



## Communication

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# Twitter Interactions in the Era of the Virtual Academic Conference: A Comparison Between Years

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**Abstract:** The goal of this study is to assess variations in interactions over social media at academic conferences when held onsite versus online. Here, Twitter activities from different years of the *Annual Meeting of the Association for Information Science and Technology* (ASIS&T AM) are analyzed and reported. Data elements of individual tweets were examined using both primary- and second-level analyses, showing overall participation levels and the number of actions across different variables. The activity level and relative impact on the overall results of users who appeared in both years emerged as a key finding. Twitter activities during both the 2018 (Vancouver) and 2020 (online) ASIS&T AM were collected and compared.

**Keywords:** Twitter, analytics, scholarly communication, academic conferences

## 1 Introduction

The role and use of social media as a part of the conference experience have been studied and described (Chung & Woo, 2016; Ferguson et al., 2014; Holmberg & Thelwall, 2014; Kimmons & Veletsianos, 2016; Reinhardt, Ebner, Günter, & Costa, 2009). Microblogging sites such as Twitter are used to converse online about the events and content from academic conferences. Findings on social media's role at academic conferences have been reported using a range of domains and disciplines, spanning education, cardiology, urology, and others (Chung & Woo, 2016; Ferguson et al., 2014; Holmberg & Thelwall, 2014; Kimmons & Veletsianos, 2016). The intersection of scholarly communication, social media, and the nature of academic conferences provides an important and unique context; it is composed of online interactions and conversations among scholars coinciding with events, themes, and research reports occurring within a short window of time.

The COVID-19 pandemic caused academic conferences to move fully online as virtual events. Many virtual conferences aim to capture the structure, format, and outcomes of those held onsite or in-person. For example, there are sessions – including papers, panels, and posters – keynotes, live interactions between attendees, speakers and participants, happy hours, and just about everything else you would expect at an onsite conference. Moreover, there are different options available to organizers for developing and implementing virtual conferences, such as the use of pre-recordings versus live papers and presentations versus chat-based interactions, and so on. Each conference chooses the approach and format that best meet their goals for a virtual event.

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As a backchannel, Twitter specifically has helped supplement dialogue and conversations occurring during academic conferences. Now, the question is that with interactions and content of academic conferences being moved online, many times in self-contained conference software and/or proprietary platforms, what is the impact and role of the social media channel (specifically Twitter) during such virtual events? Is there any change in Twitter use during an onsite conference compared to virtual? The present study aims to provide some initial findings into these questions.

## 2 Research Objective

The present study examines Twitter activity during two separate years of the same conference – the *Annual Meeting of the Association for Information Science and Technology* (ASIS&T AM) – one held onsite (2018, Vancouver) and one online (2020). As such, the study aims to measure and better understand any variations in participation and interactions over Twitter during these years of the ASIS&T AM.

## 3 Related Research

Social media's role as a channel for scholars and researchers has been described (Sugimoto, Work, Larivière, & Haustein, 2017). Research findings have shown that scholars from different disciplines employ social media for a range of research-related purposes spanning research dissemination, promotion, collaboration, and coordination (Rowlands, Nicholas, Russell, Canty, & Watkinson, 2011).

Specifically, social media has helped supplement academic conferences by providing a backchannel for users to report or comment on what is occurring onsite. For example, Twitter use throughout different time points of individual conferences has been examined, including activity levels on certain days and times (Gonzales, 2014). Additionally, Twitter interactions occurring at multiple conferences from the same academic discipline have been collectively analyzed (Mahrt, Weller, & Peters, 2014; Parra et al., 2016; Wen, Lin, Trattner, & Parra, 2014a). Previous studies have also compared Twitter use at specific conferences over time – i.e., multiple years (Wen et al., 2014a). Søreide et al. (2019) analyzed Twitter activity at a surgical oncology conference using geographic and social network analyses.

A host of findings have emerged from such descriptive analyses of Twitter use at academic conferences. For example, specific time points during the conference were found to not have any statistical relationship with user activity levels (Gonzales, 2014). However, variations in Twitter use were found based on the academic discipline or scholarly domain of the conference (Mahrt et al., 2014). More granular findings have also been reported for specific types of Twitter actions; most Twitter interactions occurring during academic conferences were found to be retweets, not original posts (Gonzales, 2014). “Categories” of researchers who post during conferences have also been used as a basis of comparison (Wen, Parra, & Trattner, 2014b). Findings showed that established scholars received more attention than junior researchers and other categories of users, including students (Wen et al., 2014b).

