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UNDERGRADUATE BUSINESS STUDENTS SOCIAL MEDIA AND ONLINE TROLLING BEHAVIOR: TRENDS DURING AND AFTER COVID-19

Abstract:

Social media participation has now been woven into the fabric of nearly two-thirds of the world population. One unfortunate consequence, however, has been the incidence of trolling evidenced by online hate and harassment. Because undergraduate business students will be the future users and managers of social media, this study was undertaken to empirically examine social media participation and trolling incidence, in particular, with regard to the Covid-19 pandemic and its aftermath. Results demonstrate that undergraduates primarily utilize six sites with total social media time peaking at 310 minutes per day during the first year of the pandemic and then dropping to 273 minutes after the pandemic. In terms of trolling, while trolling incidence varied by year and by social media platform, both the percentage of students being trolled and the quantity of trolls received per person have been steadily increasing since the beginning of the pandemic. These results suggest that the pandemic has had a tangible effect on undergraduate student online behavior and that there is an increasing level of online social discord.

Keywords:

Trolling, Social Media Usage, Empirical Study, Online Behavior, Business Students

JEL Classification: I29, M15

Introduction

Social media participation has reached extraordinary levels. In January 2024, it was estimated that there were 5.04 billion social media users or 62% of the world's population (Petrosyan, 2024). This is an increase of 266 million new users joining social media in the previous 12 months equating to an annualized growth of 5.6% with an average rate of 8.4 new users every single second (Datareportal.com, 2024).

Specifically, according to Statista, the platforms with the most active monthly users are Facebook (3.1 billion), YouTube (2.5 billion), WhatsApp (2.0 billion), Instagram (2.0 billion), TikTok (1.6 billion), WeChat (1.3 billion), Facebook Messenger (.9 billion), Telegram (.8 billion), Douyin (.75 billion) and Snapchat (.75 billion) (Dixon, 2024a). In terms of time and gender, users spend an average of 144 minutes per day with females using Snapchat, Pinterest, Instagram, and TikTok and males using Twitter-X, LinkedIn, and YouTube (Woodward, 2024).

Unfortunately, a variety of troubling behaviors have been associated with social media participation. In 2024, for instance, 34% of surveyed adults in the U.S. indicated that social media has had a somewhat negative or very negative impact upon his/her mental health (Dixon, 2024b). One particularly insidious problem is that of trolling. The Merriam-Webster dictionary defines trolling as “to antagonize (others) online by deliberately posting inflammatory, irrelevant, or offensive comments or other disruptive content” or “to harass, criticize, or antagonize (someone) especially by provocatively disparaging or mocking public statements, postings, or acts” (2024).

A 2023 study of 5,005 U.S. students ages 13 to 17, for example, found that 55% experienced cyberbullying at some point in his/her lifetime with 27% being cyberbullied in the most recent 30 days (Pathcin, 2024). The recent cyberbullying included mean or hurtful comments posted online (30%), exclusion from group chats (29%), rumors spread online (28%), and someone embarrassing or humiliating them online (27%). In particular, adolescent girls rather than boys were more likely to have experienced cyberbullying in his/her lifetime (59% vs. 50%). A survey of U.S. adults further found that 41% of Internet users had personally experienced any kind of online harassment with 27% reporting to have experienced severe forms of online harassment such as physical threats, sexual harassment, stalking, and sustained harassment (Dixon, 2023). Research has also found that cyberbullying increases suicide attempts by 8.7 percent (Nikolaou, 2017).

Previous research studies have examined factors related to trolls such as who are trolls, why do they troll, what are the trigger mechanisms, and so on. This study, on the other hand, was conducted to empirically profile social media usage and troll victimization. Undergraduate business students were selected as subjects because current business students are the future professionals that will be utilizing social media in business. Ultimately, these findings will be helpful in determining if students are adequately prepared to face these challenges when they enter the corporate workforce. This research was conducted to examine several questions. What are the primary social media sites utilized and what is the incidence of trolling within each site both in terms of the percent of students and volume of trolls? Are there relationships between the factors of gender, academic class, and time spent on social networking to the volume of trolls received? Has the March 11, 2020 World Health Organization declaration of the novel

coronavirus (COVID-19) as a global pandemic changed activity (Cucinotta & Vanelli, 2020)? And, what has been the effect with the WHO declaration on May 5, 2023 of the end of the pandemic (Mundasad & Roxby, 2023)? Results are important in determining if there is a need for further proactive education to improve student behavior.

