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Using Google Analytics to Measure Engagement with a Teaching and Learning Centre During COVID-19

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Postsecondary educators and students were among the first affected by COVID-19 pandemic safety protocols and were required to transition quickly from face-to-face to unfamiliar remote teaching and learning environments. To support this transition, support staff at teaching and learning centres (TLCs) also pivoted their support strategies and developed and delivered more online resources and virtual professional development workshops. The purpose of this study was to examine whether the demands for online and remote teaching and learning support was evident in the Google Analytics data of the TLC webpages of a research-intensive Canadian university. To facilitate interpretation of observed trends, we aligned the timing of messages emailed to faculty and new resource launches on the TLC webpages to the analytics data. Results confirmed that TLC webpages are vital sources of information for faculty development, and targeted communications increased faculty engagement with teaching resources and professional development opportunities. As pandemic safety protocols ease and educators and students return to their postsecondary campuses, they will face new challenges. In response, TLCs must continue to monitor faculty engagement and their changing support needs, and they must continue to adjust approaches to offering information and professional development opportunities as necessary. The examination of website analytics data is just one measure that can support evidence-informed decision making for this purpose.

Introduction

Teaching and Learning Centres (TLCs) are critical to the growth and development of educators in higher education (Schumann et al., 2013), with

approximately 113 and 1,284 TLCs supporting educators in colleges and universities across Canada (Educational Developers Caucus, n.d.) and the United States (POD Network, 2021), respectively. TLCs provide a space for information on best practices in teaching, and professional growth, innovation, and interdisciplinary collaboration and mentorship among educators (Schumann et al., 2013). Technology, including enhanced online presence, has enabled further reach, interaction, and ability for TLCs to provide development and collaborative opportunities, which in turn positively affects the student learning experience (Atkins et al., 2017). In the spring 2020, institutions transitioned quickly to remote learning for public health and safety due to the COVID-19 pandemic, which had an impact on over 850 elementary to postsecondary students in 102 countries and local shut-downs in 11 other countries (UNESCO, 2020). TLCs, including our own Centre for the Advancement of Teaching and Learning, University of Manitoba, became primary units of support for faculty navigating remote instruction. The present study aimed to explore website use as a measure of faculty engagement at our postsecondary TLC. Website analytics can provide valuable information for enabling decisions about resource allocation for website re-design and content building. Such decisions can enhance communication with faculty about available teaching and learning resources and increase access to pedagogical and technical supports.

Literature Review

Over time, TLCs have emerged with the responsibility of bridging the gap between practice and the ever-changing research on teaching and learning (Schumann et al., 2013). TLCs are tasked with exploring the latest trends in teaching and learning and how these trends align with institutional missions, and transferring this knowledge to educators with varying degrees of knowledge and skills in teaching (Cruz, 2018; Gillespie, 2010; Schroeder, 2010; Schumann et al., 2013). Administrators look to TLCs to drive cultural change around teaching and learning (Schumann et al., 2013) to encourage faculty to develop beyond their discipline-specific subject-matter expertise to becoming well-rounded professionals in higher education (Dunn, 2020; Ouellett, 2010). To meet the needs of faculty and administrators, TLCs share knowledge through workshops on a wide variety of topics, programs and consultations covering topic areas in the scholarship of teaching and learning (SoTL), personal development, and pedagogical and technical support. Because TLCs are often staffed with professionals with a wide range of roles

(e.g., educational developers, technology experts) and from diverse research and teaching backgrounds (McDonald, 2010), they can more easily meet the needs of faculty in different disciplines. The range of expertise within TLCs, writes Dunn (2020), "can mean opportunities for continued growth in the field as well as different views on rigor, methodology, and course design of educational development" (p. 18).

Support offered by TLCs, however, is often constrained by a number of challenges, including chronic understaffing, limited time, physical space, and funding (Aebersold et al., 2020; Herman, 2013), and shifting institutional priorities (Brinthaupt et al., 2019). To meet their goals, TLCs are often required to do more with less. A further challenge is that faculty may not consult with TLC programming as much as they could to enhance their teaching (Cook & Kaplan, 2011; Forgie et al., 2018), which may exacerbate funding challenges. The lack of engagement may be due to the poor visibility of TLCs on postsecondary campuses (Brinthaupt et al., 2019; Forgie et al., 2018; Sorcinelli, 2002). To raise the profile of their services, TLCs have increasingly leveraged the internet to inform and encourage participation in educational development (Atkins et al., 2017). Using webpages, social media, mobile applications, and email communications, TLCs have delivered resources and communicated the availability of professional development opportunities to position TLCs as reliable and valuable sources of teaching and learning information and support with the ultimate goals of enhancing student learning and learning experiences.

