

BOREDOM AND ONLINE LEARNING MOTIVATED ATTENTION AND REGULATION STRATEGIES DURING COVID-19

Kristina Randelović¹, & Jelena Opsenica Kostić²

¹*Department of Psychology, University of Priština in Kosovska Mitrovica, Faculty of Philosophy (Serbia)*

²*Department of Psychology, University of Niš, Faculty of Philosophy (Serbia)*

Abstract

During online classes, teachers face the challenges of keeping the students focused and motivated in the online environment. The results of the research showed that students who get bored during online classes are less motivated and achieve poorer academic results. The initial assumption that this paper makes is that in relation to the level of boredom that students experience during online lessons, it is possible to predict which strategies of attention regulation and direction students will use. The research sample consists of 198 students, between 18 and 39 years of age ($AM = 21.03$; $SD = 2.43$), 84.9% of which are female. The sample included survey participants who stated that class attendance was mandatory during online classes due to the Coronavirus pandemic. The instruments used were the Online Learning Motivated Attention and Regulation Strategies (OLMARS) questionnaire, dimension of Boredom from the Achievement Emotions Questionnaire - Short version (AEQ-S). The results of simple regression analysis showed that boredom during online lessons is a predictor for four statistically significant strategies of attention regulation and direction: Perceived attention discontinuity ($R^2=.21$; $F(1,196)=53,442$; $p=.000$ $\beta=.463$; $p=.000$), Lingering thought ($R^2=.16$; $F(1,196)=39,350$; $p=.000$ $\beta=.409$; $p=.000$) and Social media notification ($R^2=.17$; $F(1,196)=40,975$; $p=.000$ $\beta=.416$; $p=.000$) Behavioral strategies ($R^2=.05$; $F(1,196)=12,574$; $p=.000$ $\beta=-.246$; $p=.000$). The results indicate that when boredom happens, students reach for various digital distractors to which they direct their attention to. We can see that the highest percentage of variance is explained by strategies aimed at drawing attention to stimuli from the environment. Moreover, it should be kept in mind that the research was conducted under specific circumstances, at the beginning of the Coronavirus pandemic, although the results obtained were in line with the findings of other researchers according to whom attention deficit is caused by the presence of negative emotions during lessons. Given the tendency to continue with online education, these results can be useful for understanding the needs of students who attend classes on online platforms.

Keywords: *Boredom, learning motivated attention and regulation, covid-19.*

1. Introduction

When the state of emergency due to the Covid-19 pandemic was declared, it has led to regular lectures to be switched to distance learning and the Internet became the main resource for learning activities - from direct lecture streaming, to communication and sharing materials via social media, emails, drives. Although there is an opinion that online instruction due to lack of face-to-face contact with students cannot replace traditional instruction, it still represents an educational shift from traditional to modern approach to learning (Mishra, Gupta, Shree, 2020). The use of information and communication technology in the classroom and at home during learning is widespread among students, as evidenced by numerous studies (eg Rosen, Carrie & Cheever, 2013; Flanigan & Babchuk, 2015). In addition to numerous advantages, this environment also offers plenty of distractors.

Some studies suggest that students are more prone to digital distractions such as checking social media, sending messages when watching lectures online than live (Lepp et al., 2019) or when using a computer for learning activities (Judd & Kennedy, 2011). The use of social media during lectures happens as a conscious and reflexive decision, where learning activities are intentionally interrupted in order to “check” Facebook or it is seen as a type of reflexive activity (Flanigan, Babchuk, 2015). There are studies that claim that students are attracted to social media mainly through the usual distraction in the form of notifications that tempt them to check what is happening on the networks (Aagaard, 2015). The results of a survey conducted in the United States on 1,774 students suggest that while engaged in academic obligations outside of lectures, students spend an average of 60 minutes a day on Facebook, 43 minutes

browsing and 22 minutes e-mailing. Moreover, students state that they send an average of 71 messages a day while studying for the exam (Junco, Cotten, 2012). Students in the online environment may have a strong desire to use social media because they are constantly waiting for information from social media or wondering what is happening there, because previous experiences on social media were pleasant and thus increased their desire to use them.

During online lectures, teachers face the challenges of keeping the attention and motivation of students in the online environment. The results of some studies showed that students who become bored during online lectures are less motivated and achieve poorer academic results. Reinhard Pekrun (Pekrun, Goetz, & Titz, 2002; Pekrun, 2006) proposes a theory in which emotions play a primary role in activating, maintaining, or reducing student motivation and related processes (Pekrun, Goetz, & Titz, 2002). As part of his Control-value theory, he introduces the notion of academic emotions, which refers to emotions related to teaching, learning and achievement. On the one hand, boredom as an academic emotion does not disrupt teaching too much, while from a clinical perspective it has no psychopathological importance. However, boredom seems to be experienced often and plays an important role in the teaching process, especially when it comes to achievement (Spacks, 1995; Tze, Klassen, Daniels, 2014; Tze, Daniels, Klassen, 2016). Boredom occurs as a consequence of a non-stimulating situation, and is most often defined as an affective state of relatively low physiological arousal, decreased desire to act, tendency to escape from a situation that causes boredom behaviorally or mentally (e.g., daydreaming) (Goetz & Frenzel, 2006). Boredom reduces the self-regulation of achievement activities, which is defined by active goal setting, strategy selection and tracking of outcomes. As a consequence of the negative effects of boredom on attention, motivation, cognition, boredom aims to divert attention from activities that lack value and to direct attention to activities that are more stimulating and supportive (Pekrun, 2006; Zeidner, 1998).

