

Relationships among faculty policies, technology addiction, non-academic technology use, and GPA



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We examined the relationship among faculty policies, technology addiction, distracted technology use, and overall GPA in 241 college students. While lax faculty policies predicted increased cell phone and laptop non-academic technology use (NATU), addiction did not moderate this relationship as predicted. Further, while cell phone use predicts GPA, laptop use does not. Finally, cell phone NATU mediates the relationship between technology policies and GPA, while laptop NATU does not.

Technology use is increasingly ubiquitous on college campuses, making the frequency of technological engagement a problematic distraction in classrooms. A study by Olmstead and Terry (2014) found that 97.5% of participants either sent or read text messages during class. Such use is problematic, as previous studies suggest that internet use negatively affects exam scores (Ravizza et al., 2014), particularly when students used technology for non-academic purposes (Aaron & Lipton, 2018).

A number of factors have been connected to students' non-academic technology use (NATU) in the classroom. For example, NATU use has been associated with both technology addiction (Young, 2014) and lenient faculty policies (Bartel & Fornasaglio, 2019). Indeed, faculty policies may be one factor related to student success because students in classes with a lax faculty technology policy score lower on tests related to class material (Aaron & Lipton, 2018). It is unknown, however, if these policies are equally effective at preventing – or at least suppressing – NATU in all students. Perhaps, for example, students who display signs of internet addiction would be less likely to moderate their technology use even with stricter policies in place.

The present study set out to replicate previous research that faculty policies are related to NATU and grades. However, rather than examining these in a single class, we explored relationships among these variables across students' college experiences. In addition, we sought to expand upon prior research by examining whether technology addiction moderates the relationship between faculty policy and non-academic technology use.

We predicted that we would replicate previous research that found a negative relationship between technology use during class and GPA (**H₁**; Bjornsen & Archer, 2015) and a positive relationship between strictness of faculty policies regarding in-class NATU and GPA (**H₂**; Aaron & Lipton, 2018). In our study, we examined global faculty policies, global technology use, and overall GPA as opposed to exploring these only within the context of a single class session or course. Finally, we predicted that technology addiction would moderate the relationship between faculty policies and NATU such that strict faculty policies would be associated with lower NATU only for low-addicted students while lax faculty policies would be associated with similar NATU in high- and low-addicted students (**H₃**).

Method

This study was preregistered on the Open Science Framework. The methods, hypotheses, and analysis plan were all part of the preregistration, available at <http://osf.io/kqha4>. In addition, data and materials are available at <https://osf.io/saj7z>.

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We distributed a link to an online survey through social media, email, and faculty solicitation of students at several universities, ultimately reaching a snowball sample of 231 college students (71% female, mean age 20.74 $SD = 3.80$) representing 39 colleges and universities. In the recruitment flyer/email and at the conclusion of the survey, we asked participants to share the survey with college students they knew both at their current university and at other schools. On the survey, participants responded to items assessing internet addiction, cell phone addiction, faculty policies regarding technology, frequency of NATU in the classroom, and GPA.

Internet Addiction Test

We assessed internet addiction using a 9-item measure developed by Young (2014). Responses ranged from 1 [does not apply] to 7 [always] to items such as, "How often do your job or class performance or productivity suffer because of the Internet?"

Cell Phone Intrusive Thoughts Scale

We assessed cell phone addiction using the 4-item Cell Phone Intrusive Thoughts Scale developed by Olmstead and Terry (2014). Responses ranged from 1 [strongly disagree] to 5 [strongly agree] to items such as "When I'm busy doing things, it bothers me if I'm unable to access my cell phone."

Faculty Technology Policies

Faculty policies were measured using a single item with responses from 1 [totally unacceptable] to 7 [totally acceptable]. Participants rated faculty policy strictness by responding to the following prompt: "Your professors' policies regarding non-academic technology use in the classroom likely differ. What would you say is the most typical policy regarding non-academic technology use during class?"

