



Proceedings of the Informing Science + Information Technology Education Conference

An Official Publication
of the Informing Science Institute
InformingScience.org

InformingScience.org/Publications

June 23 – June 28 2018, La Verne, California, United States

THE PERSISTENCE OF ANXIETY EXPERIENCED BY NEW GENERATION IN ONLINE LEARNING

Dennis Kira	Concordia University, Montreal, Canada	dennis.kira@concordia.ca
Fassil Nebebe	Concordia University, Montreal, Canada	fassil.nebebe@concordia.ca
Raafat George Saadé*	Concordia University, Montreal, Canada	raafat.saade@concordia.ca

* Corresponding author

ABSTRACT

Aim/Purpose	To investigate anxiety in online courses and its relationship with overall online courses satisfaction as it may vary with online courses experience.
Background	Delivering online courses in higher education institutions continue to increase. Anxieties seem to be persistent. Although there are many technology and internet related anxieties studies, online courses anxieties are relatively scarce. The cause for this anxiety has not been resolved or addressed sufficiently. This study takes part in this quest.
Methodology	A fully online course with not face to face interaction was used for the study. A survey methodology approach was used for the anxiety scale measurements. Over 1400 students participated in the survey.
Contribution	Students taking online courses continue to be challenged with anxieties. Their experiences (number of courses taken) with online courses may influence their anxieties and satisfaction levels, but that has not been studied. We contribute to this body of literature.
Findings	One third of students reported to continue to experience anxiety while taking their online courses. The effect of their anxieties on their satisfaction does not seem to be influenced by their online course experience.
Recommendations for Practitioners	Focus on the various elements that may influence anxieties and satisfaction of students while taking courses. For IT designers, interface and point of interactions may be the aspect to pay attention to, while professors would need to consider course pedagogy and its interaction within the IT learning environment.

Accepted by Executive Review by Editor Eli Cohen | Received: April 28, 2018 |

Cite as: Kira, D, Nebebe, F. & Saadé, R. G. (2018). The persistence of anxiety experienced by new generation in online learning. *Proceedings of the Informing Science and Information Technology Education Conference, La Verne, California*, 79-88. Santa Rosa, CA: Informing Science Institute. <https://doi.org/10.28945/4040>

(CC BY-NC 4.0) This article is licensed to you under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/). When you copy and redistribute this paper in full or in part, you need to provide proper attribution to it to ensure that others can later locate this work (and to ensure that others do not accuse you of plagiarism). You may (and we encourage you to) adapt, remix, transform, and build upon the material for any non-commercial purposes. This license does not permit you to use this material for commercial purposes.

Recommendation for Researchers	Anxiety in online learning should take front stage as it represents an underlying stream of influence on all research in the field. Further study of the effect of online course experience on satisfaction and anxiety is necessary.
Impact on Society	Anxiety in learning has many detrimental effects that last a student's career and personality over their entire life. The impact of reducing anxieties while online learning is significant and tangible especially that online learning is at its initial stages of an exponential growth and will change the world sooner than later.
Future Research	Pedagogy for efficient and effective online courses to reduce anxieties and increase satisfaction.
Keywords	anxiety, eLearning, satisfaction, online, experience

INTRODUCTION

Online courses offered by universities with no face-to-face interaction continue to increase in higher education. There seems to be relentless pressures by administration to encourage researchers, practitioners, and departments to getting on board with the purpose to increasing enrolment and realizing reduction in overhead such as physical classrooms. This, which we may call growth, is expected to continue in the foreseeable future (Ly, Saade, & Morin, 2017). Nevertheless, the online learning paradigm remains dubious. There is still no clear evidence on enhanced learning or even on how to leverage information technologies to enhance learning; meanwhile learning management systems have barely evolved in the direction of assessment of learning. There remains a lot of work to be done on information technology usage, effectiveness, satisfaction and more importantly on the negative drivers for learning via online courses. It seems that we are still in the beginning stages of making sense of online learning as many of its other complex dimensions are yet to be understood (Saadé, Nebebe, & Kira, 2015).

At the same time, it seems that despite today's digital age and the savviness of today's university students regarding their use of technological advancement such as social media, technophobia and anxiety with online courses is still persistent (Saade, Kira, Mak, & Nebebe, 2017; Yunus, Wahid, Omar, & Ab Rashid, 2016). Nevertheless, modern information technology devices and methods are increasingly being used in classes overall, and in online courses more specifically and have been embedded in curriculum and syllabuses with the aim of making teaching and learning more interactive and interesting; yet we still do not understand how these tools and technologies play a role in the learning process of students.

