

***Second language writing anxiety, computer anxiety,
and performance in a classroom versus
a web-based environment***

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Abstract

This study examined the impact of writing anxiety and computer anxiety on language learning for 45 ESL adult learners enrolled in an English grammar and writing course. Two sections of the course were offered in a traditional classroom setting whereas two others were given in a hybrid form that involved distance learning. Contrary to previous research, writing anxiety showed no correlation with learning performance, whereas computer anxiety only yielded a positive correlation with performance in the case of classroom learners. There were no significant differences across learning environments on any measures. These observations are discussed in light of the role computer technologies now play in our society as well as the merging of socio-demographic profiles between classroom and distance learners. Our data suggest that comparisons of profiles between classroom and distance learners may not be an issue worth investigating anymore in language studies, at least in developed countries.

Keywords: writing anxiety, computer anxiety, second language learning, ESL, distance learning

The role of anxiety in Second Language (L2) learning has been the focus of considerable research that soared in the 1970s (e.g., Daly & Miller, 1975, 1979; Scovel, 1978; Sieber, O'Neil, & Tobias, 1977). Over the following decades, researchers have differentiated L2 learning anxiety by skill – speaking (Phillips, 1992), listening (Vogely, 1999), reading, and writing (Cheng, Horwitz, & Schallert, 1999). Despite empirical data suggesting the contrary (e.g., Bailey, 1983; Brown, Robson, & Rosenkjar, 2001; MacIntyre & Gardner, 1994; Tobias, 1986), the majority of published studies on the effect of language anxiety have yielded negative relationships between anxiety and academic performance in foreign language learning (e.g., Aida, 1994; Bailey, 1983; MacIntyre & Gardner, 1991; Phillips, 1992; see Pichette, 2009 for an overview).

Only very recently has the study of L2 learning anxiety been expanded to include Distance Learning (DL). In a study conducted on anxiety and non-anxiety in a distance language learning environment, Hurd (2007) found that nearly two thirds of her participants (64.5%) preferred DL language courses for practical reasons, which included time flexibility and lack of mobility or proximity to the institution. Among the students who participated in the study, 35.3% preferred DL courses because they experienced reduced stress, could work alone or at their own pace, and/or welcomed the challenge of learning on their own. Hurd investigated three stages in which anxiety may be manifest – the input, processing and output stages – and found that, not surprisingly, the output stage produced the highest evidence of anxiety. As identified by other researchers (Horwitz, 2001; MacIntyre, 1999), speaking in front of others could be an important source of language anxiety. Although levels of anxiety were similar for both distance language learners four months into the course, 27% claimed that the distance factor actually made them less anxious.

In a study conducted at the same time but published later, Pichette (2009) looked at second language anxiety and distance language learning and found no significant difference in anxiety profiles between DL and classroom students. Pichette hypothesized that general foreign language anxiety should be present among distance language learners given the output-oriented nature of language courses and the expectation of oral interaction. He also found that there was a change in profiles of DL and classroom students over the last ten years, with DL students' profiles increasingly resembling those of classroom students, suggesting that anxiety may not be a differentiating factor in student profiles. The profiles of distance learners and classroom learners are merging, making it reasonable to assume that anxiety factors impacting classroom learners will also impact distance learners. Differences in anxiety profiles and expectation of fewer oral interactions are probably not the main reasons anymore for North-American students' choosing DL courses. Pichette identified several factors that

could explain lower anxiety levels among his DL participants, such as prior experience with L2 learning. Although, as mentioned by the researcher, an unfamiliar language or writing system could counterbalance the effect of prior experience with the target language, a DL writing course could be appealing to the language learner who feels anxious at the thought of speaking in front of a class. In addition, more experienced students as opposed to first-semester students tend to be less anxious, particularly in reading and writing. Pichette concludes that further study is warranted to determine whether more experienced language learners are less anxious than those learning another language for the first time, and whether there is a tendency for writing anxiety to be lower in DL. The current study addresses the second issue.