When the COVID-19 pandemic struck and postsecondary institutions all over the world pivoted to remote teaching and learning to keep students and staff healthy, the reliance on TLC websites for information about remote pedagogies, professional development activities (e.g., workshops), and technical support for implementing teaching and learning technologies increased dramatically. The typical pre-pandemic face-to-face workshop was reimagined and offered as live virtual sessions during the pandemic, and workshop facilitators referred to related resources available via TLC websites (e.g., Hodges et al., 2020; Horan & Kim, 2020; Johnson et al., 2020). Perhaps as a result of attending virtual workshops and visiting TLC websites about online pedagogies (i.e., deliberately and carefully planned for the purpose of distance education) and remote education (i.e., employed rapidly in response to crisis), many faculty adopted new teaching methods during the pandemic (Johnson et al., 2020). This increased dependence upon digital content and communication motivated TLCs, including our own, to review their

online presence and make changes to meet more effectively the needs of faculty.

Interestingly, website effectiveness is not typically evaluated by higher educational institutions, which is a lost opportunity as the web is a key source of information for many aspects of postsecondary life (Carlos & Rodrigues, 2012). The few studies that have done so have focused on students and have analyzed data about overall university website usability (Manzoor et al., 2019) or impact on student recruitment (Pegoraro, 2006). Some researchers have focused on measuring the effectiveness of university or college library websites (Turner, 2010) or TLC websites (Kanuka & Rourke, 2013; Woodhouse & Force, 2010) by examining web content using qualitative approaches or by interviewing faculty. Although content analysis is a powerful tool to examine communication methods (see Berelson, 1952), analyzing website metrics to determine the number of faculty who use and engage with teaching and learning content can provide insight for the redevelopment of TLC websites to improve effectiveness and increase faculty engagement.

Present Study

The goal of this study was to identify patterns in how users engage with the webpage of a TLC at a research-intensive Canadian postsecondary university. To this end, we analyzed metrics of a TLC webpage from Google Analytics across several timeframes before and during the COVID-19 pandemic. Web analytics offer a unique source of real-world data important for identifying strengths and limitations in the content and design of a webpage. Web analytics are a time-efficient and useful way to gather data to answer general questions about the number of visitors to a webpage and which pages they are viewing, and are especially useful when metrics are considered in combination (S. W. Mercer et al., 2004; Nielsen, 2013; Spin U Tech, 2015). Results from this work may be used to improve supports provided to members of the teaching and learning community.

Method

Study Setting

Web analytics were obtained for the TLC webpages of a large, research-intensive Canadian university with approximately 2,135 full-time and part-

time teaching staff of all ranks (University of Manitoba, 2018). One goal outlined in the university's strategic plan is to improve student learning experiences by providing teaching faculty with support through the TLC, which advocates for the practice and scholarship of teaching and learning. Prior to March 16, 2020, the TLC had about 120 live webpages, which were replaced by 100 new webpages on March 16, 2020. On March 18, 2020, in-person classes ceased, followed by all university buildings officially closing physical doors on March 23, 2020, in response to the COVID-19 pandemic. All university business, including teaching and learning activities, were remote after this date. On May 1, 2020, 25 new webpages with content about information and professional development opportunities to assist faculty in their transition to remote teaching were published.

Study Periods

We analyzed data captured using Google's free analytics tool. Data was obtained for each day of the baseline period of August 1, 2018, to September 30, 2019 (pre-COVID-19). Through visual inspection, we confirmed that traffic trends were similar in 2016 and 2017; therefore, we do not present data prior to August 1, 2018. Next, we exported the daily data for three 30-day windows: March 15 – April 13, 2019 (Period 1), March 13 – April 11, 2020 (Period 2), and May 1 – 30, 2020 (Period 3) to examine trends in traffic and user behaviour. These dates were initially selected in response to a request from TLC leadership to determine the impact of key events (i.e., onset of COVID protocols, publishing new information). We aligned the days of the week for comparison. Data for *university network traffic* (users identified as being connected to the university's service provider) was limited for Periods 2 and 3 as staff and students were required to teach, learn, and work remotely beginning in March 2020 and did not access the internet via university networks.

