

THE 2020-2021 PANDEMIC: UNDERGRADUATE BUSINESS STUDENT SOCIAL MEDIA USE AND TROLLING OCCURRENCE

Carl J. Case, St. Bonaventure University
Darwin L. King, St. Bonaventure University

ABSTRACT

Although social media has increased communication, a non-intended consequence has been the incidence of online trolling behaviors such as harassment and hate. Given that undergraduate business students will be the future users and managers of the social media, this study was conducted to empirically examine their social media use and occurrence of trolling to them. Of particular interest, the study collected data prior to and during the pandemic of 2020-2021. Findings suggest a transition in social media platform participation percentage and a large increase in utilization minutes, particularly after the beginning of the pandemic. In addition, while the percentage of students being trolled increased, the quantity of trolls received decreased. Finally, gender and time spent at social media sites were found to be factors with regard to trolling volume victimization.

Keywords: social media usage, trolling, undergraduate students

INTRODUCTION

Social media has been a vehicle for information flow. According to a Pew Research Center report, for example, 67% of U.S. adults in 2017 relied on social media sites for at least some of their news (Vick, 2018). However, there have been several negative consequences. An examination of 300 million tweets from the 2012 U.S. presidential election found that users selectively shared fact-checking messages that cheerlead their own candidate and denigrated the opposing party's candidate (Fisher, 2021). In addition, a Massachusetts Institute of Technology analysis of more than 126,000 stories tweeted from 2006 through 2016 found that misleading or incorrect stories traveled six times faster (Klepper, 2020).

Fortunately, the European Union and United Kingdom proposed new laws in December 2020 that would allow large technology companies to be fined up to 6% of the annual global revenue if the companies do not act swiftly to counter societal harms stemming from their business models (McNamee, 2020). In the United States, President Biden has been examining the repeal of Section 230 of the Communications Decency Act, the federal law protecting social media companies from being sued for hosting illegal content (Perrigo, 2021). The safe harbor of Section 230 provides no incentive for Facebook, for example, to prevent right-wing militias or white supremacists from using its apps as organizing infrastructure (McNamee, 2020).

Another negative outcome of the social media communication is spam. In May 2018, for instance, Twitter identified more than 9 million accounts per week as potentially spam or automated and suspended 70 million accounts during a two-month period (Ortutay, 2018).

An even more insidious consequence is trolling. The Merriam-Webster dictionary (2021) defines trolling as “to antagonize (others) online by deliberately posting inflammatory, irrelevant, or offensive comments or other disruptive content.” Trolls, those who commit these acts, may be classified as insult trolls, persistent debate trolls, show-off trolls, profanity trolls, grammar trolls, and so on (Moreau, 2018).

Of note, Tim Berners-Lee’s World Wide Web Foundation and the World Association of Girl Guides and Girl Scouts research found that more than half of young women and girls from around the world have experienced online abuse which includes threatening messages, sexual harassment, and sharing of private images without consent and that 84% believe the problem is getting worse (Dastagir, 2020). A Pew Research Center study further found 41% of U.S. adults have personally experienced online harassment with 25% experiencing more severe harassment (Vogels, 2021). This report measured online harassment using six distinct behaviors: offensive name-calling, purposeful embarrassment, stalking, physical threats, harassment over a sustained period of time, and sexual harassment. The study found that 64% of respondents under the age of 30 have been harassed online with men somewhat more likely than women to admit they have experienced any form of harassment online (43% vs. 38%). Women, on the other hand, were more likely than men to report having been sexually harassed online (16% vs. 5%) or stalked (13% vs. 9%).

Moreover, it is estimated that 80% of teenagers use Instagram and half of those users have been bullied (Steinmetz, 2019). Instagram, however, has implemented DeepText, an artificial intelligence tool to find and block offensive comments and search for bullying text, photos, and videos. Bullying is defined as content intended to “harass or shame” others and is broken down into categories including insults, shaming, threats, identity attacks, disrespect, unwanted contact, and betrayals. Another social media company, Bumble, a 2021 IPO dating application, introduced verification to weed out trolls and rolled out guidelines relating to harassment and body shaming after more than 880,000 incidents that violated user guidelines were found in 2020 (Alter/Austin, 2021). Violation consequences included written warnings, suspensions, and more than 880,000 users being banned from its platform.

