Effects of Boredom on the Academic Engagement of Students during Online Class

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Abstract

This research study focuses on determining the boredom and work engagement of the students in the online class setting. Boredom is a prevalent emotion of becoming uninterested in any activity. It is a common emotion for everyone and significantly affects the work engagement of the students in an online class. The researchers gathered data from 200 students from different universities. Student boredom was measured using the Utrecht Boredom Scale, which contains eight items capturing boredom's affective, cognitive, and behavioral manifestations. On the other hand, work engagement is measured using a 3-item version of the Utrecht Work Engagement Scale, which contains items measuring vigor, dedication, and absorption. The association between boredom and variables of work engagement is analyzed using the Pearson correlation test. Results revealed that students who felt bored during online learning displayed a low level of vigor and absorption. In contrast, students who showed a high level of vigor said a higher level of absorption and dedication during online learning. The result opens an opportunity to make the learning system in online classes better because it is more susceptible to boredom that lessens the work engagement of the students.

Keywords
Boredom, work engagement, online class, dedication, vigor, absorption

1. Introduction

Boredom is a prevalent emotion of becoming uninterested in any activity. It is a common emotion that slowly leans towards negative consequences. It can be achieved due to being empty and having nowhere to direct the energy in our system. According to (Hooft 2018), boredom correlates with the level of arousal activation of the people. As the gradual increase of boredom occurs, the mental health of a human being slowly falls on being frustrated and depressed. Based on (Weir 2013), boredom relates to the power of attention. Even though a person has different goals and priorities, being stimulated and aroused is not present. Thus, the attention is being scattered away and unable to do anything because of the mental engagement. Boredom is always present in students' engagement with different subjects. Based on a study by Sweeney (2019), a student's attention fades away due to various circumstances, such as the subject being uninteresting, the class being too easy/difficult for the student, and the professor is not conducive to learning.

This issue has already existed since school started. The universal experience of boredom affects different ages but is commonly directed to students because of lesser priorities than adults. The boredom worsened when the pandemic and online classes were introduced (Hansanali, 2021). According to Affelat's (2021) study, various factors affect students' boredom in an online class setting. Disengagement, monotony, repetitiveness, and lack of satisfaction and challenge contribute to students' boredom in classes (Pawlak et al., 2020). It was also found that low achievers report a higher boredom level than high achievers. The boredom and psychological distress of the students were also found to be significantly associated.

One of the components that are negatively impacted by boredom is engagement, which decreases performance. Boredom must be overcome to avoid disengagement (Macklem, 2015). Engagement is a multifaceted phenomenon that is an essential aspect of the learning process. Behavioral engagement, such as effort; emotional engagement, such

as high levels of enthusiasm associated with low levels of anxiety and boredom; cognitive engagement, such as the use of learning strategies and self-regulation; agentic engagement, such as the amount of conscious effort to enrich the learning experience (Veiga et al., 2014; Hiver et al., 2021).

This research intends to determine the students' boredom levels and academic engagement in different school activities. The result would help correlate the student's attention with their boredom levels. Thus, it would aid future studies to find a solution to improve the learning system that would make the students more engaged and stimulated with their activities. Additionally, the different factors of work engagement could be pinpointed as root causes that would help various universities and professors tackle their lessons proficiently while also being conducive to learning for the students.

1.1 Objectives

The researchers aim to measure students' boredom from different universities using the Utrecht Boredom Scale. Furthermore, students' academic engagement would also be measured through the Utrecht Work Engagement Scale and evaluated based on their vigor, dedication, and absorption. Finally, the relationship and effects of burnout on students' academic engagement would also be determined.

2. Literature Review

In recent years, online learning has been the norm due to the covid-19 pandemic. Many universities are leveraging the potential of online learning by implementing different learning environments. But challenges, such as boredom, might impact a student's academic engagement (Park & Lim, 2019). According to Pawlak et al. (2020), recognizing boredom as a challenging problem must be addressed to foster creativity. These other aspects are related to an interior creative element since portraying boredom has been an action-inducing factor that drives individuals to gain anything that will make them feel alive. This could lead the students to a lack of drive or motivation, disengagement, constriction, distorted view of time, and a poor link with grade average in students as they develop with increasing awareness and characterization of boredom in response to specific task settings. The routines of activity are practically constant or excessively repetitious and monotonous. As a result, many teachers and researchers showed an increasing solid interest in developing engagement to resist the students' boredom and grasp students' significant improvement in academic engagement (Salmela-Aro & Upadaya, 2012).