Research about social media use at academic conferences has expanded beyond descriptive findings of user activity. Content analysis of tweets occurring during academic conferences is a common approach. Tweet content has been analyzed using quantitative methods, such as term frequencies, to produce word clouds that have been shown to correspond to the academic discipline and conference theme (Allen, Andersen, Chambers, Groshek, & Roberts, 2018). The topic of conversation over Twitter has also led to more specific insights into the nature of discourse over social media during academic conferences. For example, topics related to information technology and social media were shown to lead to higher levels of user engagement or interactions (Gonzales, 2014).

Nolte et al. (2021), in particular, conducted multiple analyses of tweets from a urology meeting. One part of their analysis categorized the type of content or digital objects being tweeted out – e.g., photographs

of presentation slides, photographs of posters, links, textual discussion, etc. Additionally, tweets were further analyzed as to whether they corresponded to active research studies and – if so – whether or not results were later formally published; it was discovered that 19.4% of the identified research studies presented at the conference receiving a mention on Twitter (during the conference) were later found published and indexed in PubMed (Nolte et al., 2021).

While the analysis of Twitter’s use at academic or scholarly conferences – such as those performed in the present study – has been conducted and reported at significant depths, the present study provides a preliminary analysis and comparison of Twitter actions occurring during different years of the same conference, differentiated by one held in-person and the other moved online as a result of COVID-19 pandemic. This focus in goals and analysis makes the study novel.

## 4 Data Collection

Twitter use during academic conferences is the focus of the study. Twitter is used by conference attendees and other users for posting – or tweeting and retweeting – online about activities and content occurring at academic conferences. Twitter data during the 2018 and 2020 ASIS&T AMs were collected. AM ‘18 was held onsite (Vancouver) in November; AM ‘20 was fully online in October/November. An application was developed using the Twitter4J API (<https://twitter4j.org/>) to collect data by searching conference hashtags (e.g., “#ASIST18”) and their variations. Hashtags were suggested by the conferences (as specified above); however, because of potential inconsistent usage, such as including or omitting “&” within the conference hashtag, variations were also used when collecting Tweets. The application developed to collect Tweets for this study allowed the use of different hashtag formats. The end result was the collection of all tweets during both AMs, along with corresponding descriptive metadata and secondary data (e.g., number of likes).

## 5 Data Analysis

Twitter actions occurring within the actual dates of the conferences, as listed on the conference schedules, were analyzed for the study. The data elements of individual tweets were used to form variables. The variables were based on both primary and aggregated (or derived) Twitter data elements. Definitions of the primary variables as examined included the following:

- Original tweet: An original post/tweet by a user (non-retweet).
- Retweet (RT): An RT of a tweet, identified as “true” within the RT data field.
- Original tweet and RT (combined): Sum of tweet and RT counts.
- Like: A count of likes of original tweets.
- Secondary action: Sum of like count and RT count.
- Tweet retweeted: A count of original tweets that were retweeted.
- Overall actions: Sum of original tweets, RTs, and like counts.
- Unique users: A distinct user (username), whether of an original tweet or RT (usernames of likes are not accessible through the Twitter4J API).

Analysis of these variables included counts overall, by comparison, and across different time-points or days within the conference. Results of the study depict scholarly communication occurring over Twitter centered on a particular type of academic event in a highly condensed timeframe.