Given that there have been few research studies examining the incidence and behavior of business undergraduates, the social media users and drivers of the future, the study was conducted. This empirical study examines several questions. What is the five-year trend in social media activity, especially given the March 11, 2020 World Health Organization declaration of the novel coronavirus (COVID-19) as a global pandemic (Cucinotta & Vanelli, 2020)? What is the corresponding trend with respect to student victimization by Internet trolls? Finally, is there a relationship between factors such as gender, the time spent online at social media sites, and academic class with respect to the incidence of trolling? Results are important in better understanding the state of online trolling and determining if there is a need for further reactive and/or proactive efforts with respect to trolling.

PREVIOUS RESEARCH

Researchers have examined several facets related to Internet social media usage and trolls. With respect to trolling, studies have examined factors predicting perpetrators, motivations, and triggers.

As a baseline to better understand undergraduate business student online attitudes and behavior, the authors conducted an exploratory study. Results showed 65% of undergraduate business students felt that social networking is either somewhat or very important to them (Case and King, 2012). A much larger percentage of females versus males, 18% versus 12%, however, indicated that social networking is very important. Within each academic class, roughly one-half of the undergraduates indicated that social sites are somewhat important to them. A subsequent author study further found that students noticed an average of 74 other individuals being trolled online during a six-month period (Case and King, 2018). Specifically, students reported seeing an average of 33 trolling incidents per month of others being trolled.

In terms of building the psychological profile of the troll, March and Steele (2020) found in their Australian study that gender (male) is a significant predictor of trolling and that trait psychopathy and sadism are significant positive predictors. Although self-esteem had no additional value on top of trait psychopathy and sadism in explaining trolling, there was a significant interaction between self-esteem and trait sadism. These researchers thus portray the troll as a callous individual that may enjoy causing psychological harm, particularly if their self-esteem is high. Through the use of semi-structured interviews with self-confessed trolls, other researchers (Cook, Schaafsma, & Antheunis, 2018) found the three key motivations to trolling were personal enjoyment, revenge, and thrill-seeking and that trolling appears to be a cyclical, self-perpetuating phenomenon.

Moreover, an examination of college students found that significant predictors of trolling included male gender, greater need for participation in social media, and greater likelihood to make downward social comparisons on social media. (Howard, et.al, 2019). Males were more than twice as likely to engage in trolling. The Need for Participating in Social Media scale assessed participants' motivations related to social media use and a high need to participate predicted membership. In their online interactions, trolls were more likely to compare themselves to others worse off than themselves, an activity that may have allowed trolls to feel better about themselves by comparison.

In addition, through an experiment simulating an online discussion, researchers (Cheng, et.al, 2017) found two primary trigger mechanisms to trolling: the individual's mood and the surrounding context of a discussion (e.g., exposure to prior trolling behavior). Results suggest that ordinary people can, under the right circumstances, behave like trolls. In particular, both negative mood and seeing troll posts by others significantly increases the probability of a user trolling, and together double this probability. A predictive model of trolling behavior proposes that mood and discussion context together can explain trolling behavior better than an individual's history of trolling.

Finally, a research study has discovered a possible disconnect between academic and lay definitions of trolling. Scholar definitions focus on prosocial or humor-based forms of trolling

and respondent definitions focus on foreground identity-based harassment and harm on the basis of race and gender (Ortiz, 2020). According to respondents, trolling is a collective form of harassment perceived as having the malicious intent to provoke another user and is understood to be collective because although undertaken by individuals, the strategies used by trolls are shared beyond that individual person or one interaction. Specifically, trolls activate group position and exercise power in their efforts to target women, feminists, people of color, and disabled persons. Trolling is further perceived as being tied to the group positions of male, White, and conservative.

