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A Mixed Blessing? Students' and Instructors' Perspectives about Off-Task Technology Use in the Academic Classroom

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A Mixed Blessing? Students' and Instructors' Perspectives about Off-Task Technology Use in the Academic Classroom

Abstract
The widespread use of technological devices in an academic classroom brought with it many learning opportunities, but also posed a challenge of handling the off-task technology use in class. The literature on this topic is growing, but we still know relatively little about students' and instructors' perceptions regarding the off-task technology use in class. This paper addressed this gap by examining (1) how do students and instructors perceive technology in the classroom, and (2) who do they believe should be responsible for minimizing off-task technology use in class? Analyzing data from a mixed-method study with students and instructors in a Canadian university, we show that while students acknowledged that the off-task technology use can be distracting, they considered it a matter of personal autonomy, which can only be regulated when it creates distractions for others. The instructors had a more complex view and posed some challenging questions about the relationship between student engagement and technological distractions, the impact of technology on learning process, and the responsibility of educators in higher education. In conclusion, we reflect on some of the questions that ought to be considered when handling the off-task technology in an academic classroom.

L'utilisation généralisée d'outils technologiques dans les salles de classe universitaires a engendré de nombreuses occasions d'apprentissage, mais elle a également posé un défi, celui de gérer l'utilisation dans la salle de classe de la technologie non centrée sur la tâche. La documentation sur cette question est en croissance, mais nous connaissons toujours bien peu de choses sur les perceptions des étudiants et des enseignants concernant l'utilisation inappropriée de la technologie dans la salle de classe. Cet article vient combler ce vide, puisque nous y examinons (1) la manière dont les étudiants et les enseignants perçoivent l'utilisation de la technologie dans la salle de classe, et (2) qui, selon eux, devrait avoir la responsabilité de minimiser l'utilisation inappropriée de la technologue dans la salle de classe? Nous avons analysé les données d'une étude à méthodologie mixte avec des étudiants et des enseignants dans une université canadienne et nous montrons que, alors que les étudiants reconnaissent que leur utilisation inappropriée de la technologie peut entraver leur concentration, ils considèrent qu'il s'agit d'une question d'autonomie personnelle qui ne peut être réglementée que si elle empêche les autres de se concentrer. Les enseignants ont eu des opinions plus complexes et ont posé des questions difficiles sur la relation entre la participation des étudiants et les distractions apportées par la technologie, l'impact de la technologie sur le processus d'apprentissage et la responsabilité des éducateurs dans l'enseignement supérieur. En conclusion, nous réfléchissons à certaines des questions qui devraient être prises en considération quand il s'agit de savoir comment gérer l'utilisation inappropriée de la technologie dans les salles de classe universitaires.

Keywords
technology, distractions, qualitative, higher education, off-task technology use

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Some of us remember the time when students came to class carrying notebooks and pens. Sitting in a classroom, they were hurriedly jotting their notes while the instructor stood on stage, narrating the material. The contemporary western university classroom is quite different. The majority of students come to class equipped with laptops, electronic notebooks, and smart phones. Many instructors use lecture slides that are available for viewing and/or download. Striving to make their classes more engaging, some instructors screen online videos, show Ted Talks and/or Youtube videos, while others incorporate technology that allows instant student feedback, such as iClickers, Kahoot, or TopHat.

Technology has become an integral part of learning environment, but it brought with it its own array of challenges (Sana, Weston, & Cepeda, 2013). Burgeoning research on this topic examines how students and instructors utilize technology and what (if any) impact technology use has on students' achievements (Baker, Lusk, & Neuhauser, 2012; Bolkan & Griffin, 2017; Kay & Lauricella, 2011). The debates about the benefits and disadvantages brought about by technology in the classroom are ongoing. Experiments, surveys, and various constructs measuring students' academic achievements show somewhat conflicting evidence on the impact of technology on learning (Fried, 2007; Kraushaar & Novak, 2010; Risko, Buchanan, Medimorec, & Kingstone, 2013). The goal of this paper is to add to this discussion by examining how students and instructors perceive the off-task, unintended, technology use in class. Analyzing qualitative data from a mixed-methods study that employed classroom observations, focus groups, and open-ended questions in the surveys with students and instructors, as well as individual interviews with students, we examine (1) how students and instructors perceive technology in the classroom, and (2) who they believe should be responsible for minimizing off-task technology use in class.