Continuing in the same vein of online learning anxiety research (Saade et al., 2017) we contribute herein to the body of work by studying the effect of online courses experience (OCE) on satisfaction with online courses (OCSAT) and the mediation effects on anxiety (ANX). Following Saadé and Kira (2009), Saadé et. al, 2015, and Saade et al., 2017, we view anxiety in this study as an emotion of fearfulness, apprehension, and uneasiness with lack of confidence in studying online.

Considering this definition, anxiety in the present context would not be about generalized uneasiness and apprehension of using information technology, but more specifically about the student's emotion of fear of technological related problems, apprehension of course related work which needs to be done online (very dissimilar to manual face to face), and the lack of confidence to manage the requirements for the online course with the tools and support provided – all of which the student would interpret as obtaining a lower grade in the course.

BACKGROUND & RESEARCH MODEL

Finding of studies on computer usage tend to be supportive of an intuitively appearing hypothesis that a positive attitude toward computers is associated with greater computer experience. However, previous work has also pointed out that the type of computer experiences is equally important as users' direct experience with the system in forming their computer attitude. This is especially true in the online learning context. If we consider that computer experiences with respect to an online course environment as one type of computer experience, then we should expect a different set of factors that influence the student's direct experience with the course material.

Prior research in end-user computing found that individuals with more computer experience had higher levels of computer skill, and computer experience has been shown to have a positive effect on computer attitudes and satisfaction (Colley, Gale, & Harris, 1994; McIlroy, Bunting, Tierney, & Gordon, 2001) and a negative effect on computer anxiety (McInerney, McInerney, & Sinclair, 1994). However, when it comes to online learning prior research has shown that this is not true since in this context student anxiety is not only derived from computer/internet usage and experience but from the fact of its specific use for learning where the stakes are higher.

We argue that, similarly to the relationship that exists between computer experience, satisfaction, and anxiety, experience in online learning (the number of online courses taken) would also follow the same pattern of satisfaction in an online course and anxiety while taking an online course. We expect that there are significant differences between experienced and inexperienced online students. For experienced students, there may be a stronger link between the number of online courses taken and their satisfaction and anxiety levels. The results from Saade et al. (2017) seem to suggest that. Venkatesh and Morris (2000) found that as direct experience with information technology increases over time, individuals have a better assessment of the benefits and costs associated with using that technology. This can be also true with online courses whereas direct experience with online courses increases over time, students will have a better assessment of the associated benefits and costs. More importantly, students will develop stronger learning habits and become increasingly better at taking online course, thereby seeing better grades.

Research work that studies the relationship between online courses experience and satisfaction, and the role of anxiety in mediating this relationship is scarce. Students experiencing general technophobia or in specific online courses anxieties would seem to be experiencing a combination of learning challenges and computer usage, postpone taking online courses or examinations, delay assignments and show overall lower academic achievement – exactly as reported in statistics anxiety and performance (Matthew, 2000; Macher, Paechter, Papousek, & Ruggeri, 2012). To the best of our knowledge, little is known on the relationship between online learning anxieties and online course experience and performance.

Base on the above discussion, we hypothesize that previous online course experience has a significant positive effect on student's level of satisfaction with online courses – see Figure 1.

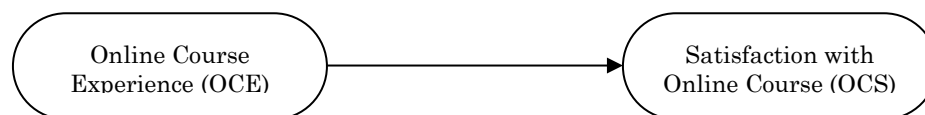


Figure 1. Effect of Computer/Internet Experience on PEU

METHODOLOGY

A survey methodology approach was used. Students from a Canadian university business school enrolled in an introductory undergraduate course were asked to complete a survey, which includes demographic information, anxiety items, and online course experience. Out of 1446 students enrolled,

one thousand three hundred and sixty-five (1365) students completed the survey with usable data. Around 32% of the students are required to take this course, while sixty-eight percent take the course as an elective. Therefore, for 32% of the students, this is a high-stakes course and may present an anxiety challenge for their learning.

The online course uses a web-based learning management system named “learning lab” (LL) designed as a project management tool for the sequencing of the activities associated with the course learning objectives. LL allows the course tasks/activities to be mapped to the learning goals.

