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**COMMUNICATION APPREHENSION AND MATHS ANXIETY AS  
BARRIERS TO COMMUNICATION AND NUMERACY SKILLS  
DEVELOPMENT IN ACCOUNTING AND BUSINESS EDUCATION**

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**COMMUNICATION APPREHENSION AND MATHS ANXIETY AS  
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***ABSTRACT***

**PURPOSE:** To establish the existence of barriers to communication and numeracy skills development and to establish the levels of these exhibited by accounting and business students at the commencement of their courses in higher education.

**FINDINGS:** Identifies the existence of high levels of communication apprehension in accounting students and maths anxiety in business studies students at the beginning of their courses. An analysis of the underlying demographic variables such as age, previous educational background, etc. is also undertaken.

**PRACTICAL IMPLICATIONS:** Where high levels of communication apprehension in accounting students and maths anxiety in business studies students are shown to exist consideration must be given to relevant curriculum design and delivery, and the use of techniques designed to reduce apprehension/anxiety in the students concerned. Because the apprehension/anxiety is present on entry to Higher Education it may be that specific courses appear to be recruiting students whose perception of their

longer term vocational skills requirements may be inappropriate to their chosen career area.

ORIGINALITY: Uses questionnaires to establish the levels of communication apprehension and maths anxiety in students at the commencement of their accounting and business courses in Higher Education. Establishes the underlying factors that are influential in determining the levels of apprehension and anxiety in individual students. Identifies specific differences in the areas of communication apprehension and maths anxiety between differently focused vocational courses, which have syllabus overlap, within a business school. Suggests further research in order to explore the specific curriculum change necessary to resolve the problem.

KEYWORDS:

communication apprehension, maths anxiety, accounting education, vocational choice.

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## **INTRODUCTION**

The importance of vocational skills development has been recognised at both national and international levels. Previous reports and studies in this area (DfEE 1999) highlight two major concerns: numeracy and literacy. The accounting profession (American Institute of Certified Public Accountants 1969) has undertaken a series of studies on practitioners, academics and students and in each case the need to improve communication skills has been identified as a priority.

Accounting academics are increasingly being asked to teach accounting to students on courses that do not major in accounting (for example business studies). Given that concerns have been expressed about the numerical ability of these 'generalist' students, it is to be expected that tutors will encounter problems when teaching accounting in these areas. Techniques for the development of vocational skills are well documented in the educational literature. However, what has been less extensively researched is the existence and impact of barriers to the development of vocational skills. Potential barriers are communication apprehension (CA) which can be divided into oral communication apprehension (OCA) and written communication apprehension (WCA) and maths anxiety (MA). This study attempts to measure and contrast the levels of the apprehension/anxiety to numeric and communication skills in new accounting and business students. The implications of the findings are then discussed in terms of curriculum development and the need for further research in the area of vocational choice.

## ***SKILLS DEVELOPMENT***

There has been an increasing emphasis on the role of education as a specific preparation for the workplace. Employers and their representatives (CBI 1991, Raggart and Williams 1999) are stressing the need to develop a closer relationship between education and industry. European Governments have expressed strong views on the reform of education and training in line with employers' views (OECD 1994, 1995, 1996a, 1996b). The UK Government has overseen the development of a set of key skills and has embedded them into the national qualifications system as part of their education and training policy (DfEE 1999). Three of these key skills: application of number, communication, and information technology are seen as compulsory for most programmes of study. These key skills emanate from the demands of employers and are referred to as "transferable", "generic", "personal" or "core" and relate to an individual's ability to operate in the workplace alone or with others. Whilst some (Fryer 1997) see these key skills as central to the future life prospects of people entering the workplace, others have been more critical. Both Hyland and Johnson (1998) and Barnett (1994) have raised fundamental objections both in terms of the definition of what a skill actually is and the extent to which transferability actually exists. Green (1997) argues that the core skills approaches taken in the UK and USA are deficit models that try to make amends for inadequate schooling systems and that this compares unfavourably with general, technical and vocational approaches to education and training taken by France, Germany and Japan.