RESEARCH DESIGN

This study employs a survey research design. The research was conducted at a private, northeastern U.S. university. A Student Internet Troll instrument (Appendix) was developed by the authors and administered each semester during a five-year period (from spring 2017 through spring 2021) to undergraduate students enrolled in a School of Business course. Because of the university unanticipated face-to-face instruction discontinuance midway through the spring of 2020, no data was collected during that semester. The courses included a variety of subjects such as Business Information Systems, Introduction to Financial Accounting, Introduction to Managerial Accounting, Macroeconomics, and Business Policy. A convenience sample of class sections and faculty members was selected to minimize the probability of a student receiving the survey in more than one class and to ensure consistency, the same questions were asked during each of the semesters. Because of the sensitivity of the subject and to encourage honesty, no personally-identifiable data were collected and respondents were informed that surveys were anonymous, participation was voluntary, and responses would have no effect on his/her course grade. In addition, students were asked to complete the survey only one time per semester. Prior to the pandemic, the surveys were completed via paper in an academic classroom. Subsequent to the beginning of the pandemic, the surveys were completed via an online link.

The survey instrument was utilized to collect student demographic data such as gender and academic class. In addition, the survey examined student Internet behavior regarding online social media sites. Students were asked to estimate the average number of minutes spent daily on fifteen social media sites and list any other social networking sites used by the student. Moreover, students were prompted to estimate the number of times that he/she had been trolled on each site during the past six months. Note that 4chan and 8chan were removed from survey after 2019 because these sites were discontinued (Krasodonski-Jones, 2019) and TikTok was added to survey in 2020 because of increased student use. Results were summarized by social media site and correlations were calculated to determine potential relationships between study factors (i.e., gender, academic class, and social media usage minutes) and the quantity of trolling incidences. To examine potential trends, the data was segmented by calendar year. Finally, repeated measures were not examined because of the anonymity of respondents, it could not be determined if a given student participated during multiple semesters.

RESULTS

A sample of 1,161 usable surveys was obtained. As indicated in Table 1, 64% of the respondents were male and 36% were female. This 64/36 ratio remained consistent over the identified five-year period and was consistent with the study university's School of Business student population.

	2017	2018	2019	2020	2021	Total
Male	65%	65%	64%	59%	63%	64%
Female	35%	35%	36%	41%	37%	36%
Count	376	315	323	83	64	1161

The response rate by year, with the exception of freshmen participation during the pandemic 2020-2021 years, was relatively equally distributed among academic class. Table 2 illustrates that overall 16% of respondents were freshmen, 34% were sophomores, 24% were juniors, and 26% were seniors.

	2017	2018	2019	2020	2021	Total
Freshmen	21%	17%	15%	4%	0%	16%
Sophomore	24%	41%	40%	19%	49%	34%
Junior	22%	18%	20%	57%	45%	24%
Senior	32%	24%	25%	20%	6%	26%

Responses were first examined with respect to the percentage of students using the various social media sites per year. Although 13-14 sites were provided on the survey instrument, each respondent was prompted to list any "other" social media sites that he/she utilized. The "other" sites named included WhatsApp, Barstool, Wall Street Oasis, Tinder, Trello, and VSCO. Table 3 illustrates that in 2017, 92% of students used Snapchat, 86% used Instagram, 81% used Facebook, 75% used Twitter, 72% used YouTube, 32% used LinkedIn, 17% used Pinterest, 12% used Google+, 9% used Reddit, 5% used YikYak, 2% used Tumblr, 2% used Other, 1% used 4chan, and zero students used 8chan or Voat. In terms of social media site utilization percentage of students by year, six social media providers increased by 2021. Snapchat increased from 92% to 98% of students, Instagram increased from 86% to 98% of students, YouTube increased from 72% to 77% of students, TikTok increased to 75% of students, Reddit increased from 9% to 13% of students, and Other increased from 2% to 20% of students. Five social media sites decreased

in percentage of students. Facebook decreased from 81% to 58% of students, Twitter decreased from 75% to 64% of students, Pinterest decreased from 17% to 8% of students, Tumblr decreased from 5% to 0% of students, and YikYak decreased from 2% to 0% of students. LinkedIn (32% to 31%) and Google+ (12% to 13%) remained consistent, 4chan and 8chan were eliminated, and Voat not used.

