Cross-country comparisons of student stress source

Horng-Jinh Chang, Whe-Min Wang

Abstract—This study investigated level and sources of stress among university students in the districts of Taiwan, NZ, and USA. The study was a cross sectional survey and the population comprised convenient samples. A questionnaire was designed by the researchers and validated through expert judgment. The data collected were analyzed using mean, standard deviation, and ANOVA for the research questions. The results indicated extracted factors are different in three countries, the degree of attention according to communication with teacher, teachers' feature, academic feature, anxiety, employment and social context. Students feel depressed when they confront with stress and that will deter their learning. In the research we traced the source of stress and made comparison among three countries, finding out possible solution and giving some suggestions for the future application.

Keywords— Classroom Assessment, Psychological Measurement, Pressure, Teachers.

I. INTRODUCTION

SOURCES of stress experienced by university students have been noticed for years in Taiwan. Ji and Zhang [9] found the positive correlation between study conditions and mental stresses of college students. An online survey by Votta and Benau [26] found that academic concerns were a primary source of stress. Another research [11] indicated that secondary school students had a medium level of stress and the significant sources of stress included academic, intra-personal and environmental. An investigation by Beiter et al. [24] indicated that the top three concerns were academic performance, pressure to succeed, and post-graduation plans.

Is it a unique phenomenon in Taiwan? Or it is a universal problem? It is necessary to make a comparison across nations for understanding the difference between oriental and western world. From 2013 to 2015, we executed a series of students' psychological stress survey. The study analyzed data from three countries, including Taiwan, New Zealand, and USA. There were 358 participants from Taiwan, 117 participants from New Zealand, and 114 participants from USA.

To investigate students' reaction of classroom learning, the questionnaire was designed by Chang [10]. The questionnaire consists 60 items which include communication with teacher, teachers' feature, academic feature, anxiety, employment and

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social context. In this research, the objectives are identifying important stress source of university students, and comparing the difference among three countries.

II. LITERATURE

A. Stress

Stress is defined as the body's non-specific response to demands made upon it, or to disturbing events in the environment [19]. Personal and environmental events that cause stress are referred to as stressors [27]. Kohler, Munz, and Grawitch [12] proposed the interaction dimension of stress and indicated that in this interaction, demands, limitations and opportunities related to work may be perceived as threatening to surpass the individual's resources and skills.

B. Stress Source

A variety of stress sources is studied by researchers. Cheng [17] summarized the sources of stress as physical/mental factor, family factor, school factor, relationship factor, and social factor. Ji and Zhang [9] indicated four sources of stresses, namely employment situations, study conditions, personal factors, and economic conditions. Akande, Olowonirejuaro, and Okwara-Kalu[11] defined the sources of stress as interpersonal, intra-personal, academic and environmental.

C. Teacher

In the classroom, we need qualified teacher to provide high-quality education to all students [20]. Talking about the development process of young generation, teachers always played a very important role [13]. Also, Jim [14] proposed teacher's role, should be: (1) A diagnostician (found in the students' needs and interests), (2) A Planner (selection of materials, courses or class method). (3) A manager (management and activities of students during school hours).

D. Classroom assessment

Assessment is probably the most important thing we can do to help our students learn [7], as Mr. Black, Paul.[4] mentioned in his book "Inside the Black Box", improving formative assessment raises student achievement, it helped teachers change their practice and students change their behavior so that everyone shares responsibility for the students' learning.

E. Education

Mr. Zheng Shiyan [5] said: "Education should include the following goals: to develop good attitudes, self-development,

from the creation, know yourself, develop relationships, and cultivate emotions, imagination and gaining capabilities". Perry Jr [22], talking about education: A path from adolescence into adulthood is mapped from the accounts of college students. The evolution in students' interpretation of their lives is seen and understood through changes in the" forms" in which they conceptualize the issues they face. Also Geoffrey Walford [8] in his "Education Policy" mentioned: They focus on key issues with broad relevance to social scientists such as access, interviewing, data restrictions, ethical dilemmas and the role of theory.

F. Psychology analysis

In this research, we searching for factors influenced students' mental ability. Rucker, Derek D[28]., pointed out: " A key aim of social psychology is to understand the psychological processes through which independent variables affect dependent variables in the social domain". Also Ashmore, Richard D [2], mentioned: A Critical Analysis of Central concepts covers the thoughts, feelings, and behaviors of individuals in social interaction.