## ***THE ACCOUNTING PERSPECTIVE***

The concerns relating to vocational skills, and ultimately their impact on the employment prospects of students have been mirrored in the occupational area of accounting. In the United States of America the accounting profession itself identified the need for change and reacted to it. Relevant bodies expressed their opinions on the desired profile for an accountant (AAA, 1986; Arthur Andersen and Co., 1989; AECC, 1990; IFAC, 1994 and 1996.). There is a common framework throughout these reports: both specific vocational skills and knowledge were considered necessary in accountancy education and training and, among the skills identified in the reports, communication skills were specifically highlighted. The International Federation of Accountants, IFAC (2002), believes that the role of the Finance Manager is shifting dramatically from one of transaction manager to that of communicator and strategist. IFAC states that in order to assume these new roles, finance managers of the future will need to possess strong communication skills. Research carried out by Albrecht and Sack (2000) indicated agreement between educators and practitioners on which skills are the most important. The three most important skills identified by both educators and practitioners were written communication, analytical/critical thinking and oral communication. In response to this perceived educational need an increasing number of undergraduate and post-graduate programs in accounting are paying more attention to communication skills by integrating specifically designed development activities into their curriculum.

Empirical research into the views of practising accountants on the skills required by accounting graduates supports this view. Bhamornsiri and Guinn



(1991), Deppe et al.(1991) and Novin and Tucker (1993) surveyed partners in accounting and consulting firms to determine the importance of various capabilities. Their results suggest that communication is the most important capability. A UK perspective is provided by Morgan (1997). His survey of UK employers confirms the relative importance of communication skills and the deficiencies exhibited by accounting graduates. Specifically in the area of management accounting education, the findings of Arquero et al. (2001) identified, based on the views of employers, that priority should be given to the development of oral and written communication skills. There are also indications in Hassall et al. (2000) that accounting students themselves recognise that a skills expectation gap exists in the areas of oral and written communication skills.

### ***BARRIERS TO SKILL DEVELOPMENT***

There have been many attempts to improve the communication skills of accounting students for example Smythe and Nikolai (2002), and Ng et al (1999). Stanga and Ladd (1990) note that despite the importance of communication skills, relatively little is known about the obstacles that students face when attempting to develop their communication abilities.

Current thinking in communication has indicated a split between communication apprehension (CA) and communication development. There are indications for example Allen and Bourhis (1996), and Spitzberg and Cupach (1984) that techniques aimed at the development of communication skills will not resolve communication apprehension and that if an individual has a high level of communication apprehension the techniques will not result

in improved communication performance. Communication apprehension is a widely researched area: Payne and Richmond (1984) found nearly a thousand studies in the area. McCroskey (1984) defines CA as “an individual’s level of fear and anxiety associated with either real or anticipated communication with another person”. Richmond and McCroskey (1989) have typified CA as being “trait” or “state”. An individual’s general unease in communication situations is seen as being a personal “trait”, whereas the fear of communicating in specific situations is referred to as “state”. Individuals will exhibit both types of CA: they will have a general trait level of CA plus a state reaction to the specific context in which they are attempting to communicate. Therefore, in order for the effective development of communication skills to take place it is necessary to diminish the level of communication apprehension that an individual may feel.

Evidence put forward by Stanga and Ladd (1990), Simons, Higgins and Lowe (1995), and Fordham and Gabbin (1996) suggests that accounting students appear to have above average levels of oral communication apprehension . A study by Hassall et al (2000) indicated that in the UK and Spain there were significant differences in OCA between accounting and business studies students. Aly and Islam (2003) conducted a longitudinal study that found no significant differences in the levels of CA in students entering and leaving an accounting course. This points to a potential deficiency in the communication skills levels of accounting graduates and the need to review current models of skills development within accounting courses.

