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ScienceDirect

Procedia Computer Science 196 (2022) 117–124

Procedia Computer Science

www.elsevier.com/locate/procedia

CENTERIS - International Conference on ENTERprise Information Systems / ProjMAN - International Conference on Project MANagement / HCist - International Conference on Health and Social Care Information Systems and Technologies 2021

Academic Procrastination and Online Learning During the COVID-19 Pandemic

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Abstract

This paper investigates online learning during the COVID-19 pandemic and explores the possibility that procrastinators have been impacted differently as compared to others. The research is explorative in nature and employs interviews from participants at a higher education institution in Norway as a primary method of investigation. The preliminary findings presented in the paper highlight differences between procrastinators and non-procrastinators regarding the desire to study and satisfaction with learning outcomes. The procrastinators are encountering a higher degree of challenges related to motivation as opposed to non-procrastinators. The preliminary findings also highlight challenges associated with student engagement and the use of the camera during online classes for all the students.

Keywords: COVID-19, Online Learning, Distance Learning, Procrastination

1. Introduction

No crisis in recent history has impacted the world the way coronavirus has. Beginning in December 2019, it has reached the most corner of the world closing down cities and limiting all forms of human activity to the bare minimum

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10.1016/j.procs.2021.11.080

[6], which is particularly true with the education sector [55]. First, the rapid pace at which the virus spreads, uncertainty and possible scenarios have pushed the university higher education sector towards a fully online form of learning, which meant a sudden transformation of the curriculum and learning styles [39]. Second, preventive measures like quarantine and social distancing have meant isolation for students, which resulted in problems related to student performance [21], well-being [35], and academic anxiety [23]. Prior research has investigated the impact of online and distance learning on students [13; 25] and found that demands on self-regulation are higher in online and distance education settings than in traditional university settings and lack of motivation and effort [36] among students is significantly higher in online learning. Moreover, the degree of procrastination is amplified in an online setting [13] and academic procrastinators are less inclined to self-regulate, which will have a negative effect on performance [13; 36; 48]. Recent studies conducted during the COVID-19 pandemic [21; 35] have also indicated the same. Furthermore, while past research on online learning has resulted in useful prescriptions for academic procrastinators, the research in isolated online learning is still emerging. With an objective to address the current situation, this paper attempts to answer the following research questions:

1. *What are the main challenges for online learning under the COVID-19 conditions?*
2. *Has the shift to online learning impacted procrastinators differently as compared to others?*

The remainder of the paper is organized as follows. First, we review the recent studies on online learning and introduce academic procrastination. Second, we present the research design and data collection. Next, we present the preliminary findings and finally conclude and reveal our future research direction.

2. Literature Review

2.1. Related studies on COVID-19 Pandemic and Online Learning

Online Learning has always been a crucial resolution during catastrophic disasters much before the COVID-19 pandemic. One notable example is the case of Canterbury, New Zealand in 2011, wherein universities quickly adapted to a web-based environment with social media becoming a prominent source of support for learners [11]. This sudden change to online learning was reported to be both beneficial and challenging for educational institutions and students [4]. In the case of the current coronavirus situation, social distancing and isolation have become new norms and while some initial studies [3; 18; 24] have reported that a shift to online learning has been well accepted, many others [5; 38; 40] have highlighted the challenges many students face like poor time management [38], improper utilisation of online peer strategy [5; 38], feeling of isolation, lack of desire or motivation, issues with synchronous online communication [40], worry about their appearance in online seminars i.e., keeping their webcams on [8], lack of engagement in online classes [1], lack of self-regulation and procrastination [21; 35] to name a few. Furthermore, studies on the transition to online learning for teachers [14; 37; 41] have reported the shift to online learning being time-constraining and claimed that using digital tools necessitates more preparation and better classroom management.