Performance Indicators

We describe nine metrics considered key indicators of webpage effectiveness when used in combination. These metrics are important for identifying and analyzing trends (C. Mercer, n.d.; Nielsen, 2013; Spin U Tech, 2015).

Traffic refers to the number of unique users and unique sessions to a website. Traffic may be aligned with events (e.g., advertising) designed to increase traffic and should be considered within the context of the primary

goals of the website and organization more broadly. *Users* refers to the number of new and returning visitors to a website during a set period and are identified using cookies and unique identifiers. Users may be identified as different if they visited a website using multiple devices or browsers, devices in different locations, or cleared cookies at any point during the period examined. *Sessions* refer to a set of user interactions that take place in a certain period. *Sources* and *medium* refer to the origin of website traffic (e.g., search engines or another website) and how users arrive to a website (e.g., from searches, links, email, direct by typing in URL or from a bookmark), respectively.

Pages refer to the total number of pages visited, whereas *pages per session* is the number of pages viewed in a single session by a user and indicates ease of access and how compelling users find the content. The industry standard is two pages per session. *Average session duration* refers to the mean length of all site visits combined, and the industry standard is approximately 2-3 min, where longer durations indicate greater engagement with content. *Bounce rate* is the proportion of users who navigate away from the webpage after viewing only one page without interacting (e.g., scrolling, clicks) with it (Google, 2019). Bounce rates of about 50% is an industry standard but are often seen to range from 25 to 65%. Lower bounce rates may be considered optimal and higher bounce rates may indicate that users are leaving the site without exploring its content or are finding and clicking on relevant links quickly.

TLC Communications

The primary method of communicating TLC activities to members of the university community is through email via internal academic staff listservs, which typically feature upcoming professional development opportunities accompanied with links to the workshop registration webpage or other information about teaching and learning (e.g., information about technology supports). Examination of subject lines revealed that a subset of emails sent in April 2019 announcing a conference co-hosted by the TLC directed recipients to the conference website and not the TLC webpages. These email communications were excluded from our analyses. Workshop registration numbers for each study period were obtained, where possible.

Data Analysis

Microsoft Excel and SPSS Version 27 were used for data analyses. Descriptive statistics, *t*-tests, and analysis of variance (ANOVA) tests were used to compare metrics across study periods as appropriate.

Results

Baseline Period

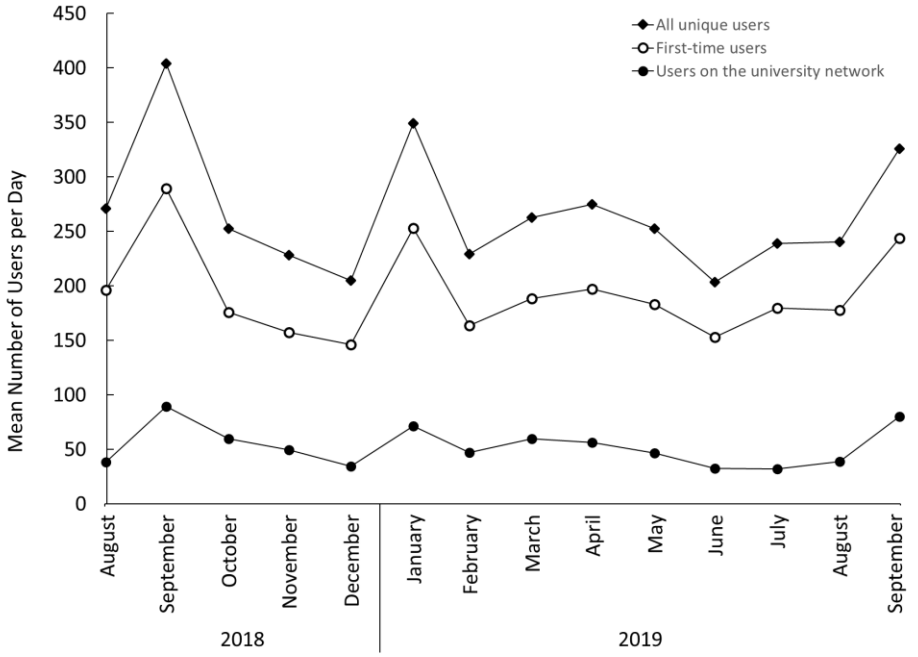
Peaks of user visits occurred in September 2018 ($N = 404$), January 2019 ($N = 349$), and September 2019 ($N = 326$) (see Figure 1), representing an average of 16.8% of full-time and part-time teaching staff of all ranks on any given day. The traffic pattern is mirrored in the average number of first-time users per day and the university network users per day. First-time users represented approximately 72.9% of all unique users across the baseline period and growth in traffic was not observed. The number of users per day ($M = 267.1$, $SD = 131.8$, *Range* = 85 – 1,333) was correlated with the number of sessions per day ($M = 293.5$ sessions, $SD = 146.6$, *Range* = 87 – 1,484) [$r(424) = .999$, $p < .001$]. Approximately 85% of all unique users accessed the TLC webpages while located in Canada, whereas 4.0%, 1.1%, and 1.0% viewed them from the United States, India, and Nigeria, respectively.