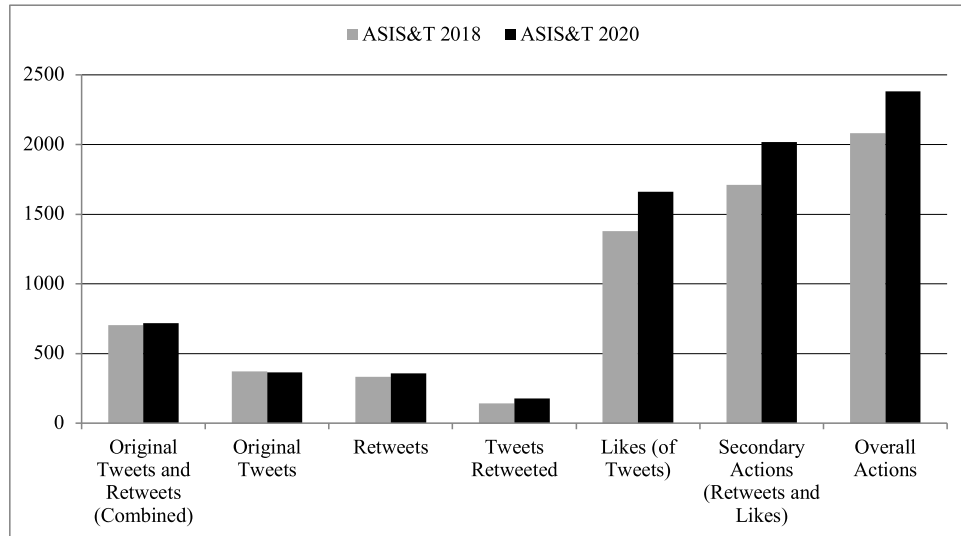


Figure 1: Overall counts of Twitter actions for ASIS&T 2018 and ASIS&T 2020.

## 6 Results

Results of the study are presented in Figures 1–3 and Tables 1 and 2. In total, 4,463 interactions were collected and analyzed, and 385 users were identified across the different years, including 33 individual users participating on Twitter during both years of the AM (referred to as “return users”). First reported are the results of the Twitter actions. Overall counts for the different types of Twitter actions are shown in Figure 1.

Next, the number of users, uniquely identified for each year of the AM, is reported. The results include the number of users who either tweeted or retweeted, along with the combined count (Figure 2). Usernames of users who like a tweet are not accessible via Twitter4J API. The number of users posting original tweets or retweets by day of the AMs is also reported (Figure 3).

Other descriptive results are shown in Table 1. These results show the maximum and minimum number of actions taken by a unique or individual user; the number of users demonstrating the maximum and minimum number of actions is provided in parentheses.

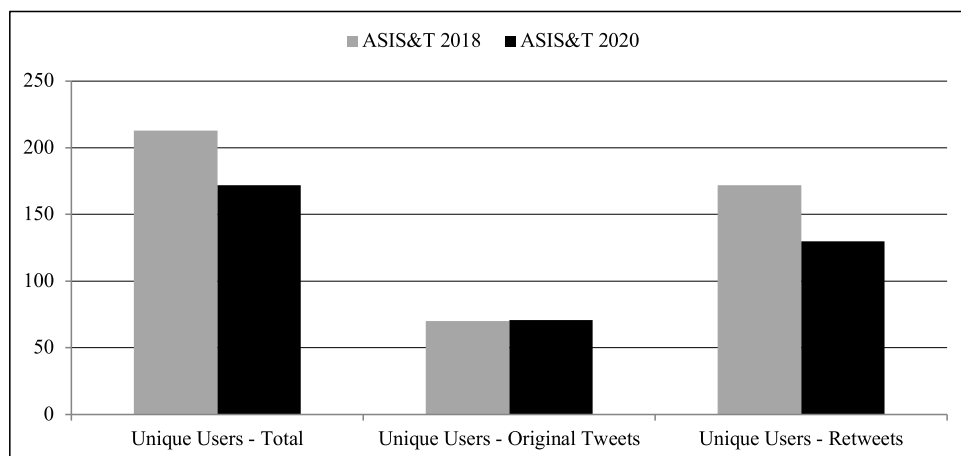


Figure 2: The number of unique users, overall, and of different Twitter actions for ASIS&T 2018 and ASIS&T 2020.