Defining engagement is a good, rewarding task state of mind distinguished by vigor, dedication, and absorption (Schaufeli et al., 2002). Student engagement in their learning environment at home has to examine in various fields. The global literature reveals that student engagement is directly related to academic performance and favorable learning outcomes (Ouweneel et al., 2013). As a result, educators focus attention on student engagement to resolve poor academic achievements among various students (Fredricks et al., 2004). According to Eastwood et al., 2007, students should be taught to accept boredom as a temporary absence of excitement and recognize their emotional states to perform activities with more remarkable perseverance, seriousness, and engagement. To lessen boredom, presenting students with solutions that allow them to feel more active in academic engagement, a literary achievement that demonstrates the actual value of perseverance, can be reinforced by alleviating dullness. It makes students less likely to give up in difficult situations and increases their motivation to discover task-based self-improvement activities (Gonzalez-DeHass, 2011).

Satisfying students' underlying psychological desires is critical to their development and well-being (Ryan & Deci, 2017). students are naturally active and development-oriented; they are prone to achieve their potential, implying that they are interested in learning things, acquiring knowledge, and pursuing challenges and opportunities interests. People who meet their needs are enthusiastic about participating in an activity and are also more intrinsically motivated (Cherry K., 2020). But on this day of a pandemic, the activity has a long way to go where the academic engagement is no longer that active. This result is the repetitive and autonomous everyday lifestyle of students. Unsatisfied needs may impede a student's state of mind because unsatisfied needs nullify optimal motivation. Students who have unattained needs need to engage in activities to elevate the feeling of boredom. Furthermore, unsatisfied needs stifle energy production; associated with them is emotional exhaustion (Vansteenkiste et al., 2007), leading to boredom.

The creation of numerous scales to assess boredom has resulted from an interest in the topic. However, the Utrecht boredom scale and the Utrecht engagement scale were designed to evaluate students' academic engagement alongside boredom in their environment. Utrecht boredom scale, also known as UBORS, is a trait boredom assessment that allows researchers to assess how people feel about their association with boredom. Wilmar Schaufeli created the

UBORS in 2009 to emphasize the understanding and embodiment of work boredom. The significance of using the Utrecht Boredom Scale and Utrecht Work Engagement Scale is its weighing scheme method to measure students' boredom index and academic engagement. The tool used in the study is due to our objective of finding the effects of boredom on academic engagement that would later be analyzed on whether boredom has a significant difference with academic engagement (vigor, dedication, and absorption).

3. Methods

3.1. Survey Questionnaire

The data gathered in the study was obtained using an online survey questionnaire. The survey was randomly distributed to college students in the Philippines. The survey questionnaire consisted of Utrecht Boredom Scale and Utrecht Work Engagement Scale items. Student boredom was measured with the Utrecht Boredom Scale, developed by Reijseger et al. (2012). This one-dimensional scale for measuring workplace boredom uses a seven-point rating scale ranging from 0 (‘never’) to 6 (‘always’). Student boredom is measured by eight items (e.g. ‘time goes by very slowly and 'I feel not so much to do’). The scale has a reported Cronbach’s alpha coefficient of 0.80 (Reijseger et al., 2012). On the other hand, work engagement was measured using items from the Utrecht Work Engagement Scale (UWES) (Schaufeli et al. 2006). This instrument usually contains 17 items, each evaluated on a seven-point frequency-rating scale ranging from 0 ('never') to 6 ('always'). As markers of work engagement, three items from the core components, such as vigor, dedication, and absorption items were employed. The UWES has been utilized successfully in previous studies (Storm & Rothmann 2003).