The number of emails sent per month correlated significantly with the average number of users per day per month for all unique users [$r_s(12) = .54$, $p = .048$] and university network users [$r_s(12) = .77$, $p = .001$], suggesting that the communication strategy encouraged faculty to visit the TLC webpages and register for workshops (i.e., 11,186 registrations from January to September 2019). During baseline, few emails encouraged users to visit static content, such as course and curriculum development information, on the TLC's webpages.

Users viewed an average of 2.6 pages per session ($SD = .3$, *Range* = 1.8 – 6.0) with each session lasting approximately 2.0 min ($SD = .48$, *Range* = .72 – 4.28 min). The average values of these metrics were consistent with industry standards. The average number of pageviews per day was 754.8 ($SD = 357.0$, *Range* = 217 – 4,343). The 20 webpages with the most average views per day included those with information on flexible learning (7 – 144 views/day), LMS (8 – 93 views/day), homepage (31 views/day), professional development programs (7 – 19 views/day), and teaching resources (8 views/day). The average daily bounce rate for all TLC webpages was 55.3% ($SD = 4.9\%$, *Range*: 40.3 – 72.2%). The bounce rates of 30 pages fell between 23.2% and 50% with

an average of 0.99 min of viewing time and 16 pages had bounce rates of 50.8 – 65.0%. with 1.56 min average viewing time.

Figure 1
Mean Number of Users per Day
During each Month of the Baseline Period



30-Day Study Periods

The average numbers of new and returning users per day for Period 1 (M = 280.3, SD = 84.1, *Range* = 137 – 417), Period 2 (M = 276.1, SD = 188.9, *Range* = 100 – 948), and Period 3 (M = 317.8, SD = 255.2, *Range* = 65 – 1,252) were similar [$F(2, 87) = .44$, $p = .65$, $\eta_p^2 = .01$]. A similar traffic pattern was observed for the number of first-time users, but the percentages of first-time users differed across study periods [$F(2, 87) = 19.25$, $p < .001$, $\eta_p^2 = .31$]. Follow-up (LSD) tests indicated that the proportion of first-time users was larger during

Period 1 (M = 72.5%, SD = 3.9%, *Range* = 66.0 – 81.1%) than during Periods 2 (M = 62.7%, SD = 7.2%, *Range* = 50.9 – 80.0%) or 3 (M = 64.9%, SD = 7.4%, *Range* = 52.6 – 76.9%) ($p < .001$, for both comparisons). These findings are in line with workshop registration data—189 faculty registered for workshops during P1 and 1,142 faculty registered for workshops during P3. Limited professional development workshops were offered during P2 with no registrations. As can be seen in Figure 2, two large spikes in users occurred during Periods 2 and 3 with the launch of new webpages and COVID-19 restrictions plus new professional development and remote teaching resources, respectively. During the week that followed, the average number of users dropped from 948 to 386 and 1,252 to 543, respectively.