Literature Review

The impact of technology on learning continues to be a contentious issue in the literature (Demb, Erickson, & Hawkins-Wilding, 2004; Fried, 2007; McGrail, 2006). There is no consensus on whether or not the introduction of technology into academic classroom brought with it substantial benefits to learning, with some arguing for further integration of technology into the classroom (Fitch, 2004; Ince, 2014; Stephens, 2005) and others demanding or implementing institution-wide bans (Andrew-Gee, 2015; Meierdiercks, 2005; Young, 2006). The proponents of technology use in class suggest that laptops can enhance learning, provide more opportunities for engagement, and facilitate interactions between faculty and students (Barak, Lipson, & Lerman, 2006; Eyyam & Yaratan, 2014; Granberg & Witte, 2005), although the meaning of enhanced learning and the measures used to evaluate learning outcomes are often undefined in this literature (Kirkwood & Price, 2013, 2014). The evidence on the benefits of technology may also be shaped by the impact of academic disciplines in which the technology is introduced (Tamim, Bernard, Borokhovski, Abrami, & Schmid, 2011) and the type of technological innovations that are being tested in the classroom (Kirkwood & Price, 2014).

The opponents of technology, however, argue that the positive effects that technology use can bring to the classroom cannot outweigh the temptation that has been caused by the proliferation of social media platforms to use personal technological devices (e.g., laptops or smartphones) for purposes unrelated to class and for multitasking, which results in decrement in academic performance and lower educational satisfaction (Grinols & Rajesh, 2014; Hembrooke & Gay, 2003; Wurst, Smarkola, & Gaffney, 2008).

Multitasking—using technology for both class-related and class-unrelated purposes—can result in cognitive overload (Lee, Lin, & Robertson, 2012), decline in the ability to retain and process the information during lectures (Risko et al., 2013), and decrease in students' academic performance (Junco & Cotton, 2012; Rosen, Carrier, & Cheever, 2013). There is no agreement on how often students engage in off-task technology use in class, with some estimating the off-task use to be around 42% (Kraushaar & Novak, 2010) and others suggesting that over 90% of students use technology in class for purposes unrelated to class (Bolkan & Griffin, 2017). Moreover, many students are unaware that their off-task technology use does not only negatively impact their own academic performance, but also inhibits the learning of other students (Fried, 2007; Sana et al., 2013).

Clearly, the off-task use of technology in the university classroom has become a widespread problem (Bolkan & Griffin, 2017; Young, 2006). What remains unclear is how to remedy its negative impact on learning. It is highly unlikely that the suggestions to implement institution-wide bans (Andrew-Gee, 2015; Young, 2006), which were employed in some secondary education systems (Beland & Murphy, 2016), can be enforced given the rapid integration of technology into everyday life and into the education system itself. Furthermore, laptops, smartphones, and tablets can provide access to education for students with disabilities, making such bans discriminatory and in violation of human rights legislations in some jurisdictions.

Most research that examines students' off-task technology use in class suggests that it is influenced by internal and external factors (Bolkan & Griffin, 2017). The internal factors can be conceptualized as students' ability to exercise self-control and self-regulation by refraining from using technology for unrelated to class purposes (Rosen et al., 2013). Educating students about the negative impact of multitasking on their learning can promote self-regulation and reduce the off-task technology use in class (Rosen et al., 2013). The effectiveness of this approach, however, can be questioned on three grounds. First, behaviour modification is never a simple task and is often influenced by a multitude of social and cultural factors (Davis, Campbell, Hildon, Hobbs, & Michie, 2015). For example, it might be difficult for students not to use technology for off-task purposes when everyone else in class uses it. Second, research shows that off-task technology use is more detrimental to academic performance of lower-achieving students, who also have less capacity for self-control and self-regulation than their better-achieving counterparts (Beland & Murphy, 2016; Rosen et al., 2013). Finally, Aagaard (2015) suggests that the use of electronic devices has become a deeply habitual, embodied experience that is not always driven by the rational decision-making process on behalf of the student. In this case, self-regulation may prove to be particularly challenging to achieve.

The external factors that influence the off-task technology use among students include providing interactive, engaging, and stimulating classroom environment (Bolkan & Griffin, 2017) and integrating technology into the classroom in a structured, meaningful way (Grinols & Rajesh, 2014; Kay & Lauricella, 2011). Those researchers who advocate for this approach identify a direct link between increased opportunities for student engagement and a reduction of off-task use of technology in class (Bolkan & Griffin, 2017; Kay & Lauricella, 2011). However, Aagaard (2015) challenges this assumption, suggesting that the embodied use of technology among students could actually signify a reverse relationship. Despite some disagreements about directionality of this relationship, research shows that classrooms that promote student engagement have less off-task technology use and more opportunities for active learning, whereas traditional, formal lectures foster boredom and cognitive overload among students, which leads to increased off-task

technology use (Kay & Lauricella, 2011; Ledbetter & Finn, 2016). Consequently, in order to reduce off-task technology use, instructors need to be educated on how to promote student engagement and how to effectively integrate technology in the classroom (Ince, 2014; Kraushaar & Novak, 2010; Wurst et al., 2008).