Finally, in a recent descriptive, non-correlational study conducted with 120 students in North Cyprus, Tuncay and Uzunboylu (2010) identified language anxiety and computer anxiety as reasons for students' resistance to distance learning. Therefore, among the anxiety-related affective variables shown over the last three decades to impact language learning, two are likely to exhibit different patterns of influence among students in DL and in classroom settings: writing anxiety and computer anxiety. Writing anxiety describes the dysfunctional anxiety that many individuals suffer when confronted with writing tasks. According to studies conducted by Daly and Miller (1975, 1979), writing anxiety, or apprehension as they call it, is a distinct form of anxiety, unique to written communication. It interferes not only with the development of skills, but with students' personal and professional lives as well. Coupled with other types of anxiety, such as computer anxiety, the learner may experience a disempowerment to carry out even the easiest task. Computer anxiety is a situation-specific anxiety (Heinssen, Glass, & Knight, 1987) much like test anxiety and math anxiety. As its name suggests, it is the type of anxiety learners feel when interacting with computers, or at the prospect of doing so. Given the increased presence of computers in language courses, the role played by this type of anxiety has also been the focus of considerable research in language learning (e.g., Aydin, 2011; Lu, 2005; Matsumura & Hann, 2004; Saade & Kira, 2010).

Research shows a negative relationship between various types of anxiety and academic performance (e.g., Bailey, Onwuegbuzie, & Daley, 2000; Chen & Chang, 2004; MacIntyre & Gardner, 1991; Phillips, 1992). Anxiety also has a negative correlation with motivation toward learning (Gardner, Day, & MacIntyre, 1992), and motivation is an essential variable in a learning situation. Motivation, self-confidence, and anxiety, when low, can hinder success in L2 acquisition by raising a hypothetical affective filter (Krashen, 1982) or forming a mental block that prevents the input from getting through or becoming assi-

milated. Learners who experience L2 writing anxiety will most likely avoid situations that require them to write in the second language. Such individuals may opt for the classroom course environment in response to their feelings of anxiety. On the contrary, L2 learners who may be particularly anxious about oral interaction in the target language may opt to take distance courses because DL presupposes interaction primarily in the written form. Therefore, it can be speculated that, on the one hand, distance L2 learners know that written communication is required in distance courses and opt for such courses because they are less anxious about writing than they are about speaking, and those learners who are more anxious about writing avoid DL courses.

This study examines whether relationships exist between ESL performance and these two variables: writing anxiety and computer anxiety, and whether these anxiety variables show different correlations in classroom and DL environments. Based on the above considerations stemming from earlier research, three research hypotheses were examined. First, as suggested by most research summarized above, the variables of writing anxiety and computer anxiety should be related significantly to performance in both environments. Second, as suggested by data from Pichette (2009), it is expected that writing anxiety should be lower in a DL environment than in a classroom environment. Finally, in light of the merging profiles of students in both environments and the assumed familiarity people now have with computers, there should be no difference in computer anxiety in the DL and classroom environments.

Method

Participants

The study took place at an English-speaking Canadian university. A total of 45 learners enrolled in hybrid/blended learning and classroom courses took part. The participants were adult learners of English as a second language, 12 of whom had French as their first language, 33 of whom were native speakers of other languages which included Spanish, Arabic, Mandarin, Romanian, Albanian, Ukrainian, Vietnamese and Hindi, and 28 of them reported speaking a third language, in most cases Spanish or Arabic. Their level of proficiency in English, as measured by the University's Entrance Placement Test, was low advanced, which corresponds approximately to the B2 level on the Common European Framework of Reference of Languages. Since this was the only course that lent itself to this study, having both a classroom and a hybrid version, all the students were at the low advanced level by default. Not all participants had applied for admission to the certificate program. Approximately

two thirds were considered special students, taking courses for reasons other than for obtaining the Certificate of Proficiency – English for Professional Communication. Consequently, learners were at different stages in the program ranging from first semester to last semester. Their mean age was 33 years, with a range of 22 to 57 years.