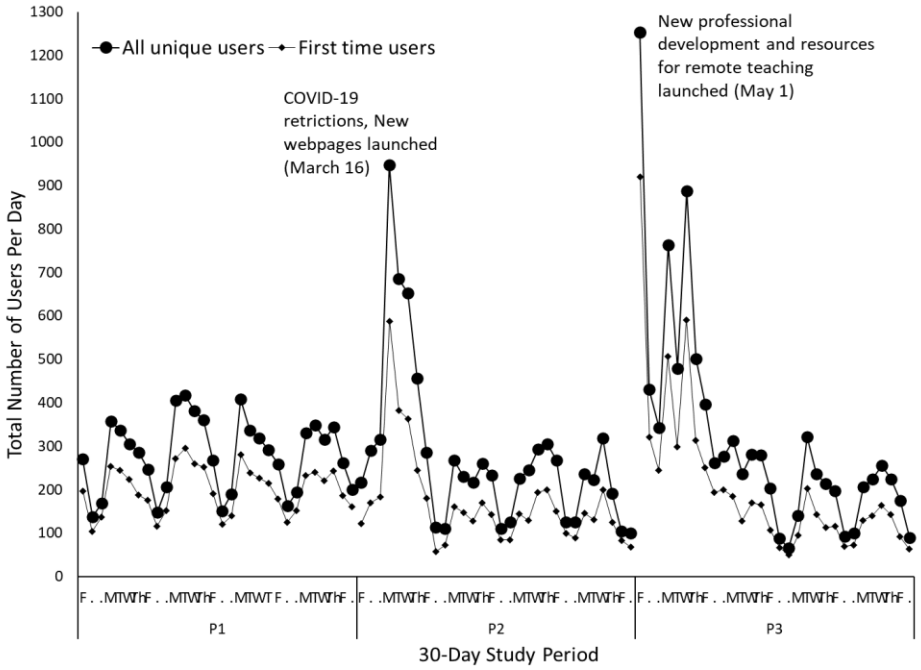
For Period 2, 52.4% of all unique users (and 61.4% of first-time users) arrived at the TLC webpages as the result of direct visits, whereas other sources and mediums were the result of searches (30.5%), links (15.7%), and email (0.2%). During Period 3, 60.6% of all unique users (and 68.3% of first-time users) arrived at the website as the result of direct visits, followed by links (20.0%) and from searches (14.4%). The percentage of other sources is quite minimal. The low percentage of visits due to email communications suggests that this method of directing academic staff to the TLC website could be improved upon.

Across the three periods, the average number of pageviews was similar [$F(2, 86) = .09$, $p = .92$], with a mean of 784.7 pageviews per day (SD = 461.3, *Range* = 115 – 2,591). The average number of sessions per day during each of the three 30-day study periods were similar [$F(2, 87) = .47$, $p = .62$], with an average of 331.6 sessions (SD = 220.1, *Range* 77 – 1,413), but the average time spent per session varied [$F(2, 87) = 3.48$, $p = .04$]. More time was logged per session during Period 2 (M = 2.28 min, SD = .69) than Period 3 (M = 1.92 min, SD = .43) (LSD; $p = .01$) but there was no difference from Period 1 (M = 2.03 min, SD = .44) (LSD; $p > .08$, for both comparisons). During Period 2, the 15 most viewed webpages were the homepage (248 views/day), and those that provided information about remote teaching and learning (27 – 176 views/day), learning technologies (8 – 83 views/day), workshops (18 – 57 views/day), and academic integrity (14 views/day). The same pages were viewed during Period 3, with one exception—a new page about alternative forms of assessment and grading had 173 views/day.

The average daily bounce rates differed significantly across the three 30-day study periods [$F(2, 87) = 4.25$, $p = .02$, $\eta_p^2 = .09$]. Follow-up (LSD) tests indicated that the average bounce rate was lower for Period 1 (M = 55.2%, SD = 3.6%, *Range* = 46.0 – 61.7%) than for Period 3 (M = 59.9%, SD = 6.5%,

Range = 48.5 – 75.0%) (p = .005). The average bounce rate for Period 2 (M = 57.0%, SD = 7.1%, *Range* = 43.6 – 73.1%) did not differ significantly from the rates seen for the other two periods (p > .08, for both comparisons). In general, low bounce rates were observed for webpages with information for-teaching assistant training and workshops. Low bounce rates suggest more interaction with the content on these webpages when they are visited.

