

How *Slack* Facilitates Communication and Collaboration in Seminars and Project-Based Modules

Stefan Müller*

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Abstract

Lectures and seminars increasingly rely on digital technology. Moreover, many modules strive for continuous interactions between learners and the instructor. I show how the communication program Slack enables communication, collaboration, and coordination. After identifying learning needs and introducing the software, I analyze daily activity statistics in a methodological and a group-based postgraduate module, which have been taught both in-person and online. The quantitative analysis reveals three insights. First, students are active on Slack throughout the entire term. Second, students post messages in public channels, but also extensively use direct messages to communicate with their peers. Third, many students follow the conversations, which ensures transparent and fair communication between students and instructors. The data and feedback from module evaluations exemplify how Slack can create ‘team spirit’ and facilitate mutual support. I conclude with four lessons I have learned: students should sign up in the first week of term; create channels for different aspects of the module; allow for private conversations between students; and monitor activities regularly. I hope this instruction encourages module coordinators to consider interactive communication tools for virtual and in-person modules.

Keywords: computer-mediated communication; collaboration; online learning; Slack

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Ethics Approval: The data provided by Slack do not contain any sensitive or personal information since information are aggregated to the unit of days. The author confirms that the study design and method of data analysis were reviewed and approved by the Office of Research Ethics (approval number: HS-C-22-92).

* Stefan Müller is an Assistant Professor and Ad Astra Fellow in the School of Politics and International Relations at University College Dublin (stefan.mueller@ucd.ie; <https://muellerstefan.net>)

Introduction

Facilitating communication with and between students, coordinating group projects, and collaborating on assignments are central features of modern teaching and learning approaches. In the past, module instructors communicated with students during and after lectures and tutorials, on e-learning platforms, and via email (Trudeau 2005; Miller 2014). Digitalization, the Covid-19 pandemic, and the move towards active and digital learning have changed many of these traditions (Loepp 2021). Meetings via videoconferencing applications became more common; physical distancing restrictions or long commutes moved formerly in-person meetings to online settings; and the emergence of smartphones incentivized many groups to communicate via messenger apps.

In this instruction, I introduce the free version of the business communication software Slack as an effective tool for enabling collaboration, communication, and coordination. Time-series data provided by Slack allow for moving beyond self-reported use and reveal the factual engagement with the software. Relying on daily activity statistics from two postgraduate modules and open-ended student responses, I identify advantages and limitations of Slack. The modules have been delivered both online and in person, allowing us to assess whether Slack also contributes to communication when students can meet on campus.

The empirical analysis shows that most students actively use the platform several times per week. Across the four modules, on average, between 130 and 383 messages have been sent per week. During a typical weekday almost half of the module participants checked Slack. The program also enables efficient communication between learners and module instructors: not all students *ask* questions, but many module participants *read* questions and responses. These numbers highlight how Slack can contribute to ‘learning from listening to peers’, which has been identified as an important factor for course performance (Hamann et al. 2009). Open-ended survey questions from module evaluations confirm that many students liked collaborating and communication on Slack, resulting in ‘team spirit’ among module participants.

After a briefly describing the learning needs, I introduce Slack and potential alternative tools. Next, I present quantitative and qualitative evidence on the advantages and limitations of the tools. I conclude with four lessons I have learned when introducing Slack as the primary tool for communication and collaboration.

Learning Needs and Choice of Technology

Collaboration and constant interactions motivate learners and correlate with performance. For instance, Hamann et al. (2009) find that reading others' comments can improve grades. Glazier (2016) tests rapport-building teaching strategies, such as video updates, personalized emails, and electronic feedback. These interventions lowered attrition and improved grades. Discussions, questions, and examples thus play a crucial role in enabling constant exchange and motivating students.

Moreover, group-based and problem-based modules enjoy greater popularity in the social sciences (e.g., Krajcik and Blumenfeld 2006; Meyer 2022). Such modules require software tools for discussions, feedback, allocating tasks, and monitoring progress. Appropriate software should facilitate effective and intuitive communication between groups of students and between learners and module instructors. In addition, ideally, the software solutions are not only used in university settings but also in the public and private sectors to develop transferable skills.

