiased research results.

Bibliography

Baltatescu, Ionela. "The Economics of Net Neutrality: Policy Issues." *Knowledge Horizons. Economics Bucharest*, vol. 6, no. 2, 2014, pp. 114–118.

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Griner, Todd. “Net In-Neutrality’s Impact on Health Care.” *Nursing Administration Quarterly*, vol. 43, no. 3, Sept. 2019, pp. 205–2011. *insights-ovid*, doi:10.1097/NAQ.0000000000000350.

Castillo, Michelle, and Todd Haselton. “The FCC Has Reversed a 2015 Rule That Could Change How You Access and Pay for Internet Service.” *CNBC*, 14 Dec. 2017, https://www.cnbc.com/2017/12/14/fcc-reverses-open-internet-order-governing-net-neutrality. Accessed 11 Nov. 2019.

Chase, Ashley Krenelka. " Neutralizing Access to Justice: Criminal Defendants' Access to Justice in a Net Neutrality Information World." *Missouri Law Review*, vol. 84, no. 2, 22 Mar. 2019, pp.323-369.

Connolly, Michelle, et al. "The Digital Divide and Other Economic Considerations for Network Neutrality." *Review of Industrial Organization*, vol. 50 no. 4, June 2017, p537-556. *Gale Academic OneFile.* doi:10.1007/s11151-016-9554-8.

Cuk, Natasha, and Colin L. Robinson. "Net Neutrality Repeal and the Potential Harm to Medical Education" *Medical Education and Training.* 24 Apr. 2018, vol. 319, no. 16. pp. 1655-1656. *JAMA Network*. doi:10.1001/jama.2018.1683. Accessed 5 Nov. 2019.

Dennis, Michael, and Robert Kahn. "Internet." *Encyclopedia Britannica*, April 10, 2019, *Encyclopedia Britannica.* https://www.britannica.com/technology/Internet. Accessed 8 Dec. 2019.

Early, Jody, and Dan Bustillos. "An Internet for Some threatens health for All: What effects could the repeal of net neutrality in the USA have on individual and population health?"

Global Health Promotion, 30 Aug. 2018, pp. 1-5. *Pubmed*. Doi: 10.1177/1757975918785354

Kamal, Sara. "If It Isn't Broken, You're Not Looking Hard Enough: Net Neutrality and Its Impact on Minority Communities Notes." *Federal Communications Law Journal*, vol. 68, no. 2, 2016, pp. 329–352.

Koning, Kendall J., and Aleksandr Yankelevich. "From Internet 'Openness' to 'Freedom': How Far Has the Net Neutrality Pendulum Swung?" *Utilities Policy*, vol. 54, Oct. 2018, pp. 37–45. *ScienceDirect*, doi:10.1016/j.jup.2018.07.004.

Policy Statement. Federal Communications Commision, 23 Sept. 2005.

Reardon, Marguerite. "Net Neutrality: How We Got from There to Here." *CNET*, 24 Feb. 2015, https://www.cnet.com/news/net-neutrality-from-there-to-here/. Accessed 5 Nov. 2019.

Schaub, Florian. "The Implications of the FCC's Net Neutrality Repeal." *Media and Communication*, vol. 6, no. 3, Sept. 2018, pp. 69–72. *Cogitatiopress*, doi:10.17645/mac.v6i3.1560.

Sylvain, Olivier. "Network Equality." *Hastings Law Journal*, vol. 67, no. 2, Feb. 2016, pp. 443–498.

Wu, Tim. "Network Neutrality, Broadband Discrimination." *Journal on Telecommunications & High Technology Law*, vol. 2, no. 1, 2003, pp. 141–176.

Yamagata-Lynch, Lisa C., et al. "Net Neutrality and Its Implications to Online Learning." *International Review of Research in Open & Distance Learning*, vol. 18, no. 6, Sept. 2017, pp. 243-260.