In both aforementioned approaches, education is a key for the reduction of off-task technology use in the academic classroom, but the roles and responsibilities for students and instructors are allocated differently. In the former, the onus is on the students, who are charged with controlling and regulating their own behaviours. In the latter, the responsibility is placed on the instructors to (at least) create a stimulating learning environment for students to promote focus and engagement in class. Moreover, while research convincingly demonstrates the detrimental impact of off-task technology use on learning, we know little about instructors' and students' perceptions about the off-task technology use in class. Yet, focusing on perceptions is important, since our perceptions and attitudes towards a particular action usually inform our behaviour (Nutbeam, Harris, & Wise, 2010). Ajzen and Fishbein's (1980) theory of reasoned action, in particular, suggests that behaviour is shaped by the behavioural intention, which, in turn, is influenced by the attitudes towards this behaviour, the subjective norms related to this behaviour and perceived level of control over the behaviour. Therefore, if we would like to understand how to decrease the detrimental impact of multitasking in an academic classroom, we ought to understand students' and the instructors' perceptions about it (Taneja, Fiore, & Fischer, 2015). This study aims to explore instructors' and students' attitudes towards the off-task technology use in class by examining (a) if they believe it presents a problem, and, if yes, (b) who should be charged with the responsibility of minimizing technology-related distractions in an academic classroom?

Method

This paper is based on the qualitative analysis of the data collected in the study utilizing concurrent mixed-method design. Mixed-methods studies provide an opportunity to triangulate data collection in order to increase the depth and breadth of the findings and offer robust analysis (Creswell & Plano Clark, 2007). The study was conducted in 2016-2017 at University of Waterloo, Ontario, Canada in the faculty of Applied Health Sciences. Upon receiving ethics clearance from the University of Waterloo, we conducted the following activities.

Survey of Students' and Instructors' Use and Views of Technology

In order to examine students' and instructors' attitudes and behaviours regarding on- and off-task technology use in class, we invited all instructors and undergraduate students in the faculty of Applied Health Sciences to participate in an online survey. A total of 514 surveys were completed: 478 from undergraduate students and 36 from instructors. This response represents 20%[1] of undergraduate students and 47% of instructors in this faculty. The gender composition of the sample is similar to the gender composition of the student population in this faculty; 79% (n=348) were female, 21% (n=91) were male, and 0.5% (n=2) identified their gender as "other."

[1] We estimated the response rate for students conservatively, including, both students who were on campus and those who were in co-op during this term. Including only students who were on campus during the time of the study would produce 44% response rate.

All four years of study were represented in the sample: 29% were in 1st year, 18% were in second year, 30% were in third year, and 23% were in fourth year.

There were seven common items on the 15-item survey for students, and the 9-item survey for instructors. The focus of the surveys was students' on- and off-task technology use in class, perceptions regarding the degree to which it may hinder learning and what (if anything) instructors should do to minimize technology-related distractions in class. Since we knew that in this interdisciplinary faculty instructors use a variety of technological devices, we intentionally defined what is meant by technology broadly, referring to "laptops, tablets, phones, or other personal technology devices" in our questions. Most questions used 5-point Likert scales as response options and three questions were optional and open-ended. All students who participated in the survey were invited to enter into a draw to win one of four $25 gift cards to a popular chain of coffee shops. We provide a more detailed description of the survey administration and the summary of the quantitative results elsewhere (Zaza & Neiterman, 2018), focusing in this paper on the responses of students and faculty to the open-ended questions, which explored participants' perceptions about the need to minimize technology use in class and the strategies that would help to do so.

Classroom Observations

In order to explore how students and instructors utilize technology in class, we conducted classroom observations in nine classes: three small (less than 30 students each), three medium (31-69 students), and three large classes (>70 students). We emailed all instructors teaching in the Fall term of 2016 in the faculty, asking for their permission to conduct the observation. We purposively chose the classes from three different departments taught by different instructors to students in their first, second, and third years of study. The observations lasted 50 to 90 minutes, with most covering the duration of the whole class. One observation was conducted by one of the authors of this paper (CZ) and the rest by trained research assistants who were also students in the faculty. To minimize intrusion, our class observations were made from the back of the class using pen and paper. We recorded how many students were using technological devices (e.g., laptops, smartphone, tablets) and for what purposes (e.g., following the lecture slides, browsing Internet, visiting social media sites, etc.), the instructor's teaching style (e.g., formal lecturing, interactive discussions), and how the use of technology changed as the class progressed or the tasks/activities in the class changed.

Focus Groups and Individual Interviews

In addition to the aforementioned research activities, we conducted one focus group with six instructors, and two focus groups with students. In total, eight students participated in the focus groups—four students per group. Participants for the focus groups were recruited via listserv advertisement email sent to students and instructors. Students were also recruited by research assistants (who were also students in this faculty) using social media platforms. The focus group with instructors was facilitated by one of the authors of this paper (EN) and research assistants. The instructors who participated in the focus group had between five and 25 years of experience teaching undergraduate students; one instructor from the focus group also participated in the classroom observation conducted during previous term. Student focus groups were facilitated only by research assistants who were undergraduate students to ensure that participants were

comfortable discussing their off-task technology use in class. We also conducted short, 10-15 minutes interviews with 11 students who participated in a pilot project, which offered students free access to the Freedom app, which is a technology-blocking app that can be installed on electronic devices to help students manage technology-related distractions. Twelve students volunteered for this one-month trial, during which they were asked to use Freedom app to block their technological devices during class time. Out of these students, 11 participated in a debriefing interview during which they shared their experiences of using the app and dealing with technology in class. Students who participated in the focus groups and in the Freedom app pilot were offered a $10 coffee shop gift card in remuneration.