Course Formats

Students enrolled in two sections of the advanced-level hybrid/blended learning course and two sections of the classroom course called *Grammar and Writing Techniques*, voluntarily participated in this study. The course focused on a review of advanced grammatical structures, and on writing for the workplace, understanding and using appropriate grammar in context, form, content, tone, and specialized vocabulary for workplace correspondence, including e-mails, memos, and letters for specific purposes. This course was chosen to pilot the hybrid format of course delivery for a number of reasons. First, it is an advanced-level course, which presupposes that students have no trouble understanding and following instructions in English, especially since there is no instructor present during the hybrid sessions to provide immediate clarification and feedback. Second, it was easier to create a DL grammar and writing course because emphasis was placed on the written rather than the spoken word, and most of the activities were written in nature. Third, the mode of delivery did not require sophisticated software and equipment on the part of both the University and the students, and there was no need for students to acquire any additional software or hardware to take part in this course. Most activities were created using Word documents or PowerPoint presentations. Finally, assignments could be submitted by students in simple text form as email attachments, as opposed to audio and/or video files, had this course been an oral communication course.

The hybrid version consisted of eight meetings in a classroom and five online sessions. Each meeting or session totaled 3 hours of language learning. Therefore, 60% of the course was spent in class and 40% was spent online. The online sessions consisted of participating in a collaborative “Virtual Project”, a simulation in which learners co-created a fictitious organization or company and then applied for a municipal grant. Learners were paired up and asked to make their own arrangements as to how they would communicate with each other online throughout the course. Since the objective was persuasive writing, and there would be a lot of back and forth correspondence, most chose to email each other. Where there was misunderstanding or need of clarity, learners were encouraged to telephone or email each other for clarification. In

class, the same subject matter was taught using the same “Virtual Project” but with face to face contact and letter-writing instead of email-writing. The grammar that was taught in both types of courses was exactly the same. The course covered, among other things, subject-verb agreement, pronoun antecedents, misplaced and dangling modifiers, parallel structure, comma splices, fused sentences and fragments, and included a review of articles, prepositions, gerunds and infinitives.

Materials

Profile questionnaires.

The participants first completed a profile questionnaire of 11 items that allowed us to gather socio-demographic information, such as age, gender, etc., as well as information about their profile and experience as students. An additional 6-item questionnaire was given to students who chose the hybrid environment; it was designed to assess their motivation for that choice of learning environment. The two questionnaires can be found in Appendix A.

Measuring foreign language writing anxiety.

The Daly-Miller Writing Apprehension Test (WAT) (Daly & Miller, 1975) was used for measuring foreign language writing anxiety. As stated by Wiltse (2000), this test presents higher validity than comparable instruments measuring writing anxiety and yields a superior Cronbach alpha coefficient of .95. This 26-item test has been widely used to measure feelings and attitudes students may have toward and during the writing task. As other researchers have done in the past (e.g., Cheng, Horwitz, & Schallert, 1999; Pichette, 2009), the scale was adapted in this study to reflect students’ writing in English only.

Measuring computer anxiety.

Computer anxiety was assessed using the Computer Anxiety Rating Scale (CARS) developed and validated by Heijnen, Glass and Knight (1987). CARS is a 20-item, five-point Likert scale ranging from strongly disagree to strongly agree, and designed to assess a person’s level of computer anxiety. According to the three researchers, computer anxiety involves an affective response to computers that results in a resistance to or an avoidance of using computers because of fear, apprehension, intimidation, hostility, worry, and embarrassment.

Measuring performance.

