



WCES-2011

Validating the instrument of study anxiety sources using factor analysis

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Abstract

Anxiety can be referred as an underlying source of students' fears during their study process. Several researches have proposed and identified the anxiety sources among students. However, not many proposals are concerned on validating the instrument of study anxiety sources. In this paper, the validation of the instrument of study anxiety sources is described. For identifying study anxiety sources, a total 300 students of University Malaysia Pahang (UMP) participated in this survey during second semester in the academic year 2008/2009. Findings from 7 dimensions in identifying of study anxiety sources show that all items had achieved validity as analysed by factor analysis. These sources are exam anxiety, presentation anxiety, mathematics anxiety, language anxiety, social anxiety, family anxiety, and library anxiety. Since, the Cronbach alpha of reliability was acceptable, it can be concluded that the associations of students feeling, thought, and experiences toward study anxiety sources support the validity of the instrument.

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Keywords : Factor analysis; Validity; Study anxiety; Student.

1. Introduction

The negative feelings associated with the students searching for information at some point have been identified as sources of study anxiety. Researchers suggest that anxiety are underlying sources of students' fears and anxieties in the study process such as exam anxiety (Cassady and Johnson, 2002; Sangsiry *et al.*, 2006; and Pecoraro, 2006), language anxiety (Horwitz, 2007; and Ying, 2008), mathematic anxiety (Idris, 2006; Erden and Akgul, 2010; and Vitasari *et al.*, 2010b), social anxiety (Purdon *et al.*, 2001; and Cooley, 2007), presentation anxiety (Brenda and Tillson, 2007), family anxiety (Uwaifo, 2008; Susan and Margareth, 2005), and library anxiety (Qun and Anthony, 2002; and Carlilie, 2007). Previous research found different types of anxiety among students (Anderson, 2007; Ohata, 2005; Pan and Tang, 2005; and Chen *et al.*, 2002). There are seven possible sources that can create study anxiety among university students (Vitasari *et al.*, 2010a). The main sources of study anxiety include exam anxiety, social anxiety, presentation anxiety, mathematics anxiety, language anxiety, family anxiety, and library anxiety (Vitasari *et al.*, 2010). These sources are actually related to one another. Presentation anxiety and language anxiety occurs especially when one is required to give a class presentation in a foreign language (Vitasari *et al.*, 2010). Family anxiety and social anxiety are related to childhood experiences that is carried out into the social life

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(Elizabeth, 2003), exam anxiety and language anxiety are experienced by students in the learning process and at tertiary institutions (McCraty *et al.*, 2000). Based on the previous researches, not many proposals were concerned on validating the instrument of study anxiety sources.

In this paper, the validations of the instrument of study anxiety sources are described. A total 300 university students participated in this survey during second semester. This study began with a proposal to develop a questionnaire to classify the possible sources of study anxiety. Findings for 7 dimensions in identifying of study anxiety sources show that all items had achieved validity as expected by factor analysis. These sources are exam anxiety, presentation anxiety, mathematics anxiety, language anxiety, social anxiety, family anxiety, and library anxiety. Furthermore, since Cronbach alpha of reliability was acceptable, then we can conclude that the associations of students' feeling, thought, and experiences toward study anxiety sources support the validity of the instrument.

The rest of this paper is organized as follows. Section 2 describes the sources of study anxiety. Section 3 describes the method. Section 4 describes result and discussion. The conclusion of this study is presented in section 5.

2. The Sources of Study Anxiety

The identification of study anxiety sources is important so as to understand the possible sources that create anxiety during study. A study found a significant correlation of high level anxiety and low academic performance (Vitasari *et al.*, 2010c). The possible sources of study anxiety are presented below.

2.1. Exam Anxiety

Exam anxiety is the utmost research concerned in studies. Students feel anxious when taking exam and as a result their brain may cease to function effectively. Previous study on exam anxiety found that there is an apparent relationship between emotionality and exam performance. Emotionality impact on exam performance only emerges under situations where the individual also maintains a high level of cognitive test anxiety (Cassady and Johnson, 2002). Exam anxiety basically is rooted in some type of fear such as fear of failure, lack of self confidence, fear of blanking out in a test, poor time management or study habits, lack of organization, and concern over how test results will have an impact on their future plans. According to Sansgiry *et al.* (2006) exam anxiety is a major predictor of academic performance and various studies have demonstrated that it has a detrimental effect. Sometime exam anxiety is likened to a lack confidence or low self esteem. Pecoraro (2006) reported that a student who is not well prepared for examination may have higher levels of task-interfering worry during examination than those who are better prepared.