Data Analysis

Quantitative data were analyzed using Excel 2016 and SPSS 25. The summary of the quantitative results from this study have been reported elsewhere (Zaza & Neiterman, 2018). Qualitative data included answers to open-ended questions in the survey, transcripts from focus groups with instructors and students, field notes from classroom observations, and interview transcripts from Freedom app trial. NVIVO 11, a software for managing qualitative data, was used for data storage and coding. The data were analyzed using an inductive approach. We started coding the data by using open, line-by-line coding, summarizing the key meaning of strings of text (Charmaz, 2006). Upon completion of this initial stage of analysis, we moved to a more focused coding (Charmaz, 2006), seeking to identify the key themes emerging from the data and the relationship between these themes. Each data source (e.g., focus group transcripts, written survey responses, interviews, and classroom observations) was first analyzed separately, using the same method, and then merged with other using the same coding scheme. Once main themes in the data were identified, we compared the responses of students and instructors, examining differences and similarities between these two groups of participants. In what follows, we summarize our findings demonstrating how students and instructors perceived off-task technology use in class and how they allocated responsibility for managing the technology-related distractions in academic classroom.

Results

Perceived Impact of Technology on Learning

Students' perspectives. From the perspective of students, technological devices in the classroom are inevitable but not necessarily bothersome. On the survey, approximately 22% of students reported that the sound of students typing in class was "somewhat" or "very" distracting. Approximately 9% of students reported that seeing course-related material on other students' screens was "somewhat" or "very" distracting whereas approximately 49% of students reported that seeing screens of off-task technology users was "somewhat" or "very" distracting. These data are reported by class size in the full report of the survey (Zaza & Neiterman, 2018) but aggregated here for ease of interpretation. Providing written responses on the survey questions about the use of technology in the classroom, one student sarcastically pointed out, "Welcome to 2016," hinting that in today's day and age, imagining a classroom with no technology is unrealistic and old-fashioned. Students indicated that they are much more comfortable taking notes electronically than by hand. While they admitted that, on occasion, they could also use technology off-task, they, for

the most part, did not see it as a problem that distracts them from learning, unless the use of technology was impacting other students.

Reflecting on the presence of electronic devices in a classroom, a participant in students' focus groups noted:

> P1: I think it [technology] only distracts me if they [students] are watching something very inappropriate, or very weird, or random, then it would distract me, or [watching something] on Facebook, for example. Unfortunately, I feel like that has become very normalized, so that doesn't really, like, distract me.

And another student agreed with this statement and elaborated: P2: "I feel like Facebook doesn't really do that [distract] because virtually everyone is on Facebook, unless someone is, like, streaming a game or a show. [In this case,] I may look over for a little bit." Students clearly saw technology as in integral part of the classroom, pointing out in their survey responses that "technology is the future," "everything we do revolves around the use of technology," and suggested that technology in the 21st century is "the staple" and the "main guide for learning."

The off-task technology use, it seemed, has also become normalized, but while they admitted that it can create a distraction, students saw class distractions as inevitable with technology being not the *cause*, but a *means* for distractions:

> Distraction is an era phenomenon, you get distracted no matter what. So, I would say that, it is just a different way of getting distracted… [Distractions] will always be there, regardless of any way of getting rid of it. I guess the only thing we can do is try to minimize them as much as possible (Focus Group 2)

From the perspective of students, therefore, the use of technology was not seen as something that provides too much of a distraction in the academic classroom.

Instructors' perspectives. Contrary to Baker et al.'s (2012) perception of generational divide between instructors' and students' perceptions of technology, our survey indicated that instructors' and students' held similar views on the effects of class-related technology use on the user and on other students in the class (Zaza & Neiterman, 2017). This similarity disappeared when asked about their views of the effects of students' off-task technology use in class on the user and on other students in the class: here, their views differed significantly ($p<.05$). They also differed on their view that students' use of technology in class is a "problem" ($p<0.01$) (Zaza & Neiterman, 2018).

The instructors, however, differentiated between the use of cell-phones and laptops. The use of the phone was perceived as bothering by 68% of the instructors compared to only 32% of those bothered by the use of laptops and tablets. Instructors who participated in the focus group commented that when they are seeing their students working on laptops, they are assuming that they are focusing on the lecture (e.g., following lecture slides or taking notes). Instructors perceived the use of cell-phones, on the other hand, as an off-task activity, although they admitted that students can also get distracted using laptops.