Performance on the course was assessed by means of active participation in class or online activities, progress tests, assignments and a final exam. The means of evaluation were already in place for this course before it became offered in a hybrid version. Progress tests were designed to evaluate students' improvement in using grammar and new vocabulary, spotting and correcting their own errors, and combining ideas into coherent paragraphs and essays with a high degree of linguistic precision. Assignments consisted of graded essays and business correspondence. The final exam was comprised of two parts: A 300-350 word written production whose purpose was to persuade, compare/contrast, or state a cause or effect. This allowed for the evaluation of the student's ability to write a complex letter of a professional nature. The second part was a business letter that had to be written in response to a scenario. Each part of the final exam had equal weighting. Both classroom and hybrid courses had exactly the same assignments, tests and final exam. Performance for each student was in the form of a final grade in percentage points. The same person graded all assignments for both course environments. The grading scheme was the same as for previous versions of the course, attributing 60% of the grade to the Virtual Project, assignments, progress tests and participation, and 40% to the final exam.

Procedure

All the data were gathered in a similar manner. The Student Profile Questionnaires, the WAT, and the CARS were administered in class on the second week of classes. They took approximately 45 minutes to complete, and participating students were given class time to complete the questionnaires while their non-participating classmates worked on an individualized assignment.

At the end of the semester, all participants were asked to complete a standard 16-item, online course evaluation questionnaire and a 10-item hybrid course format questionnaire (if they had enrolled in the hybrid course) in one of the university's computer labs or at home. These questionnaires took between 20 and 30 minutes to complete. These questionnaires can be found in Appendix B.

Results

Before addressing our three research hypotheses, Table 1 presents descriptive statistics of the data obtained for the three variables considered in

our study. All means are in the form of percentages, followed by the standard deviation in parenthesis for each mean.

Table 1 Descriptive statistics for all three variables

	Writing Anxiety	Computer Anxiety	Performance
Regular	62.56 (4.96)	59.95 (4.60)	71.38 (10.27)
Hybrid	62.71 (4.85)	61.33 (8.93)	77.74 (7.79)

Hypothesis #1: *Writing anxiety and computer anxiety should be related significantly to performance in both environments*

A Pearson’s correlation matrix was run on the two affective variables and performance, for each learning environment separately.

As evidenced in Table 2 below, for the 24 students taking the regular grammar course taught in a regular classroom environment, the only significant correlation obtained is between computer anxiety and performance ($r = .45, p = .014$). Language anxiety did not yield a significant correlation with performance. The 19 students who opted for the hybrid version of the grammar course show a different pattern, where the only significant correlation is between the two types of anxiety but with a p value close to non-significance ($r = .42, p = .04$).

Table 2 Correlations between all three variables

Classroom environment ($N = 24$)				Hybrid version ($N = 19$)			
	Writing	Computer	Performance		Writing	Computer	Performance
Writing	1			Writing	1		
Computer	.19	1		Computer	.42*	1	
Performance	.03	.45*	1	Performance	-.01	-.30	1

* $p < .05$; ** $p < .01$; *** $p < .001$

Regression analyses were also performed with performance as the dependant variable and writing anxiety and computer anxiety as the independent variables. As evidenced in the analysis output, the F values obtained were low and no data were significant except for the previously identified relation between computer anxiety and performance for the students who took the classroom version of the course ($t = 2.30, p = .032$). For students who took the hybrid version of the course, combining both affective variables in the same regression also confirms the correlations we had obtained, with neither type of anxiety emerging as a significant predictor of performance. See Appendix C for the detailed regressions.

Hypothesis #2: *Writing anxiety should be lower in a DL environment than in a classroom environment*

Hypothesis #3: *There should be no difference in computer anxiety in the DL and classroom environments*

To investigate the presence of a significant difference between means on our various scales for our two environments, Z-tests were performed on the means presented in Table 1 with an alpha level set at .05, as is conventional in human and social sciences. The tests show no significant difference for either writing anxiety ($Z = -.10, p = .46$) or computer anxiety ($Z = -.62, p = .27$). Although these figures for computer anxiety support Hypothesis #3, those for writing anxiety do not support Hypothesis #2.

Discussion

Since there is little research that compared the impact of anxiety in a classroom versus a web-based environment, this study aimed to reach a better understanding of the subject, with the hope of identifying practices in distance learning that could be put in place to help students better deal with affective issues.