3.2. Statistical Analysis

The data gathered from the survey questionnaires were analyzed using Minitab version 20. The study was conducted using a 95% confidence level, and the results of $p<0.05$ were considered significant. The Pearson correlation analysis was used to determine the association between student boredom and work engagement factors (vigor, dedication, absorption).

4. Results and Discussion

4.1. Demographic Profile

The researchers had gathered a total of 200 respondents for this study. It was found that the majority of respondents were female (59%) within 21-22 years old (47%). Most of the respondents are taking up engineering programs (86%), and they reside in the city (74%) during data gathering.

4.2. Result of Boredom Measurement

Table 1 shows the descriptive statistics of respondents' responses regarding student boredom measurement. Six (8) items were captured from the survey questionnaire evaluated using the 7-Point Likert Scale (0-6). The mean scores were calculated from the average scores to measure variables to test the respondent's degree of agreement. A mean of 3.5 was chosen as the lowest acceptable mean score on the 7-point Likert scale, indicating that any item with a mean value above 3.5 agreed that respondents feel agreed with the given statement in the questionnaire. The result showed that the respondents agreed to all items in the boredom measurement questionnaire. However, the item that had the highest rating was "restlessness," followed by "time goes by very slowly," and "feel bored during an online class." On the other hand, the item with the lowest rating was "feeling not so much to do."

Table 1. Result of Boredom Questionnaire

Items	Mean	Std. Dev.	Range	Agreement
Time goes by very slowly	4.16	1.50	0-6	Agree
Feel bored during online class	4.10	1.31	0-6	Agree
Spend time aimlessly	3.55	1.23	0-6	Agree
Restlessness	4.21	1.35	0-6	Agree
Daydreaming	3.68	1.58	0-6	Agree
Seems working days never ends	4.08	1.48	0-6	Agree
Tend to do other things	4.07	1.39	0-6	Agree
Feel not so much to do	3.12	1.72	0-6	Agree

According to Sujani Hansanali (2021), students get bored during online classes because they look at their devices' screens for a long time, and the lack of interaction brings down their engagement in the lesson. Likewise, according

to a study by Wang and Zhang (2021), an online learning environment is quite different from the traditional teaching environment, which will impact learners' emotions due to the rapid growth of information technology and the widespread use of online courses. Internet learning anxiety is called "environmental anxiety" in the information processing process. It is triggered by various unclear and ambiguous aspects in the online learning environment. It is believed that learning anxiety is an emotional response of learners in the learning process in an online environment, which is triggered by information overload, numerous unclear elements in online learning, and other learning challenges.

Similarly, in a study by Derakhshan et al. (2021), it was found that four categories have been established for the causes of boredom in online classes: teacher-related factors such as instructional practices and personality, IT/computer-related factors such as the nature of online classes and computer literacy, task-related factors such as task overload, task difficulty, and dull materials and subjects, and student-related factors such as unmotivated students and students' irrelevant talk. Since the teaching method in online setting places more demand on learners' abilities to study independently compared to traditional classroom teaching, it is therefore recommended the following solutions to minimize student boredom during online classes: providing broader learning resources (audio, video, and animation, excluding courseware), arranging group work (group discussion, group activities, etc.), enhancing teachers' quality of the information, promoting extracurricular activities (speech, dubbing, debate, and oral stories), monitoring tests and assessments (timely testing, post-test analysis, and finding and filling in gaps), and continuing to improve learners' network skills.

4.3. Result of Work Engagement Measurement

Work engagement was measured with the student version of the Utrecht Work Engagement Scale (UWES-S; Schaufeli et al., 2002), which includes three subscales: Vigor (6 items), Dedication (5 items), and Absorption (6 items). Items were scored on a 7-point frequency scale (0 = “never”), (6 = “always”). A mean of 3.5 was chosen as the lowest acceptable mean score on the 7-point Likert scale, indicating that any item with a mean value above 3.5 (Table 2) agreed that respondents feel engaged depending on the identified variable. Based on results, respondents had agreed that they feel engaged as reflected by following items: “always persevere even things do not go well”. “find work full of meaning and purpose”, “tasks inspire me”, feel proud on the work”, “job is challenging”, time flies when working”, “forget everything while working”, and immersed in work”. However, the item that has the highest score is “job is challenging”.