Previous Research

As a baseline to better understand undergraduate business student online behavior, the authors conducted an exploratory study (Case and King, 2017). Results showed that all students indicated using at least one social media site with the average undergraduate spending 176 minutes (nearly 3 hours) per day on social media sites. Although undergraduate business students used nearly 20 social media sites, there were five sites that were used by most students. These included Snapchat (95% of students), Instagram (88% of students), Facebook (81% of students), Twitter (76% of students), and YouTube (67% of students). Relative to trolling, the highest percentage of site users being trolled included YikYak (63% of users) and Twitter (32% of users). The social media sites that other individuals were most actively trolled included 4chan (100% of respondents), YikYak (75% of respondents), Twitter (67% of respondents), Facebook (64% of respondents), Reddit (64% of respondents), Tumblr (57% of respondents), and Instagram (49% of respondents). Overall, 41% of students reported being trolled and 73% indicated noticing others being trolled at least once during the past six months. In terms of volume, on average, a student was trolled more than one time per month (8 times per student during the prior six months) and each student reported seeing an average of 37 trolling incidences per month (223 during the past six months) of others being trolled.

A subsequent three-year author-conducted study examined gender differences with respect to social media usage and trolling (Case, King, & Case, 2019). When comparing gender, although participation varied by social media site, a larger percentage of females versus males subscribed to each social media sites except YouTube and Reddit. Overall, while males spent 188 minutes on social media per day, females spent 27 more minutes (215 minutes per day) or 14% more time than males. In terms of troll incidence by gender, while 40% of males and 26% of females indicated being trolled at least once during the semester, the quantity of trolls received per student being trolled was nearly identical, 17.8 and 17.7 per month per student, respectively. Finally, females were correlated to more minutes on social media while males were correlated with receiving a larger volume of trolls.

Recent research studies have also examined trolling. Researchers have conducted studies that relate to anonymity, human and non-human entity interaction, the Dark Tetrad of personality, predictors of trolling, and mindfulness.

Relative to anonymity, Nitschinsk, Tobin, & Vanman (2022) conducted an experiment using Australian undergraduate students. Participants in the anonymous condition trolled more than those in an identifiable condition. Analyses also revealed that sadism and global trolling were positively associated with trolling in the chat room, but psychopathy showed no association.

In addition, research shows that online trolling is often an unintended consequence of interactions between human and non-human entities (bots, buttons, notifications, tech features) that are joined in the performance of trolling behavior (Golf-Papez & Veer, 2022). The entities include troll(s), target(s), a medium of exchange, audience(s), other trolls, trolling artifacts, regulators, revenue streams, and assistants. The actors (i.e., troll, target, medium) play a role in initiating and other actors (un)intentionally sustain trolling by celebrating it, boosting it, facilitating it, and normalizing it. The findings highlight the role of nontraditional actors in the performance of misbehaviors and suggest that effective management of online consumer misbehaviors such as trolling will include managing the socio-technical networks that allow and fuel these misbehaviors. Trolling acts may be stopped or interrupted by making the online place less or not at all friendly to trolling and suggest that regulators should give the impression that a particular channel is actively monitored (e.g., displaying the online moderator's status as online) and that sanctions for trolling are applied swiftly (e.g., auto-banning users who keep trolling after being warned once).

An examination of German-speaking participants also indicated a clear correlation between global trolling and all facets of the Dark Tetrad personality (Machiavellianism, narcissism, psychopathy, and sadism) as well as with aggressive and self-defeating humor styles (Volkmer, Gaube, Raue, & Lermer, 2023). However, no significant relationship between experiencing exclusion/inclusion and trolling motivation emerged. Findings suggest that psychopathy and sadism scores have a significant positive effect on immediate trolling motivation after the experimental manipulation, whereas Machiavellianism and narcissism did not explain variation in trolling motivation. Moreover, being socially excluded had generally no effect on immediate trolling motivation, apart from participants with higher immediate trolling motivation, for whom the experience of social exclusion actually reduced trolling motivation.