There is evidence (Zanakis and Valenzi (1997), and Richardson and Suinn (1972)) to suggest that business studies students have problems related to

maths anxiety. Richardson and Suinn (1972) have characterised maths anxiety as “Feelings of tension and anxiety that interfere with the manipulation of numbers and the solving of mathematical problems in a wide variety of ordinary life and academic situations” (Richardson and Suinn 1972, p551). Several studies have documented the negative effects of maths anxiety on maths performance and achievement (Betz, 1978; Brush, 1978; Dreger and Aitken, 1957; Gaudry and Spieberger, 1971; Suinn, Edie, Nicoletti and Spinelli, 1972; Wigfield and Meece, 1988). Dew, Galassi, and Galassi (1983), Fox (1997) and Alexander and Matray (1989) found evidence of gender differences in the levels of math anxiety reported by students. A distinction has been drawn by Rounds and Hendel (1980) between anxiety concerning maths and an anxiety concerning the testing of maths.

Tutors may therefore face two separate problems. When teaching accounting students the problem could be how to overcome issues associated with communication but when teaching non-accounting students the problem could be related to numeracy.

The studies mentioned above have reported high levels of communication apprehension in accounting students and high levels of maths anxiety in business studies students. The purpose of this study is to measure the levels of communication apprehension and maths anxiety in students immediately before they undertake their chosen courses at university.

## ***RESEARCH METHOD***

In order to assess the levels of communication apprehension for this study, an instrument was designed that incorporates the Personal Report of

Communication Apprehension (PRCA-24) developed by McCroskey to measure OCA, and the WCA instrument devised by Daly and Miller (both instruments can be found in Simons et al., 1995). The resulting instrument consists of a 48-item questionnaire to be responded to on a 5-point Likert scale. The questions were split equally between writing and oral communication items. The oral communication items were grouped into 4 equal subsections that assigned 6 questions each to “presentations”, “interviews”, “group discussions” and “conversations”. This is illustrated in Appendix 1. The measurement of the levels of mathematics anxiety was done using the 25 item Math Anxiety Rating Scale (MARS) developed by Alexander and Martray (1989) from the 98 item MARS of Suinn (1972).

The questionnaires were administered to first year students about to enter the accounting and business courses at XXXXX University in the UK. The students completed the questionnaire on their first or second day at the University i.e. before any formal teaching had commenced or any information had been given to the students concerning the academic content of their chosen courses.

The numbers of responses from the students and their respective courses are shown in Table I.

#### **Take in Table I: Areas of study**

Table II shows the gender distribution of the students.

#### **Take in Table II: Gender**

The gender balance in accounting is more male orientated whilst in business studies students there is an almost equal male/female split.

The students were asked to indicate if their previous educational background had in their view been predominantly numerate/scientific or literate/arts. The results are shown in Table III.

**Take in Table III: Educational background**

The respective responses show that a high percentage of the accounting students consider themselves to have a numeric/scientific background whilst the business studies students tend to come predominantly from a literate/arts background.

***RESULTS***

In order to see if lecturers need to be aware of the possible differing hurdles they will face when teaching on various programmes, the levels of apprehension and anxiety for the new student cohorts to the accounting and business studies degrees were analysed and compared. The results are shown in Table IV.

**Take in Table IV: CA and MA scores by specific course**

The students preparing to undertake an accounting degree have a significantly higher level of writing apprehension than their business studies counterparts. There is no significant difference in the levels of communication apprehension relating to oral communication (OCA) although in each case the accounting students recorded higher scores. The students preparing to undertake a degree in business studies recorded significantly higher scores for maths anxiety than the accounting students.

The population statistics indicated that the accounting students were predominantly males and had principally a numerate/scientific educational background. Conversely, business studies entrants were predominantly from a literate/arts background. Tables V and VI show the CA and MA scores for the accounting and the business studies students split by gender respectively.

**Take in Table V: CA and MA scores by Gender for accounting students**

In general, the female accounting students recorded higher scores than the males but the only area in which there is a significant difference is for communication apprehension in formal situations. This is in agreement with previous research: Hassall et al (2000) reported that females are significantly more apprehensive than their male counterparts in formal situations.

**Take in Table VI: CA and MA scores by Gender for business studies students**

The only significant difference of the gender analysis for business studies students is that females have significantly higher levels of maths anxiety. Similar to the accounting students, in general the females recorded the higher scores except interestingly for writing apprehension.