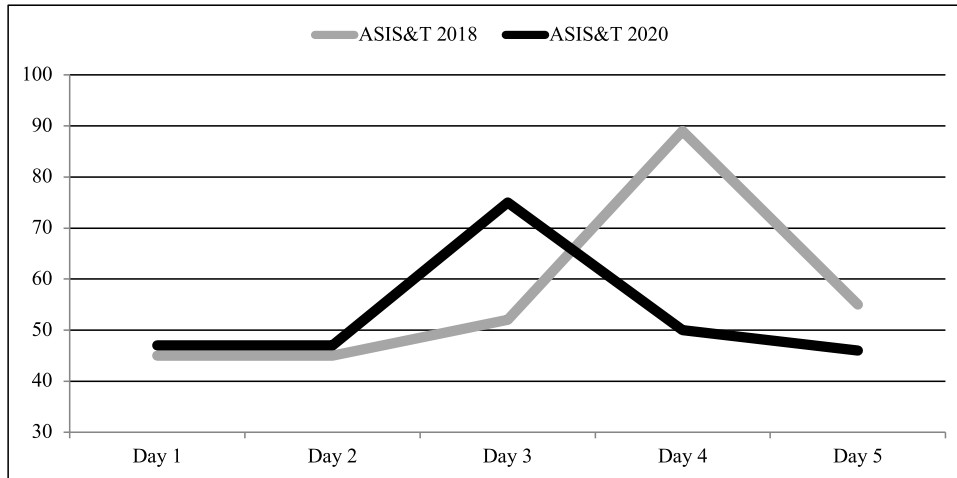


Figure 3: The number of unique users by day of the conferences.

Table 1: Maximum and minimum number of tweets or retweets (number of users)

	ASIS&T 2018	ASIS&T 2020
Maximum	121 (1)	151 (1)
Minimum	1 (141)	1 (102)

Table 2: Number and percentage of tweets and retweets by the “return” users

	Number of tweets and retweets (combined) of return users	Overall percentage
ASIS&T 2018	289	41
ASIS&T 2020	413	57

Table 2 reports on the (33) users observed participating on Twitter during both AM ‘18 and AM ‘20 (referred to as “return users” in Table 2) along with their level of participation (number and percentage of tweets/retweets) in relation to the activity level of the wider audience.

## 7 Findings

The study reports the levels of different types of Twitter activities throughout two separate meetings of the same professional organization, one held in person (AM ‘18) and the other held online because of the COVID-19 pandemic (AM ‘20).

Generally speaking, the patterns observed across both of these years of the ASIS&T AM were not considerably different. There were more users participating over Twitter during AM ‘18 than AM ‘20, so the number of overall users did drop for the conference that was moved online. This is also notable due to the increase in registered attendees for AM ‘20. AM ‘18 had “nearly 550 attendees” (Annual Meeting Recap., 2018) while the AM ‘20 had “record-breaking attendance, with 653 attendees” (Annual Meeting Recap., 2020). If Twitter participants were largely or exclusively AM registrants, then AM ‘18 might have had higher online engagement based on percentage of total registrants (and presumably attendees) participating. However, despite the lower ratio of Twitter actions by number of registrants/attendees, there were more Twitter actions overall during AM ‘20 than AM ‘18.

One explanation to this finding is that the “heavy lifters” – or the highly active Twitter users – demonstrated higher rates of participation during AM ‘20 than AM ‘18. The results provided in Tables 1 and 2 show that the top tweeter from AM ‘20 had almost 25% more posts than in AM ‘18 (Table 1); meanwhile, the 33 return users (Table 2), who participated in both years of the AM, accounted for 16% more of the overall number of Twitter actions. Additionally, the higher number of likes for AM ‘20 – despite having a smaller number of Twitter users overall – could be a result of the 2 years difference between the conferences, such as additional time for social networks (Twitter followers) to grow.

## 8 Conclusions

AM ‘20 was held entirely online in a closed (registration-required) environment; overall, Twitter activity did not vary substantially and the number of observed users on Twitter decreased from AM ‘18. One prominent factor across both years was the heavy lifters, who remained undeterred in utilizing Twitter as a conference backchannel, regardless of the shift to online and content delivery in a separate platform. Additional analyses of these data to include cross-referencing of presenters, poster authors, registrant lists, and others could reveal patterns of engagement based on user involvement. Descriptive or statistical research (such as presented here) might be further enlightening if activity is tracked across multiple years of academic conferences or if results are triangulated with findings of Twitter use at academic conferences of other disciplines. Many opportunities remain for better understanding social media use at academic conferences in our domain.

Future research can also include content analysis of such Twitter data to better understand the nature of the discourse that is occurring during these different years of the conference. For example, the constructs of quality among user interactions over social media at academic conferences and the corresponding effects and wider implications can be further examined.

The overarching research agenda is intended to give organizers and scholars more understanding on how to maximize the experience of academic conferences. Such experiences can include leveraging backchannels happening simultaneously to expand user engagement, promote diverse ideas, and facilitate learning based on how users interact and communicate within these spaces.

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**Ethical approval:** The conducted research is not related to either human or animals use.

**Data availability statement:** The datasets generated during and/or analysed during the current study are available in the Twitter repository.

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