Social Media Site	2017	2018	2019	2020	2021
Snapchat	92%	92%	91%	98%	98%
Instagram	86%	93%	93%	96%	98%
Facebook	81%	68%	62%	63%	58%
Twitter	75%	79%	73%	82%	64%
YouTube	72%	73%	73%	73%	77%
TikTok	-	-	-	70%	75%
LinkedIn	32%	36%	35%	43%	31%
Pinterest	17%	18%	19%	15%	8%
Google+	12%	12%	10%	11%	13%
Reddit	9%	8%	9%	8%	13%
Tumblr	5%	5%	2%	1%	0%
YikYak	2%	0%	2%	0%	0%
Other	2%	3%	4%	27%	20%
4chan	1%	1%	0%	-	-
8chan	0%	0%	1%	-	-
Voat	0%	0%	0%	1%	0%
Overall Average	99%	99%	100%	100%	100%

Results illustrate that for every year of the study, there are six sites that are used by most students. These include Snapchat (91-98% of students per year), Instagram (86-98% of students per year), Facebook (58-81% of students per year), Twitter (64-82% of students per year), YouTube (72-77% of students per year), and TikTok (70-75% of students per year). LinkedIn and Pinterest are used by considerably less students, 31-43% per year and 8-19% per year, respectively. The remaining sites were not commonly used by undergraduates. The least utilized social media sites are Google+ (11-13% of students per year), Reddit (8-13% of students per year), Tumblr (0-5% of students per year), YikYak (0-2% of students per year), Other (2-20% of student per year), and Voat (0-1% of student per year). Overall, the percentage of students using social media each year was between 99-100% of students.

Table 4 presents the volume of minutes per day that a student indicated he/she used each social media site during each of the study years. In 2017, for example, users of each of the social media venues reported spending 50 minutes per day on Snapchat, 41 minutes on Instagram, 32 minutes on Facebook, 43 minutes on Twitter, 43 minutes on YouTube, 9 minutes on LinkedIn, 21 minutes on Pinterest, 33 minutes on Google+, 36 minutes on Reddit, 14 minutes

on Tumblr, 21 minutes on YikYak, 52 minutes on Other, and 60 minutes on 4chan. By 2021, the number of minutes per day on Snapchat increased by 18 minutes, Instagram increased by 16 minutes, Facebook decreased by 12 minutes, Twitter remained the same, YouTube increased by 22 minutes, TikTok decreased by 5 minutes, LinkedIn increased by 4 minutes, Pinterest decreased by 2 minutes, Google+ decreased by 3 minutes, Reddit decreased by 27 minutes, Tumblr decreased to 0 minutes, YikYak decreased to 0 minutes, and Other increased by 24 minutes. Overall, the average minutes per day increased from 184 minutes (3 hours) to 282 minutes (4.7 hours), an increase of 53%. Of note, the average minutes peaked at 310 minutes per day during the first year of the pandemic.

Social Media Site	2017	2018	2019	2020	2021
Snapchat	50	65	68	94	68
Instagram	41	56	60	52	57
Facebook	32	32	28	25	20
Twitter	43	51	46	53	43
YouTube	43	48	56	48	65
TikTok	-	-	-	68	63
LinkedIn	9	16	15	9	13
Pinterest	21	25	19	16	19
Google+	33	27	33	26	30
Reddit	36	38	41	19	9
Tumblr	14	15	12	20	0
YikYak	21	0	87	0	0
Other	52	68	41	69	76
4chan	60	82	30	-	-
8chan	0	60	10	-	-
Voat	0	0	0	10	0
Overall Average	184	229	227	310	282

Next, the percentage of students receiving trolls at each social media site was examined by year in Table 5. An examination of trolling finds that in terms of the percent of students that were trolled from 2017 to 2021, Snapchat increased from 15% to 25% of users trolled, Instagram increased from 15% to 25% of users trolled, Facebook increased from 16% to 30% of users trolled, Twitter decreased from 23% to 20% of users trolled, YouTube increased from 3% to 6% of users trolled, LinkedIn decreased from 4% to 0% of users trolled, Pinterest decreased from 8% to 0% of users trolled, Google+ increased from 7% to 13% of users trolled, Reddit decreased from 20% to 0% of users trolled, Tumblr decreased from 12% to 0% of users trolled, YikYak decreased from 57% to 0% of users trolled, and Other decreased from 33% to 0% of users trolled. Overall, the percent of students trolled increased from 34% to 58% of students during the study time frame, with the largest yearly increase during the first year of the pandemic.

