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Research Paper

RELIABILITY AND VALIDITY OF ACCOUNTING CLASSROOM ANXIETY SCALE (ACAS) IN THE PHILIPPINES: DEVELOPING A NEW INSTRUMENT

Abstract

In Philippine context, accounting anxiety has been rarely investigated directly for the past decades. (Borja, 2003; Bearden 2004; Malgwi, 2004; Chen, B. H., Hsu, M.-S., & Chen, M.-H., 2012); Duman, H. et.al, 2015). This research study aimed at developing a new instrument to measure accounting anxiety among accounting students. Specifically, this study aimed to analyze the reliability and validity of Accounting Classroom Anxiety Scale (ACAS), a 30-item Likert scale developed by the researchers. It employed a simple random sampling technique. A total of 155 accounting students participated in this study. SPSS package was used for statistical data analysis. Results of the mean scores revealed that item-question 17 got the lowest mean score of 2.05 and item-question 2 got the highest mean score of 4.48. Respondents got a total mean score of 3.42 (moderately anxious). Results of the reliability analysis for Cronbach's Alpha if item deleted showed a range of acceptable internal consistency with a total range α = .915 - .921. The internal consistency reliability of ACAS is α = 0.92. Results of the factor analysis revealed an appreciable factor loading = .4 up to the high factor loading = .79 construct validity. Thus, it is concluded that accounting anxiety is a specific-construct emergent in the classroom. It is recommended that academic intervention be given for accounting anxiety reduction to foster efficient and enhanced teaching and learning process.

Key words: Accounting Classroom Anxiety Scale, Accounting Students, Reliability, Validity

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Introduction

Anxiety (*angst* from the Latin *angere*) means 'to torment' (Berube et al. 1997; as cited in Bigdeli, 2010). Anxiety is a popular research issue in psychology and psychiatry (Duman, H. et al., 2015). But, it is one of the most important concepts in psychoanalytical theory that often affects negatively adult learners in teaching and learning contexts (Hall, 1954; as cited in Bigdeli, S., & Bai, H., 2009; Bigdeli, 2010). In other words, anxiety impacts adult learners adversely in specific contexts. While numerous researches focused on learning anxiety in statistics, mathematics, and computer (Malgwi, 2004; Chen, B.H., Chen, M.H., & Hsu, 2012), discussions regarding anxiety in accounting classes have been scarce. Malgwi (2004) defined accounting anxiety as "individual's apprehension or fear of accounting in terms of comprehending accounting concepts, applying economic events by completing the accounting cycle, preparing the final accounts, interpreting, analysing and communicating financial information useful for decision making". Previous studies suggest that accounting is generally regarded as a high-risk course characterized by high failure and withdrawal rates (Etter et al., 2000; as cited in Malgwi, 2004).

Recent trends and findings confirmed that accounting anxiety is a possible explanation for the decline in accounting education (Buckhaults & Fisher, 2011). For this reason, there is a dire need to explore accounting anxiety. One most important factor causing anxiety among learners in accounting education is boredom that affect learning efficacy among others (Warren, Reeve, & Duchoc, 2007; as cited in Duman, H. et al., 2015). In fact, some scholars also attempted to provide methods of intervention in reducing accounting anxiety in the learning process among students (Borja, 2003; Bearden, 2004; Buckhaults & Fisher, 2011). Accounting anxiety is a specific-construct in the classroom setting that is presently less investigated worldwide evident in previous studies (Malgwi, 2004; Chen, B.H., Chen, M.H., & Hsu, 2012), most especially in Philippine context. There is lack of empirical investigation and scientific measurement in validating accounting anxiety in specific context among accounting students. Hence, the purpose of this study is to develop a new instrument to measure accounting classroom anxiety among Filipino accounting students. Specifically, this study analyzed the reliability and validity of Accounting Classroom Anxiety Scale (ACAS) developed by the researchers. It analyzed the internal consistency for reliability and factor loadings for the validity of the ACAS.