Qualitative analysis of instructors' views on technology revealed three different approaches that were used by instructors to deal with technology in the classroom (see Figure 1).

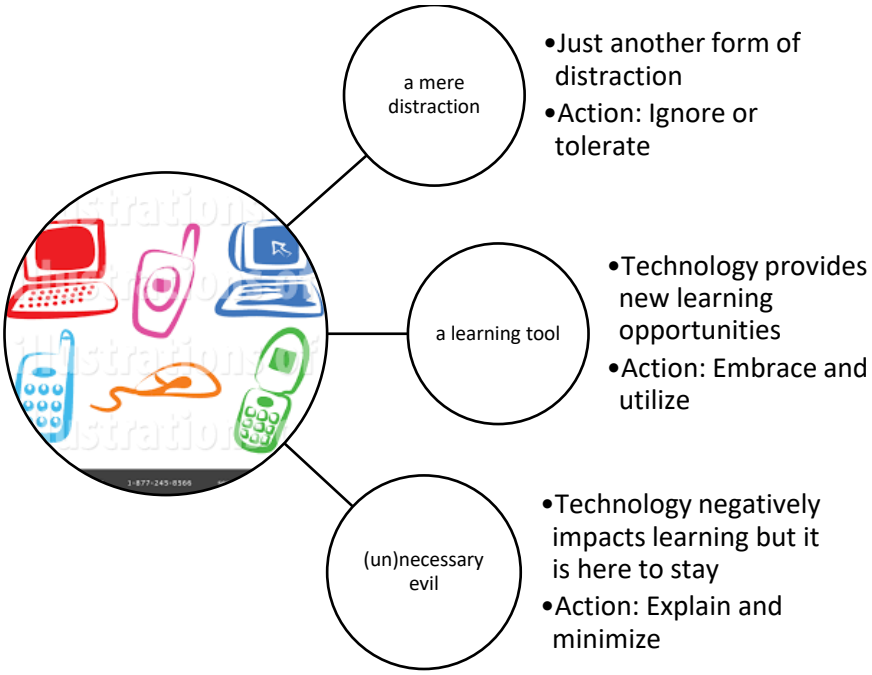

Figure 1. Instructors' approaches to dealing with technology in the classroom

For those who did not see technology as a problem, the distractions created by technologies were not significantly different from other forms of distractions. For example, one experienced instructor commented, "Well, I remember people reading the student newspaper in undergraduate lectures. Is it really any different?" Similarly to students, the instructors who adopted this view saw technology as a means, and not the cause, of distraction.

A sizeable proportion of instructors who participated in the survey (23.5%) indicated that they incorporate technology into their learning and suggested that the use of technology should be steered towards learning activities. Many instructors, for example, provided PowerPoint slides for the students that are accessible and available on course-designated websites. Some also incorporated online quizzes, such as Kahoot, into their classes and others asked to do fact-checking online to facilitate learning. During the focus group discussion, one of the instructors shared the following example of incorporating technology in class as a tool for learning:

> Prof 1: I was in class, uh, the other day with a guest speaker and....she asked the class to use their laptops or phones to… do an exercise involving Google maps and, you know, kind of looking at different communities and proximities and what not… and it was, uh, you know, I think an effective use of technology.

While only 36% of instructors indicated that students' use of laptops, tablets, or phones in the classroom is a problem, those who belonged to this group touched upon both short-term and long-term negative consequences of technology for students' learning. For most of these instructors, technology in the classroom was seen as a necessary evil that should only be tolerated because it provides accessible education to students with learning disabilities:

> We cannot ban technology in classrooms because some students need [it] for accommodations. We therefore need to learn to live with it and work with students and

> faculty to understand potential disruptions of technology and how it can be used appropriately (Instructors' survey).

Instructors perceived the off-task use of technology as especially problematic, both because it created distractions for other students and because it signified the students' lack of self-control. Some also saw the use of technology as a sign of disrespect. One of the instructors commented in the written portion of the survey: "I am constantly amazed at how brazen students are about using their laptops and cell phones for non-course related purposes." During the focus group, the instructors shared their experiences of witnessing their students' use of technology for non-class related purposes in class without hiding it or feeling embarrassed when "being caught" by the instructor. Focus group discussions revealed that some instructors have adopted a set of strategies that they used to police students' use of technology in class, such as walking among isles and checking the screens or asking students to stop using technology. Sharing her experiences, one of the instructors commented:

> I think that the technology has facilitated new types of rudeness without people labelling it as rudeness, even though some of us feel that way. Students, like a third of the class, getting up and leaving...I feel is rudeness. People on digital devices on social media during class or sharing their phone or something, I perceive it as rudeness. I have a physical reaction. I hate it. I… I really, really don't like it. (Focus group with instructors)

This instructor attributed her reaction to students' off-task technology use in class to generational differences and cultural perceptions on acceptable social behaviours. But further discussions with instructors during the focus groups revealed that the instructors saw students' use of technology as partly stimulated by the powerful appeal of social media and not only students' general inability to exercise self-control. Still, many did feel deeply affected by students' overt use of technology off-task while in class, finding it extremely distracting. One instructor, for instance, complained that she has "[negative] physical reaction" to the use of technology that creates distractions for her as a teacher. In this case, technology was seen as not only affecting students' learning directly, but also indirectly, by hindering instructors' ability to teach effectively. Some instructors perceived speaking to the classroom full of computer screens as very threating and undermining their confidence in class.

