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Nikola Levkov
Ss. Cyril and Methodius University in Skopje, Republic of North Macedonia

Bojan Kitanovikj
Ss. Cyril and Methodius University in Skopje, Republic of North Macedonia

To cite this article:

Levkov, N. & Kitanovikj, B. (2024). How cyberloafing affects students' cognitive engagement and psychological detachment in higher education classes? *International Journal of Technology in Education (IJTE), 7*(4), 870-882. https://doi.org/10.46328/ijte.948

International Journal of Technology in Education
2024, Vol. 7, No. 4, 870-882 https://doi.org/10.46328/ijte.948

How Cyberloafing Affects Students' Cognitive Engagement and Psychological Detachment in Higher Education Classes?

Nikola Levkov, Bojan Kitanovikj

Article Info

Article History

Received:
07 July 2024
Accepted:
23 September 2024

Keywords

Cyberloafing
Psychological detachment
Cognitive engagement
Grade point average

Abstract

While the right usage of technology brings a plethora of benefits, misusing technological devices and the Internet in an educational context can manifest in different behavioral tendencies. This ranges from growing addiction to technology and cyberbullying to technological anxiety and technostress. Yet, the effects of cyberloafing on students' academic performance and engagement during class have attracted the attention of professors and educational decision-makers. Thus, the article aims to analyze the impact of cyberloafing intentions and cyberloafing practices on students' psychological detachment and cognitive engagement among higher education students who are studying business and economics, using a structural equation modeling (SEM) methodological approach grounded in survey data. The findings stress that cyberloafing intention positively impacts cyberloafing habits and activities, further decreasing students' cognitive engagement and increasing their psychological detachment from classes, while the grade point average (GPA) positively affects cognitive engagement. This underscores significant potential implications for both scholars and practitioners.

Introduction

Surfing the internet and actively using technological devices has become a ubiquitous activity, more so with newer generations who have been raised with rapid technological advancements (Berte et al., 2021). Using technological devices comes with a variety of opportunities in people's living environments (Latif et al., 2019), yet this may be brought into question when they are used inappropriately during specific times or places. In the educational context, studies, which are grounded in the belief that using technology can foster innovation, efficiency in the learning process, and interaction between teachers and students have grown exponentially (Bernacki et al., 2020). On the contrary, the discourse on the negative consequences related to misusing technological devices and the internet tells another tale. Namely, researchers highlight the need for establishing limits and policies in educational institutions that can regulate, control, and generally stand for, consciousness in utilizing these tools (Rana et al., 2019). Conceptually speaking, misusing technological devices, gadgets, as well as the Internet at work, in school, or at university is manifesting in different behavioral tendencies. One of the most prominent behavioral approaches is so-called cyberloafing or cyberslacking. It has been defined as the use of the internet and devices for personal reasons as a way of distraction (Gökçearslan et al., 2016), which in the educational context would mean current classes or academic tasks. Related to this, cyberloafing often manifests through using social media

networks and other applications, accessing entertainment content like music or movies, online shopping, sharing content, browsing information, and similar (Metin-Orta & Demirtepe-Saygılı, 2023).

In other words, it can be understood as a counterproductive behavior that can impede students' psychological detachment and cognitive engagement due to shifting the focus and attention from the lecture onto unrelated web content (Mihelič et al., 2023). As a result, this can manifest in unachieved students' objectives and failing academic performance (Wu et al., 2021). Growing evidence points to a spillover effect where these manifested behaviors of cyberslacking from the university environment are transferred in the organizational or work context as well as into the private lives of the students, thus demonstrating the long-lasting impact in different spheres of the lives of students who practice cyberloafing (Meriac, 2015). Moreover, there is a higher tendency for current students to engage in cyberloafing than the present workforce (Akbulut et al., 2017). Additionally, there is an evident lack of awareness among students about the destructive consequences of cyberloafing, which is perceived as uncivil, distracting from the lectures, and impolite towards the lecturer (Lim & Teo, 2024). This further underscores the importance of analyzing this topic in the particular research context.