2.2. Language Anxiety

Language study is one of study anxiety sources, and hence has an effect on students' academic performance (Horwitz, 2007). According to Worde, half of students examined reported experiencing debilitating levels of language anxiety (Ying, 2008). Researchers reported that students who experienced language anxiety showed high score in foreign language anxiety and test anxiety due to the feeling of worried about failing (Hizwari *et al.*, 2008). MacIntyre observed that language anxiety is a form of specific anxiety experienced in a particular foreign language context (Ying, 2008). Horwitz (2007) claim that language anxiety is a unique type of anxiety specific to foreign language, and that there is a great deal of language anxiety in aspects such as speaking, listening, writing, and reading. Similarly, Horwitz (2007) conceptualized foreign language anxiety as a distinct complex of self perceptions, beliefs, feelings, and behaviour related to classroom language learning. With a different perception, Ying (2008) mentioned that language anxiety is caused by (a) personal and interpersonal, (b) learner beliefs about language learning, (c) teacher belief about language anxiety, (d) teacher-learner interactions, (e) classroom procedures, and (f) language testing.

2.3. Mathematics Anxiety

Mathematics poses a potential source of study anxiety among students, many of whom are observed to have a fear or even a dislike toward mathematics. Anxiety response to mathematics is a significant concern in terms of the perception that high anxiety will relate to avoidance of mathematical tasks (Anderson, 2007; and Furner *et al.*, 2003). A study among university students found that high mathematics anxiety is correlated with poor performance in mathematics courses (Erden and Akgul, 2010). A prior study reported that low mathematics achievement is significantly related to a high level of anxiety later, but prior high mathematics anxiety is hardly related to low

mathematics achievement (Ma and Xu, 2003). Mathematics is one of the fundamental skills an individual of modern societies require in sustaining their daily life, Finding it difficult in coping with mathematics possibly increase anxiety toward mathematic (Erden and Akgu, 2010). For some students having to spend high levels of concentration means that mathematics is a difficult subject for them. Mathematics anxiety was manifested into five dimensions for engineering students namely; (a) feeling mathematic is a difficult subject, (b) always failing in mathematics, (c) always writing down during mathematics class, (d) feeling anxious if they don't understand, and (e) losing interest on mathematics (Vitasari *et al.*, 2010b). Generally, students' fear of mathematics is because it is one of the difficult subjects involving calculations.

2.4. Social Anxiety

Social anxiety causes individuals to feel fear of social situations. People tend to assume that if they feel anxious in a social situation, it is because they are not performing well (Pardon, 2001). Previous studies have found symptoms of social anxiety as a sign of weakness, incompetence, mental instability, stupidity, and leading to humiliation or embarrassment which is a cardinal feature of social anxiety and accounts for much of the negative self-evaluation in social situations reported by social phobic individuals (Purdon *et al.*, 2001). Another opinion cited by Alden in Purdon *et al.* (2001) is that individuals with social phobia also have a tendency to exhibit social anxiety symptoms. Studies of the negatively perceived symptoms of social anxiety within the general population might be helpful in treating the anxiety. Social anxiety can also be seen in students with special needs as they are more likely to face this anxiety due to the low self-confidence they feel about being a rarity (Cowden, 2010). Symptoms of social anxiety often vary among students (Cooley, 2007).

2.5. Family Anxiety

The family has been recognized as having a lot of influence on the academic performance of students (Uwaifo, 2008). Family factors have contributed to the development of anxiety disorders among students such that children of parents with anxiety disorders have an elevated rate of anxiety disorders (Susan and Margareth, 2005). Individuals who never leave home tends to exhibit separation anxiety disorder when they suddenly are faced with the prospect of spending time away from home (Elizabeth, 2003). Also, cases like divorced parents, family problems, family pressure, childhood experiences, and low appreciation of students' achievement also affect academic performance (Susan and Margareth, 2005). The anxiety experienced from within the family component can cause a family member to experience anxiety; such experience are family dissatisfaction of a child's academic performance, financial problem, as well as family size have significance consequences for student life. As a result of these factors that create family anxiety, students do not have not sufficient exposure to the kind of education and experience that would more likely promote a positive feeling about the family problems. Hence, the family background affects students' reaction to anxiety.

2.6. Presentation Anxiety

Presentation anxiety is the fear experienced by students when giving presentation in class. Anxiety associated with giving presentation is an issue faced by university students as it occurs with reasonable frequency (Elliot and Joyce, 2004 and Stephanie, 2001). Performing in front of a group of other students, colleagues and lecturers is a difficult part of the students' experience and speaking in public can frighten some students (Anna and Marion, 2008). Presentation is considered to be of paramount importance to students, but Horwitz (2007) cited that the anxiety among students can lead to avoid studying and in some cases skip classes entirely. According of Krannich in Brenda (2007) the fear of delivering a speech or presentation ranks as the number one fear among most people, including students. Bishop reported that 35% of the students surveyed were identified as having public speaking anxiety (Elliot and Joyce, 2004).