At the end of the semester the link to the survey was enabled and students were given a period of time to complete it online. They were assured that the information they provide will be strictly confidential and used only for statistical purposes, that only the results of the statistical analysis will be used for academic and research purposes, and that the aim of the analysis is to help the online course team refine the course elements regularly and every semester.

The course was offered completely online without any face-to-face interaction with the professor or the teaching assistant. At the end of the semester, students were asked to complete the survey as candidly as possible and to the best of their knowledge. They were instructed that there were no right or wrong answers, and they were given participation points towards the course grade. Table 1 presents the survey used in this study.

Items (presented in Table 1) used to measure the constructs of anxiety (ANX) were adopted from prior research work (Saadé et al., 2015). We adapted the validated items where some wording was changed to account for the context of Learning Lab. All items were measured using a five-point Likert-type scale with anchors from “Strongly disagree = 1” to “Strongly agree = 5”.

Table1. Items and constructs used in the study.

Construct	Item	Measure
Anxiety (ANX)	ANX1	Online courses scare me.
	ANX2	I have a lot of confidence when it comes to studying online.
	ANX3	I got a bad feeling when I think of taking an online course.
	ANX4	I am anxious while taking an online course.
Demographics:		
Gender <input type="radio"/> Male <input type="radio"/> Female		
Age: [entered in textbox]		
Experience:		
What is your overall experience with online courses in general: [1: Very dissatisfied, 2: Dissatisfied, 3: Slightly Dissatisfied, 4: Neutral, 5: Slightly Satisfied, 6: Satisfied, 7: Very Satisfied, 8: It is my first online course.]		

Since the inception of this course 10 years ago, students in general were motivated to do extra work towards a better grade. Basically, extrinsically motivated to seeing that their goal is oriented towards something tangible – in this case their final grade. This would be rather suitable considering the composition of the course entailing a diverse group of students with the following regards:

- Mother tongue (Primarily English, French, Chinese, Arabic, and Spanish) presenting a complex environment for teaching and learning,
- Work (part-time = over 50% and full-time = close to 10%),
- A large number of students taking the course have not made up their mind on what to major in.

Running the course for such a long period, we continue to observe students still having anxieties while taking the online course. It is still not evident whether this is generalized anxieties caused by environmental conditions and which portion of it is contributed by the online environment. In our continuous quest to understand the underlying psychological tenets for this persistent and anti-

intuitive anxiety in online learning, we continue herein our investigation into the students' experiences of anxiety in relation to their experience with online learning.

Analysis and Discussion of Results

ONLINE COURSES EXPERIENCE & SATISFACTION

The survey data of 1365 students were analyzed using SPSS. Gender was equally distributed across the students. Table 2 presents the age group distribution of the sample used for analysis. Three quarters of the students were between the age of 19 and 22 years old. Table 2 shows the frequency distribution of student's online courses satisfaction.

Table 2. Overall experience with online courses in general

Scale	Frequency	Percent	Cumulative %
1	56	4.1	4.1
2	102	7.5	11.6
3	152	11.1	22.7
4	298	21.8	44.5
5	164	12.0	56.6
6	298	21.8	78.4
7	76	5.6	84.0
8	219	16.0	100.0
Total	1365	100.0	

Scale: 1: Very dissatisfied, 2: Dissatisfied, 3: Slightly Dissatisfied, 4: Neutral, 5: *Slightly Satisfied*, 6: Satisfied, 7: Very Satisfied, 8: It is my first online course

Note that neutral is at scale 4. From Table 2, 22.7% of the students are less than satisfied, 21.8 % are neutral, and about 39.4% are more than satisfied with the online courses. Considering the students who reported to be neutral with the experiences in online courses as a non-negative, then it can be said that over 3 quarters of the students feel that online courses are at the least not bad, of which 80% of them are satisfied with their experience(s). In our student sample 16% have reported that this course was their first online course and as such this question does not apply to them.

Table 3 presents the relationship between student online courses experiences and their overall satisfaction with those online courses.

Table 3. Effect of OCE on OCS.

Model	Unstandardized Coefficients		St. Coefficients		Sig.	
	B	Std. Error	Beta	t		
1	(Constant)	5.228	.073		71.567	.000
	OCS	-.179	.038	-.127	-4.736	.000

a. Dependent Variable: Online Courses Satisfaction (OCS)

It appears that the more experience with online courses, the less satisfied the student is with the online course (negative slope of $-.179$). This is counter intuitive as one would expect that the more online courses a student takes, the more they are expected to be satisfied with online learning in general. However, there can be situations where this negative effect is possible. Considering that as the student takes more and more online courses, their expectation to leverage the online environment and information technology increases. If this does not occur, then every new online course becomes the more boring. This is a context if all online courses are designed in the same fashion. At least, this finding begs to be further studied.