While we expected, through our first research hypothesis, that both affective variables under consideration would show correlations with language learning outcomes as reflected by course performance, only computer anxiety showed a significant correlation, and only in the case of learners who opted for the traditional classroom setting. This correlation is most likely a statistical artifact due to the limited number of participants, since there is no obvious reason why that type of anxiety would exclusively impact the performance of the participants whose learning environment shows limited use of computers. In addition, a positive correlation such as the one we obtained means that higher anxiety leads to better performance. This observation serves as additional empirical data suggesting the positive effects of certain amounts of anxiety, as was discovered in studies mentioned in the introduction of this article. Large-scale research is warranted to investigate the amount of anxiety that has either negative or positive effects on learning, and to examine anxiety- and learner-related variables that determine the nature of the effect observed.

The fact that writing anxiety does not impact performance despite the notable presence of writing in that grammar course suggests that this type of anxiety plays a lesser role on language learning outcomes, when compared to the more prevalent and oft-cited oral anxiety. A large number of participants are probably needed for writing anxiety to show a non-negligible impact on language learning, but even such possibility is purely hypothetical, since this

impact can be either positive or negative depending on the amount and the nature of such anxiety. Consequently, our correlational data for writing anxiety and computer anxiety suggest that such types of anxiety should not worry language teachers needlessly. Computer anxiety is probably still an issue among older learners who may be less familiar with computer technologies, or in countries and places where the presence of such technology may be more recent and less widespread, thus explaining results such as those obtained by Tuncay and Uzunboylu (2010).

Regarding the second and third research hypotheses, the absence of differences between students in both learning environments with regards to affective variables confirms the observation made by Pichette (2009) as to the merging of socio-demographic profiles between classroom and distance learners. An increasing number of students now combine both types of environments in their curriculum and such choices are based mainly on considerations other than of an affective nature. Such data suggest that comparisons of profiles between classroom and DL learners may not be an issue worth investigating anymore in language studies, at least in developed countries, since that would be assuming a difference between groups of learners that does not exist any longer. The absence of significant correlations in our study was important in confirming previous hypotheses, and it bears implications for future studies on affective factors in language learning, namely stressing the need here for future studies on the issues surrounding the positive or negative effects of anxiety on learning, while suggesting the irrelevance of future studies that assume differences between classroom and distance learners in developed countries. This study also highlights the importance of disseminating and publishing studies even when they do not yield significant correlations, or when they do not support the research hypotheses and/or do not contradict earlier findings, since decisions not to publish such studies prevent the scientific community from getting a complete picture of certain issues and result in a serious shortcoming for meta-analyses (see Egger & Smith, 1998; Talbot, 2011).

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APPENDIX A

Student Profile Questionnaires

1. Student's Name (or McGill Student Identification Number if you prefer)

2. Gender: __ Male __ Female
3. Occupation/Profession _____
4. Highest Level of Education _____
5. Age group (please check appropriate box)
 - 18-21
 - 22-29
 - 30-39
 - 40-49
 - 50-59
 - 60 +
6. Mother tongue/First language _____
Other Languages (spoken and/or written) _____
7. Reason for taking an English course at McGill University (please check box)
 - Professional
 - University preparation
 - Personal interest
 - Other (specify) _____
8. Do you have access to the Internet at home, at work, or at some other location?
 - YES
 - NO
9. How much time per week can you devote to homework assignments?
 - 1 hour-2 hours
 - 3 hours
 - 4 hours
 - 5-6 hours
10. What kind of learner are you? (Please check the statements that apply to you.
You may select more than one.)
 - I like to work independently.
 - I prefer to work in pairs/groups.
 - I learn through theoretical study.
 - I learn through practical application.
 - I am a visual learner.
 - I am an auditory learner.
 - I learn best when (please complete the statement)

11. Do you have any experience with any of the following? (Please check the boxes
that apply to you.)
 - WebCT VISTA
 - Microsoft Word
 - Microsoft PowerPoint
 - Chats (instant messengers)

- Discussion Forum
- Listserv (email discussion list)
- Blogs
- Pod casts
- Wikis
- Videoconferencing
- Virtual worlds (ex. Second Life)

Motivation questionnaire

To complete this questionnaire, please circle the number from 1 (Strongly Disagree) to 5 (Strongly Agree) that best corresponds to your opinion about each statement below. There is no right or wrong answer. Be as truthful as you can about each response.