2.2. Academic Procrastination and Online Learning

Academic procrastination is an increasing concern within the educational sector, especially in this pandemic [21; 35]. Prior studies have found that low self-efficacy, disorganisation, low intrinsic motivation, poor effort regulation, and time management are all strong characteristics of academic procrastination [22; 36; 43; 51; 56], and thus, argue that academic procrastination is a reliable predictor of poor academic performance [17; 34; 51]. Prior research on online and distance learning suggests that the demands on self-regulation are higher in distance education settings [25] with students tending to lack self-regulation [38], effort regulation, and motivation [36]. It is further argued that academic procrastinators are less inclined to self-regulate, which has a negative effect on performance in online courses [13; 48]. Likewise, research indicates that the degree of procrastination may be amplified in a digital learning setup [13], as students tend to procrastinate more when they are not expected of a particular behaviour. The most applied methods to academic procrastination research are surveys [9; 10; 49] or tracking students' learning activities through digital platforms [2; 29]. However, there is a lack of qualitative research into academic procrastination [34; 51; 52].

There has been research distinguishing between active and passive procrastination, arguing that active procrastination is a flexible time management strategy for people who prefer to do work under pressure, and thus,

making a deliberate decision to procrastinate [9; 10]. One of the most popular procrastination scale used is the Tuckman procrastination scale [47], with others like the procrastination questionnaire for students [16], the irritational procrastination scale and pure procrastination scale [44] as being used. Within the scope of this paper, we use the Tuckman Procrastination Scale [47; 49] to identify academic procrastinators.

3. Data Collection and Methodology

This study employs both quantitative and qualitative methods, primarily focusing on the qualitative aspect. As described in the next sub-sections, we first conducted a survey to identify procrastinators and non-procrastinators and then conducted semi-structured interviews with a subsample of students from each of the groups or clusters. An invitation for participating in the survey[2] was sent to students from two study programs at a university in Norway i.e., 19 students from bachelor's and 120 students from master's program between September 2020 and December 2020. Overall, 50 (40%) opened or started the survey and 25 (18%) completed the surveys, with a gender distribution of 52% (Male) and 48% (Female). The participants were first asked to answer questions related to the Tuckman Procrastination Scale to measure academic procrastination [30; 47]. In this study, we employed only 13 of the 16 questions using an 8-point scale as shown in Table 1. We started off with 16 items but reduced it after the first test run as the 16 questions were part of a larger survey and after the first test run, it was decided to reduce the number of questions[3] based on feedback received.

3.1. Data Analysis to identify procrastinator types

The Tuckman Procrastination Scale (TPS) measured academic procrastination using the 16 items scale on a single factor with loadings of 0.4 and reliability (Cronbach's α) of 0.86 [47]. This has been validated by more recent studies [48; 49] wherein the single factor has been well established and employed along with a reliability (Cronbach's α) of 0.92 and 0.89 respectively. In this study, we first employ exploratory factor analysis (EFA) to first verify the one factor scale (Table 1) and second to extract factor scores to classify the participants. For the factor analysis[4], in line with best practices employed in other papers; e.g. [26; 30], we look at the extent of common variance among the variables, KMO and Bartlett's Test of Sphericity. First, we employ the factor analysis using SPSS and load all items on one factor which results in 60% of the variance loading on the first factor. We then drop two items due to low or double-item factor loadings, thus having one factor that explains 68.79% of the variance with a high KMO (0.868) and Bartlett's test is highly significant ($p < .001$). Next, cluster analysis was carried out using the factor scores. The hierarchical clustering was conducted using the Ward algorithm. To determine the number of clusters, visual measures (i.e., dendrogram) and TPS scores were used, resulting in a 4-cluster solution classified as extreme procrastinators, somewhat procrastinators, somewhat non-procrastinators, and non-procrastinators.

Table 1. Items, descriptive statistics, and factor loadings.

Item	Mean	SD	Loadings	Cronbach's α	Question (Never [1]-Always [8])
Q3_1	3.60	2.236	.934	0.949	I needlessly delay finishing jobs, even when they are important.
Q3_2	3.08	2.253	.867		When I have a deadline, I wait till the last minute.
Q3_3	3.52	2.104	.889		I delay making tough decisions.
Q3_4	3.12	1.856	.782		I manage to find an excuse for not doing something.
Q3_5	4.16	1.650	.196		I put the necessary time into even boring tasks, like studying.