Social Media Site	2017	2018	2019	2020	2021
Snapchat	15%	16%	11%	5%	25%
Instagram	15%	17%	18%	16%	25%
Facebook	16%	11%	13%	13%	30%
Twitter	23%	23%	15%	16%	20%
YouTube	3%	4%	6%	0%	6%
TikTok	-	-	-	3%	10%
LinkedIn	4%	1%	3%	8%	0%
Pinterest	8%	0%	0%	0%	0%
Google+	7%	0%	3%	11%	13%
Reddit	20%	13%	10%	0%	0%
Tumblr	12%	0%	13%	100%	0%
YikYak	57%	100%	0%	0%	0%
Other	33%	9%	0%	4%	0%
4chan	100%	0%	0%	-	-
8chan	100%	0%	50%	-	-
Voat	100%	0%	0%	100%	0%
Overall Average	34%	33%	30%	56%	58%

The quantity of trolls received for only those individuals that were trolled is presented in Table 6. Relative to trolling volume during a six-month period per year, Snapchat user volume decreased from 7.8 to 6.0 incidences, Instagram user volume increased from 5.5 to 11.5 incidences, Facebook user volume decreased 8.2 from to 3.6 incidences, Twitter user volume remained the same at 7.8 incidences, YouTube user volume decreased from 14.7 to 5.0 incidences, TikTok increased to 7.6 incidences, LinkedIn user volume decreased from 6.4 to 0 incidences, Pinterest user volume decreased from 12.2 to 0 incidences, Google+ user volume decreased from 4.3 to 3.0 incidences, Reddit user volume decreased from 17.1 to 0 incidences, Tumblr user volume decreased from 2.5 to 0 incidences, YikYak user volume decreased from 25.5 to 0 incidences, and Other user volume decreased from 33.7 to 0 incidences. Overall, the quantity of trolling incidents decreased by 39% from 19.5 to 11.8 during the study time frame, with the lowest incidence occurring during the first year of the pandemic.

Social Media Site	2017	2018	2019	2020	2021
Snapchat	7.8	11.1	12.1	1.5	6.0
Instagram	5.5	6.1	12.2	3.1	11.5
Facebook	8.2	3.7	4.0	2.1	3.6
Twitter	7.8	5.8	3.3	10.5	7.8
YouTube	14.7	6.1	4.1	0.0	5.0
TikTok	-	-	-	5.5	7.6
LinkedIn	6.4	5.0	4.7	1.0	0.0
Pinterest	12.2	0.0	0.0	0.0	0.0
Google+	4.3	0.0	1.0	5.0	3.0
Reddit	17.1	18.0	6.7	0.0	0.0
Tumblr	2.5	0.0	3.0	2.0	0.0
YikYak	25.5	0.0	0.0	0.0	0.0
Other	33.7	10.0	0.0	5.0	0.0
4chan	66.7	0.0	0.0	-	-
8chan	0.0	0.0	0.0	-	-
Voat	0.0	0.0	0.0	5.0	0.0
Overall Average	19.5	13.6	19.0	4.4	11.8

Finally, Spearman Rho correlations were calculated to determine if there are correlations between study factors (i.e., gender, academic class, and social media usage minutes) and the quantity of trolls that each student received. As indicated in Table 7, gender and user minutes spent using social media each had a statistically significant correlation (significant at the .05 level and significant at the .01 level, respectively) to the quantity of trolls that one receives. In other words, males were more likely to receive trolls and the more time spent on social media increased the likelihood of being trolled. There was no significant correlation regarding academic class and trolling volume.

Study Factor	Troll Volume
Gender	.070*
Academic Class	-.047
Minutes Using Social Media	.098**

* Correlation is significant at .05 level (2-tailed).

** Correlation is significant at .01 level (2-tailed).

CONCLUSIONS AND FUTURE RESEARCH

Results demonstrate that in terms of social media use, there has been a transition during the past five years and, in particular, after the beginning of the pandemic. Although there are now six platforms most popular among undergraduate business students, Snapchat and Instagram have the largest enrollment participation percent, 98% for each, which is considerable larger than the next most enrolled platform (YouTube at 77%). Of the most popular six sites, two have seen dramatic decreases in participation percent with Facebook declining by 28% and Twitter declining by 15%. In terms of minutes utilizing each platform, four sites had substantial percentage increases during the five years. Snapchat increased by 18% to 68 minutes per day, Instagram increased by 16% to 57 minutes per day, YouTube increased by 22% to 65 minutes per day, and Other increased by 24% to 76 minutes per day. Overall, minutes increased by 53% from 184 (3 hours) to 282 (4.7 hours) per day per student. The minutes peaked during the first pandemic year at 310 minutes (5+ hours).

