Computers & Education 70 (2014) 194–202

Contents lists available at ScienceDirect

Computers & Education

journal homepage: www.elsevier.com/locate/compedu

Making sense of multitasking: The role of Facebook

Terry Judd

Medical Education Unit, The University of Melbourne, Parkville, VIC 3010, Australia

ARTICLE INFO

Article history:
Received 11 June 2013
Received in revised form
19 August 2013
Accepted 20 August 2013

Keywords:
Post-secondary education
Media in education
Multitasking
Human–computer interface
Social media

ABSTRACT

Media multitasking and Facebook use are commonplace among college and university-aged students. While the two are often linked and each has been independently associated with reductions in academic performance, their relationship to each other is not particularly well understood.

This relationship was examined by analysing comprehensive time-based logs of students' computer-based tasks, including Facebook, during unsupervised, self-directed learning sessions. A total of 3372 sessions contributed by 1249 students were analysed. Multitasking was extremely common – around 99% of sessions involved some multitasking (at least three instances of a particular task within a 20 min period). Facebook was the second most common task overall (University was first), accounting for 9.2% of all task instances and being present in 44% of sessions. Sessions containing Facebook typically contained more, shorter duration tasks and were significantly more likely to include multitasking behaviour. The introduction of Facebook within a session was associated with an increase in multitasking and a reduction in focused (no more than two tasks in a 20 min period) behaviour. Facebook users (students who contributed at least five sessions and used Facebook in at least one of these sessions) were also more likely to multitask and less likely to engage in focused behaviour. These results confirm that Facebook use is a key contributor to students' task switching and multitasking behaviours.

1. Introduction

Facebook is currently the number one ranked website in the world (Alexa, 2013) with around 1.1 billion users (Facebook, 2013), or 45% of the global population of Internet users (Miniwatts Marketing Group, 2013). It is particularly popular among younger adults, engaging 83% of US 18–29 year old Internet users according to a recent poll (Duggan & Brenner, 2013), and this value is higher still among US college and university students – around 90% (Smith & Caruso, 2010). Most of these students are frequent users, accessing the site many times per day (Dahlstrom, de Boor, Grunwald, Vockley, & Oblinger, 2011). They spend a substantial amount of time on the site – although estimates of this time vary considerably. Studies based on self-reports of use (e.g. Ellison, Steinfield, & Lampe, 2011; Junco, 2012) suggest an average of between 80 and 100 min a day. However, in a new 'observational' study, where students' computer activities were automatically logged over a two-month period, the average daily time spent on Facebook was much lower, at between 21 and 26 min (Junco, 2013).

The potential for Facebook to act as a major distractor to learning was recognised well before it reached its current levels of use (Bugeja, 2006) and this seems to have been confirmed by recent studies that report a negative association between Facebook use and academic performance and engagement (Gabre & Kumar, 2012; Junco 2012 a,b,c; Junco & Cotton, 2012; Karpinski, Kirschner, Ozer, Mellott, & Ochwo, 2013; Kirschner & Karpinski, 2010; Rosen, Lim, Carrier, & Cheever, 2011; Rouis, Limayem, & Salehi-Sangari, 2011; Wood et al., 2012). In addition to its purely social use, many students use Facebook for study-related communications (more than 50% according to a large study of US undergraduates – Smith & Caruso, 2010). Students' perceptions of the effect of Facebook on their learning vary, with almost three quarters of Facebook users (73.8%) in a 2010 study by Kirschner and Karpinski (2010), claiming that it had no impact on their learning, while a small percentage felt that it had a positive impact. In contrast, when high school students were asked about their use of Facebook during homework, most students believed that it affected their homework completion times, and at least slightly reduced the quality of their work (Tharayil & Prince-Cohen, 2012). Against this trend, a small proportion of these students felt that using Facebook actually improved their work slightly.

Widely touted as a fundamental capability – and advantage – of 'net generation' adolescents and young adults over the rest of us, a preference and predilection for multitasking using digital devices (often referred to as media multitasking – Foehr, 2006; Roberts, Foehr,

E-mail addresses: tsj@unimelb.edu.au, tsj@netspace.net.au.

0360-1315/$ – see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.compedu.2013.08.013

& Rideout, 2005) is increasingly being viewed in a negative light. While the rhetoric about this generation of users appears true in as far as they do regularly engage in media multitasking, and tend to do so more often than older users, there is little evidence to suggest that they do it any more effectively (Carrier, Cheever, Rosen, Benitez, & Chang, 2009; Foehr, 2006; Jeong & Fishbein, 2007; Smith & Boyles, 2012). Moreover, real concerns are being raised around the interaction between multitasking and learning, in light of strong evidence that multitasking can interfere with the learning process. Aside from the simple distractive potential of attempting to attend to additional tasks, cognitive studies highlight a number of negative effects of multitasking – these include a decline in task accuracy and performance (Adler & Benbunan-Fich, 2012; Ophir, Nass, & Wagner, 2009), and an increase in the time taken to complete concurrent tasks compared to when they are undertaken sequentially (Pashler, 2000; Rubenstein, Meyer, & Evans, 2001). Moreover, multitasking seems to inhibit the encoding of information into memory, with fMRI studies indicating that there is a shift in activity from the hippocampus to the striatum, suggesting a switch from declarative to procedural memory (Edwards & Gronlund, 1998; Foerde, Knowlton, & Poldrack, 2006). While this may lead to improvements in our capacity to manage multiple mundane tasks (e.g. Dux et al., 2009), it is clearly not conducive to deeper learning.