Other predictors of trolling were examined by Marrington, et.al. (2023). Results showed in the past year, 24.2% of Australian adolescents (aged 13–18 years old) reported being trolled and 13.4% reported having trolled others. Gender, psychopathy, sadism, self-esteem, cognitive empathy, affective empathy, and “negative social potency” (i.e., enjoyment of antisocial rewards) combined, explained 30.7% of variance in adolescents’ trolling behaviors. Psychopathy was characterized by diminished empathy, impulsivity, thrill-seeking, interpersonal manipulation, grandiosity, and emotional shallowness. When accounting for shared variance, gender (male), high psychopathy, and high negative social potency were significant predictors of trolling, aligning with findings of adult samples. Contrary to adult samples, sadism was not found to be a unique predictor of adolescents’ trolling. For adolescents, the variance in trolling explained by sadism was nonsignificant when controlling for negative social potency.

Finally, mindfulness was studied. Results showed that when examining Chinese college students, trait mindfulness was negatively related to online trolling and that this relationship was partially mediated by anger rumination (Liu et.al, 2022). Moreover, the effect of anger rumination on online trolling was strengthened when online disinhibition was high. Mindfulness was defined as one's ability to keep attention and awareness focused within the present moment, observing and experiencing the thoughts, emotions, and physical states that occur at each moment purposefully, receptively, and non-judgmentally. Anger rumination was defined as the tendency to dwell on one's angry experience and moods, as well as the causes and consequences of anger events.

Online disinhibition refers to the tendency to feel less inhibited and exhibit certain behaviors that they would not normally display in the offline world.

Research Design

This study employs a survey research design. The research was conducted at a private, northeastern U.S. university. A Student Social Media Usage and Troll Incidence instrument was developed by the authors and administered via an online link to undergraduate students enrolled in a School of Business course. The surveys were collected each semester during a five-year, eight-consecutive semester period (from Fall 2020 through Spring 2024). The courses included a variety of subjects such as Business Information Systems, Introduction to Financial Accounting, Introduction to Marketing, Macroeconomics, and Business Policy. A convenience sample of class sections and faculty members was selected 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. As a result, the response rate was over 80% each semester.

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 fourteen social media sites and list any other social networking sites used by the student. WhatsApp was added to survey in 2024 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 and social media usage minutes). 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 685 usable surveys was obtained. Table 1 indicates that 71% of the respondents were male and 29% were female.

Table 1: Gender Response Rate

	2020	2021	2022	2023	2024	Total
Male	59%	61%	75%	74%	76%	71%
Female	41%	39%	25%	26%	25%	29%
Count	83	109	115	271	107	685

Source: Own based upon survey data

The response rate by year, with the exception of freshmen participation during the pandemic 2020-2022 years, was relatively equally distributed among academic class. Table 2 illustrates that overall 14% of respondents were freshmen, 31% were sophomores, 36% were juniors, and 19% were seniors.

Table 2: Academic Class Response Rate

	2020	2021	2022	2023	2024	Total
Freshmen	4%	0%	5%	24%	21%	14%
Sophomore	19%	35%	50%	21%	39%	31%
Junior	57%	55%	34%	27%	28%	36%
Senior	20%	10%	11%	28%	11%	19%

Source: Own based upon survey data

Responses were first examined with respect to the percentage of students using the various social media sites per year. Table 3 illustrates that in 2020, 98% of students used Snapchat, 96% used Instagram, 63% used Facebook, 82% used Twitter-X, 73% used YouTube, 70% used TikTok, 43% used LinkedIn, 15% used Pinterest, 11% used Google+, 8% used Reddit, 1% used Tumblr, 0% used YikYak, 27% used Other, and 1% used Voat. In terms of social media site utilization percentage of students by year, seven social media providers increased by 2024. Instagram increased from 96% to 98% of students, YouTube increased from 73% to 80%, TikTok increased from 70% to 77%, LinkedIn increased from 43% to 64%, Google+ increased from 11% to 13%, Reddit increased from 8% to 20%, and YikYak increased from 0% to 35%. Five social media sites decreased in percentage of students. Snapchat decreased from 98% to 95%, Facebook decreased from 63% to 33%, Twitter-X decreased from 82% to 46%, Pinterest decreased from 15% to 11%, and Other decreased from 27% to 15%. Tumblr and Voat remained consistent at 1%.