Table 2. Result of Work Engagement Questionnaire

Variable	Items	Mean	Std. Dev.	Range	Remarks
Vigor	Bursting with energy	2.42	1.17	0-6	disagree
	Feel strong & vigorous	2.35	1.31	0-6	disagree
	Feel like going to work	2.00	1.56	0-6	disagree
	Can continue to work for very long periods of time	2.80	1.41	0-6	disagree
	Resilient mentally	2.88	1.24	0-6	disagree
	Always persevere even things do not go well	3.50	1.19	1-6	agree
Dedication	Find work full of meaning and purpose	3.07	1.22	0-6	agree
	Enthusiastic about the task	2.96	1.25	0-6	disagree
	The tasks inspire me	3.17	1.26	0-6	agree
	Feel proud on the work	3.40	1.28	0-6	agree
	Job is challenging	4.53	1.21	2-6	agree
Absorption	Time flies when working	3.58	1.35	0-6	agree
	Forget everything while working	3.10	1.29	0-6	agree
	Intensely happy	2.71	1.49	0-6	disagree
	Immersed in work	3.12	1.22	0-6	agree
	Get carried away when working	2.95	1.31	0-6	disagree
	Difficult to detach from job	2.53	1.51	0-6	disagree

In a study conducted by Barnes & Noble College Insights (2022) on 400 college students whose schools had recently moved to online education, it was found that 60% of students thought they were at least somewhat prepared for the transition and find online learning more challenging that traditional learning. This was especially true for students who had previously taken an online class. 64% of survey participants voiced concerns about their ability to focus and sustain the self-discipline required to study online. Most of the students recounted the challenges of distance learning, from struggling to understand assignments and getting easily distracted to not having reliable internet. This current state of online learning is likely to worsen existing disparities and create barriers to remote learning. According to a nationwide cross-sectional study, thirty-two percent (32%) and twenty-two percent (22%) of 3,670 Filipino medical students polled, respectively, have difficulty transitioning to new learning styles and do not have dependable internet access (Baticulon et al., 2020). For some, purchasing a learning gadget that allows them to effortlessly tune in to online classes and turn in assignments in the online system may be tough (Santos, 2020). Despite efforts to make education more accessible to all, Filipino university students still face numerous challenges when it comes to distant learning.

4.4. Result of Correlation Analysis

Table 3 showed the Pearson r correlation results. Student boredom was tested to each factor of work engagement (vigor, dedication, and absorption). The result indicated that vigor and absorption had negative association to boredom suggesting that the more bored students reported themselves to be, the lower their levels of vigor, absorption and behavioral engagement. Moreover, it was found that absorption had highest association with vigor and has moderation association with dedication. This suggest that students who exhibited high level of vigor had exhibited also high level of absorption and dedication during online learning. These findings are consistent with previous research into the relationship between boredom and its causes and effects (Pekrun et al., 2010, Tze et al, 2013; Tze et al, 2014).

Table 3. Result of Correlation Analysis

Factors	Pearson correlation (r)	p-value	95% CI	Remarks	level of association
Vigor → Boredom	-0.25	0.012	(-0.425, -0.056)	significant*	minor association
Dedication → Boredom	0.081	0.424	(-0.118, 0.273)	not significant	no association
Absorption → Boredom	-0.242	0.015	(-0.419, -0.048)	significant*	minor association
Dedication → Vigor	0.459	<0.001	(0.288, 0.601)	significant**	moderate association
Absorption → Vigor	0.66	<0.001	(0.532, 0.758)	significant**	high association
Absorption → Dedication	0.446	<0.001	(0.273, 0.590)	significant**	moderate association

According to studies, boredom and work engagement are linked, suggesting that boredom reduces students productivity and well-being (Whiteoak, 2014). Work engagement is defined as "a pleasant, rewarding work-related state of mind marked by energy, dedication, and immersion" (Schaufeli et al., 2002,). Students who are bored, on the other hand, are in a dissatisfying negative mood that is often related with unfavorable outcomes and withdrawal from task (Bruursema, Kessler & Spector, 2011; Game, 2007). It suggests that boredom reduces student engagement and vice versa (Reijseger et al. 2012). Workplace boredom (an unpleasant state of passiveness) is the polar opposite of job engagement (a positive state of activity). According to Warr and Inceoglu (2012), work engagement is adversely associated to workplace boredom.