Some instructors also pointed out that the very integration of technology might have compromised students' ability to learn, to store and process the information. The following survey response from one of the instructors illustrates this concern:

> Even in small classes, some days I notice that half or more of the class is distracted using digital devices. It appears like they lose awareness of what they are doing, not realizing that their distractedness is visible to others. Sometimes I think that current undergraduates are turning into zombie robots, rotely exercising their devices. Old-fashioned daydreaming is a lot easier to tolerate or deal with. I worry they have a diminished capacity for sustained intellectual engagement. It seems to me that they are less capable or engaged than students even 5 years ago. I think this is a huge problem not just for how instructors can be effective teachers but also for students' personal and professional development.

While representing the views of the minority of instructors, this individual clearly linked students' use of technology with the change in how students process or understand information. The image of the zombie also highlighted the nature of the technology use—unconscious, lacking self-regulation or agency. Focus group discussion with instructors revealed that this concern was shared by at least some of the instructors in this faculty:

> I'm also very concerned about... the process of taking notes and how well people remember…I think there's something that's lost [without notetaking] and I think part of it is just engaging with what's actually going on in front of you, so I try not to give [Power Point] slides in advance… I'm trying to get through… something that has some kind of narrative...something that has some new information, including things that you might not expect...and part of communicating that is… that you don't have it all in front of you and you haven't seen it all... and that you can pay attention to what's going on and then, as you say, figure out what is important for yourself… and try to do that work to...synthesize and incorporate the information... I'm not going to tell you what's important to write down... via bullet points.

According to this instructor, technology might have changed the way the information is being processed by the students, and, based on his perception, this change is not necessarily a positive one. Only some instructors in our study shared this concern, but it did touch upon a question that perhaps would resonate with many instructors: Do our roles extend to education beyond the classroom? If they do, how should the use of technology by students in class be managed?

Whose job it is to minimize off-task technology use in the classroom? The participants in this study were asked to consider who is ultimately responsible for minimizing the off-task technology use in class, but the answers provided by students and instructors to this question were quite different. For the most part, students expressed a strong desire to be in charge of their own learning and be treated like adults, emphasizing that they are not only students, but also consumers who are paying for their own education. The use of electronic devices in class, for both on- and off-task purposes, was seen by students as an informed and personal decision:

> I think that it is up to an individual to decide what they are doing on their electronics during class, and it is up to an individual to decide if their own learning is impacted by their use of technology. I don't think it's appropriate to tell someone what they can or cannot do in class if it is not taking away from others' learning.

Students suggested that instructors "are not meant to shadow" over students and simply "can't physically minimize technology" use in the class. Such policing was referred to as "babysit[ting] adults, a waste of time... [that is] insulting towards the instructor."

The ambiguity of this policy was evident when students discussed how the technology use of one student could potentially affect other students. Some students indicated that technology distractions affecting others should be handled by students themselves, but most believed that in such cases the instructors can and should intervene, since not all students would feel confident to "speak up":

> P3: I think that the professor mainly does it as an advocate for the students who are too scared to stand up for themselves. I want to tell that person to stop watching that video because it is annoying and getting in my way of listening, but I don't want to talk, or speak up because there is 200 people around me, so it is kind of nice to have a professor be that person for you (Focus group with students 2).

Being an advocate for other students has been a familiar role for some instructors, and some, in fact, indicated that they have been asked by students to intervene and ask students to refrain from watching movies or sports in class. But students also believed that instructors are somewhat responsible for students' distractions in class; often time students alluded to "boring" classes and lack of engagement as triggers for technology-related distractions. One of the students wrote in the survey:

> Instructors shouldn't try to minimize technology-related distractions because if someone is getting distracted by another person's laptop then the lecture was probably already boring to begin with. Instead, instructors should be more engaging, less boring, more organized, and less monotonous.

The use of media, in the view of this participant, was clearly linked to the level of engagement offered by the instructor. This theme was echoed by students participating in the focus groups. One of them commented:

> I would say that it [off task technology use] pretty much depends on the prof. A prof who is really interesting…. keeps you engage[d]. Humor is always good, if you are laughing, you want to hear more and be more engaged. I would say that engagement with students has to increase if you want to properly compete with Facebook. I know it is hard, the idea of competing with social media, just because it is always there, and all their friends are, and people can be contacting, Snapchatting, or checking to see what people are doing. I can see the stress of having to compete - they [instructors] have to be cool and interesting, be something that the students want to see.