Slack is a communication platform used extensively in the industry sector. Messaging tools such as Slack are “rapidly becoming an expected stable of [the] professional toolkit” (Menzies and Zarb 2020: 1). Slack runs on laptops, tablets, computers, and smartphones. Each Slack ‘workspace’ includes ‘channels’ for specific content or groups (public or private) and direct messages.¹

Slack enjoys high popularity in companies and among software developers.² More than 10 million people use Slack daily, and over 600,000 organizations use Slack, with 550,000 relying solely on the free version. These numbers highlight that the free version is

¹The free software currently stores ‘only’ the 10,000 most recent messages. The premium version stores all conversations. See <https://slack.com/intl/en-ie/features> for an overview of the main features.

²<https://techjury.net/blog/slack-statistics/>.

usually sufficient, even for companies. A survey conducted by Lin et al. (2016) reveals that software developers mention communication, team collaboration, discovery, and community support as some of the main reasons for using Slack.

Many research teams have switched from emails to Slack since it helps allocate tasks, provides real-time updates, recognizes collaborators' inputs, and briefs new members (Perkel 2017). More recently, Slack has been introduced for collaboration and coordination in lectures and seminars. For example, Sabin and Olive (2018) test Slack in a second-year undergraduate module with over 160 students. The authors conclude that Slack "replicates and integrates the online and social-media environments that students already inhabit" and that it "can assist faculty in meeting their pedagogical goals online" (Sabin and Olive 2018: 183). In a study on project-based learning, Meyer (2022) mentions Slack as a communication platform for peer support and cohesion. Other work tests the effectiveness of Slack based on student surveys (Sabin and Olive 2018; Zhang et al. 2019; Menzies and Zarb 2020). This instruction provides one of the first systematic empirical assessments of actual Slack usage in social science modules and a direct comparison between active and passive users.

Slack has at least five advantages over emails, e-learning platforms, and other messenger tools. First, the software facilitates real-time conversations and does not require tedious log-ins into an e-learning platform to check for updates. Students open the software or mobile app and receive notifications about new messages. Second, unlike emails, Slack ensures that *all* students can read an instructor's reply to a question. The transparent communication enhances fairness since students who are less willing to ask questions will be able to read the responses. Third, instructors can encourage students to help each other before providing an answer. Instructors can also easily share additional materials or useful websites without drafting a formal email. Slack allows for direct replies to posts or reactions to content through emojis. As a result, users can thank other participants for their input. Fourth, while popular messenger tools such as WhatsApp have been successfully deployed for active learning purposes (Dahdal 2020), many students primarily use WhatsApp to chat with family and friends. Communicating with learners on WhatsApp could diminish the separation between professional and private life, potentially worsening learners' (and

the instructor's) work-life balance. Slack can solve this problem since it is intended for work-related conversations and because users can easily 'snooze' notifications outside their regular working hours. Finally, many companies and institutions use Slack, but most undergraduate or postgraduate students have not worked with this software before. Modules that use Slack provide students with technical skills that can be very beneficial when entering the job market.

Results

The evidence presented in this paper comes from two modules offered for master's students at University College Dublin between 2020 and 2022. The first module, Introduction to Statistics, is targeted at master's students without advanced knowledge of quantitative methods or statistical programming languages. The second module, Connected_Politics, is a project-based course that involves attending a bi-weekly speaker series, presenting progress from a group project, writing a final research paper and a blog post about the methods and findings. Students in this module have advanced knowledge of computational social science methods. Selected blog posts are posted on the website of the university. The overarching goal of this module is to produce research papers that the groups could submit to a peer-reviewed journal.

Slack served slightly different purposes in the two modules. In Introduction to Statistics, Slack should facilitate discussions about statistical concepts, implementing these methods in programming languages, and questions about assignments. In the project-based module, Slack should ensure constant exchange between groups and project coordinators.