Methodology

Research Design

This study is a quantitative descriptive-factorial research. It employed SPSS statistical analysis for the descriptive statistics on the reliability and construct validity of the self-made questionnaire Accounting Classroom Anxiety Scale (ACAS). This new instrument ACAS is developed by the researchers to measure the specific-construct accounting anxiety in the classroom setting. The researchers administered the new survey instrument among 155 Filipino accounting students from different levels (1st year – 4th year) as target participants of the study. It utilized a simple random technique. Participants of the study were oriented and given informed consent prior to answering the survey instrument. ACAS utilized a five-point Likert scale, 1-strongly disagree, 2- disagree, 3-neutral, 4-agree and 5-strongly agree to measure accurately students' accounting anxiety levels. In other words, the new instrument is deemed to measure the higher students' score, the higher they are anxious on each item in ACAS.

Developing the New Survey Instrument

ACAS is a 30-item Likert scale patterned and modified by the researchers based on Foreign Language Classroom Anxiety Scale (FLCAS), a 30-item Likert Scale developed by Horwitz, E. K., Horwitz, M. B., & Cope, J. (1986). The pattern, modification, and development of the new instrument ACAS was inspired by the findings that confirmed learning accounting process is similar to learning a foreign language for students, from which it determined reduction of anxiety to both educators and learners by way of preparing before the lesson and giving of homework (Borja, 2003; as cited in Duman, H. et al., 2015). However, this study set the parameter in measuring accounting anxiety levels among accounting students only to determine underlying anxiety factors that affect their learning process.

ACAS has undergone five (5) stages of development: 1) pattern and modification based on FLCAS, a 30-item Likert Scale by Horwitz. E. K. et al. (1986), as inspired by (Borja, 2003), 2) content validity from experts, 3) self-administration of the survey questionnaire ACAS among 155 Filipino accounting students, 4) use of SPSS statistical analysis on scale reliability test and, 5) construct validity by factor loadings.

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Results and Discussion

Descriptive Statistics of ACAS

Results of the mean scores as shown in Figure 1 below revealed that item Q17 over 30 items got the lowest mean score of 2.05 (low anxiety level) *"I often feel like not going to accounting class because I always get low scores."* while item Q2 got the highest mean score of 4.48 (high anxiety level) *"I worry about the consequences of failing my accounting class."* Respondents got a total mean score of 3.42 (moderate anxiety level) based on the set legend. Results of the study implied that even though accounting students are highly anxious about consequences of failing in accounting class, they disagree on the statement of not going to accounting class because they always get low scores. Getting low scores do not negatively affect accounting students' motivation and self-confidence in attending accounting class as shown by their low anxiety level. However, high anxiety level revealed that what they worry about are the consequences of failing their accounting class. In other words, students are highly motivated and highly confident in attending accounting class even if they are highly anxious on the consequences of failing in accounting class.

This study's findings are in contrast with the findings of Chen, B.H., Chen, M.H., & Hsu (2012) that there was a significant relationship between learning motivation and accounting learning anxiety. In other words, hospitality management students as the participants of their study were not highly motivated to study accounting subject. It was found out that as accounting anxiety decreases, self-confidence increases. Hence, the researchers observed that measuring accounting anxiety levels and understanding students' motivation and self-confidence between two set of variable participants, 1) accounting major students and, 2) hospitality major students, significantly vary in context.