Table 3: Percent of Students Using Social Media by Year

Social Media Site	2020	2021	2022	2023	2024
Snapchat	98%	96%	97%	94%	95%
Instagram	96%	97%	91%	94%	98%
Facebook	63%	51%	40%	40%	33%
Twitter – X	82%	66%	61%	53%	46%
YouTube	73%	77%	77%	73%	80%

Social Media Site	2020	2021	2022	2023	2024
TikTok	70%	79%	72%	72%	77%
LinkedIn	43%	34%	41%	55%	64%
Pinterest	15%	10%	7%	14%	11%
Google+	11%	15%	4%	9%	13%
Reddit	8%	13%	19%	11%	20%
Tumblr	1%	0%	1%	3%	1%
YikYak	0%	12%	57%	26%	35%
Other	27%	20%	20%	17%	15%
Voat	1%	0%	0%	1%	1%
WhatsApp	-	-	-	-	12%
Overall Average	100%	100%	99%	99%	100%

Source: Own based upon survey data

Results illustrate that for every year of the study, there were six sites that are used by most students. These include Snapchat (94-98% of students per year), Instagram (91-98% of students per year), Twitter-X (46-82% of students per year), YouTube (73-80% of students per year), TikTok (70-79% of students per year), and LinkedIn (34-64% of students per year). The lesser utilized social media sites were Facebook (33-63% of students per year), Pinterest (7-15% of students per year), Google+ (4-13% of students per year), Reddit (8-20% of students per year), Tumblr (0-3% of students per year), YikYak (0-35% of students per year), Other (15-27% of student per year), Voat (0-1% of student per year), and WhatsApp (12% in 2024). 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. In 2020, for example, users of each of the social media venues reported spending 94 minutes per day on Snapchat, 52 minutes on Instagram, 25 minutes on Facebook, 53 minutes on Twitter-X, 48 minutes on YouTube, 68 minutes on TikTok, 9 minutes on LinkedIn, 16 minutes on Pinterest, 26 minutes on Google+, 19 minutes on Reddit, 20 minutes on Tumblr, 0 minutes on YikYak, 69 minutes on Other, and 10 minutes on Voat. By 2024, the number of minutes per day on Snapchat decreased by 34 minutes, Instagram increased by 13 minutes, Facebook decreased by 8 minutes, Twitter-X decreased by 25 minutes, YouTube increased by 12 minutes, TikTok increased by 1 minute, LinkedIn increased by 4 minutes, Pinterest decreased by 1 minute, Google+ increased by 22 minutes, Reddit decreased by 5 minutes, Tumblr decreased by 20 minutes, YikYak increased by 8 minutes, Other decreased by 19 minutes, and Voat decreased by

1 minute. Overall, the average minutes per day decreased from 310 minutes (5+ hours) to 273 minutes (4.5 hours), a decrease of 12%. Of note, the average minutes peaked at 310 minutes per day during the first year of the pandemic.

Table 4: Minutes per Day Utilizing Social Media by Year

Social Media Site	2020	2021	2022	2023	2024
Snapchat	94	66	69	77	60
Instagram	52	56	57	59	65
Facebook	25	18	17	18	17
Twitter – X	53	39	28	29	28
YouTube	48	64	54	62	60
TikTok	68	66	69	88	69
LinkedIn	9	10	13	19	13
Pinterest	16	18	15	12	15
Google+	26	32	29	30	48
Reddit	19	14	31	15	14
Tumblr	20	0	10	3	0
YikYak	0	7	13	12	8
Other	69	67	125	128	50
Voat	10	0	0	3	9
WhatsApp	-	-	-	-	63
Overall Average	310	277	272	294	273

Source: Own based upon survey data

Next, the percentage of students receiving trolls at each social media site by year was examined in Table 5. In terms of the percent of students that were trolled from 2020 to 2024, Snapchat increased from 5% to 24% of the users being trolled, Instagram increased from 16% to 33%, Facebook increased from 13% to 21%, Twitter-X remained consistent at 16%, YouTube increased from 0% to 9%, TikTok increased from 3% to 20%, LinkedIn decreased from 8% to 7%, Pinterest increased from 0% to 8%, Google+ decreased from 11% to 7%, Reddit increased from 0% to 10%, Tumblr decreased from 100% to 0%, YikYak increased from 0% to 19%, Other

increased from 4% to 19%, Voat decreased from 100% to 0%, and WhatsApp was 15% in 2024. Overall, the percent of students trolled increased from 30% to 50% of students during the study time frame.