Frequency of NATU

Two, single item measures ranging from 1 [never] to 7 [the entire time] were used to measure frequency of NATU in the classroom. We asked participants to respond to "How frequently do you use a cell phone for non-academic purpose during class?" to measure cell phone NATU, and to "How frequently do you use a laptop for non-academic purposes during class?" to measure laptop NATU.

GPA

Finally, we asked participants to self-report their cumulative grade point average.

Results

To test H_1 , we examined the correlation between GPA and both cell phone and laptop NATU.¹ While there was a

significant correlation between cell phone NATU and GPA, ($r = -0.28, p < 0.001$), there was no relationship between laptop NATU and GPA, ($r = 0.02, p = 0.84$).

Supporting H_2 , there were significant correlations between faculty technology policies and NATU for both cell phones ($r = 0.28, p < 0.001$) and laptops ($r = 0.23, p = 0.002$) such that lax policies were associated with higher reported NATU. However, the bivariate correlation between faculty technology policies and GPA was not significant ($r = -0.03, p = 0.35$).

We tested H_3 using moderated mediation as outlined by Hayes (2017) and using the PROCESS macro (see Figures 1 and 2 for our models and regression coefficients). Specifically, we examined whether technology addiction would moderate the relationship between faculty technology policies and NATU and that NATU would mediate the relationship between faculty technology policies and overall GPA. For laptop use, while faculty policies did predict NATU ($b = 0.26, p < 0.001$) – with laxer policies predicting increased student technology use – internet addiction did not moderate this relationship. For laptop use, faculty policies significantly predicted overall GPA ($b = -0.08, p < 0.05$), with stricter policies being associated with higher GPAs, but NATU did not mediate this relationship as the confidence interval for the index of moderated mediation ($-.009, .008$) included zero. For cell phone use, faculty policies also predicted NATU ($b = 0.33, p < 0.001$) -- with laxer policies predicting increased student technology use – but again, cell phone addiction did not moderate this relationship (though it did predict cell phone NATU, $b = 0.25, p < 0.01$). NATU predicted GPA ($b = -0.17, p < 0.001$), with more frequent users having a lower GPAs, although NATU did not mediate the relationship between faculty policies and GPA, as the confidence interval for the index of moderated mediation ($-.039, .034$) included zero.

Discussion

Our study partially replicated previous research that found a relationship between non-academic technology use and GPA. Curiously, however, our results suggest that GPA is significantly negatively correlated with cell phone NATU but not with laptop NATU. This could be in part due to students preferring to use apps that are only available on cell phones and not on laptops. Likewise, students who

¹ Because we were only interested in laptop NATU by participants who may possibly have engaged in this behavior, we conducted this analysis for all participants who responded that they bring a laptop to class "occasionally," "almost every time," or "every time." We excluded participants who "never" or "almost never" do so. Because 98.6% of college students own a smartphone (Kim, 2017), our assumption was that participants would have a cell phone available to (and with) them, so we did not ask whether they were brought to class. Thus, the number of participants in the laptop and cell phone NATU analyses differ markedly.

leave their cell phones out in sight while they are in class may become distracted by notifications that appear on the screen; conversely, laptops do not always receive the same notifications for texts or social media alerts that cell phones often do.

We were able to replicate previous research that found a relationship between faculty technology policies and NATU. For both cell phones and laptops, stricter policies were associated with less reported use. However, stricter policies were unrelated to GPA in our entire sample, though when only regular laptop users were considered, stricter faculty policies did, indeed, predict higher GPAs.

In contrast to our prediction, technology addiction did not moderate the relationship between faculty policies and NATU, though students who scored higher on cell phone addiction did report more NATU ($b = 0.25, p < 0.01$).

Limitations and Future Research Directions

In this study, we used a self-reported measure for students to indicate their GPA, and while other researchers have found that such self-reports tend to be valid, it is possible that our participants misrepresented their GPAs to us. Further, our measures of both faculty policies and participants' evaluation of extent of their own NATU were both subjective, opening the possibility that they may have misunderstood or inaccurately remembered them.