Findings also illustrate that trolling percentages varied by social media site and by year. However, while trolling was prevalent among almost all sites in 2017, by 2021, there were four sites that accounted for most of the trolling, three of which had large increases. Students indicated that 25% of them were trolled in Snapchat in 2021 (a 66% increase from 2017), 25% were trolled in Instagram (a 66% increase), 30% were trolled in Facebook (an 88% increase), and 20% were trolled in Twitter (a 13% decrease). Overall, while 34% indicated being trolled in 2017, 58% indicated being trolled in 2021, a 71% increase. The 2021 percentage is somewhat consistent with the 2021 Pew Research Center study finding that 64% of respondents under the age of 30 have been harassed online. Fortunately, the quantity of trolls received per person per six-month period decreased by 39% from 19.5 to 11.8 trolling incidents from 2017 to 2021. All platforms except for Instagram had a decrease in volume. Instagram, however, had an increase of 109% in quantity per person.

Finally, correlation analysis suggests that gender and minutes using social media impact the quantity of trolls received. The gender finding is consistent with the 2021 Pew Research Center study that found men are somewhat more likely than women to admit they have experienced any form of harassment online.

There are two important implications from the study. Findings illustrate that social media participation and minutes have dramatically increased, especially during the two pandemic years. This suggests that the undergraduate student population adapted to the pandemic and modified their social media behavior. Face to face restrictions and the transition to online learning, for example, likely have increased the reliance on social media for social interaction. It will be interesting to see if the behavior reverts to pre-pandemic levels after the pandemic ends or if this will be the new normal.

A second implication is the world of trolling has changed. Although the percentage of students receiving trolls has nearly doubled, the quantity of trolls received per student has decreased by 39%. Chart 1 further illustrates the increasing percentage of students being trolled for the six most utilized social media platforms. It is possible that social frustrations because of

lockdowns and increased minutes on social media during the pandemic led to the increase in trolling.