Table 5: Percent of Students Trolled by Year

Social Media Site	2020	2021	2022	2023	2024
Snapchat	5%	28%	22%	26%	24%
Instagram	16%	23%	29%	28%	33%
Facebook	13%	29%	20%	15%	21%
Twitter – X	16%	22%	14%	18%	16%
YouTube	0%	8%	8%	9%	9%
TikTok	3%	16%	17%	19%	20%
LinkedIn	8%	5%	6%	9%	7%
Pinterest	0%	9%	0%	0%	8%
Google+	11%	25%	0%	16%	7%
Reddit	0%	7%	23%	23%	10%
Tumblr	100%	0%	0%	14%	0%
YikYak	0%	31%	26%	18%	19%
Other	4%	18%	26%	30%	19%
Voat	100%	0%	0%	100%	0%
WhatsApp	-	-	-	-	15%
Overall Average	30%	43%	49%	45%	50%

Source: Own based upon survey data

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 increased from 1.5 to 7.5 incidences, Instagram user volume increased from 3.1 to 7.0 incidences, Facebook user volume increased from 2.1 to 2.4 incidences, Twitter-X user volume increased from 10.5 to 22.0 incidences, YouTube user volume increased from 0 to 13.1 incidences, TikTok user volume increased from 5.5 to 15.9 incidences, LinkedIn user volume increased from 1.0 to 2.6 incidences, Pinterest user volume increased from 0 to 2.0 incidences, Google+ user volume

increased from 5.0 to 6.0 incidences, Reddit user volume increased from 0 to 25.5 incidences, Tumblr user volume decreased from 2.0 to 0 incidences, YikYak user volume increased from 0 to 2.6 incidences, Other user volume increased from 5.0 to 27.0 incidences, Voat user volume decreased from 5.0 to 0 incidences, and WhatsApp was 15.0 incidences. Overall, the quantity of trolling incidents increased by 163% from 8.3 to 21.8 during the study time frame, with the lowest incidence occurring during the first year of the pandemic.

Table 6: Quantity of Trolls for Only Students Trolled by Year during a Six-Month Period

Social Media Site	2020	2021	2022	2023	2024
Snapchat	1.5	5.4	11.7	16.2	7.5
Instagram	3.1	13.4	7.0	10.0	7.0
Facebook	2.1	3.0	4.3	13.9	2.4
Twitter – X	10.5	5.3	4.7	10.7	22.0
YouTube	0.0	13.6	6.1	4.6	13.1
TikTok	5.5	6.6	10.7	11.2	15.9
LinkedIn	1.0	2.5	7.7	3.2	2.6
Pinterest	0.0	5.0	0.0	0.0	2.0
Google+	5.0	21.5	0.0	15.3	6.0
Reddit	0.0	1.0	2.4	3.0	25.5
Tumblr	2.0	0.0	0.0	0.0	0.0
YikYak	0.0	10.3	11.1	7.4	2.6
Other	5.0	7.0	3.7	10.9	27.0
Voat	5.0	0.0	0.0	1.5	0.0
WhatsApp	-	-	-	-	15.0
Overall Average	8.3	20.6	20.3	29.0	21.8

Source: Own based upon survey data

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, there was no significant correlation with either gender or academic class relative to trolling volume. However, user minutes spent using

social media had a statistically significant correlation (significant at the .01 level) to the quantity of trolls that one receives. In other words, the more time spent on social media increased the likelihood of being trolled.

Table 7: Spearman Rho Correlations between Study Variables and Troll Volume per Student

Study Factor	Troll Volume
Gender	.062
Academic Class	.721
Minutes Using Social Media	.228**

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

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

Conclusions

Results illustrate that there are six sites each year that were used by most students. In 2020, these included Snapchat (98% of students), Instagram (96% of students), Twitter-X (82% of students), YouTube (73% of students), TikTok (70% of students), and Facebook (63% of students). By 2024, the ranking changed to Instagram (98% of students), Snapchat (95% of students), YouTube (80% of students), TikTok (77% of students), LinkedIn (64% of students), and Twitter-X (46% of students). Of note, Facebook participation decreased from 63% to 33% of students while LinkedIn increased from 43% to 64% of students. The remaining sites were not commonly used by undergraduates for all of the study years. Overall, however, nearly 100% of students indicated using social media.

The time spent using social media varied by year and by social media site. In 2020, for example, the sites with the most minutes expended per day were Snapchat (94 minutes), Other (69 minutes), TikTok (68 minutes), Twitter-X (53 minutes), Instagram (52 minutes), and YouTube (48 minutes). On the other hand, in 2024, the sites with the most minutes expended per day were TikTok (69 minutes), Instagram (65 minutes), WhatsApp (63 minutes), Snapchat (60 minutes), YouTube (60 minutes), and Other (50 minutes). Total minutes peaked during the first year of the pandemic (2020) at 310 minutes but dropped to 277 minutes in 2021 and then remained relatively consistent.