[2] The full survey has measured passive & active procrastination, self-regulation, and exam anxiety. However, for this research in progress paper, we only report on passive or academic procrastination.

[3] Three questions were dropped i.e., (a) I keep putting of improving my work habits, (b) I am a time waster now, but I cannot seem to do anything about it, and (c) putting something off until tomorrow is not the way I do it. The scale was changed to an 8-point scale i.e. Never (1) to Always (8) for consistency with other questions that were asked in same questionnaire. Prior papers employed a 4-point or 5-point scale when using TPS.

[4] We employ steps prescribed by [19]. As an extraction method, principal components analysis (PCA) was employed.

Q3_6	3.32	1.676	.814		I am an incurable time waster.
Q3_7	2.96	1.925	.880		When something is too tough to tackle, I believe in postponing it.
Q3_8	3.12	1.965	.925		I promise myself to do something and then drag my feet.
Q3_9	3.08	1.656	.437		Whenever I make a plan of action, I follow it.
Q3_10	3.60	1.803	.582		I finish important jobs with time to spare
Q3_11	4.40	2.021	.581		I get stuck in neutral even though I know how important it is to get started.
Q3_12	3.36	1.997	.829		I postpone starting on things I don't like to do
Q3_13	3.32	2.174	.832		Even though I hate myself if I don't get started, it doesn't get me going.

3.2. Semi-structured Interviews: Purposeful case sampling

For the interviews, a subsample of students was identified using the strategy of purposive case sampling [31; 33]. This was a deliberate choice as it allows us to capture the complexity of users and allows a deeper understanding of the user needs in a specific context [54]. Out of the 25 students who took the survey, 19 agreed to be interviewed and we contacted students strategically to ensure cases in all four clusters. A total of 13 students (68%) were interviewed of which 11 interviews have been analyzed. The process of conducting interviews was deliberately spread across three rounds due to explorative nature of the study. Due to the current pandemic, the data interviews were conducted digitally using Zoom. The interviews were recorded, transcribed, and coded by two of the authors. The teacher interviews were drafted based on themes and related topics developed after analysing the student interviews. The first round of interviews had many open questions which were refined and structured by the third round. To analyze and sort the interview data we used a thematical approach; following the five-phased approach proposed by Braun and Clarke [7], which allowed us to analyze data, allocate codes and themes in a systematic manner. Next, we proceeded by conducting supplementary interviews with the four teachers and one teaching technology centre (TTC) manager. This was done to strengthen and validate our findings. These five interviews were conducted in a semi-structured manner to also allow open and independent answers.

4. Results and Analysis

This section demonstrates the key findings and will discuss the most relevant themes. Table 2 addresses both the research questions i.e., challenges for online learning under COVID-19 conditions and their impact on procrastinators.

Table 2. Themes extracted related to challenges or issues with online learning.

Themes	**Sub-themes**	**Description**	**Summary of Findings**
Academic Indicators	Academic Performance	Satisfaction on meeting their own expectations in terms of grades.	While non-procrastinators achieve better grades, the rest of the three clusters see no decline on average.
	Learning Outcome	The degree to which learning outcomes i.e., academic knowledge, skills and competencies are met in online settings.	Non-procrastinators see increased satisfaction with achieving learning outcomes, the rest of the three clusters see negative effects.
	Exam Anxiety	Degree of worry or anxiousness about academic performance i.e., exam and grades.	Procrastinators are more anxious about exams and grades as compared to non-procrastinators.
Desire to Study	Motivation	Challenges to stay motivated and spending much less time on their studies.	While non-procrastinators remain largely unaffected, the rest of the three clusters are negatively affected.
	Structure	Difficulty in planning everyday routines and following classes indicating low self-regulation.	Extreme procrastinators have major challenges with structuring their everyday routines, while non-procrastinators thrive and positively use the time to study.
Online Lectures & Engagement	Participation & Engagement	The extent of participation in learning activities (i.e., lectures, discussions, assignments, communication with teachers).	Online lectures have negatively impacted the participation of procrastinators and non-procrastinators.
	Mode of Delivery	The delivery of online lectures i.e., Asynchronous, synchronous or both.	Online lectures have a negative impact on extreme procrastinators, but synchronous delivery has a positive impact on non-procrastinators.