Chart 1. Percent of Students Trolled Trends

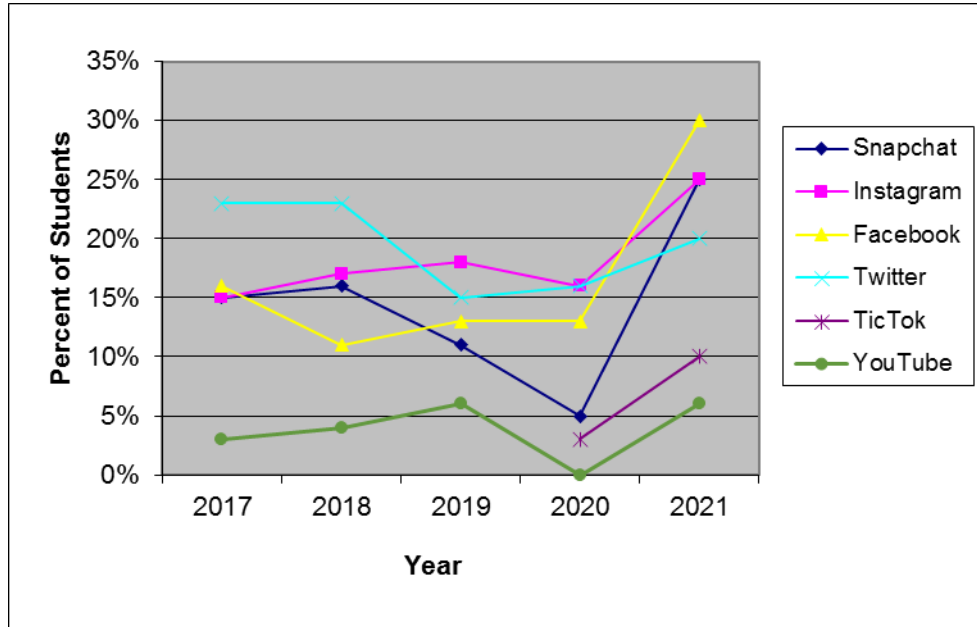
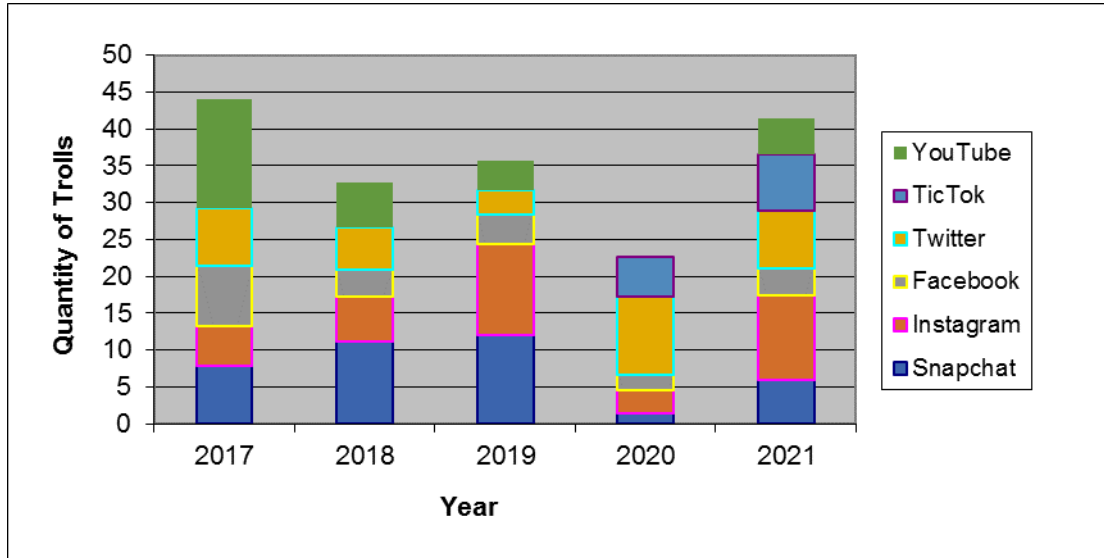


Chart 2 depicts the corresponding volume trends. There are several possible reasons for the decrease. Social media sites may be getting better at controlling trolls once they are identified and/or users may be becoming more tone-deaf to troll quantity given the ubiquity of trolling. Users may also have devised techniques or improved their behavior, possibly as a result of education, to not respond to trolls and thus may be stopping the vicious cycle of encouraging a response from the troll.

Chart 2. Quantity of Trolls Received Trends



The limitations of this study are primarily a function of the sample, sample distribution, and type of research. The use of additional universities, a more equal distribution among gender, and increased freshman participation would increase the robustness of results. Another limitation relates to the self-reported nature of the survey. Future research will need to include new sites such as Bumble that are becoming more popular. In addition, research is needed to further explore if the end of the pandemic affects usage and trolling. Finally, research is needed to determine which measures may be implemented in the education process to bring about more positive change in behavior and response to victimization.

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APPENDIX

Survey Instrument

This survey is designed to study the incidence of trolling. A troll is a person who sows discord on the [Internet](#) by starting arguments or upsetting people, by posting inflammatory, [extraneous](#), or [off-topic](#) messages in an online community with the deliberate intent of provoking readers into an [emotional](#) response. It can be equated with online harassment. All responses are anonymous and will be used solely for research correlation purposes. *You may choose not to answer any questions in the survey that you do not feel comfortable answering*, although your full response to this survey is appreciated. By filling in this survey, you are giving your consent to act as a respondent. You must be 18 years of age or older to participate and *you may opt out of the survey at any time*.

Class:

- Freshman
 Sophomore
 Junior
 Senior
 Graduate

Gender: Male Female

School of Major: Business Education, Arts/Sciences, Comm, Franciscan Studies

	Average minutes per day using	# of times " you " have been trolled in past 6 months
Facebook		
Twitter		
Instagram		
Pinterest		
Snapchat		
Tumblr		
Reddit		
Google+		
LinkedIn		
Voat		
YikYak		
4chan*		
8chan*		
YouTube		
TikTok**		
Other Social Media (specify)		

* 4chan and 8chan were removed from survey after 2020 because sites were discontinued.

** TikTok was added to survey in 2020.