5. Conclusion

Based on the findings, the students indeed feel bored during online classes. When the COVID-19 pandemic occurred, most students had difficulty transitioning to virtual learning. According to the result of this study, most of the students found their studies challenging during online learning, and while doing some school requirements, they observed that time seemed to pass very quickly. It was also found in the study that students who feel bored during class had displayed low level of vigor and absorption during online class. Thus, to avoid boredom during online learning, the researchers recommend the following. It is recommended that the institution initiate interaction by providing creative and helpful programs during online classes, such as making games as promising learning tools every once in a while, throughout

the class. Games have unique characteristics that allow teachers to engage difficult-to-reach students in ways that lessons cannot (Matthew Lynch, 2016). Furthermore, it is recommended that the institution find new ways to check in with the students, such as assistance to struggling students, then conducting surveys regarding their mental health and providing contact details to the people they can reach out to. It is also recommended for students to involve in some indoor activities with people in their houses, such as indoor exercises, family game nights, and virtual movie parties with friends. When things become more unmotivating during online classes, these activities may help them boost their social interactions.

Students should be taught to accept boredom as a temporary absence of excitement and to recognize and understand their own needs and feelings in order to devote more diligence, sobriety, and engagement to their assignments. Boredom can be lessened by giving students choices so that they feel more in control of the learning process. Mastery goals that demonstrate the true meaning of perseverance can also be strengthened to reduce boredom. It makes students less likely to give up in difficult situations and makes them more determined to discover task-based self-improvement activities.

References

Affelat, F, The impact of boredom on the attitudes and behaviours of edutourists during the era of COVID-19 and the mediating role of psychological distress. 2021. Retrieved from NCBI: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8494727/

Baticulon, R. E., Alberto, N. R., Baron, M. B., Mabulay, R. E., Rizada, L. G., Sy, J. J., Tiu, C. J., Clarion, C. A. & Reyes, J. C. , Barriers to online learning in the time of COVID-19: A national survey of medical students 2020.

Carmona-Halty, M. A, The Utrecht Work Engagement Scale for Students (UWES–9S): Factorial Validity, Reliability, and Measurement Invariance in a Chilean Sample of Undergraduate University Students. 2019. Frontiers. https://www.frontiersin.org/articles/10.3389/fpsyg.2019.01017/full

Cherry K. , Differences of Extrinsic and Intrinsic Motivation. 2020. https://www.verywellmind.com/differences-between-extrinsic-and-intrinsic-motivation-2795384

Derakhshan, A., Kruk, M., Mehdizadeh, M., and Pawlak, M. , Boredom in online classes in the Iranian EFL context: sources and solutions. System 101:102556. , 2021.

Eastwood, J. D., Cavaliere, C., Fahlman, S. A., and Eastwood, A. E. , A desire for desires: Boredom and its relation to alexithymia. Pers. Individ. Dif. 42, 1035–1045. 2007.https://www.sciencedirect.com/science/article/abs/pii/S019188690600362X?via%3Dihub

Fredricks JA, Blumenfeld PC, Paris AH. School engagement: potential of the concept, state of the evidence. Rev Educ Res.;74(1):59–109. 2004. https://journals.sagepub.com/doi/abs/10.3102/00346543074001059

Furner, J. M., and Gonzalez-DeHass, A, How do students' mastery and performance goals relate to math anxiety? Eur. J. Mathe. Sci. Technol. Educ. 7, 227–242. 2011. https://www.ejmste.com/article/how-do-students- mastery-andperformance-goals-relate-to-mathanxiety-4222