	Distraction	Students get easily distracted during online learning with social media, texting, etc.	Same as Participation & Engagement, equally impacts all four clusters.
	Role of Camera	The use of the camera during online (synchronous) lectures and their role in class.	Same as Participation & Engagement, equally impacts all four clusters.

Academic Performance: 80% of participants belonging to all four clusters do not report a significant decline in grades. However, non-procrastinators report achieving relatively better results as compared to their prior performance, while procrastinators on the other hand report no decline in their results. This was corroborated by the teachers we interviewed who also report that in terms of absolute numbers the grades have not declined. Some teachers have attributed this to easier exam formats and evaluations, but also speculate that the students might have used more time to study[5]. Interestingly, the two procrastinators that reported a decline in grades also report higher exam anxiety. This is consistent with prior research [45; 57] which indicates that exam anxiety occurs more frequently among procrastinators also negatively impacting their performance. Furthermore, while non-procrastinators report increased satisfaction with regards to learning outcomes, the rest of the three clusters report the need for physical classes to meet the learning outcomes as quoted by one "I think I would have gotten more out of the lectures if they were physical".

Desire to Study: As expected, motivation is seen to be the most significant difference between procrastinators and non-procrastinators. Procrastinators have challenges structuring their routines and report spending less time on their studies due to change in the study environment as quoted by one of the participants "I've become so unstructured when I get home, because now it's all up to me". Furthermore, our analysis reveals that procrastinators rely on social pressure i.e., they prefer to show up on campus to study efficiently and are struggling to initiate self-study from home. We argue that the procrastinators' poor ability to self-regulate is a consequence of lack of motivation since motivation is one of the main drivers of self-regulation [42; 58; 59]. Non-procrastinators do not report any changes in their motivation, maintain good structure and report taking advantage of extra time for their studies.

Online Lectures & Engagement: Both procrastinators and non-procrastinators report low engagement and participation in online classes, as compared to physical classes. Participants report different challenges raging from communication being one-sided and boring to their own hesitancy to ask questions online[6]. This has mostly been attributed to three factors: (a) distraction (64%) when taking classes from home, (b) mode of delivery of lectures (55%) and (c) the role of the camera (64%). Our analysis indicates that students who prefer synchronous mode do not appreciate asynchronous mode and report a negative impact on engagement[7] and desire to study consequently. Interestingly, the mode of delivery has no significant impact on the procrastinators; they do not join or participate when the mode is synchronous as they see a possibility to consume the recording later, which they do not do either. Our findings are in line with prior research [22; 36; 43; 51; 56], wherein procrastinators were found to be more prone to postponing their tasks and not taking advantage of the extra time available. On the contrary, non-procrastinators prefer the synchronous mode[8] as it gives them a well-defined structure & routines with fewer distractions. Furthermore, our analysis on the synchronous mode of delivery also found that students tend to have cameras off, resulting in a lack of participation and engagement. Participants mostly attribute behavior to culture and peer effect[9],worry about their appearance in online seminars, being more visible in the seminars, and avoid[10] being seen as

[5] One teacher stated "If you look at the numbers, it looks like it's less students that fail courses than before (…) because some of the grading has been changed from an A-F to a Pass-Fail, at least at the bachelor level. (…) looks like the overall statistics, and nation-wide, less people are failing, and I don't know for sure why". Another teacher stated "poorer, but there are two sides of it. They learn less they perform worse. But then we have made it easier for those in the exam, and hence, the exam's grade is at least as good or maybe better."

[6] The student stated: "it was a lot easier to approach the teachers during these physical lectures and ask questions and get direct answers."

[7] The student stated: "With recorded sessions you can let it play in the background, but I experience that it just remains in the background while something more important is happening another place".