While there is a growing body of research investigating the antecedents and consequences of cyberloafing, this has mostly concentrated on several geographical regions such as Western Europe, South and North America, and parts of Asia (Metin-Orta & Demirutku, 2022; Meurer & Costa, 2022). As a result, we believe these findings and recommendations should not be fully copied and pasted into every research context as they cannot be generalized due to different contextual and cultural factors (Deffner et al., 2022). The context of a developing country in the Western Balkans or South-East Europe has not been represented so far, which is why we position this research endeavor based on a sample of students who study business and economics in the Republic of North Macedonia. This sample of students is of particular interest as the students who study this will most likely go on to become business professionals with key decision-making powers in organizations, responsible for leading teams and managing key operational processes (Khan et al., 2019). In turn, they will most likely influence the attitudes and behaviors of their team members once they obtain leadership positions.

Considering this, the objective of this article is to analyze the impact of cyberloafing intentions and cyberloafing practices on students' psychological detachment and cognitive engagement in the context of higher education students who are studying business and economics. To achieve this, we rely on a quantitative research approach with structural equation modeling (SEM) and one-way ANOVA based on survey data. Moreover, the findings have the potential for significant two-fold implications. On one hand, the article presents a theoretical model, which can be further scaled up, upgraded, and tested by future research. On the other hand, the practical implications can be seen in the usefulness for teachers, decision-makers in higher education institutions (HEIs), and education policymakers, who can utilize the findings to improve the teaching environment and make it more engaging and captivating for the involved stakeholders.

Theoretical Background

Cyberloafing. While cyberloafing has first gained ground in the workplace environment (Agarwal & Avey, 2020),

in the educational one it is increasingly less researched. Yet, higher education has been significantly impacted and transformed by new technology (Mohd Daud, 2023), making it a captivating context for this type of study. This signals the need for exploring the misuse of devices and the internet in the classroom due to the existence and persistence of this form of behavior in universities and the spillover of negative implications for organizations as current and future employers of students who practice cyberloafing (Alanoglu & Karabatak, 2021). When it comes to the antecedents of cyberloafing, researchers have primarily relied on the theory of planned behavior (Tandon et al., 2022). Soh et al. (2018) demonstrated that class engagement negatively impacts the attitudes toward cyberloafing, while perceived behavioral control and prescriptive norms have a positive impact on the intentions. Other studies focused on social norms and perceived threats (Galluch & Thatcher, 2011) as well as habits (Soh et al., 2018), all of which act as drivers of cyberloafing intentions. The scientific discourse has also analyzed the consequences of cyberloafing. Going beyond the immediate academic context, cyberloafing consequences access the private lives of students and can alter their personas. Students' cyberloafing has been often linked to growing addiction to technology and digital gadgets and rising levels of cyberbullying, technological anxiety, and technostress (Rana et al., 2019). Yet, some scholars have found that cyberloafing can be used as a strategy for combating stress as well as boredom in the workplace setting (Ohana et al., 2024). Considering this, we propose the following hypothesis:

H1: The intention to cyberloaf will be positively related to cyberloafing in classes.

Psychological detachment. We believe that only physical presence in the classroom is not enough to achieve high academic success, considering that students should be psychologically present during the lectures, too. When the term detachment was first introduced, it related to the personal feeling of being away from a certain situation (Luta et al., 2021). Hence, detachment refers to a state where one is not occupied by school-related obligations or is not actively engaged in these activities (Sonnentag et al., 2010). As such, this implies that the individual is not thinking about the lessons or schoolwork as well as any academic challenges or opportunities. It goes beyond just physical absence and abstaining from school-related tasks (Luta et al., 2021). Related to that, we believe that cyberloafing practices in the classroom can result in higher rates of psychological detachment as the students' attention will be focused on the phones or the internet content instead of on the lecture and the lecturer (Mihelič et al., 2023). Therefore, our next hypothesis is:

H2: The habit of cyberloafing during classes will be positively related to psychological detachment in classes.

Cognitive engagement. Researchers explain cognitive engagement as the spending of thoughtful energy so that the individual can fully understand complex concepts and ideas, beyond the minimal requirements (Rotgans et al., 2018). In other words, it focuses on the psychological investments one makes so that one comprehends, learns, and masters certain knowledge, which becomes especially important in the higher-educational context (Kassab et al., 2022). Moreover, cognitively engaged students express a willingness to expand their knowledge and go deeper into the subjects, which goes beyond the minimal requirements (Rotgans et al., 2018). So, students with higher cognitive engagement most likely exhibit higher psychological attachment to the lectures and the class (Wallace-Spurgin, 2020). As a result, this concept is closely related to students' personal characteristics and intrinsic motivation (Barlow & Brown, 2020). When it comes to cyberloafing, these habits tend to negatively impact

cognitive engagement (Koay & Poon, 2023). As a result, we define the following hypotheses:

H3: The habit of cyberloafing during classes will be negatively related to cognitive engagement in classes.