An examination of trolling found that in terms of the percent of students that were trolled in the primarily used sites in 2020, 16% were trolled in Instagram, 16% were trolled in Twitter-X, 13% were trolled in Facebook, 8% were trolled in LinkedIn, 5% were trolled in Snapchat, and 3% were trolled in TikTok. By 2024, 33% were trolled in Instagram, 24% were trolled in Snapchat, 21% were trolled in Facebook, 20% were trolled in TikTok, 16% were trolled in Twitter-X, 9% were trolled in YouTube, and 7% were trolled in LinkedIn. Overall, while 30% indicated being trolled at least once during the semester in 2020, the percentage increased to 50% in 2024. In terms of the

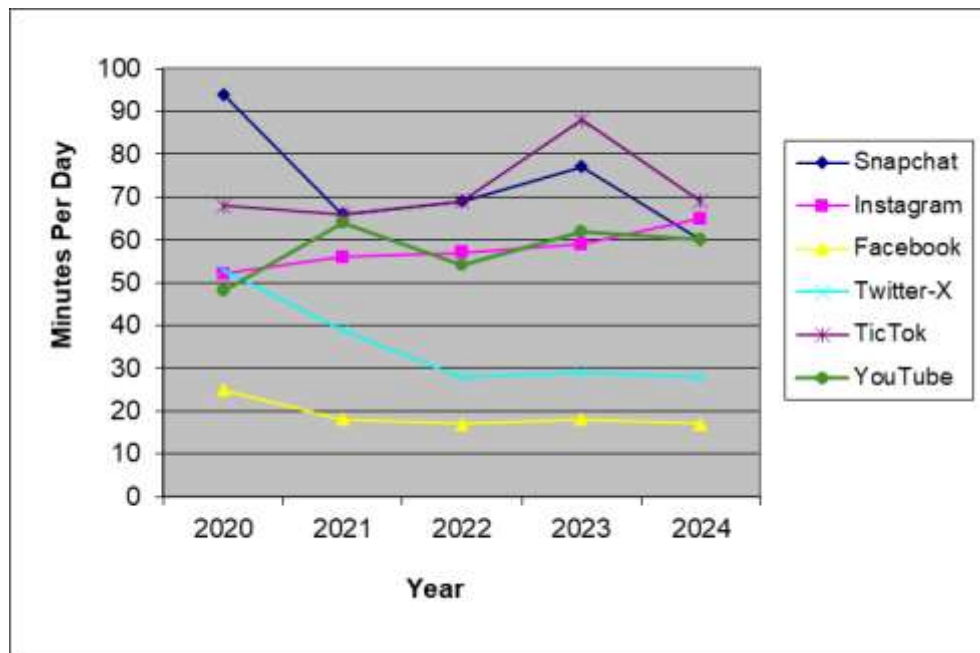
quantity of trolls received per student being trolled, the volume varied by year and by social media site. In 2020, for example, students reported having 10.5 trolling incidences in Twitter-X, 5.5 TikTok incidences, 5.0 Other incidences, 5.0 Google+ incidences, and 3.1 Instagram incidences during the past six months. By 2024, there were 27 Other incidences, 25.5 Reddit incidences, 22 Twitter-X incidences, 15.9 TikTok incidences, 15.0 WhatsApp incidences, and 13.1 YouTube incidences. Overall, the quantity per student increased from 8.3 incidences in 2020 to 21.8 incidences in 2024.

Finally, a correlation analysis of study factors suggests that the total minutes on social media is positively correlated to the volume of trolls received. However, gender and academic class are not correlated to the quantity of trolls received.