The effect of previous educational background on the apprehension and anxiety of accounting and business students are shown in tables 7 and 8.

**Take in Table VII: CA and MA scores by educational background for accounting students**

Accounting students from a literate/arts educational background recorded significantly higher levels of maths anxiety than their numerate scientific counterparts. This is however not reversed in terms of communication skills

where it could have been expected that the numerate students would have had higher levels of apprehension.

**Take in Table VIII: CA and MA scores by educational background for business studies students**

Business studies students from a literate/arts educational background recorded a significantly higher level of maths anxiety than their numerate/scientific counterparts. In this case there is a reversal; students with a numerate/scientific recorded significantly higher levels of writing apprehension than students from a literate/arts background.

***DISCUSSION AND WAYS FORWARD***

There is clear evidence that at both national and specific vocational levels there are concerns about numeracy and communications skills. Research has indicated that in both of these areas there are barriers that restrict skills development and inhibit academic performance. Research studies indicate that communication apprehension and maths anxiety are barriers to skills development in their specific areas and can therefore restrict academic performance and achievement. The first year intakes to courses at XXXXXX University were questionnaired prior to contact with academic staff. The results show that the students recruited to these different courses had significantly different levels of communication apprehension and maths anxiety. Previous studies and the current research both show that gender and educational background are influencing factors.

Previous studies (Stanga and Ladd (1990), Simons, Higgins and Lowe (1995), and Hassall et al (2000)) have indicated that accounting students are

recognised as having comparably high levels of communication apprehension. The results of this study infer that the apprehension is not initiated by accounting courses but it is present in students when they enrol onto an accounting course. This is an area worthy of further exploration. What can be done to help accounting students with high levels of communication apprehension? A longitudinal study following and recording individual students might enable the identification of critical incidents that lowered individual levels of apprehension. These critical incidents could then be considered in terms of their general applicability for the broader student body. In the area of teaching to non-accounting accounting students, accounting academics are teaching a group that have comparable levels of initial oral communication apprehension and slightly lower levels of writing apprehension. However, this group has significantly higher levels of maths anxiety and this will need to influence curriculum design delivery and assessment.

Further research is also needed into the determinants of vocational choice for accounting and business degrees. How are the students' perceptions of accounting and business as a career developed? What factors influence this choice of vocational area? Why is accounting attracting the type of students it currently attracts, who in certain respects, as evidenced by their self reported levels of communication apprehension, can be seen as being unsuitable for the future demands of their chosen career? The need to identify the factors that determine vocational choice in attracting students to careers in accounting is important given the mismatch between the accounting professions view of communication skills requirements and those of potential



students. It is important to explore ways of correcting this apparent mismatch not only for its implications for teaching learning and assessment but also in terms of its implications for the future development of the accounting profession.

The implications for accounting academics are important in terms of curriculum development not only for their own accounting degrees but also in terms of their input into other courses.

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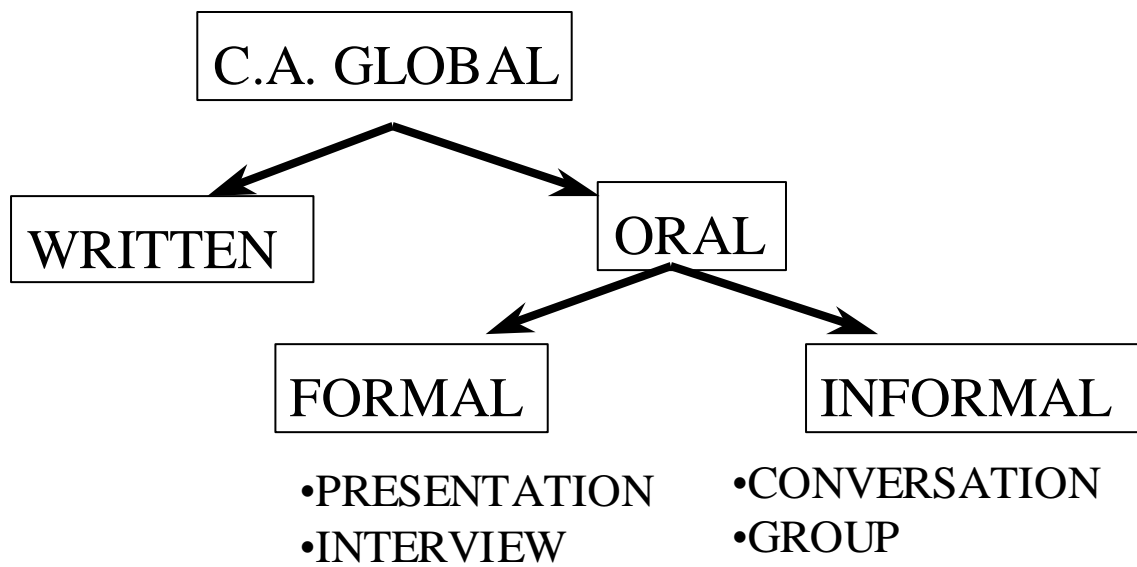
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APPENDIX 1.