H4: Cognitive engagement during classes will be negatively related to psychological detachment in classes.

Moderating roles of cyberloafing and cognitive engagement. Respecting the difference between an intention to cyberloaf and doing cyberloafing practices in the classroom (Khansa et al., 2017), we believe that cyberloafing can act as a mediator between the cyberloafing intentions and the so-called outcomes of this activity, i.e., psychological detachment and cognitive engagement. Additionally, we believe that cognitive engagement can also be considered a mediator between cyberloafing intentions and psychological detachment. This is reflected in prior literature that views psychological detachment as a deeper concept where cognitive engagement can act as an antecedent (Wong & Liem, 2022). With this in mind, we present the following hypotheses that focus on the mediating relationships between the analyzed variables:

H5: Cyberloafing mediates the negative effect of cyberloafing intention on cognitive engagement.

H6: Cognitive engagement mediates the negative effect of cyberloafing intention on psychological detachment.

H7: Cyberloafing mediates the positive effect of cyberloafing intention on psychological detachment.

Grade point average (GPA). Students' grade point averages (GPA) are one of the most frequently used measures that represent academic performance in similar studies (Wu et al., 2018). In the Macedonian educational system for higher education, the GPA is reported on a scale from 6 to 10, which is different from the practices of Asian or Western universities. Self-reported GPA has been demonstrated to have a significant and truthful correlation with the students' actual GPA (Caskie et al., 2014). In the context of our research, the literature points to findings that students who texted during lectures tended to be more impulsive decision-makers (Hayashi & Blessington, 2018) and have lower GPAs (Metin-Orta & Demirtepe-Saygılı, 2023). Hence, it has been found that cyberloafing practices negatively affect students' learning and overall academic performance (Yilmaz et al., 2023). In line with this, researchers found a positive relation with feelings of frustration in teachers on the other part of the educational process (Tandon et al., 2022). Consequently, the remaining two hypotheses are:

H8: There is no significant difference in cyberloafing between the groups with a different GPA.

H9: There is no significant difference between the groups in academic engagement with a different GPA.

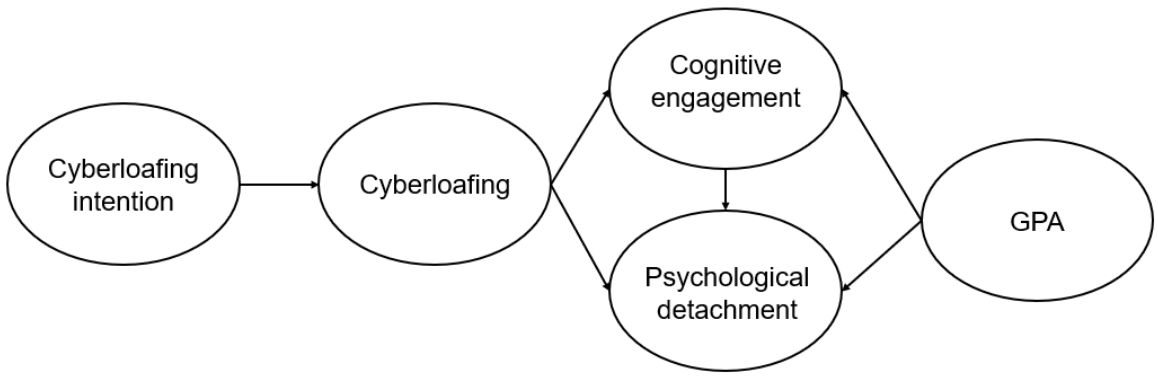


Figure 1. Conceptual Model

Based on the outlined hypotheses and the chosen variables, we propose the study's conceptual model (see Figure 1).

Method

To test the research model, we collected data from students from one of the Macedonian universities through an online survey conducted in April 2024. A QR code from the survey was sent to email to the students at the selected university. After data cleaning (e.g., removing responses that were signaling extremely low variance) the final sample included 186 respondents in total. At the beginning of the survey, all students needed to fill in personal consent to participate in the survey. We measured all research constructs using seven-point Likert scales ranging from 1 for "strongly disagree" to 4 for "neither agree nor disagree" to 7 for "strongly agree".