[8] A non-procrastinator stated: "I work better when it's live because I get less distracted by not being able to pause, because the lecture (…)"

[9] The student stated: "It has also become a culture for us, to not have your camera on", while another stated: "because nobody else has their camera on". Another stated: "I feel like if I do keep my camera on (...) then I feel like people are going to laugh at me behind their camera".

[10] A non-procrastinator stated: "I do not feel like having others to see me while I just sit here in my own world, trying to concentrate."

not being focused, which is in line with recent research [8; 15]. This significantly impacted both *students and teachers*[11] *alike.*

Learning Management Systems (LMS) and Analytics (LA): To improve engagement, prior studies have put emphasis on the importance of retaining good support for students and how students are learning especially in an online learning context [32; 50]. Therefore, universities are attempting to adopt both LMS and LA to detect at-risk students and provide personalised feedback [20; 27; 28]. In this current study, we consider procrastinators as at-risk and hence explored the use of LMS and LA. Our analysis reveals the following findings: First, both teachers and students express fundamental knowledge with LMS due to prior experiences before the pandemic but also reported a steep learning curve while using video streaming platforms like Zoom and Panopto. Second, while both teachers and student's express satisfaction with LMS as a content sharing platform, there is a lack of satisfaction with its interaction potential. The students argue that the existing LMS lacks effective communication capabilities and prefer the use of external communication channels like discord or slack. The teachers too shared similar concerns, but while being open for adoption of external communication channels raised concerns of work overload due to the large increase of student inquiries through multiple platforms. Third, our findings suggest that while LA tools are implemented and their benefits are well known, their use is limited[12] or non-existent[13] as there is a lack of an appropriate framework to adequately adopt LA. The teachers have not adopted LA student follow-ups mostly due to time constraints, limited resources, in addition to a lack of policy framework and encouragement. Finally, there are concerns about GDPR, privacy and personal data [46] among the administrators[14] which explains the lack of a policy framework for LA use.

5. Conclusion and Future Direction

Online learning in a crisis such as the COVID-19 pandemic has presented many challenges for students, in particular procrastinators. To understand this issue, we explored the different factors that impact academic procrastinators. Our paper has found that online learning during the COVID-19 pandemic has negatively impacted procrastinators with regards to academic performance, their desire to study and online engagement due to their lack of self-regulation. Our paper has also explored the challenges with the mode of lecturing and the use of cameras during synchronous online learning. Our preliminary findings will be particularly interesting to universities and colleges that are currently conducting their teaching online during this pandemic. Our paper has also highlighted challenges related to the adoption of learning analytics in identifying procrastinators and for student follow-ups. Our study's limitations are that of any other small-N sample study i.e., by the fact that the participants are from a single institution and limited to the department of technology. Future work would include expanding this study to a larger audience and explore the possibility of digitally nudging [12; 53] the procrastinators to see if we could increase their online engagement and improve their learning experience through follow-ups. In addition to this, the impact of a compulsory class assignment, deadlines and continuous feedback on procrastinators would also be explored.

Acknowledgements

This research project was funded by Høyskolen Kristiania under the Strategic Funds – research on own pedagogical practice 2020. We thank Høyskolen Kristiania for the funding and support. This paper is a developed based on the master thesis of two co-authors based on the data collected by the research group.

[11] A teacher stated: "(...) it's cruel, because in my classes, the students don't turn on their camera…. I have zero control over how well I hit. I have no idea about the funny points about them smiling at them, I have no idea if the technical stuff is understandable, zero control on how it gets taken at the other end". Another teacher stated: ""(...) to most extent it is only black screens. It's a vacuum, so that has been to some extent problematic".

[12] The teacher stated: "I especially view how often the students have logged in, who have logged in and for how long, and then I drill down to view what they have been looking at, and what not. I have not gone more in depth on for how long they have watched each video and those ... things."

[13] The teacher stated: "The answer here is no; we did not use any of that. *** showed us how it worked, and it was very clear that it would benefit us a lot. But obviously we did not get around to actually getting into it before we had our class".

[14] The TTC manager stated: "we weren't prepared to... it's a mine field. We don't want to break laws regarding GDPR".

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