Figure 2
Number of Users per Day Accessing the TLC's Webpages
Period 1 (P1): March 15 – April 13, 2019; Period 2 (P2): March 13 – April 11, 2020; Period 3 (P3): May 1 – 30, 2020.



Discussion

Website quality is not typically examined nor evaluated by higher educational institutions (Carlos & Rodrigues, 2012). Studies that have investigated quality or usability of the postsecondary websites have obtained data from student users about usability metrics related to ease of navigation, organization, design (Manzoor et al., 2019; Roy et al., 2014) and student recruitment

(Pegoraro, 2006), and use of library websites (Baba & Ganaie, 2019; Fung et al., 2016). To our knowledge, investigations of TLC webpage analytics to examine faculty engagement have also not been published in the peer-reviewed research literature. This project aimed to fill this gap by exploring trends in user visits and how users engage with the TLC webpages at a research-intensive Canadian postsecondary university before and during a significant global event (i.e., the COVID-19 pandemic).

We estimated that approximately 16.8% of full-time and part-time teaching staff of all ranks visited the TLC webpages on any given day. There was no obvious pattern of growth in the number of users over time. Little to no growth might be expected given that the number of teaching staff employed by a university should be fairly stable over short periods. The proportion of users did increase, however, when new content and opportunities for professional development were published. The most significant surge occurred during periods of immediate need, when users were motivated to seek resources and support about teaching and learning in remote environments (see Williamson et al., 2020)**. S**ignificant correlations between the number of emails sent and frequency of webpage visits also show that communication campaigns drive educators to TLC webpage content. Greater use of TLC webpage content at any given time may serve as an indicator of continued growth and development of an institutions' teaching staff, further impacting student outcomes. In other contexts, effective email communications increases website traffic resulting in changes in consumer retail habits (Dolega et al., 2021) and other behaviors (e.g., increased organ donation registry signings; Feeley & Moon, 2009). Although our TLC email campaigns appeared successful, it is important to consider that postsecondary institution staff are typically at or near levels of *email overload* (Pignata et al., 2015). For this reason, the frequency and timing of TLC communications must be carefully planned to avoid negative perceptions.

In our study, surges in webpage traffic were temporary and use quickly dropped to baseline levels in the days that followed each surge. This pattern of webpage visits can be attributed to the specific messages that the emails from the TLC contained (i.e., workshop announcements). Most email messages did not encourage exploration of static (unchanging) web content. Viewers are unlikely to revisit a website when they expect that website content will not change (Cyr, 2014) unless motivated by external factors (e.g., quickly finding information about online teaching during the coronavirus crisis). Although the average numbers of users were similar across study periods, user behaviour varied. Users spent more time viewing webpages that

provided remote teaching and learning resources with the advent of COVID-19 restrictions. Our findings are consistent with other research showing that instructors relied on easy access to resources for teaching remotely early in the pandemic (Johnson et al., 2020). This unprecedented demand for resources was met by TLC staff by dramatically scaling up efforts and resources (Aebersold et al., 2020) and answering the call for TLCs *responsiveness mandate* (Wright et al., 2018). At other postsecondary institutions, faculty reported feeling generally satisfied with the support and information offered by their TLCs (Horan & Kim, 2020), and perceived that the transitions to remote teaching were successful as course quality and student outcomes remained relatively unchanged (Sims & Baker, 2021).