The measurement scales for the analyzed variables were based on prior research. So, for measuring cyberloafing intentions and cyberloafing we used the scales by Askew et al. (2014), for cognitive engagement the scale used by Zhoc et al. (2019), and for psychological detachment the scale by Sonnentag and Fritz (2007). To avoid the potential problem with common method bias, we randomized the questions' order to disrupt potential interference between questions, and we protected the respondent's anonymity. A minimum sample size of 100 is required for structural equation modeling (SEM) models that include five or fewer constructs, each with more than three items (observed variables) with high item commonalities (0.6 and higher) (Iacobucci, 2009). Hence, the sample size of 186 responses was sufficient to conduct SEM. The demographic characteristics of the students who participated in the survey are presented in the Appendices section (Table A1).

Results

Since in the proposed research model, all constructs are latent variables, to test the proposed hypotheses in the theoretical background of the article we conducted structural equation modeling. A measurement and structural model were examined to analyze the theoretical model. We assess the psychometric properties of the scales based on their loadings, discriminant validity, and internal consistency. In Table 1, all AVE values are greater than the recommended 0.50 level and the square root of the AVE is greater than the correlations between the constructs.

Table 1. Composite Reliability and Correlations among the Constructs

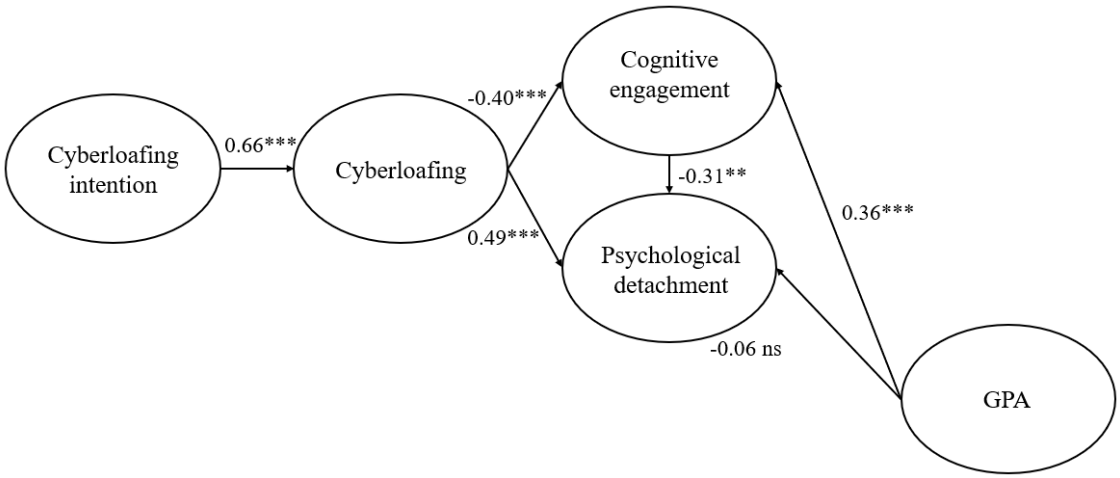
	CR	AVE	MSV	MaxR(H)	CL	CLI	CE	PD
CL	0.795	0.509	0.398	0.850	0.713			
CLI	0.895	0.741	0.406	0.928	0.631	0.861		
CE	0.768	0.512	0.278	0.669	-0.346	-0.428	0.749	
PD	0.767	0.523	0.406	0.769	0.556	0.637	-0.527	0.723

Notes: CL = Cyberloafing; CLI = Cyberloaf intention; CE = Cognitive engagement; PD = Psychological detachment

The AVE values for cognitive cyberloafing (0.509), cognitive engagement (0.512), and psychological detachment (0.523), are close to the recommended threshold of 0.5, but still above the required minimum to convey sufficient

variance for the variables to converge into a single construct.

Hypothesized relationships between constructs were examined as part of the validation of the structural model. The results in Figure 2 confirm all the hypothesized direct relationships. The strongest positive relationship is between cyberloafing intention and cyberloafing (0.66***) supporting hypothesis H1. Additionally, a positive relationship was confirmed between cyberloafing and psychological detachment (0.49***).



[Notes: ns = non-significant, ***p < 0.00; **p < 0.01; *p < 0.005. Fit indices: $x2/df$ = 126.11; GFI = 0.906; AGFI = 0.857; CFI = 0.935; RMSEA = 0.071.]