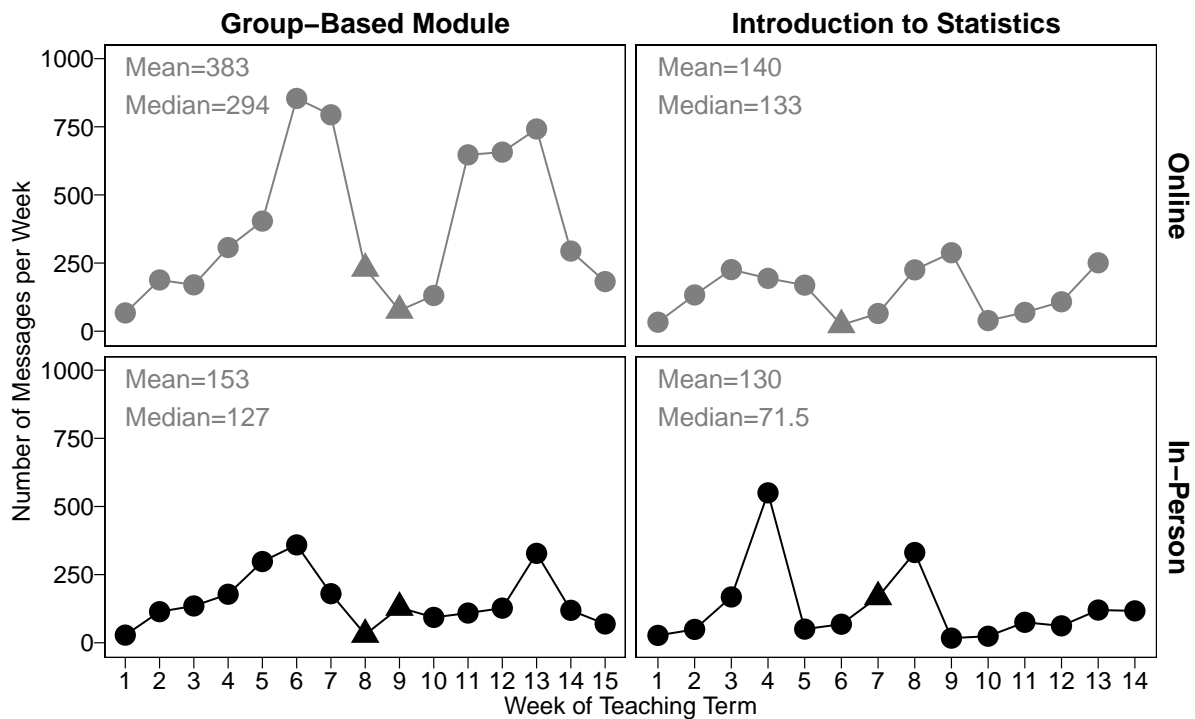
Evidence From Slack Usage Data

First, I assess the suitability of Slack for communication with and between students through daily statistics. Slack publishes information on the number of messages per day, the number of members posting messages, and the number of members reading the

content.³ By default, all statistics are anonymized and do not allow for the identification of students, specific channels, and the content.

The average weekly messages ranges from 130 (Introduction to Statistics, in-person) to 383 (group-based module, online). On a typical day, users posted between 18 and 54 messages in public and private channels. These levels of engagement are considerable, given that only 13 to 44 students registered for the modules. For all modules, we observe spikes before the submission of assignments (usually in weeks 4–6 and weeks 9–11). Table 1 presents additional summary statistics which reveal that messages in channels account for a large share of the activity.

Figure 1: Number of messages in channels and private messages per week



Note: Triangles indicate ‘reading weeks’.

Figure 1 shows the count of messages per week for each of the four modules. Grey dots indicate an online delivery of the module; black color represents in-person modules. The figure reveals that students and the instructor have communicated throughout the entire teaching term.