2.7. Library Anxiety

Every student is required to use the library at some point in his study. The term library anxiety was first used by Mellon in 1986 to describe the sense of fear and anxiety using the library among students (Carlile, 2007). Library anxiety was as negative feelings toward using the academic library. Library anxiety is one of the psychological barriers that encounter students when they are performing a library task (Abusin and Zainab, 2010). A previous study reported that 75% to 85% of undergraduate students experience uncomfortable cause of library anxiety (Qun and Anthony, 2002). Library anxiety is also defined as a negative experience characterized by excessive worry, self defeating thoughts, fear, tension and physiological arousal that arises during the typical library task cycle (Ansari, 2009). The theory of library anxiety proposed that when students are confronted with the need to gather information in the library, many become so anxious that students are unable to approach the problem logically and effectively

(Carlile, 2007). Library anxiety is an obstacle to academic success among students (Ansari, 2009). In general, compared to low anxiety students, high anxiety students often have low self perception about their ability to use the library effectively. The phenomenons of library anxiety do exist in Malaysian academic environment (Ansari, 2009).

3. Method

Method used in this paper includes description of participants, instrument materials, and process to collect data. Explanation of the method was presented as follows

3.1. Participants

A total of 300 students were consisting of 114 males and 186 females. The participants were the first year students of second semester in the academic year 2008/2009. They were undergraduate students from five engineering faculties of Universiti Malaysia Pahang. The demographic profile of the participants was on gender, age, and faculties.

3.2. Materials

This instrument was used to identify the sources of study anxiety among students. That was developed based on prior research, observations, and results in terms of anxiety among students. There are forty items in the questionnaire and for each item there were five scales: one (never), two (almost never), three (undecided), four (fairly often), and five (very often). After the questionnaires were completed, each item was analyzed and the score can be considered as nominal data.

3.3. Process

The survey was conducted in the classroom, with 25 to 30 respondents per class, took approximately five weeks to complete the data collection. The students first read the survey questionnaires, and if they did not understand any question, the researcher was at hand to explain the question. The students were asked to answer basic questions related to their feelings, experiences, thoughts and anxieties associated with their studies and academic performance

4. Results and Discussion

The study anxiety has seven sources that were possible among students. A total 300 students were examined to validate the instrument. The results show demographic profile of participants, validation of each sources, and reliability score. The analysis of data used SPSS data analysis with factor analysis to construct the validation.

4.1. Demographic profile of Participants

The participants were categorized based on gender, age, and faculties. The demographic was show for gender (38% male and 62% female), age of participants average 18-26 years old, and faculties (22% for FKKSA, 23% FKASA, 23% FKKEE, 21% FKM and 11% FKP).

4.2. Validation of the questionnaire

The objective of the questionnaire survey was to identify sources of anxiety since by knowing them it will be easier to further conduct treatment to reduce the anxiety level of students and to improve their academic performance. Factor analysis was used to test the validity of the questionnaire, and those items with score < 0.3 were removed. All items shows $KMO = .806$, Bartlett's test of sphericity = $.000$, and Cronbach alpha yield $.897$.

The results were presented in table 2. Consequently of the results, it was not necessary to change the items of the questionnaire. The previous study found a large number of sources of anxiety, especially when the students were notified of coming examinations.

Table 2. Confirmatory Factor Analysis of Study Anxiety Questionnaire ($N=300$)

Sources	Items	Item deleted	Cronbach alpha	KMO score	Bartlett's test
Exam anxiety	7	-	.740	.804	.000

Language anxiety	5	-	.727	.781	.000
Mathematics anxiety	5	-	.734	.796	.000
Social anxiety	7	-	.771	.820	.000
Family anxiety	5	-	.710	.743	.000
Presentation anxiety	5	-	.808	.821	.000
Library anxiety	6	-	.807	.831	.000

The results are consistent with that Nunnally finding (1978), that recommended the instruments used in basic research must have a reliability of Cronbach Alpha score .70 or better. Test Validity interpretation of the correlation between items (KMO score) according to Sekaran (2003) must be ≥ 0.30 , and Bartlett's test of sphericity must be significant. The instrument was consistent for validation and reliability, respectively.

5. Conclusion

The negative reaction associated with the source of anxiety during study usually involves contact with the student at some point. In this paper, we have tested the validation of the instrument to identify study anxiety sources. Findings for 7 dimensions in identifying of study anxiety sources show that all items achieved validity as expected by factor analysis. Furthermore, those items with score below 0.3 were removed. All items shows KMO = .806, Bartlett's test of sphericity = .000, and Cronbach alpha of reliability was acceptable with .897. Based on these results, the relative feelings, thoughts, and experiences toward study anxiety sources support the validity of the instrument. The instrument was acceptable and suggested as a relevant criteria for related studies.

Acknowledgement

This work was supported under the research grant No Vote 070144, Universiti Malaysia Pahang, Malaysia.

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