Figure 2. Research Model

Further, two negative relationships are confirmed between cyberloafing and cognitive engagement (-0.40***) and between cognitive engagement and psychological detachment (-0.31***). The results presented on the research model support the hypotheses H1-H4. Regarding the control variables, we controlled the model only for GPA, and we found that GPA has a significant positive relationship with cognitive engagement (0.36***) while the relationship of GPA with psychological detachment is non-significant (-0.06 ns).

To further test the hypotheses H5-H7 we tested the model for indirect effects, and we found confirmation of all three proposed mediations in the model presented in Table 2. The results suggest that cyberloafing transmits the effects of cyberloafing intention on cognitive engagement and psychological detachment. Also, the results confirmed that cognitive engagement mediates the negative effect of cyberloafing on psychological detachment. Hence, the empirical analysis confirmed the previously stated hypotheses H5-H7.

The validation of the structural model confirmed that greater cyberloafing intention has a positive impact on cyberloafing which further decreases the level of cognitive engagement of students during classes while at the same time increasing their psychological detachment from classes. Through the analysis of the results, it can also be concluded that the greater cognitive engagement of students in classes negatively affects their psychological detachment. The model is also significantly impacted by the control variable GPA which positively affects cognitive engagement, suggesting that the higher the GPA is, the higher the students' cognitive engagement is in class.

Table 2. Testing the Indirect Effects

	Indirect effect	p-value	SE	Bias	Hypotheses (H5-H7)
Cyberloafing intention - Cyberloafing - Cognitive engagement	-0.170	0.018	0.040	-0.005	H5: Cyberloafing mediates the negative effect of cyberloafing intention on cognitive engagement.
Cyberloafing - Cognitive engagement - Psychological detachment	0.181	0.009	0.048	-0.003	H6: Cognitive engagement mediates the negative effect of cyberloafing intention on psychological detachment.
Cyberloafing intention - Cyberloafing - Psychological detachment	0.195	0.020	0.007	0.012	H7: Cyberloafing mediates the positive effect of cyberloafing intention on psychological detachment.

To further analyze the impact of GPA we conducted one-way ANOVA to test the hypotheses H8-H9. We transformed the items from the seven-point Likert scale that measures cyberloafing and academic engagement as ordinal into continuous variables by summarizing the score for each observation for these two constructs. To satisfy the assumptions for one-way ANOVA we performed the Levene test for homogeneity of variance, which was not significant for both variables, 0.556 for cyberloafing and 0.969 for academic engagement respectively. This indicates that the variance is equal among groups, which satisfies the assumption for performing one-way ANOVA. We present the results from the descriptive statistics from one-way ANOVA in the Appendices section (Table B1) while the results about the significance of the tested hypotheses are given in Table 3.

Table 3. Testing the Difference between Groups based on GPA

	Sum of squares	df	Mean Square	F	Significance
Cyberloafing (Between groups)	743.488	3	247.829	2.852	0.039
Academic engagement (Between groups)	508.914	3	169.638	9.869	0.000

The results in Table 3 show the significance of the p-value for both hypotheses H8-H9 indicating that the formulated null hypotheses about no difference between the four groups are rejected. This means the four GPA groups show significant differences in cyberloafing and academic engagement.

Discussion

The results of the analysis showed that increased cyberloafing intentions positively affect cyberloafing, which then negatively reflects the level of cognitive engagement of students during classes and increases their psychological detachment. These findings are in line with past research where results also point to a destructive impact on students' feelings of engagement and attachment towards the classes (Mihelič et al., 2023). In this sense, Rana et al. (2019), additionally link distractions by others, lack of attention, and indifference towards class

materials as predictors of cyberloafing attitudes. Moreover, higher levels of students' cognitive engagement had negative implications on their psychological detachment. This has also been previously confirmed in the literature where the latter is viewed as a deeper level of nonchalance towards the lectures and the lecture content (Wong & Liem, 2022).