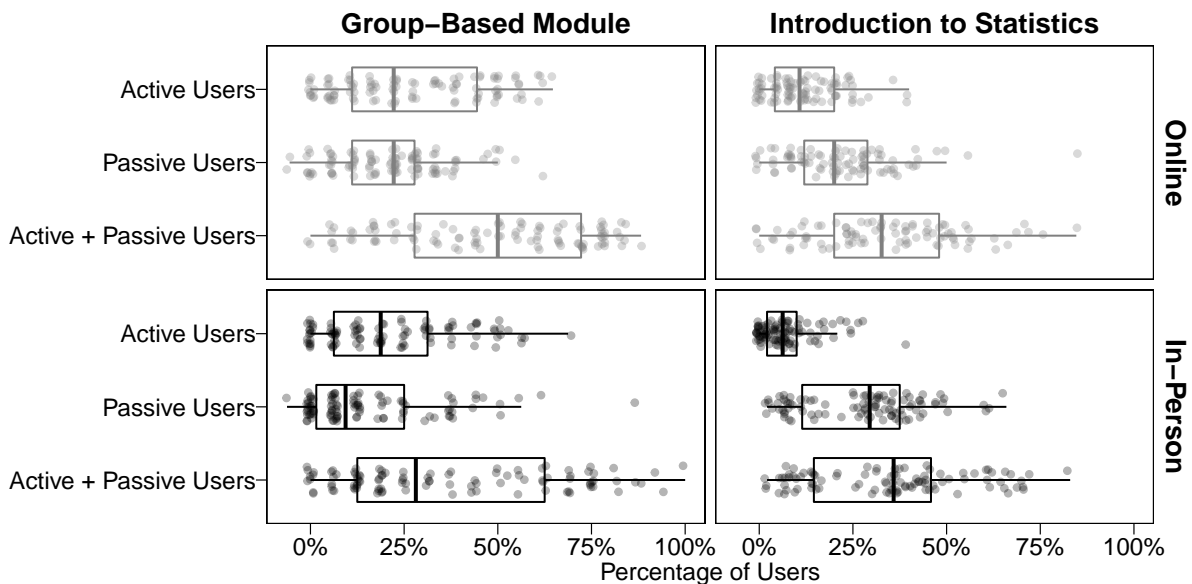
³As of July 2022, administrators can retrieve the data by opening the workspace settings, selecting ‘Analytics’ and export the statistics for ‘All Time’ or the last 30 days. The data do not allow for differentiating between module participants and instructors/project coordinators.

Table 1: Summary statistics of weekly Slack messages (Channels: public and private channels; Direct M.: direct messages between students or a student and the instructor)

Module	Delivery	Channels (Mean)	Channels (Median)	Direct M. (Mean)	Direct M. (Median)	Students
Group-Based Module	Online	163	119	220	173	13
Group-Based Module	In-Person	57	56	96	71	12
Intro to Statistics	Online	39	43	101	82	23
Intro to Statistics	In-Person	31	17	99	54	44

Having shown that Slack facilitated communication throughout the entire term, we turn to analyzing ‘active’ and ‘passive’ users. Transparent and efficient exchanges between students and the module coordinators were the central objectives. While emails often rely on one-on-one conversations, Slack provides everyone with the opportunity of reading these questions and answers. Figure 2 shows the percentages of students who posted content (*Active Users*) in public or private channels, students who only followed conversations (*Passive Users*), and the total number of students checking or posting on Slack (*Active + Passive Users*). Each dot indicates one day during the term.

Figure 2: Daily statistics on the percentage of students who posted messages (*Active Users*), or read messages (*Passive Users*), or used Slack to post and/or read messages (*Active + Passive Users*)



Note: The boxplots show the median and interquartile ranges. Small random noise was added to reduce overplotting of data points.

Figure 2 reveals that the share of passive students is at least as high as the number of active users. This is a reassuring and encouraging finding. While fewer students are

willing or comfortable to post messages, many students follow the activity on Slack. The difference between active and passive users is most prevalent in Introduction to Statistics. For example, the median of posting students on a given day amounts to around 10 percent of all students, while the median of passive students is around twice as high. Table 2 highlights high and consistent levels of activity. Across all four modules, on an average day, 38.5 percent of students (median: 37.5 percent) checked Slack or posted content. These numbers increase to 47.2 percent (mean) and 45.8 percent (median) when excluding Saturdays and Sundays from the sample. In other words, during a typical weekday almost half of the module participants opened Slack to follow or contribute to conversations.