Although TLC webpages are often designed to provide information about pedagogy and professional development opportunities (Woodhouse & Force, 2010), a key purpose of TLCs is to facilitate community building (Hodges et al., 2020). Online hubs or community spaces hosted by TLCs where faculty across disciplines can meet, share, and brainstorm ideas may lead to better overall engagement with TLCs (Cook & Kaplan, 2011; Forgie et al., 2018; Sorcinelli, 2002). By exploring faculty member perceptions and experiences with a virtual Professional Learning Community (PLC) on a social media platform, Bedford (2019) confirmed that the PLC was able to engage faculty, build relationships, and foster shared learning. Tucker (2019) shared similar success with a Twitter personal learning network (PLN). Atkins et al. (2017) found that 42% of Canadian TLCs maintained Facebook or Twitter accounts, but the frequency of use across institutions varied widely, from daily updates to a state of inactivity. Interestingly, 90% of faculty in the United States use social media in a professional capacity and/or in the classroom (Moran et al., 2011). In contrast, 47% of typical U.S. workplace employees use social media for this purpose (Bughin & Chui, 2010) and may assume that university faculty are slow adopters of technology. Future research could examine if communication through social media, in addition to email campaigns, affects TLC webpage traffic or user behaviour, or other metrics of faculty engagement. Moreover, if the internet can be leveraged, so too can on-campus (e.g., libraries, student affairs, and human resources) and off-campus (e.g., professional organizations) partners to increase reach to teaching staff (Brinthaupt et al., 2019). An exploration of the effectiveness of cross-unit advertising of supports and services on websites may provide valuable insights as to the strength of on- and off-campus partnerships.

Limitations and Future Directions

A limitation of our data was the inability to distinguish between different campus stakeholders (e.g., students, teaching staff, support staff, administrators, visitors to the university). Greater understanding of TLC webpage visitors and their reasons for visits would facilitate the development of more effective webpage designs and content that meets their needs**.** Survey methodology to collect user demographic (e.g., years of face-to-face, online, and remote teaching experience) information and satisfaction with the quality of information provided can be useful for this purpose (Carlos & Rodrigues, 2012). Webpage aesthetics, e.g., simplicity, diversity, colourfulness, and craftsmanship (Moshagen & Thielsch, 2013), facilitates user understanding of the available web content (e.g., Bernstein et al., 2022), but has been overlooked in research examining TLC webpage effectiveness. Determining the extent of the association between faculty perceptions of TLC webpage aesthetics, quality of the webpage content, user understanding, and user behaviour would provide more holistic information important for website redesign, including content editing.

Another limitation of our work is that we were unable to directly link TLC workshop registration data to email communications to the performance indicators extracted from Google Analytics. Measuring conversion and micro-conversion rates or the percentage of users who take a desired action (e.g., completing forms, contacting experts) or secondary action (e.g., clicking links, watching videos, and scrolling past the page fold) once they are on the website can be an informative indicator of website effectiveness (Nielsen, 2013; Spotless, n.d.). Low conversion rates are indicative of issues with accessibility, low quality content, and general disinterest. Examining conversions and other metrics (e.g., load time, browser compatibility, html errors) (Al-Ananbeh et al., 2012), broken links, internal search, and images with/without descriptions (Manzoor et al., 2019) in relation to the goals of the website and organization more broadly can facilitate better website design and overall communication strategies to encourage user engagement with website content.

Although web analytics can be a time-efficient and useful way to gather data to answer questions about website effectiveness, combining various data-collection methods and examining the data through several different lenses has the potential to provide a more complete picture of website effectiveness. For example, measuring users' performance (e.g., success rate, completion time, error rate) on a given set of tasks typically completed while

interacting with websites can provide insight into the effectiveness of websites (Nielsen, 2001; Roy et al., 2014; Scholtz, 2001). Performance-based evaluation can be conducted using remote usability (e.g., using a screen recorder) or laboratory-based testing methods. In the laboratory, users could also complete tasks while their facial expressions and their gaze direction are recorded. This approach could be used to examine whether frustration, boredom, interest, or confusion is experienced while viewing/reading certain content or whether certain areas of a webpage demand attention or are ignored.

Conclusions

As pandemic safety protocols ease and educators, students, and other staff return to their postsecondary campuses, they will face new challenges. In response, TLCs must continue to monitor faculty engagement and their changing support needs, and continue to adjust their approaches to offer information and professional development opportunities as necessary with the end goal of enhancing student experiences and outcomes. Situating adjustments within broader institutional initiatives helps to ensure that TLCs remain, not only relevant, but critical to the work of the postsecondary institution (Schroeder, 2010). Although not a typical approach, the examination of TLC webpage traffic and user behaviour can provide interesting insights for enabling evidence-informed decision-making about resource allocation for overall TLC programming and communication about teaching and learning information. Web analytics can stand alone to a certain extent; however, data collection using other methods can verify the observed trends in traffic and the content that university community members engage on TLC webpages.

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