**Table I: Areas of study**

	Number	%
Business Studies	178	61.6
Accounting	111	38.4
Total	289	100.0

**Table II: Gender**

	Male	Female
Business Studies	50.6%	49.4%
Accounting	63.1%	35.9%



**Table III: Educational background**

	Numeric/scientific	Literate/arts
Business Studies	38.8%	61.2%
Accounting	73.6%	26.4%

**Table IV: CA and MA scores by specific course**

	<b>Course</b>	<b>Mean</b>	<b>Sig T-Test</b>
<b>Writing apprehension</b>	Business studies	65.26	0.05
	Accounting	68.08	
<b>Oral apprehension</b>	Business studies	67.62	N.S.
	Accounting	68.72	
<b>Formal</b>	Business studies	38.51	N.S.
	Accounting	38.36	
<b>Informal</b>	Business studies	29.12	N.S.
	Accounting	30.36	
<b>Maths anxiety</b>	Business studies	59.56	0.00
	Accounting	52.26	

**Table V: CA and MA scores by Gender for accounting students**

	Gender	Mean	Sig T-Test
Writing apprehension	Male	67.73	n.s
	Female	68.68	
Oral apprehension	Male	67.31	n.s
	Female	71.12	
Formal	Male	37.13	0.02
	Female	40.46	
Informal	Male	30.19	n.s
	Female	30.66	
Maths anxiety	Male	51.42	n.s
	Female	53.74	

**Table VI: CA and MA scores by Gender for business studies students**

	Gender	Mean	Sig T-Test
Writing apprehension	Male	66.67	n.s.
	Female	63.82	
Oral apprehension	Male	66.63	n.s.
	Female	68.64	
Formal	Male	37.80	n.s.
	Female	39.23	
Informal	Male	28.83	n.s.
	Female	29.41	
Maths anxiety	Male	57.11	0.030
	Female	62.21	

**Table VII: CA and MA scores by educational background for accounting students**

	<b>Educational background</b>	<b>Mean</b>	<b>Sig T-Test</b>
Writing apprehension	Numerate/scientific	69.99	n.s.
	Literate/arts	65.11	
Oral apprehension	Numerate/scientific	68.51	n.s.
	Literate/arts	70.21	
Formal	Numerate/scientific	38.29	n.s.
	Literate/arts	39.18	
Informal	Numerate/scientific	30.22	n.s.
	Literate/arts	31.04	
Maths anxiety	Numerate/scientific	49.91	0.011
	Literate/arts	58.65	

**Table VIII: CA and MA scores by educational background for business studies students**

	<b>Educational background</b>	<b>Mean</b>	<b>Sig T-Test</b>
Writing apprehension	Numerate/scientific	68.44	0.003
	Literate/arts	63.10	
Oral apprehension	Numerate/scientific	66.48	n.s.
	Literate/arts	67.90	
Formal	Numerate/scientific	37.61	n.s.
	Literate/arts	38.86	
Informal	Numerate/scientific	28.88	n.s.
	Literate/arts	29.05	
Maths anxiety	Numerate/scientific	55.33	0.003
	Literate/arts	62.06	