In order for students to be able to follow lectures and process information cognitively, they must first focus on the content, so the issue of focus and remain engaged is fundamental to the major cognitive learning activities (Petersen & Posner, 2012). That is, learners' awareness of and willful regulation of their attention are essential for achieving focused attention (Reisberg & McLean, 1985). Persistence in learning in an online environment probably depends on multiple and complex factors (Berge & Huang, 2004; Tiler-Smith, 2006). Understanding the state of students' attention as well as their regulation of attention during the learning process has become a critical issue in the age of digital distraction.

Guided by previous research that students are prone to multitasking and the use of social media and other digital distractors that are not related to instruction in the online environment, we were interested in whether the level of boredom can predict whether and which regulation strategies and attention will be used by students during online lectures.

2. Methods

2.1. Sample and procedure

The research sample consists of 198 students, between 18 and 39 years of age ($M = 21.03$; $SD = 2.43$), 84.9% of which were female. The sample included participants who stated that class attendance was mandatory during online lectures due to the coronavirus pandemic. The data were collected through computer-adapted testing, one year after the Covid-19 pandemic was declared, or one year from the beginning of online lectures. The participants previously confirmed that they were familiar with their rights and testing rules, and then moved on to the questions section. Also, they were given the opportunity to withdraw at any time, so that the answers would be saved only when the participants entered all the necessary data and sent them to the database, and in case of withdrawal, no traces of their participation were recorded.

2.2. Instruments

A Short Version of the Achievement Emotions Questionnaire (AEQ-S, Bieleke, et al., 2021) - Boredom Subscale is related to the experience of boredom during the lectures. The boredom subscale consists of 4 items and measures an individual's boredom experience. The answers are given on a five-point Likert-type scale (1- I do not agree, 5- I completely agree). The average value of the answers is calculated, where higher results indicate a greater level of boredom.

Revised Online-Learning Motivated Attention and Regulation Scale (OL-MARS v.2, Wu, 2017) is an instrument based on meta-attention theory that assesses the level of students' attention and the use of regulation strategies during online learning. The instrument has two factors - Perceived Attention Problems (PAP) which contains subfactors that represent students' awareness of their distractions and behavior on social media during learning: awareness of the problem with attention caused by Lingering Thoughts (LT), distraction by Social Media Notifications (SMN) about events such as waiting for a friend

to comment on a post on social media, leading to a perception of Perceived Attention Discontinuity (PAD). The second factor is the Attention Self-Regulation Strategy (SRS), which contains the following subfactors: the use of Behavioral Strategies (BS) and mental strategies by students, such as Outcome Appraisal (OA), which helps students control and regulate their attention. Answers are given using a Likert-type scale (1- does not apply to me at all, 5 - applies to me completely).

2.3. Results

Table 1 shows the descriptive-statistical indicators of the variables used in the research. Also, correlations between variables are presented, as well as measures of reliability of the instruments used.

Table 1. Descriptive-statistical indicators of variables used in the research, reliability of scales and intercorrelation of the dimensions used.

Variables	1 BL	2 PAD	3 LT	4 SMN	5 BS	6 OA
1	-					
2	.463***	-				
3	.409***	.665***	-			
4	.416***	.601***	.651***	-		
5	-.246***	-.039	-.201***	-.104	-	
6	.096	.272***	.129	.310***	.430***	-
<i>M(SD)</i>	2.58(1.31)	2.92(1.12)	2.59(1.03)	3.24(1.19)	3.43(.92)	3.63(1.02)
<i>α</i>	.95	.90	.73	.84	.75	.66

*** $p < .001$; BL - Boredom during the Lectures; PAD - Perceived Attention Discontinuity; LT - lingering thoughts; SMN - Social Media Notifications; BS - Behavioral Strategies; OA - Outcome Appraisal

The results indicate that there is a statistically significant correlation between predictors and criteria. Measures of curvature and elongation indicate that there is no excessive deviation from the normal distribution for all variables. The Cronbach's alpha coefficient of internal consistency indicates that the reliability of all scales is satisfactory, ranging from low to high.

The results of simple regression analysis showed that Boredom during online lessons is a predictor for four statistically significant strategies of attention regulation and direction: Perceived Attention Discontinuity ($R^2=.21$; $F(1,196)=53,442$; $p=.000$ $\beta=.463$; $p=.000$), Lingering Thought ($R^2=.16$; $F(1,196)=39,350$; $p=.000$ $\beta=.409$; $p=.000$) and Social Media Notification ($R^2=.17$; $F(1,196)=40,975$; $p=.000$ $\beta=.416$; $p=.000$) Behavioral Strategies ($R^2=.05$; $F(1,196)=12,574$; $p=.000$ $\beta=-.246$; $p=.000$).