Motivation towards the learning environment

1. I like online writing activities.
2. I like in-class writing activities.
3. I would rather study English in class with my instructor and classmates than study independently.
4. I like interacting with my instructor and classmates using the WebCT online communication tools.
5. I like the "hybrid" format of the course (i.e. in-class meetings every two weeks; self-instructional online modules every other week)
6. I would prefer that this course be completely online.

APPENDIX B

Hybrid Course Survey

This survey is not an evaluation of the course. It will serve to assess the impact of instructional technologies on learning. Your contribution is indispensable, and we greatly appreciate it. Please respond to the questions below by checking the box that best represents your opinion.

1. Based on your experience, does the hybrid format of the course demand more or less work than the traditional (classroom) format?	<input type="checkbox"/> more work	<input type="checkbox"/> less work	<input type="checkbox"/> just as much work
2. According to you, does a hybrid course demand more or less discipline than a traditional course?	<input type="checkbox"/> more discipline	<input type="checkbox"/> less discipline	<input type="checkbox"/> no difference
3. Does being obliged to come to class help you to discipline yourself for the online part of the course?	<input type="checkbox"/> it helps a lot	<input type="checkbox"/> it does not help at all	<input type="checkbox"/> it helps somewhat
4. According to you, is it more or less difficult to manage your time in a hybrid course?	<input type="checkbox"/> more difficult	<input type="checkbox"/> less difficult	<input type="checkbox"/> no difference
5. According to you, does a hybrid course offer more or less flexibility for the work required than a traditional course does?	<input type="checkbox"/> more flexibility	<input type="checkbox"/> less flexibility	<input type="checkbox"/> no difference
6. At the moment of selecting a course, how important is the flexibility of time that a course offers?	<input type="checkbox"/> very important	<input type="checkbox"/> somewhat important	<input type="checkbox"/> not important

7. According to you, does the hybrid course generate more or fewer exchanges between you and the other students than the traditional course does?
 more exchanges fewer exchanges as many exchanges

8. According to you, does the hybrid course generate more or fewer exchanges between you and the lecturer than the traditional course does?
 more exchanges fewer exchanges as many exchanges

9. In general, would you say that the hybrid format favours student learning?
 Yes, a lot No, not at all Somewhat

10. What format of an English writing course seems to better suit your needs and your situation?
 a traditional course a hybrid course an e-learning course