III. METHOD

The participants came from 3 countries. In Taiwan, 212 students of Oriental Institute of Technology and 146 students of Asia University completed the questionnaire. One hundred and seventeen university students in New Zealand and 114 university students in USA participated in this survey. A face-to-face survey was applied to collect the data. The participants were asked the likelihood of stress source.

The psychology scale developed by Chang [10] was applied to measure stress source. This instrument includes communication with teacher, teachers' feature, academic feature, anxiety, employment and social context. Each dimension has 6 to 7 questions of multiple choices anchored on 7 being the most intense stress and 1 would be having no stress

at all.

To test reliability and validity, first, we examined KMO value shown in Table 1. According to Kaiser & Rice [15], KMO value between 0-1, when KMO value gets bigger, it means that more communalities between variables, so it is suitable for processing factor analysis.

In Table 1, all three countries' KMO value are greater than 0.85. It means that the survey designed is suitable for investigation. And when we tested reliability, Taiwan was 0.964, USA was 0.984, and New Zealand was 0.961. When Cronbach's α is great than 0.7, it means this Stress Scale is suitable for investigation.

Table 1 KMO and Bartlett's Test

	USA	NZ	Taiwan
Number of sample	114	117	358
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.931	0.897	0.905
Bartlett's test of Spherical Chi-Square	6223.708	12308.97	17957.57
Df	1035	1431	1770
Sig	000	000	000

After examining reliability and validity, then we used factor analysis to extract main factors. Table 2 shows total variance explained of ROC, only eigenvalue great than 1 was chosen. There are 7 items measuring "Communication with teacher" with reliability of 0.94, 8 items measuring "Teachers' feature" with reliability of 0.95, 9 items measuring "Academic feature" with reliability of 0.93, 5 items measuring "Anxiety" with reliability of 0.86, 3 items measuring "Employment "with reliability of 0.83, and 5 items measuring "Social context "with reliability of 0.77.

Table 2 Validity and Reliability of Measurement on ROC

Stress source	Item	Reliability	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Communication with teacher	Teachers often give a negative evaluation - blaming or criticizing	0.94	0.75					
	Teachers treat students with a lack of respect		0.69					
	Teachers will not accept the views of students		0.67					
	Relationship with teachers is unfriendly		0.65					
	Teachers seldom provide students with positive feedback		0.65					
	Teachers offer little help for student's troubles		0.61					
	Teachers seldom encourage students to think		0.53					
Teachers' feature	Teachers are not adequately prepared when teaching	0.95		0.68				

Dimension	Item						
	Teacher's lectures versus class textbooks information vary widely		0.68				
	Teachers teaching without patience or lack enthusiasm		0.67				
	Teacher often go off-topic		0.67				
	Teacher evaluation standards are inconsistent or not objective		0.63				
	Teacher uses a single, rigid teaching methods		0.60				
	Teachers and students do not have two-way communication		0.60				
	Teachers cannot be expressed content clearly in class		0.56				
Academic feature	Courses cannot complete in-depth learning	0.93		0.68			
	Subjects too complex			0.68			
	Textbooks often too difficult			0.65			
	No clear learning objectives and future applications			0.63			
	Bridging courses unsatisfactory			0.61			
	Course progresses too fast to keep up with			0.60			
	Most courses too short for learning			0.59			
	Curriculum emphasis on theory so not fit for practical using			0.58			
	Students not informed of the teacher's requirements and expectations			0.56			
Anxiety	Afraid of exams	0.86			0.78		
	Anxiety over exams				0.78		
	Fear of not graduation on schedule				0.75		
	Fear of being expelled				0.66		
	Families living in poverty / can't help support the student				0.41		
Employment	Owners are not allowed to work hours reading	0.83				0.81	
	Part-time work places often too far away - failing to get to school on time					0.76	
	Is part-time work affecting learning					0.68	
Social context	Campus activities interfere with class	0.77					0.66
	Positive performance and good learning results were laughed at by others						0.65
	Class or surroundings too noisy						0.61
	Ridiculed by others if I am studious						0.55
	Fierce competition among students						0.55
	Class is overcrowded						0.49
Eigenvalue		20.48	5.08	3.10	2.65	2.19	2.01
Variance		34.13	8.47	5.17	4.42	3.65	3.35
Cumulated variance		34.13	42.61	47.78	52.20	55.85	59.20

III. RESULT

The result showed that there was significant difference among these three countries, as Table 3. There are six stress sources. Almost all the dimensions had the highest score for Taiwan's students, except the dimension of employment. There was not significant difference for the dimension of employment between Taiwan and USA. For the dimension of teaching feature, there was not significant difference between Taiwan and NZ.