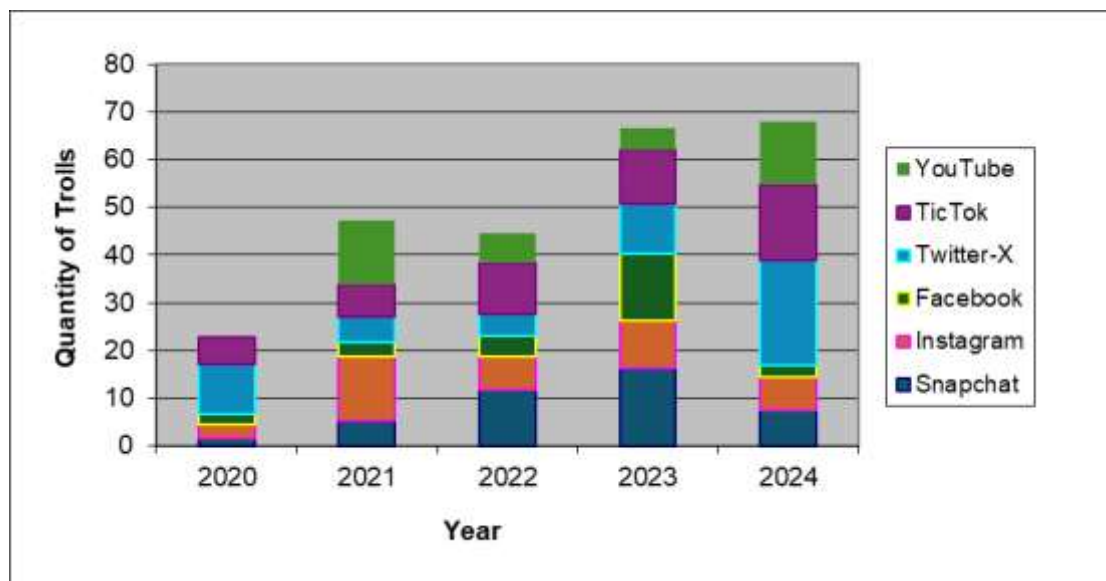
Implications

There are three important implications from these findings:

1. One implication relates to the pandemic having a tangible effect on undergraduate student online behavior. During the first year of the pandemic, social media minutes per student peaked at 310 minutes per day with only 30% indicating being trolled and 8.3 trolling incidences per person. Subsequent years, however, demonstrated a mostly continual decrease in social media minutes but steady increase in both the percent of students trolled and volume of trolling incidences. Chart 1, for example, illustrates social media minutes for each of the primary social media sites and shows that as the pandemic progressed and subsequently abated, minutes generally decreased. This implies that the initial year of the pandemic was a social shock to students that forced students to find alternatives to face-to-face interaction. As time progressed, behavior changed and has since remained constant so this may indicate the new societal norm.
2. A second implication relates to an increasing level of social discord. During the five-year study, both the percentage of students reported being trolled and the reported troll volume received per person greatly increased. The percentage of students increased from 30% to 50%, even though minutes per day per student decreased. More disturbing is that the volume of trolls received increased by 163%. Chart 2, for example, depicts the quantity of trolls received by year for each of the sites used primarily by students. It is possible that student frustration is rising, social media users feel empowered by the ease and relative anonymity of trolling, the lack of enforcement emboldens users, and/or that students are more sensitive in his/her perception of trolling. This suggests that educators may need to be increasingly concerned about student mental health because of students receiving troll comments that may negatively affect the student. It is possible the student may need counseling and possibly education on how to deal with living in this era of increasing negativity.
3. The third implication is that social media is evolving in usage. Facebook, one of the first and major social media platforms, and Twitter-X have seen dramatic decreases in participation and usage minutes while TikTok has been increasing in popularity. It is possible that Facebook is now being perceived as passe and the Twitter-X is decreasing in popularity because Elon Musk removed trolling and misinformation guardrails designed to restrict the flow of mis- and disinformation. This includes stripping away what was once a free account verification process designed to combat impersonation and replacing it with paid "blue check" accounts that guarantee posts will be prioritized by X's algorithm (Czopek, 2023). It is also possible that undergraduates are impatient and enjoy and seek new forms of enjoyment and/or social interaction such as TikTok.

Chart 1: Minutes Per Day on Social Media

Source: Own based upon survey data

Chart 2: Quantity of Trolls Received

Source: Own based upon survey data

The limitations of this study are primarily a function of the sample, sample distribution, and type of research. The use of additional universities and more equal distribution among academic class and gender would increase the robustness of results. Another limitation relates to the self-

reported nature of the survey. Future research is needed to explore why the reported social discord is rising both with respect to the number of students being trolled and the volume that each student receives. Moreover, research is needed to determine which measures in the education process may be most effective in promoting positive online social network behavior and effectively dealing with the receipt of troll comments. Overall, however, the study provides a profile to better understand undergraduate student social media usage and trolling.

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