Regarding our participants, it is important to note that our sample was disproportionately represented by students from two universities. Notably, one of these schools, accounting for approximately 40% of our participants, has a policy whereby all students receive laptops and tablets, making technology ubiquitous on the campus. Further, the largest represented sample is a small, private, liberal arts institution, making generalization to other types and sizes of institutions difficult. Future research should explore the relationships described in this study with broader samples.

In our sample, addiction predicted cell phone but not laptop NATU, indicating possible connections between the social nature of NATU and suggesting this as a fruitful avenue for future research. Likewise, the effects of internet and cell phone addiction on NATU while studying could be further investigated.

Open Practices

All data and materials have been made publicly available via the Open Science Framework and can be accessed at <https://osf.io/saj7z..> The design and analysis plan were also preregistered and can also be found at <https://osf.io/3ftu6/>. This poster therefore qualifies for the badges for Open Data, Open Materials, and

Preregistration. More information about the Open Practices badges can be found at <https://osf.io/tvyxz/>.

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Figure 1. Relationship between internet addiction, NATU, faculty policies, and GPA

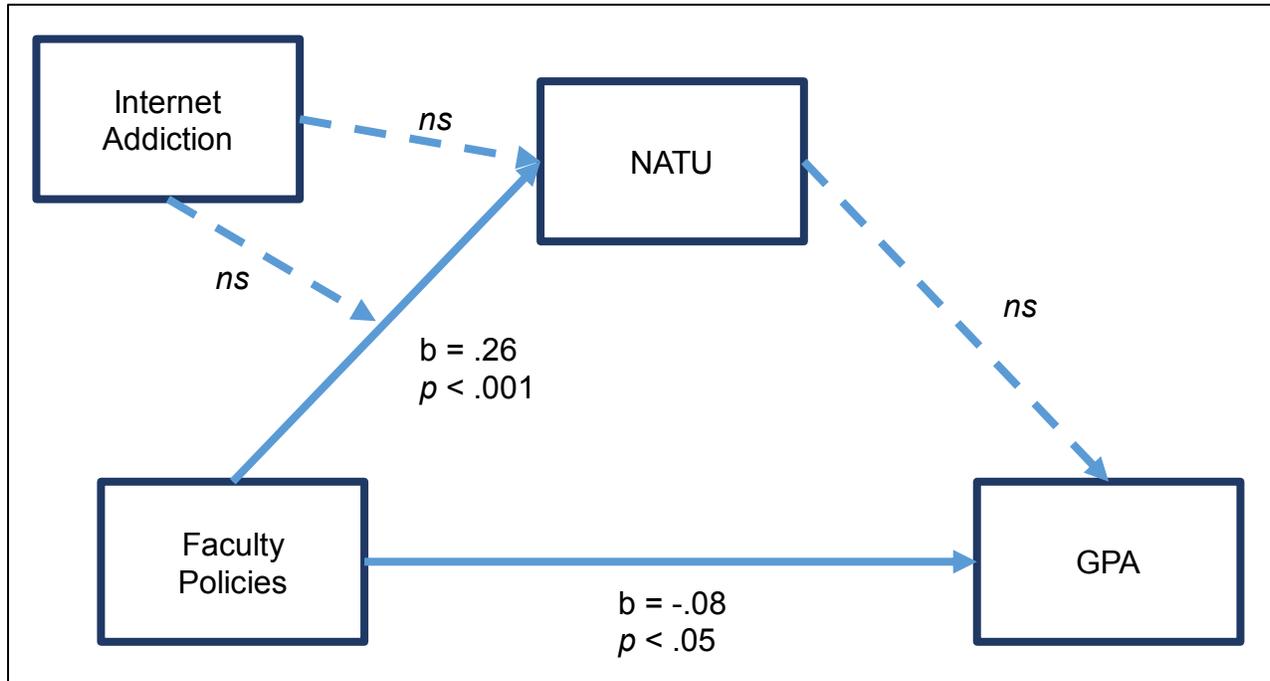


Figure 2. Relationship between cell phone addiction, NATU, faculty policies, and GPA