Fig. 1: Item Statistics

Item-Statements	Mean	Std. Deviation	Verbal Interpretation
Q1. During accounting class, I find myself thinking about things that have nothing to do with the course.	3.1355	1.06952	Moderate anxiety level
Q2. I worry about the consequences of failing my accounting class.	4.4839	.78422	High anxiety level
Q3. I feel overwhelmed by the number of equations, rules and solutions you have to figure out in accounting class.	3.6903	.90143	Moderate anxiety level
Q4. In accounting class, I get so nervous that I even forget things I know.	3.4839	1.21332	Moderate Anxiety Level
Q5. It would not bother me at all to take more accounting subjects.	2.7290	1.14704	Moderate Anxiety Level
Q6. I never feel quite sure of myself when I am solving problems in accounting class.	3.5161	1.04667	Moderate Anxiety Level
Q7. I get upset when I don't understand my Professor's way of teaching in accounting.	3.9677	1.10147	Moderate Anxiety Level
Q8. I am usually not at ease during tests in my accounting class.	3.5677	1.05695	Moderate Anxiety Level
Q9. I start to panic when I have to solve problems without preparation in accounting.	3.9806	1.11350	Moderate Anxiety Level
Q10. I worry about making mistakes in accounting class.	3.8839	1.05039	Moderate Anxiety Level
Q11. I get so nervous over solving problems with time limit in accounting classes.	4.1613	.99664	High Anxiety Level
Q12. It makes me afraid when I don't understand the techniques of Professor in discussing problems in accounting class.	3.9806	.94985	Moderate Anxiety Level
Q13. It embarrasses me to volunteer answers in my accounting class.	3.4323	1.24848	Moderate Anxiety Level
Q14. I am self-conscious discussing the accounting problems with my classmates.	3.1806	1.14796	Moderate Anxiety Level
Q15. I keep thinking that the other students are better in getting high scores in accounting than I am.	3.6258	1.28502	Moderate Anxiety Level

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Q16. I feel more nervous in my accounting class because my Professor discusses so quickly in accounting.	3.4065	1.17715	Moderate Anxiety Level
Q17. I often feel like not going to accounting class because I always get low scores.	2.0516	1.22099	Low Anxiety Level
Q18. I am afraid other students would laugh at me when I get low scores in accounting.	2.6387	1.29376	Moderate Anxiety Level
Q19. I am afraid that my accounting Professor is ready to correct my mistakes in class.	2.4968	1.14741	Moderate Anxiety Level
Q20. I can feel my knees trembling when I'm going to be called on in accounting class.	2.8903	1.31212	Moderate Anxiety Level
Q21. The more I study for accounting subject, the more anxious I become.	2.6839	1.23664	Moderate Anxiety Level
Q22. I feel so pressured to prepare very well for major exams in accounting class.	3.7548	1.14723	Moderate Anxiety Level
Q23. I always feel that other students are better than me in accounting class.	3.6710	1.22797	Moderate Anxiety Level
Q24. I feel ashamed about solving problems in accounting in front of other students.	3.1419	1.17572	Moderate Anxiety Level
Q25. Accounting class makes me worry about getting left behind always.	3.6581	1.19218	Moderate Anxiety Level
Q26. Even if I am well prepared for accounting class, I feel nervous about it.	3.6581	1.00284	Moderate Anxiety Level
Q27. I get confused when I am solving problems in accounting class.	3.6581	.98981	Moderate Anxiety Level
Q28. My Professor's strategies in teaching accounting makes me confused always.	2.7226	.81013	Moderate Anxiety Level
Q29. I don't feel confident when I recite to solve problems in accounting class.	3.3548	1.03033	Moderate Anxiety Level
Q30. I am worried when my Professor will give unannounced quiz in accounting class.	4.0323	1.04085	High Anxiety Level

*Legend: 4.5 - 5 = Extreme anxiety level
3.5 - 4.49 = High anxiety level
2.5 - 3. 49 = Moderate anxiety level
1.5 - 2.49 = Low anxiety level
0 - 1.49 = Very low anxiety level

*Grand Mean = 3.4213 (moderate anxiety level)

Reliability of the New Survey Instrument ACAS

Fig. 2: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.921	.921	30

Results of the ACAS for Chronbach's Alpha revealed that the internal consistency reliability of ACAS is α = 0.92. This implied that ACAS is internally consistent and highly reliable since Croasmun & Ostrom (2011) recommended reliability coefficient of α = 0.70. Hence, this implies that adaptation of the scale is highly reliable in measuring anxiety among accounting and non-accounting major students for future conduct of relevant researches.