As with Facebook use, media multitasking appears to be widespread and frequent among high school and college or university aged students, meaning that it often coincides with learning-related activities, both in and out of the classroom. In a 2005 study by Jeong et al., (cited in Jeong & Fishbein, 2007) students spent an average of 37 h per week using media, with around 75% of this time spent engaged in some form of multitasking (although not necessarily involving other digital media). Much of this time is spent online – 21.3 h per week according to the 2009 ECAR (Educause Center for Applied Research) study (Smith, Salaway, Caruso, & Katz, 2009), and probably more, if we include mobile phone use. For example, in a 2010 study by Hanson, Drumheller, Mallard, McKee and Schlegel (2010), students reported spending more than 14 h per week on texting alone – not surprising with US adolescents sending an average of 150 text messages per day (Lenhart, 2012). It is not entirely clear what proportion of this time dedicated to or at least involves learning activities, although Junco and Cotton (2012) report that students spent around 2 h per day searching for information and more than 3.5 h per day communicating online while studying. Of these students, a substantial proportion reported texting (51%), using Facebook (33%) and emailing (21%) at least 75% of the time while studying.

Within more formal learning settings, such as lectures or tutorials, many students use laptops, tablets and smartphones to access course materials or related resources. A substantial proportion of these students also use their devices to access and engage in personal and social activities unrelated to their learning. In a 2008 survey of law students, 70% admitted to using their laptops for non-class activities during lectures (McCreary, 2008). Similarly, Fried (2008) reported that 64% of surveyed psychology students had used laptops during classes, spending an average of 17 min per 75-min class engaged in multitasking using their devices. A large proportion of these students admitted to spending time on non class-related tasks, such as checking email (81%) or instant messaging (68%). More recently, real-time automated monitoring of students' laptops during class by Kraushaar and Novak (2010) revealed that students opened an average of 65 tasks (windows) per class, with 62% of these being classified as distractive. Non course-related tasks were open and active on students' laptops 42% of the time. It seems reasonable to expect that multitasking will be even more prevalent during self-directed learning, when there are fewer constraints on students' activities and this is borne out by a recent study by Burak (2012). Burak compares the incidence of multitasking – of a number of common activities – by students engaged in either classroom or online coursework. Of the classroom students, 50.6% reported either frequently or very frequently sending texts, while the equivalent figure for Facebook was 24.7%. For the online group, these values rose considerably, to 69.3% and 62.7% respectively. These latter figures appear to be more or less consistent with our recent findings that around 70% of online self-directed computer-based learning sessions involved some level of multitasking (Judd, 2013).

Again, as with Facebook use, there is mounting evidence, from both experimental and survey data, that regular multitasking can have a negative impact on academic performance. Rosen et al. (2011) demonstrated that students who texted frequently during class later recalled significantly less information than those who did texted infrequently or not at all. Wood et al. (2012) report similar results for students who used Facebook during class. Students' frequency of texting during class also appears to be negatively correlated with overall academic performance, as measured by their grade point average Junco (2012c). Facebook use during class is similarly correlated, as is the frequency with which they text and use Facebook when engaged in any type of study (Junco & Cotton, 2012).

We therefore have the following settings amongst students – very high levels of Facebook use and media multitasking and negative impacts of both on academic performance. That both occur at high levels and negatively impact on learning suggests the two are linked. Part of the negative impact of Facebook on learning may simply reflect the time that students spend accessing the site – some of which would otherwise be spent studying. However, given the frequency with which many students check on their Facebook status, both in and out of class, it also seems likely that Facebook use is contributing to multitasking behaviours. The question is, in what form and to what extent does this contribution occur?

Existing evidence linking Facebook and multitasking comes primarily from self-reports and observational data. In a German study by Gehlen-Baum and Weinberger (2012), roughly half of 664 respondents reported using notebooks, smartphones or tablet computers during lectures. Those users reported being twice as likely to use these devices to engage in activities unrelated to, than related to, the lecture, and around 15% of these 'off-task' users admitted to accessing social networking sites (predominantly Facebook) during lectures. In an even larger survey of US students ($n = 1839$), 28% admitted to using Facebook during class but only 4% agreed that they did so somewhat frequently or very frequently (Junco, 2012b). However, observational studies suggest that these may underestimate true levels of use. Gehlen-Baum and Weinberger (2012) also reported that almost 50% of observed off-task activity during lectures involved social networking sites, and this is backed up by Aguilar-Roca, Williams, and O'Dowd (2012), who report that accessing social networking sites (again, primarily Facebook) was the most common off-task activity they observed among students using laptops during a series of biology lectures. Facebook use during self-directed learning activities (including homework) is likely to be higher still and this is supported by a survey of college students ($n = 1839$) by Junco and Cotton (2012), where 79% report using Facebook while doing 'schoolwork', with 33% of respondents agreeing that they did so somewhat or very frequently. This is more or less consistent with our recent study, in which around 38% of computer-based self-directed learning sessions included the use of social networking software (primarily Facebook). That figure, based on data collected in 2009, was up dramatically, from less than 5%, only three years before (Judd & Kennedy, 2010). The increase also coincided with a substantial increase in multitasking frequency, from approximately 50% of learner sessions in 2007 to 70% in 2009 (Judd, 2013). Both studies utilised data collected during unsupervised self-directed learning session in the same open-access computer laboratory. While there were some minor differences in sampling between the earlier and later study, they seem unable to account for the substantial difference in multitasking rates, leaving social networking use as a plausible cause.