Agreeing with this statement, another student pointed out:

> I feel bad, because it seems like I am saying that this is all the professors' fault, but if this is to try to decrease distractions, we must incorporate training [on] how to really engage with students on a level or in a world that they always have social media access, include trending topics or content, or use it for breaks in class. Just try to incorporate more relatable things to include.

So, while students felt that it is their *choice* to use the technology, they saw it as the instructors' *responsibility* to motivate them not to use it.

Most of the instructors would probably disagree that they are in a direct competition with a social media for students' attention, but many did feel that the implicit message of the academic teaching is that there is an "expectation to be entertaining." And while many pointed out that student engagement is a strategy to reduce off-task technology use, for some this task was somewhat out of reach:

> You can't compete, even if you were really entertaining. How can you compete with whatever's on the action movie that... somebody's watching in the back row? … This argument that if the professors were more interesting, they [students] would learn better … is really a poor, poor argument. You know, we cannot compete with an industry that has billions and billions of dollars and…. [is] dedicated to getting you addicted [to technology] and to getting you to click on stuff.

For this professor, competition with technology was an unfair battle, where the instructors have to compete with the industry that provides students with constant opportunities for engagement via technological devices. While student engagement was a goal for many instructors, some professors believed that student engagement is not always possible; a large, required class, for instance, was seen as offering fewer opportunities for an engaged teaching than a small elective. In addition, instructors believed that certain topics were simply not suitable for interesting and engaged lecturing. Explaining this view, one of the instructors noted:

> And some of the things that we have to pass on… you know, [for example] calculating mortality rates… For most people, you know, undergraduates, this is not super exciting… And it's having a bit of the drudgery work… People are different, but for most undergraduates that's not where the action is… but that's okay, right? … It's not super juicy…. [but] you have to drive through it. That's the point. Not everything that you have to learn is going to be exciting. Like sometimes you got to practice your scales… like it's just … work like that. You know, that's why we call it work and not fun...

According to this instructor, there is also value in learning how to focus on the tasks that do not spark a lot of interest in students. This view resonated with other instructors. One attendee of the focus group, who considered classroom learning to be a step in the direction of one's movement toward the "real world," stated:

> Well, you know, it brings up the issue of the responsibility of an educator… [This] isn't just to package the material and kind of… set up a structure that… works for good students to get it. It's also to respond to them where they are. At the same time, overresponding to that reduced attention span isn't about the real world of expectations… And their co-op placements or their professional lives, when all of a sudden [they are] expected to… sit in the two-hour meeting once a week and not be online, and pay attention, and register stuff when their boss or their supervisor or co-workers are going on and on and on… And having a good attention span and building that over time, and being able to focus is one of those unstated competences that we should be able to facilitate in this education.

As this instructor suggested, learning in the classroom is not only about that particular topic; it is a preparation for the world of professional interactions. Accommodating students in the classroom by providing entertaining lectures may work to increase students' attention in this particular class, but may create a situation where students are poorly prepared for the world of work. Some instructors in the focus group suggested that they saw their role as educators, not only course instructors, and that outside of the university classroom, social interaction is not dictated by the carefully designed lesson plan and does not always incorporate built-in strategies for engagement. From this perspective, the job of the instructor is to ensure that the students are ready for the

workplace, and acknowledging students' need for technology breaks may not serve students the best.

Therefore, while many instructors believed that technology hinders learning, they did not believe that their role as educators should be about policing the use of technology. As one of the survey respondents noted, "Students are adults and, as such, don't need to be told what to do. All we can do is guide them in the direction of 'the real world' in hopes of maintaining a professional focus in class."

Discussion and Conclusion

The goal of this study was to explore how students and instructors perceive technology use in the classroom. Our analysis revealed that both students and instructors largely agree that when technology is used for class-related purposes, it becomes an integral part of learning. Elsewhere (Zaza & Neiterman, 2018) we demonstrated that over 80% of students who participated in our survey reported being asked by their instructors to utilize some form of technological devices in class, which clearly indicates that instructors do rely on technology and do consider it to be an important factor for advancing learning in the classroom. Literature suggests that, in general, technology can enhance learning experience and improve learning outcomes, although the positive effect of technology varies by students' academic discipline (Kirkwood & Price, 2014; Tamim et al., 2011). Still, some instructors suggested that the constant reliance on technology should not be applauded. Some saw it as responsible for hindering the learning process and decreasing students' ability to focus. This view is hardly surprising; both students and instructors who participated in the focus groups supported their claims by referring to the results of a study, which made international headlines linking the use of technology to the decrease in attention span, that has supposedly been found to be just about eight seconds and lower than that of a goldfish (McSpadden, 2015). Although this study was debunked (Shank, 2017), its popularity in the pseudoscience discourse and among our respondents demonstrates that both groups believed that the "students of today" have been changed by technology—they are less focused and more distracted. Seeing technology as ultimately responsible for this change, some instructors who took part in our study raised concerns about the role of professors in facilitating the use of technology in academic classroom.