Hansanali, S. , How to Kill Boredom during Online Learning and Teaching.2021. Retrieved from Medium: https://medium.com/illumination/how-to-kill-boredom-during-online-learning-and-teaching-b5f8ae069e8a

Hansanali, S. , How to Kill Boredom during Online Learning and Teaching. Medium. 2021. https://medium.com/illumination/how-to-kill-boredom-during-online-learning-and-teaching

Hooft, E, The state of boredom: Frustrating or depressing? 2022. Retrieved from NCBI: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6208645/

Lynch, M, The positive connection between games and online learning. The Tech Edvocate. 2018. https://www.thetechedvocate.org/the-positive-connection-between-games-and-online-learning/

Neeley, T, Harvard Business Publishing Education. 10 Ways to Help Your Students Cope with the Transition to Virtual Learning. 2018. Retrieved February 10, 2022, from https://hbsp.harvard.edu/inspiring- minds/10-ways-to-help-your-students-cope-with-the-transition-to-virtual-learning

Park, T., & Lim, C. , Design principles for improving emotional affordances in an online learning environment. Asia Pacific Education Review, 20(1), 53–67. 2019. https://doi.org/10.1007/s12564-018-9560-7.

Pawlak, M., Zawodniak, J., and Kruk, M. , Boredom in the Foreign Language Classroom: A Micro- Perspective. Switzerland: Cham. Springer. 2020a.https://books.google.com.ph/books?hl=en&lr=&id=zJjuDwAAQBAJ&oi=fnd&pg=PR7&ots=PTAO3oQnb h&sig=BJcTJpvytmLMJHBydet_gdl4bNw&redir_esc=y#v=onepage&q&f=false

Pekrun, R., Goetz, T., Daniels, L. M., Stupnisky, R. H., & Perry, R. P. , Boredom in achievement settings: Exploring control–value antecedents and performance outcomes of a neglected emotion. Journal of Educational Psychology, 102(3), 531–549. 2010.

Ryan, R. M., & Deci, E. L, Self-determination theory: Basic psychological needs in motivation, development, and wellness. 2017. https://selfdeterminationtheory.org/wp-content/uploads/2017/03/2017_DeciOlafsenRyan_annurev-orgpsych.pdf

Salmela-Aro, K., & Upadaya, K, The Schoolwork Engagement Inventory: Energy, dedication, and absorption (EDA). European Journal of Psychological Assessment, 28(1), 60., 2012.

Santos, A. P. , In the Philippines, distance learning reveals the digital divide. Retrieved from https://eu.boell.org/en/2020/10/06/philippines-distance-learning-reveals-digital-divide, 2020.

Schaufeli, W. B., Salanova, M., González-Romá, V. and Bakker, A. B, The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. Journal of Happiness Studies, 3(1), pp.71-92. , 2002.

Sweeney, R, https://www.apa.org/monitor/2013/07-08/dull-moment. Retrieved from Mc Graw Hill: https://www.mheducation.com/highered/ideas/homepage/why-students-get-bored-in-class-and-what-to-do-about-it, 2019.

Tze, V. M. C., Daniels, L. M., Klassen, R. M., & Li, J. C.-H, Canadian and Chinese University Students' approaches to coping with academic boredom. Learning and Individual Differences, 23, 32–43. 2013.

Tze, V. M. C., Klassen, R. M., & Daniels, L. M, Patterns of boredom and its relationship with perceived autonomy support and engagement. Contemporary Educational Psychology, 39(3), 175–187. 2014

Vansteenkiste, M., Neyrinck, B., Niemiec, C. P., Soenens, B., De Witte, H., & Van den Broeck, A, On the relations among work value orientations, psychological need satisfaction and job outcomes: A self- determination theory approach. Journal of Occupational and Organizational Psychology, 80, 251–277.2007.

Wang, X., & Zhang, W. , Psychological anxiety of college students' foreign language learning in online course. Frontiers in Psychology, 12, 2021.

Weir, K. , Never a dull moment. Retrieved from American Psychological Association: https://www.apa.org/monitor/2013/07-08/dull-moment, 2013

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