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Fig. 3: Item-Total Statistics

Item-Statements	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q1	99.5032	321.278	.408	.456	.920
Q2	98.1548	326.352	.392	.364	.920
Q3	98.9484	327.880	.287	.305	.921
Q4	99.1548	310.989	.599	.535	.917
Q5	99.9097	340.940	-.099	.220	.927
Q6	99.1226	318.810	.486	.462	.919
Q7	98.6710	323.495	.337	.392	.921
Q8	99.0710	314.105	.610	.590	.917
Q9	98.6581	318.356	.465	.541	.919
Q10	98.7548	316.602	.545	.542	.918
Q11	98.4774	319.823	.484	.552	.919
Q12	98.6581	320.084	.503	.534	.919
Q13	99.2065	311.282	.573	.611	.918
Q14	99.4581	310.938	.638	.618	.917
Q15	99.0129	309.415	.597	.680	.917
Q16	99.2323	313.959	.545	.455	.918
Q17	100.5871	317.621	.436	.447	.920
Q18	100.0000	312.039	.533	.518	.918
Q19	100.1419	317.993	.459	.477	.919
Q20	99.7484	312.826	.507	.543	.919
Q21	99.9548	311.355	.577	.518	.917
Q22	98.8839	310.610	.647	.609	.916
Q23	98.9677	309.343	.630	.712	.917
Q24	99.4968	307.265	.714	.721	.915
Q25	98.9806	305.811	.740	.696	.915
Q26	98.9806	316.837	.567	.530	.918
Q27	98.9806	314.461	.645	.590	.917
Q28	99.9161	324.921	.428	.487	.920
Q29	99.2839	314.451	.617	.613	.917
Q30	98.6065	323.383	.364	.395	.920

Results of the reliability analysis for Cronbach's Alpha if item deleted as shown in Figure 3 revealed a range of highly acceptable internal consistency with a total range α = .915 - .921. In other words, this results implied that all items in ACAS scale are internally consistent and highly reliable. Thus, no items will be removed from the scale as it passed reliability test.

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Fig. 4: Eigenvalue for Factorial Loadings

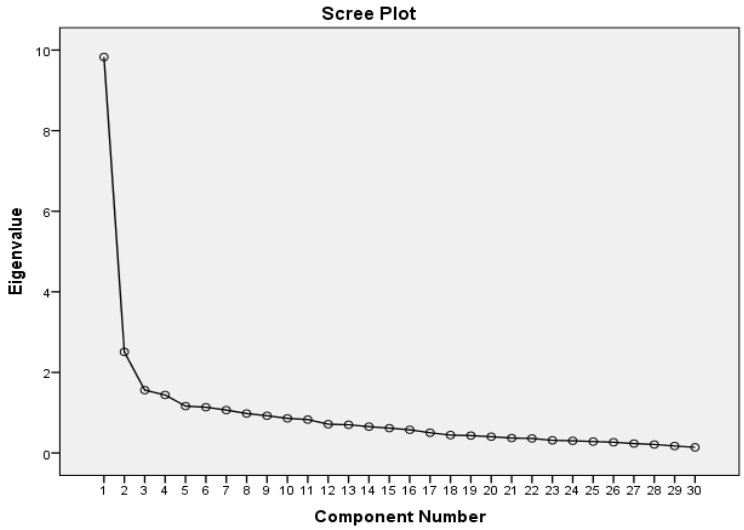

Fig. 5: Rotated Component Matrix[a]