The students and the majority of the instructors who participated in our study viewed the personal off-task technology use as falling under the domain of individual freedom, personal decision-making, and matter of personal autonomy. However, they were uncertain about how to maintain the right for personal freedom when the off-task use of technology by one student became a disruption for others. Here the infringement on personal rights had been identified as an appropriate intervention that should be carried out by the instructor. Did the students who took part in our study see an academic classroom as a group of individuals who congregated in a specific time and place for a common purpose or as a learning community? In the case of a former, nominating the instructors to police the order in the classroom is probably prudent, but if we are striving to create a learning community, we ought to disperse the responsibilities for the rules of communication to other community members—the students. Sense of community in the classroom can improve students' engagement with the material and promote mutual respect and support (Hostetter, Williamson, Byers, & Huggins, 2007). Informing students about the negative impact of their technology use on others (Sana et al., 2013) may show them the interdependent nature of an academic classroom and pave a path for a sense of belonging to a classroom community.

Learning about how their actions impact the actions of others might motivate the students to change the way they understand the balance between personal freedoms and collective responsibilities in an academic classroom. We could also educate students about the impact that the off-task technology use could have on the instructors. Some of the instructors who participated in our study admitted that the use of technology by students negatively affected their own performance in class and undermined their confidence. Having an open discussion with the students about the use of technology in the class can help both students and instructors to set up joint expectations about the use of technological devices in their course.

The broad definition of "technology" that we used in our study can be interpreted as a limitation, as we asked our participants to comment on how they perceived technology in class in general. But it is quite possible that instructors can perceive the use of laptops as instrumental for learning (e.g., notetaking), whereas the use of a smartphone would be perceived as detrimental (e.g., texting), therefore making it hard to comment on the usefulness of technology "in general." Focus group discussions and comments in open-ended survey questions further emphasized that the type of technology used was less important than the context; the instructors would expect students to use a smartphone when answering Kahoot questions, but would find it bothersome when they explain a new concept to the audience. Teaching is an interactive process. The non-verbal cues from students could provide an instructor with an opportunity to see if students understand the topic, if they are interested in it, and if they are socially present in the classroom. Some of the instructors who participated in our study talked about the challenge of teaching in a classroom where the human contact is lost or blocked by the screens of laptops and tablets. The interruption of a digital device screen in interpersonal communication is not unique to an academic classroom. In today's time and age, social interactions are often interrupted by individuals checking their phones and looking at their screens. The students who participated in our study did not consider how their technology use may influence the instructors, yet we found that some instructors felt that their teaching ability was impaired by students' use of technology for non-class related purposes. Technology is a tool for engaging students in learning (Barak et al., 2006). It also is a necessary tool for providing accessible education for some students with learning and physical disabilities. If we assume that the use of digital devices has become a habitual activity (Aagaard, 2015), which permanently penetrated interpersonal communication, we should better prepare instructors on how to deal with technology in the classroom.

Some students and instructors used the metaphor of marketplace to describe the academic environment, envisioning students as "consumers" of higher education and instructors as "providers" of this service. In this model of higher education, the onus is on the provider to make the product attractive for the clients. But the instructors are not really in charge of providing education—colleges and universities are. Evidently, many universities and colleges in Canada promote excellence in education and strive to offer their students engaging learning environment. Yet, graduate education—a stepping stone to academic teaching —focuses almost exclusively on research skills training. We do not require our faculty to undergo any type of mandatory teaching training (although many universities have now established centres for teaching support to offer educational resources to faculty). In research-based universities, teaching performance is often perceived as less important than contributions for research. Moreover, boosting academic enrolment, many institutions resort to increasing class sizes, which is detrimental to student engagement and leads to higher off-task technology use in class (Zaza & Neiterman, 2017).

In this context, expecting instructors to provide entertaining lectures may not be the most effective way to deal with off-task technology use in the classroom. Instructors can (and should)

strive to make their classes engaging, but it is hard to compete with a multi-billion dollar social media industry over the attention of our students. Moreover, the marketplace analogy also necessitates a question about the nature of the "product" that we offer in higher education. Is our role to provide students only with skills and knowledge applicable to their disciplinary field or are we also tasked with preparing students to the competitive job market environment and a future workplace? If all we are required to do is to "transfer" the knowledge from the instructor to student, perhaps we ought to take on the responsibility of competing with Facebook, Snapchat, and Netflix over students' attention (although with the exception of a talented few who could switch a career from education to entertainment industry, our efforts would be futile). If we assume, however, that our goal is to prepare our students to the workforce, then perhaps we ought to teach our students how *they* could take more responsibility for their own learning and restrain technology use even in the lectures that are less entertaining than their social media feed.

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