Table 2: Average daily levels of activity

Module	Delivery	Active	Active (week- days)	Passive	Passive (week- days)	Active + Passive	Active + Passive (week- days)
Group-Based Module	Online	27.3%	34.6%	21%	25.3%	48.3%	59.9%
Group-Based Module	In-Person	21.3%	27.4%	15.5%	19.7%	36.8%	47.1%
Intro to Statistics	Online	11.8%	13.9%	22%	25.6%	33.8%	39.5%
Intro to Statistics	In-Person	7.2%	8.9%	27.4%	32.7%	34.6%	41.6%

The quantitative analysis reveals two main insights. First, hundreds of messages were sent on Slack in each module (Figure 1 and Table 1), and many students contributed to discussions or asked questions (Figure 2 and Table 2). Second, the fine-grained data reveal that many learners use Slack passively. Not all students posted messages, but most students checked the workspace several times per week. Thus, ‘listeners’ can benefit from their more active peers and conversations between students and the instructor, highlighting the advantages of Slack for collaborative learning.

Student Feedback

Having investigated the daily activity, I turn to qualitative evidence based on official course evaluations conducted by the university. I focus on the following question: “Identify up to three aspects of the module that most helped your learning.” Over 40 percent of the students who participated in the surveys for Introduction to Statistics explicitly mentioned Slack as one of the three aspects that most helped their learning. Given that the survey question only asks about positive aspects of the module, it is remarkable that

Slack has been mentioned very often. After the online delivery of Introduction to Statistics a student mentioned that the “use of the platform Slack was super helpful for asking questions and discussions amongst peers.” Another student wrote that “the Slack channel makes sure that we can all learn from other students questions.” The responses confirm that Slack encouraged students to communicate with each other. During the in-person delivery of the module, a student liked the “emphasis on collaboration through Slack in seeking assistance.” A module participant appreciated “constant help from other students on Slack.” A student who completed the project-based module mentioned that “the Slack channel was invaluable in this module. It helped me stay up to date with the general class events as well as my team group.” The text box below presents additional comments from module evaluations. These opinions provide further evidence for the popularity of Slack in postgraduate seminars and group-based modules.

Selected replies to the following question from module evaluations: “Identify up to three aspects of the module that most helped your learning.”

- “The module instructor setting up Slack was a really great idea and I think it was utilised very well”
- “Slack channel proved useful for assistance between classmates and with the module instructor”
- “He created additional channels for all the students to connect (via Slack), which was desperately needed considering how terrible online learning can be”
- “Brilliant communication between lecturer and students”
- “Use of the platform Slack was super helpful for asking questions and discussions amongst peers”
- “The module instructor is also very responsive to questions and the Slack channel makes sure that we can all learn from other students questions”
- “Easy ways how to communicate with colleagues (e.g., Slack)”
- “Constant help from other students on Slack”
- “The emphasis on collaboration through Slack in seeking assistance”
- “Use of Slack for communication and to support each other with code”
- “The Slack channel for questions”
- “Possibility for instant help via Slack”
- “Superb one-to-one feedback in the form of Slack responses and final paper comments”
- “The ability to get help from classmates and the lecturer on Slack is a nice option”
- “The use of the Slack channel was invaluable in this module. It helped me stay up to date with the general class events as well as my team group”

Conclusion and Lessons Learned

I conclude by summarizing four lessons I have learned when using Slack. First, students should create their accounts in the first week of term. Mentioning that communication will happen on Slack, not via e-learning platforms or email, ensures that students install and monitor the software. By sharing additional materials, links to online tutorials, or newspaper articles, module instructors can initiate interactions early in the teaching term.

Second, communication on Slack is particularly effective if the workspace contains various channels (e.g., #questions, #assignments, #coding, #events, #useful-materials). Channels structure discussions and avoid some questions or comments ‘getting lost’ by being hidden between discussions on different topics. Third, private channels are vital for group work. Students may not want to share questions on public channels. Participants who are not confident about posting a message publicly can send a private message to peers or the module instructor. The instructor can subsequently post the message in one of the public channels if the question could be relevant to several learners. Fourth, the module coordinator must monitor the activity on Slack daily. If students do not answer a question among themselves, after 24 to 36 hours, the module coordinator should provide an answer or additional materials. Timely replies motivate module participants to continue asking questions on Slack.