ANXIETY

Frequency analysis of the four anxiety items are presented in table 4, for ANX 1, 2, 3, and 4. The table shows the frequency analysis of the scale items from strongly agree to strongly disagree (SA=Strongly Agree; A=Agree; N=Neutral; D=Disagree; and SD=Strongly Disagree).

Table 4. Frequency of Anxiety items

	ANX1	ANX2-Rev	ANX3	ANX4
SA	9.4	5.5	8.0	7.5
A	26.3	18.9	18.1	21.7
N	39.9	39.9	37.5	38.7
D	18.9	26.3	25.1	21.1
SD	5.5	9.4	11.4	11.0
Total	100.0	100.0	100.0	100.0

ANX1: Online courses scare me.

ANX2: I have a lot of confidence when it comes to studying online.

ANX3: I got a bad feeling when I think of taking an online course.

ANX4: I am anxious while taking an online course.

Table 4 shows that 35.7% of students feel scared about taking an online course, while 24.4% of them felt otherwise reporting that online courses do not scare them. What is interesting is that close to 39.9% of the students were neutral. In relation to student confidence with studying online, and despite those that felt scared taking an online course, about 24.4% of the students agreed with being confident when it comes to studying online. Around 35.7% felt less confident to studying online even though 39.9% of the students did not feel scared about taking the online course. It is curious and even to clean that the frequency of the ANX1 is the exact as that of ANX2 even though reverse in scale. These two items seem to match perfectly indicating a strong direct and proportional relationship between being scared and confidence.

Consistent with being scared to take online courses, 26.1% of the students also felt that they have a bad feeling when they think of taking an online course. It is interesting to note that although 35.7% reported to be scared, only 26.1% reported to have a bad feeling. This indicates that from the students who are scared from online courses, around 60% of them would have a bad feeling. When it comes to asking the question of anxiety directly, 29.2% of the students reported that they are not anxious while taking the online course

Table 5 presents the frequency of the average of the four anxiety items in order to look into the aggregated consolidated anxiety as a construct. As shown in Table 5, if we consider the scale 3 as neutral, then we can assume that on the average, around one third of the students do feel anxious while taking online courses while 43% do not. This is consistent with our previous investigations on anxiety but different context. This 33% of anxiety continues to be persistent.

Table 5. Frequency of the average of Anxiety items

Scale	Frequency	Percent	Cumulative Percent
1.00	20	1.9	1.9
1.25	12	1.2	3.1
1.50	10	1.0	4.0
1.75	21	2.0	6.0
2.00	63	6.0	12.1
2.25	58	5.6	17.6
2.50	87	8.3	26.0
2.75	80	7.7	33.7
3.00	241	23.1	56.8
3.25	92	8.8	65.6
3.50	59	5.7	71.2
3.75	68	6.5	77.8
4.00	100	9.6	87.3
4.25	36	3.5	90.8
4.50	23	2.2	93.0
4.75	29	2.8	95.8
5.00	44	4.2	100.0
Total	1043	100.0	
Missing	351	25.2	
Total	1394	100.0	

ANXIETY & OVERALL SATISFACTION

In our analysis, we looked next into the effect of anxiety on overall satisfaction as a function of amount of student's experiences in online courses, namely none (Table 6), one course (Table 7), two courses (Table 8) and three courses (Table 9).

Table 6. Effect of Anxiety on Satisfaction for OCE = 0

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.424	.318		7.629	.000
	ANX	.945	.099	.399	9.553	.000

Table 7. Effect of Anxiety on Satisfaction for OCE = 1

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	2.794	.512		5.461	.000
	ANX	.717	.152	.432	4.712	.000

Table 8. Effect of Anxiety on Satisfaction for OCE = 2

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	4.255	.857		4.966	.000
	ANX	.400	.231	.267	1.728	.092

Table 9. Effect of Anxiety on Satisfaction for OCE = 3

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	1.881	.317		5.935	.000
	ANX	.912	.097	.420	9.351	.000

Looking at Tables 6 to 9 together, we report first that with OCE = 2, the relationship is not significant. For the others, the relationship is significant with the strength of the relationship being the highest for OCE = 3 at 0.912 and $t = 9.351$. However, there is no clear indication that the more students take online course, the relationship of anxiety to satisfaction changes. In other words, results seem to suggest that students' anxiety with online courses does not change their satisfaction level as they take more online courses. This calls for more investigation on the changes in anxiety levels as students take more online course.