For each country, it seems that Taiwan's students had higher

stress than other countries. There were 5 dimensions with scores of more than 3. The students from NZ had 2 dimensions with scores of more than 3, and the students from USA had only one dimension with higher value.

The result showed that the highest score was the dimension of anxiety for students from Taiwan, and for both New Zealand's and USA, the highest score was the dimension of employment.

The correlations between each dimension for three countries are shown as Table 4, 5, and 6 respectively. For Taiwan's students, the correlations between each dimension are significant. For New Zealand's students, the correlations between employment and communication with teacher, teaching feature, and anxiety are not significant. For USA's students, the correlation between employment and communication with teacher is not significant.

Table 3 Cross-country Comparison of Stress Source

Stress	Taiwan (1) Mean SD		NZ (2) Mean SD		USA (3) Mean SD		F	p	Scheffe's
Communication with teacher	2.92	1.42	2.43	1.26	1.54	0.82	49.58	<.001	1>2, 2>3
Teaching feature	3.17	1.40	2.97	0.98	1.90	0.79	46.06	<.001	1>3, 2>3
Learning feature	3.89	1.40	2.39	0.65	1.90	0.77	131.33	<.001	1>2, 2>3
Anxiety	3.93	1.56	3.24	0.81	2.18	0.83	77.99	<.001	1>2, 2>3
Employment	3.17	1.79	3.97	0.70	3.13	1.53	12.71	<.001	1<2, 2>3
Social context	3.17	1.22	2.82	0.98	1.78	0.75	68.85	<.001	1>2, 2>3

Table 4 Correlation between Stress Sources (Taiwan)

	Communication with teacher	Teaching feature	Learning feature	Anxiety	Employment	Social context
Communication with teacher	1	-	-	-	-	-
Teaching feature	0.83**	1	-	-	-	-
Learning feature	0.67**	0.66**	1	-	-	-
Anxiety	0.41**	0.41**	0.49**	1	-	-
Employment	0.41**	0.35**	0.46**	0.44**	1	-
Social context	0.48**	0.43**	0.52**	0.38**	0.51**	1

**p<.001

Table 5 Correlation between Stress Sources (New Zealand)

	Communication with teacher	Teaching feature	Learning feature	Anxiety	Employment	Social context
Communication with teacher	1	-	-	-	-	-
Teaching feature	0.92**	1	-	-	-	--
Learning feature	0.93**	0.76**	1	-	-	-
Anxiety	0.83**	0.88**	-0.08	1	-	-
Employment	0.06	0.13	0.74**	0.14	1	-
Social context	0.83**	0.89**	0.36**	0.93**	0.24**	1

**p<.001

Table 6 Correlation between Stress Sources (USA)

	Communication with teacher	Teaching feature	Learning feature	Anxiety	Employment	Social context
Communication with teacher	1	-	-	-	-	-
Teaching feature	0.89**	1	-	-	-	-
Learning feature	0.88**	0.99**	1	-	-	-
Anxiety	0.65**	0.90**	0.91**	1	-	-
Employment	0.00	0.42**	0.44**	0.71**	1	
Social context	0.94**	0.97**	0.97**	0.85**	0.30**	1

**p<.001

IV. DISCUSSION

The study was a cross sectional survey and the population comprised convenient samples. The total number of 358 students in Taiwan came from two schools. One is Oriental Institute of Technology (OIT) [21], traces its roots back to 1968, when the Oriental Academy of Industrial Technology was established. Mr. Yu-Ziang Hsu, the founder of Far Eastern Textile Group, aimed to meet the need of the economic growth nationwide, presented his version of a school based on the spirit of "Broaden Knowledge, Appreciate Virtue, Cultivate Talents, and Prosper Nation". Another one is Asia University (AU)[3], which is a dynamic higher education institution with great vision. There are 114 participants from USA and 117 participants from New Zealand. All participants are university students.

There is something we found interesting in the Result; we are going to make further discussion on the following:

A. The difference of stress sources across three countries

The results showed the difference of stress sources for three countries. Among these 6 factors, Taiwan's students had the highest score for 5 factors. It means that psychological stress of Taiwan students were heavier than the other two countries. The first factor is:" Communication with teacher", it accounts for 34 %; that is the highest percentage of all six factors. Students think about their teachers as:" Teachers often give a negative evaluation - blaming or criticizing", "Teachers treat students with a lack of respect ", "Teachers will not accept the views of students", "Relationship with teachers is unfriendly", "Teachers seldom provide students with positive feedback", "Teachers offer little help for student's troubles", "Teachers seldom encourage students to think".