Additionally, these relations were found to be largely impacted by the student's GPA, which positively affects cognitive engagement. This led us to the finding that a higher GPA leads to higher levels of students' cognitive engagement in class. In turn, past research streams have viewed GPA as an outcome of cyberloafing or cognitive engagement (Metin-Orta & Demirtepe-Saygılı, 2023), which this research builds upon. Related to this, other studies have shown that students who sent text messages to each other and other people during class displayed more impulsive decision-making (Hayashi & Blessington, 2018). Subsequently, cyberloafing is often negatively related to learning passion in students, and their academic performance (Yilmaz et al., 2023). This is highly likely due to the large distraction powers of phones and devices, which negatively influence students' abilities to memorize and retrieve information as well as take notes (Dontre, 2021).

While the article makes a contribution to the existing body of knowledge, it does not come free of some constraints. In this regard, the data collection took place in one Macedonian university and the data sample cannot be considered large enough to provide a wider generalization of the findings. Also, longitudinal trends cannot be extracted from this research endeavor as it was done at one specific point in time. Moreover, the respondents, i.e., the students in our case who took part in filling out the questionnaire may have been biased towards presenting themselves in a better light. Lastly, using a positivist research approach and the SEM methodology may present one aspect, while the bigger picture may be addressed by incorporating other non-quantitative research approaches. These limitations can be alleviated by future research endeavors on the topic.

Considering the outlined results, this research endeavor represents a cross-validation of findings in a new research setting, which has previously been neglected. This highlights the study's two-fold implications in terms of conceptualizing a theoretical model, which can be further scaled up and analyzed in other contexts, too, as well as presenting valuable insights to a wide array of stakeholders from the educational sector. With the widespread digital nativity and growing integration of information and communications technologies (ICT) in every sphere of society including the educational process, such phenomena as cyberloafing are almost inevitable and thus deserving of researchers' continuous interest.

Conclusion

With this research endeavor, we set out to analyze the impact of cyberloafing intentions and cyberloafing practices on the psychological detachment and cognitive engagement of students from a Macedonian university who are studying business and economics. To achieve this, we applied structural equation modeling and one-way ANOVA on data collected from a survey. In an effort to provide cross-validation of findings in a new research context, we confirmed that cyberloafing intention positively impacts cyberloafing habits and activities, further decreasing students' cognitive engagement and increasing their psychological detachment from classes. The findings related

to the students' GPA underline the positive relationship between the students' academic performance and cognitive engagement. These conclusions have significant potential implications for professors, decision-makers in higher education institutions (HEIs), and education policymakers, by using them to enhance the teaching and learning environment, making it more engaging and attractive for the students as primary stakeholders.

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Author Information

Nikola Levkov

https://orcid.org/0000-0003-0210-4746

Ss. Cyril and Methodius University in Skopje

Faculty of Economics – Skopje

bul. Goce Delcev 9V

1000 Skopje

Republic of North Macedonia

Contact e-mail: *nikola.levkov@eccf.ukim.edu.mk*

Bojan Kitanovikj

https://orcid.org/0000-0002-1968-8955

Ss. Cyril and Methodius University in Skopje

Faculty of Economics – Skopje

bul. Goce Delcev 9V

1000 Skopje

Republic of North Macedonia

Appendix A. Demographics

Table A1. Demographics of the Respondents

Gender	Male	Female	Do not want to disclose	
	47 (25.26%)	139 (74.03%)	1 (0.71%)	
Year of study	First	Second	Third	Fourth
	49 (26.34%)	49 (26.34%)	48 (25.80%)	40 (21.52%)
Grade point average (GPA)	6-7	7.1-8	8.1-9	9.1-10
	33 (17.74%)	77 (41.40%)	56 (30.11%)	20 (10.75%)

Appendix B. ANOVA Results

Table B1. Descriptive Statistics from One-way ANOVA

						95% Confidence Interval for Mean			
		N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Min.	Max.
Cyberloafing	6-7	33	25.73	10.153	1.767	22.13	29.33	8	45
	7.1-8	77	21.06	9.040	1.030	19.01	23.12	8	48
	8.1-9	56	22.09	9.647	1.289	19.51	24.67	8	49
	9.1-10	20	18.70	7.901	1.767	15.00	22.40	8	37
	Total	186	21.95	9.460	.694	20.58	23.31	8	49
Academic engagement	6-7	33	15.61	4.272	.744	14.09	17.12	5	27
	7.1-8	77	17.55	4.021	.458	16.63	18.46	7	28
	8.1-9	56	20.07	4.182	.559	18.95	21.19	10	27
	9.1-10	20	19.90	4.315	.965	17.88	21.92	10	27
	Total	186	18.22	4.434	.325	17.57	18.86	5	28