3. Discussion

Guided by previous studies which have shown that students are prone to multitasking and the use of social media and other digital distractors that are not related to online lectures, we were interested in whether the level of boredom can predict whether and which regulation strategies and attention focus strategies students will use during online lectures.

The results have shown that there is a positive correlation between boredom and students' perceived attention is directed to content that is not relevant to the learning process, i.e., that boredom largely predicts discontinuity in attention. Boredom, to a large extent, statistically significantly predicts all subfactors that belong to the factor of awareness about the perceived attention discontinuity. Students who perceive online instruction as non-stimulating tend to run away from such a situation behaviorally or mentally, and their attention is drawn to sounds, notifications from social media or digital devices and to wait and think that something new will happen on social media and will they receive a notification.

Students often state that boredom during lectures leads them to use the Internet that is irrelevant to lectures, such as social media (Rosen, Carrier & Cheever, 2013; Terry, Mishra & Roseth, 2016). According to the Control-value theory (Pekrun, Goetz and Titz, 2002; Pekrun, 2006) boredom aims to divert attention from activities that lack value and to direct attention to activities that are more stimulating and supportive and it is related to the emergence of thoughts irrelevant for the assignment (Pekrun, Goetz, & Titz, 2002). During online lectures, students may feel less in control of their academic engagement and performance due to the specifics of online lectures, which can often be hampered by poor connection. Moreover, they may underestimate the assignments they receive during online lectures, since they know that the teacher does not have a clear insight into their engagement. In the online environment, the teacher does not have a clear insight into whether students follow him or not, as is the case in live classes, he cannot make eye contact or ask a question to a specific student in order to engage him and thus prevent boredom.

Because of the above-mentioned, instead of the lecture topics, students start thinking about things happening on the Internet/social media and may be more receptive to the sound of notifications on the phone, because these activities are perceived as more pleasant and "valuable" at that time. It is well-known that nowadays students are used to being connected with their peers at all times (Felisoni, Godoi, 2018) and the most common activity during lectures is staying in touch with friends through social media and messaging applications, which is in line with the developmental period of our sampled group - late adolescence and the beginning of early adulthood in which loyalty to the group is most valued and the need for closeness is expressed. Other studies confirm that students who have more faith in their academic abilities will use strategies to resist multitasking, i.e., digital distractions and thus obtain better learning outcomes (Zhang, 2015).

The results of our research also show that there is a negative correlation between boredom and self-regulation strategies, namely behavioral strategies. In our sample, students who experience boredom will not use self-regulation behavioral strategies such as turning off sounds or log out from applications irrelevant to learning. It is known that notifications often tempt students to check what is happening online (Aagaard, 2015). But, the decision to stay logged in on social media or to leave the sound for notifications on, as well as the decision to (not) resist thoughts and activities irrelevant to learning is a conscious decision and responsibility of the student himself. In the context of education, theoretical approaches (Pekrun, 2006) and empirical results (Goetz, Pekrun, Hall, & Haag, 2006) suggest that boredom negatively affects motivation, cognitive activation and self-regulation of learning. Previous studies have confirmed the connection between academic emotions and self-regulation or learning strategies (Artino & Jones, 2012; Marchand & Gutierrez, 2012; Pekrun, Goetz, Daniels, Stupnisky, & Perry, 2010; Pekrun, Goetz, Titz, & Perry, 2000), specifically, students who experience boredom often have difficulty with self-regulation activities (Wegmann et al., 2018; Ralph et al., 2014).

4. Conclusion

Results of our research have confirmed the assumption that there is a positive correlation between boredom and students' awareness that they focus on content that is not relevant to the learning process, i.e., that boredom largely predicts discontinuity in attention. Boredom largely statistically significantly predicts all subfactors that belong to the awareness that there is a discontinuity in attention. Also, the results show that there is a negative correlation between boredom and self-regulation strategies, primarily strategies related to behavior. In our sample, students who experience boredom will not use self-regulation behavioral strategies such as turning off sounds or log out from applications irrelevant to lectures.

These findings are in line with the Control-value theory of achievement emotions, which states that environmental factors such as assignment requirements, support for autonomy, and goal structure influence control and assessment of student values, which provoke certain academic emotions, and emotions further influence the use of student learning strategies and self-regulation strategies. The theory suggests that boredom negatively affects motivation, cognitive activation, self-regulation of learning and academic outcomes, which in our case represents multitasking during lectures, i.e., not responding to digital distractors (e.g., social media).

Limitations in the methodology blur the picture of whether students really (do not) get hard assignments, perceive lectures as insufficiently stimulating or perceive their academic control over achievements as small and therefore turn to social media, or it might happen that due to screen addiction or fear of missing out students use the internet and social media during lectures, which leads to the perception of classes as boring. Given the small number of variables included, the data presented here cannot provide a full account of the topic, so the recommendation for future research is to explore possible sources of boredom in online set-ups, such as teacher skills for conducting such lectures, conditions in which students learn, adaptation of the learning material used, etc. Also, a comparison with live lectures would be very useful.

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