Item-Statements	Component						
	1	2	3	4	5	6	7
Q1				.382	.355		
Q2			.532			.376	
Q3						.740	
Q4	.444	.466					
Q5							
Q6	.386	.381					
Q7		.695					
Q8		.631					
Q9		.580	.504				
Q10			.730				
Q11			.689				
Q12		.732					
Q13	.599						
Q14	.728						
Q15	.740						
Q16							
Q17				.706			
Q18	.391			.590			
Q19				.704			
Q20				.454	.429		
Q21	.455			.471			
Q22	.539		.489				
Q23	.808						
Q24	.788						
Q25	.448	.355					

Q26	.410		.394		.411		.354
Q27	.353		.368		.506		
Q28					.806		
Q29	.645				.356		
Q30		.475					.388

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.[a]
a. Rotation converged in 13 iterations.

To establish the construct validity of the ACAS, factor analysis was utilized by the researchers. According to Thompson, B. (2004), as cited in Čonková, M. (2014), factor analysis reduces large number of variables into smaller set of variables or factors, establishes underlying dimensions, allows refinement of theory and provides construct validity evidence measured by the survey questionnaire. Figure 5 presents then the Extraction Method: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization, with rotation converged in 13 iterations that revealed seven (7) factor loadings. Overall, results of the factor analysis revealed an appreciable factor loading (= .4 up to the high factor loading = .79) construct validity. Items with <0.40 were removed to establish validity of factorial loadings.

Specifically, the first factor showed ten (10) loaded appreciably (.4 −.6) out of 30 items and four (4) loaded with the highest loadings (>.7) which are indicative of *a)* accounting anxiety related to self-conscious on classmates' accounting classroom performance (items 14, 15, 23 and 24). Second factor showed six (6) loaded appreciably (.4 −.6) and two (2) loaded with the highest loadings (>.7) which are indicative of *b)* Professor's teaching strategies (items 7 and 12). Third factor showed five (5) loaded appreciably (.4 −.6) and two (2) loaded with the highest loadings (>.73) which are indicative of *c)* mistakes and time limit in solving accounting problems (items 10 and 11). Fourth factor showed four (4) loaded appreciably (.4 −.6) and two (2) loaded with the highest loadings (>.7) which are indicative of *d)* attendance in class due to low scores and mistakes rectification from the Professor (items 17 and 19). Fifth factor showed five (5) loaded appreciably (.4 −.6) and one (1) loaded with the highest loading (>.81) which is indicative of *e)* Professor's strategies in teaching that confused students (item 28). This finding is similar to the second factor analysis (items 7 and 12). Sixth factor showed one (1) loaded appreciably (.4) and one (1) loaded with the highest loading (.74) which is indicative of *f)* accounting anxiety related to solving overwhelming number of equations, rules and solutions (item 3). Seventh factor showed two (2) loaded appreciably (.4) and zero (0) or none loaded with the highest loading.

Conclusion

This research study aimed at developing a new instrument to measure accounting anxiety among accounting students. Specifically, this study aimed to analyze the reliability and validity of Accounting Classroom Anxiety Scale (ACAS), a 30-item Likert scale developed by the researchers. It was found out that the newly developed survey instrument ACAS by the researchers are both reliable and valid statistically. Findings also revealed that accounting classroom anxiety among accounting students are highly indicative of the following: a) self-conscious on classmates' accounting classroom performance (items 14, 15, 23 and 24), b) Professor's teaching strategies (items 7 and 12), c) mistakes and time limit in solving accounting problems (items 10 and 11), d) attendance in class due to low scores and mistakes rectification from the Professor (items 17 and 19), e) Professor's strategies in teaching that confused students (item 28) similar to findings on the second factor analysis (items 7 and 12), f) accounting anxiety related to solving overwhelming number of equations, rules and solutions (item 3). In sum, out of seven factors, only six (6) factors were derived from the newly developed scale in measuring accounting classroom anxiety. Thus, this study concluded that accounting anxiety is a specific-construct emergent in the classroom. It is recommended that academic intervention be given for accounting anxiety reduction to foster efficient and enhanced teaching and learning process.

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