From above we find out the relationship between teacher and student of Taiwan seems not good at all, students attributed all problems to their teachers. But the scores of New Zealand and USA are below average, it means that there are no problems in these countries. Employment is main concern of students in these two countries, because students of these two countries are more independent, they care about "employment" because they need part time jobs. Parents of Taiwan's students always pay all tuition through graduate of college, so it is no more problem and don't need to worry about it in Taiwan.

The second factor of ROC we extracted is:" Teaching feature", it accounts for 8.5 %; that is the second highest percentage of all six factors. It includes:" Teachers are not adequately prepared when teaching", "Teacher's lectures versus class textbooks information vary widely", "Teachers teaching without patience or lack enthusiasm", "Teacher often go off-topic", "Teacher evaluation standards are inconsistent or not objective", "Teacher uses a single, rigid teaching methods"," Teachers and students do not have two-way communication", "Teachers cannot be expressed content clearly in class".

Students' opinion on their teachers is not good at all in Taiwan, also the score of New Zealand close to Taiwan, but the score of USA below average. So we can find out students of USA are not complaint so much as the other two countries, they are more independent and can solve problems by themselves.

American students are used to ask and challenge their teachers. But, Taiwan's students are more prudent with the level of interaction sometimes even being silent when expected to participate. Further, Taiwan's students are accustomed to follow instructions and have a higher level of respect towards their teachers.

The "Anxiety" is the fifth stress factor of Taiwan, it is the highest score in all six factors, it includes: "Afraid of exams", "Anxiety over exams", "Fear of not graduation on schedule", "Fear of being expelled", "Families living in poverty / can't help support the student". All students in three countries warry about exams, it's a universal problem, but students of Taiwan is a little bit higher. From kindergarten, after school children got to go to the pro classes, review and test what they learned in daytime, until 9 pm; then go home. Remedial education accounted for the majority of school children in Taiwan, while western students after school at 2 pm. So, Taiwan students do not have enough time to relax, education authorities of Taiwan need to reconsider if it is suitable for these young generation.

B. Stress and school adjustment

Several studies examining school adjustment have proved that internal factors, external factors, and home environment have contributed to the adjustment of college students [16] [18] [25] [29] [30] [32].

Whenever there is stress, it deters learning. We found students' stress confronted from school is getting worse. The correlation of New Zealand between employment and communication with teacher, teaching feature, and anxiety are not significant. For USA's students, the correlation between employment and communication with teacher is not significant; but in Taiwan the correlations between each dimension are all significant.

Employment in western world is a serious problem; it connected to students' anxiety, teaching feature and communication with teacher. There are more and more students having part time jobs in Taiwan, it really affected their learning. In the classroom, teachers wondering should they wake up those students sleep lying on the table. Some families better economic students surfing mobile phone in class without paying attention to the class. So there are a lot of problems we need to face and find out the solution.

C. Some trivial issue

Item of 44, 45 and 46 are not belonging to six factors, it's the 7th factor. Its variance account for 2.58%, it is about tuition issue. Only New Zealand is a free tuition country, students of New Zealand don't have a burden on it, but that is a source of stress on USA and Taiwan. When tuition hike each year, students shouted intolerable. Item 56(Attention to evaluate others on their own) of Taiwan students shows significant higher; they care about others' opinion and that affect their own behavior.

V. CONCLUSION

Study of education, as early as in the times of Plato[23] and Aristotle[1], and even farther before them, believed the purpose of education is to train all kinds of psychic abilities, such as

memory, judgment, reasoning, learning technique and so on [5]. Moving into 21th century, do our students happy in learning? Or getting worse? All over the world, countless parents and teachers have been shocked, delighted or inspired by "Neill of Summerhill" [6] , his subversive ideas about education. It might be controversial and debatable issue, but it really inspired us to think about offering better education for younger generation.

From 2013 to 2015, we continued our exploration on students' psychology stress issue. In 2014, our research topic of "Technical institute student's psychological stress investigation reflect on the role of the teachers' "[31], we discussed about psychological stress of students in the classroom. Our main concern on this paper was about learning of students, can they just accept whatever teachers offer in the class? What bother them the most? We discuss further more on this paper by comparing with USA and New Zealand two countries, the result might be help to understand the source of stress and figure out the best solution. Only comparing with different countries we can find out applauded problem solutions.

Higher levels of stress may induce students' psychological maladjustment and have negative impact on their academic career. We need to take care of all these problems. Besides these, there are more topics about school's problem such as: Graduates Customer Satisfaction Survey and Teachers Satisfaction Survey, it will be the focus of our future explored

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