Course Evaluation Questionnaire

SUMMARY OF EVALUATION RESULTS

QUEST- NO.	VALID RESPONSES	PERCENT BREAKDOWN					STD DEPT MEAN DEV MEAN MEAN					DEPT COURSE	FIRST LINE OF QUESTION TEXT	
		1	2	3	4	5	N/A	1	2	3	4			5
Q001	6		3	3			50	50		4.5	0.5	4.2	4.2	OVERALL, THIS IS AN EXCELLENT COURSE.
Q002	6		3	3			50	50		4.5	0.5	4.2	4.2	OVERALL, I LEARNED A GREAT DEAL FROM THIS COURSE.
Q003	6			6				100		5.0	0.0	4.4	4.4	M.F. : OVERALL, THE INSTRUCTOR IS AN EXCELLENT TEACHER.
Q004	6		2	4			33	67		4.7	0.5	4.3	4.3	M.F. : OVERALL, I LEARNED A GREAT DEAL FROM THIS INSTRUCTOR.
Q005	6		1	5			17	83		4.8	0.4	4.3	4.3	M.F. : THE INSTRUCTOR PROVIDED USEFUL FEEDBACK ON MY PROGRESS IN THE COURSE.
Q006	6		2	4			33	67		4.7	0.5	4.5	4.4	M.F. : THE INSTRUCTOR WAS UP-TO-DATE WITH THE SUBJECT MATTER.
Q007	6			6				100		5.0	0.0	4.5	4.4	M.F. : THE INSTRUCTOR WAS WELL-PREPARED AND ORGANIZED.
Q008	6			6				100		5.0	0.0	4.6	4.6	M.F. : THE INSTRUCTOR RELATED TO STUDENTS IN WAYS THAT PROMOTED MUTUAL RESPECT.
Q009	6		4	2			67	33		4.3	0.5	4.4	4.4	THE GENERAL ATMOSPHERE IN THIS COURSE WAS GOOD FOR LEARNING.
Q010	6		1	5			17	83		4.8	0.4	4.4	4.3	THE COURSE OBJECTIVES WERE CLEARLY EXPLAINED AND THE COURSE CONTENT MATCHED THESE OBJECTIVES.
Q011	6		4	2			67	33		4.3	0.5	4.1	4.1	IN GENERAL, THE LEVEL OF DIFFICULTY IN THIS COURSE WAS APPROPRIATE.
Q012	6		1	2	3		17	33	50	4.3	0.8	4.2	4.2	I WOULD RECOMMEND THIS COURSE TO OTHER STUDENTS.
Q013	6			3	3			50	50	4.5	0.5	4.2	4.2	THE COURSE MATERIALS (E.G., READINGS, LECTURE NOTES, IN-CLASS EXERCISES) CONTRIBUTED TO MY LEARNING.
Q014	6		1	3	2		17	50	33	4.2	0.8	4.2	4.2	THE EVALUATION METHODS USED IN THIS COURSE WERE FAIR AND APPROPRIATE.
Q015	6		3	3			50	50		2.5	0.5	3.9	3.9	THE PHYSICAL FACILITIES PROVIDED FOR THIS COURSE WERE APPROPRIATE (E.G., CLASSROOM/LAB SP).
Q016	6		2	4			33	67		3.7	0.5	3.9	3.9	THE ADMINISTRATIVE SUPPORT SERVICES FOR THIS COURSE WERE APPROPRIATE. (E.G., TECHNOLOGY SUPPORT).

*** DEPT MEAN = Sum of all valid responses for this question in all courses in the department/number of such responses
 *** DEPT COURSE MEAN = Sum of the means for this question for all courses in the department/number of courses in the department.

APPENDIX C

Linear regressions for both environments: Performance as a function of writing anxiety and computer anxiety

Classroom environment

	<i>df</i>	<i>Sum of sq.</i>	<i>Mean sq.</i>	<i>F</i>	<i>Crit. val F.</i>
Regression	2	160.06	80.03	0.157	0.855
Residual	23	11670.60	507.42		
Total	25	11830.65			

	<i>Coeff.</i>	<i>Err. type</i>	<i>t</i>	<i>p.</i>	<i>Inf. lim.;</i> <i>p = 95%</i>	<i>Sup. Lim.:</i> <i>p = 95%</i>
Constant	101.939	75.813	1.345	0.192	-54.893	258.770
Writing anxiety	-0.065	0.921	-0.070	0.945	-1.970	1.841
Computer anxiety	-0.534	0.993	-0.538	0.596	-2.588	1.520

Hybrid environment

	<i>df</i>	<i>Sum of sq.</i>	<i>Mean sq.</i>	<i>F</i>	<i>Crit. val F.</i>
Regression	2	119.87	59.94	0.987	0.394
Residual	16	971.81	60.74		
Total	18	1091.68			

	<i>Coeff.</i>	<i>Err. type</i>	<i>t</i>	<i>p.</i>	<i>Inf. lim.;</i> <i>p = 95%</i>	<i>Sup. Lim.:</i> <i>p = 95%</i>
Constant	82.231	24.002	3.426	0.003	31.349	133.114
Writing anxiety	0.240	0.418	0.574	0.574	-0.646	1.126
Computer anxiety	-0.312	0.227	-1.405	0.179	-0.800	0.162