Despite these advantages, Slack also has some potential shortcomings. First, data protection could be an issue. Slack is “committed to helping Slack customers and users understand and, where applicable, comply with the General Data Protection Regulation (GDPR).”⁴ Yet, if data regulations or university requirements change, instructors must reassess the suitability of Slack for teaching and learning. Even though Slack seems to have worked for modules exceeding 40 students, the tool might be less suitable for large modules. Yet, Sabin and Olive (2018) report to have used Slack successfully for an undergraduate module with over 160 registered students.

Moreover, an advantage of Slack could also turn into an issue: the software provides very transparent insights into the dynamics of a module. Learners will immediately notice low levels of activity and engagement, which could discourage them from collaborating.

⁴<https://slack.com/intl/en-ie/trust/compliance/gdpr>.

To avoid this issue, module coordinators should post insightful materials throughout the term and encourage learners to ask questions. For example, if instructors cannot reply to questions in class due to time constraints, they could respond to the question on Slack after the lecture or seminar.

Friendly interactions between students and the module instructor are vital for in-person and online modules. Glazier (2021) recommends four actions to build trust and human connections. Lecturers should ‘humanize themselves’ by staying engaged with the class, react to questions, provide opportunities for interaction, and be compassionate. The quantitative and qualitative analyses presented in this instruction suggest that Slack can help module instructors achieve these goals.

References

- Dahdal, Sohail (2020). “Using the WhatsApp Social Media Application for Active Learning”. *Journal of Educational Technology Systems* 49 (2): 239–249.
- Glazier, Rebecca A. (2016). “Building Rapport to Improve Retention and Success in Online Classes”. *Journal of Political Science Education* 12 (4): 437–456.
- Glazier, Rebecca A. (2021). “Making Human Connections in Online Learning”. *PS: Political Science & Politics* 54 (1): 175–176.
- Hamann, Kerstin, Philip H. Pollock, and Bruce M. Wilson (2009). “Learning from ‘Listening’ to Peers in Online Political Science Classes”. *Journal of Political Science Education* 5 (1): 1–11.
- Krajcik, Joseph S. and Phyllis C. Blumenfeld (2006). “Project-Based Learning”. *The Cambridge Handbook of Learning Sciences*. Ed. by R. Keith Sawyer. Cambridge University Press: 317–334.
- Lin, Bin, Alexey Zagalsky, Margaret-Anne Storey, and Alexander Serebrenik (2016). “Why Developers Are Slacking Off: Understanding How Software Teams Use Slack”. *CSCW ’16 Companion: Proceedings of the 19th ACM Conference on Computer Supported Cooperative Work and Social Computing Companion*: 333–336.
- Loepp, Eric D. (2021). “Introduction: COVID-19 and Emergency e-Learning in Political Science and International Relations”. *PS: Political Science & Politics* 54 (1): 169–171.

- Menzies, Rache and Mark Zarb (2020). “Professional Communication Tools in Higher Education: A Case Study in Implementing Slack in the Curriculum”. *2020 IEEE Frontiers in Education Conference (FIE)*: 1–8.
- Meyer, Cosima (2022). “Bringing the World to the Classroom: Teaching Statistics and Programming in a Project-Based Setting”. *PS: Political Science & Politics* 55 (1): 193–197.
- Miller, Michelle D. (2014). *Minds Online: Teaching Effectively with Technology*. Cambridge, MA: Harvard University Press.
- Perkel, Jeffrey M. (2017). “How Scientists Use Slack”. *Nature* 541: 123–124.
- Sabin, Jerald and Andrea Olive (2018). “Slack: Adopting Social-Networking Platforms for Active Learning”. *PS: Political Science & Politics* 51 (1): 183–189.
- Trudeau, Robert H. (2005). “Get Them to Read, Get Them to Talk: Using Discussion Forums to Enhance Student Learning”. *Journal of Political Science Education* 1 (3): 289–322.
- Zhang, Xi, Yao Meng, Patricia Ordóñez de Pablos, and Yongqiang Sun (2019). “Learning Analytics in Collaborative Learning Supported By Slack: From the Perspective of Engagement”. *Computers in Human Behavior* 92: 625–633.