CONCLUSIONS

This paper presents the results of an investigation that looked into student anxiety while taking online courses and their satisfaction with online courses as their experiences with online courses increases. Over 1400 students were asked to complete a survey at the end of the semester to measure anxiety, satisfaction, and experience with online courses.

Moreover, results show that even though a student takes more online courses, their satisfaction does not change with their increased experiences. This is not what one would expect and requires further investigation.

REFERENCES

- Colley, A. M., Gale, M. T., & Harris, T. A. (1994). Effects of gender role identity and experience on computer attitude components. *Journal of Educational Computing Research*, 10(2), 129-137.
<https://doi.org/10.2190/8NA7-DAEY-GM8P-EUN5>

- Ly, S. L. S., Saade, R. G., & Morin, D. (2017). Immersive learning: using a web-based learning tool in a PhD course to enhance the learning experience. *Journal of Information Technology Education: Innovations in Practice*, 16, 227-246. <https://doi.org/10.28945/3732>
- Macher, D., Paechter, M., Papousek, I., & Ruggeri, K. (2012). Statistics anxiety, trait anxiety, learning behavior, and academic performance. *European journal of psychology of education*, 27(4), 483-498. <https://doi.org/10.1007/s10212-011-0090-5>
- McInerney, V., McInerney, D. M., & Sinclair, K. E. (1994). Student teachers, computer anxiety, and computer experience. *Journal of Educational Computing Research*, 11(1), 27-50. <https://doi.org/10.2190/94D0-B0AF-NLAX-7RYR>
- McIlroy, D., Bunting, B., Tierney, K., & Gordon, M. (2001). The relation of gender and background experience to self-reported computing anxieties and cognitions. *Computers in Human Behavior*, 17(1), 21-33. [https://doi.org/10.1016/S0747-5632\(00\)00037-6](https://doi.org/10.1016/S0747-5632(00)00037-6)
- Saadé, R. G., & Kira, D. (2009). Computer anxiety in e-learning: The effect of computer self-efficacy. *Journal of Information Technology Education*, 8(1), 177-191. <https://doi.org/10.28945/166>
- Saadé, R. G., Kira, D., Mak, T., & Nebebe, F. (2017). Anxiety and performance in online learning. *Proceedings of the Informing Science and Information Technology Education Conference, Vietnam*, pp. 147-157
- Saadé, R. G., Nebebe, F., & Kira, D. (2015). Characterising Computer experience and anxieties Differences between Middle Eastern and Western students in eLearning, *Proceedings of Informing Science & IT Education Conference (InSITE) 2015*, 353-365.
- Yunus, K., Wahid, W., Omar, S. S., & Ab Rashid, R. (2016). Computer phobia among adult university students. *International Journal of Applied Linguistics and English Literature*, 5(6), 209-213.

BIOGRAPHIES



Dr. Dennis Kira is a professor at the Department of Supply Chain and Business Technology Management, John Molson School of Business, Concordia University, Canada. He has been with the school since 1983. He obtained his Ph.D. from University of British Columbia. Dr. Kira teaches System design, decision support systems, data management, data mining, Internet related programming, and e-commerce His research activities include Ecommerce, web design, distance learning, decision making under uncertainty, neural networks, machine learning, and financial modeling. Dr. Kira has published in IEEE, ORQ and management science among other journals



Fasil Nebebe (Ph.D., P.Stat.) is a Professor at the Department of Decision Sciences & MIS of the John Molson School of Business, Concordia University, Montreal, Canada. His research focuses on statistical methods using Bayesian modeling and has made contributions with results published in different areas such as small area estimation, the bootstrap, Gibbs sampling, statistical computing, regression models and simulated MLE. He has served as Managing Editor of Liaison – The Newsletter of the Statistical Society of Canada (2004 – 2007), and as President of the Statistical Society of Montreal (2002/2003). He is the founding President of SSENA (1999-2002).



Dr. Raafat George Saadé is an Associate Professor and Chair of the Department of Supply Chain and Business Technology Management. He has been teaching in the faculty since 1998. He obtained his Ph.D. in 1995 (Concordia University) after which he received the Canadian National Research Council postdoctoral fellowship, which he completed at McGill University in Montreal. Dr. Saade has published in journals such as *Information & Management*, *Decision Sciences*, *Computers and Education*, *Computers in Human Behavior*, *Decision Support Systems*, and *Expert Systems with Applications*. His research interests include the development and assessment of information systems, the supply chain of digital information products, The United Nations, IT-driven change and change management, and elearning.