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A Pilot-scale Study to Reduce Water Consumption in Cotton Dyeing Using Ozone- a Green Approach

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Abstract

World's first jet dyeing machine (patented) was developed to carry out wash-off process on reactive dyed fabrics using ozone in the machine to remove unfixed and hydrolyzed reactive dyes. Four different shades were dyed on a sample jet dyeing machine using vinylsulphone reactive dyes. At the end of fixation stage, wash-off of fabrics was carried out by injecting appropriate amount of ozone in the jet dyeing machine. Ozone was continued to inject in the wash-off liquor until the liquor is decolorized around 95-100%. The color removal efficiency of liquor was considered as an indicative of removal of unfixed dyed on the fabric because fabric was being washed-off continuously in the same liquor. Fabric samples washed-off with both methods were compared in terms of change in shade, color fastness, color fading, and fabric appearance. Overall results have shown that the use of ozone during wash-off process can result in less water consumption and reduced process time without compromising color and fastness properties.

Keywords: Ozone, AOPs, Wash-off, Reactive dyes, Jet Dyeing Machine, Fastness

1. Introduction

Reactive dyeing method includes a 'wash-off treatment at the end of dyeing to remove both hydrolysed and non-reacted dyes to achieve optimum fastness and desired shade. However, wash-off process creates serious economic challenges in terms of extensive use of water (Schoeberl et al, 2005). These operations in many dyehouse are too long and dyeing technologists often strive to minimize both the washing water and treatment time without sacrificing fastness properties. In a normal reactive dyeing process, around 120-280 liters of water is consumed for each kilogram of textile material (Perkins et al, 1995). The increasing cost of electricity, gas, water, effluent treatment and the restrictions forced on waste disposal by environmental laws compel companies for optimized usage of water.

Several studies have been executed in the past to optimize wash-off process by using variety of anionic and non-ionic detergent, cationic fixing agents, and by manufacturing easy-to-wash dyes (Burkinshaw & Gandhi, 1997). Few investigators attempted to minimize water usage in reactive dyeing by using enzymes, surfactants, chitosan, and ultrasonic energy in the washing process (Burkinshaw & Kabambe, 2011; Haas et al, 2000; Xue, 2009; Akalin et al, 2007).

Recently, application of ozone to remove colour from textile effluent has been investigated extensively (Selcuk, 2005; Wu & Wang, 2001; Baban at al, 2003). Since the oxidation potential of ozone is very high (2.07 V), it is capable to degrade majority of organic compounds including textile dyes (Strickland & Perkins, 1995). The oxidizing capacity of ozone is the result of third oxygen atom that can easily destroy dye chromophores either directly using molecular ozone, or indirectly by forming hydroxyl radicals (Alton, 1983). Furthermore, ozone based decolorization process does not create any sludge or toxic by-products (Gahr et al, 1994).

The mechanism of ozone decomposition in water has been proposed by Hewes and Davison (Hewes & Davison, 1971):

$$O_3 + H_2O \longrightarrow HO_3^+ + OH^-$$
$$HO_3^+ + OH^- \longrightarrow 2HO_2$$
$$O_3 + HO_2 \longrightarrow HO\cdot + 2O_2$$
$$HO\cdot + HO_2 \longrightarrow H_2O\cdot + O_2$$

Although ozone has been investigated primarily for decolourization of aqueous solutions, however few researchers have also used it for bleaching of cotton and reduction clearing of polyester fabrics (Perincek, 2007; Prabaharan & Venkata, 2001; Hüseyin, 2006). Results presented by Perkins et al. Showed that the effluent from different dyeing processes was fit for reuse after it underwent ozone treatment (Perkins et al, 1996).

In this novel study, ozone gas was used in pilot-scale experiments (jet dyeing machine) to remove unfixed dyes from textile fabrics. This study is the extension of a novel work on laboratory scale in which ozone was added during wash-off process to improve deep shade reactive dyeing colourfastness (Shaikh et al, 2010).

2. Method

2.1 Materials

In this study, 100% cotton knitted fabric having single jersey construction (220 gsm; 18/s yarn) was used. Samples of dyes were obtained from DyStar. Chemicals auxiliaries like NaCl, Na_2CO_3, and NaOH were used without any purification. Dyeing recipes are shown in Table 1.

Table 1. Reactive dyes and recipes used in the experimental work

Commercial Name of dye	Recipe (% owf) shade				CI Name
	Grey	Red	Navy	Black	
Remazol Golden Yellow RNL	0.24	0.50	0.50	1.0	C.I. Reactive Orange 107
Remazol Red RR	0.32	3.0	0.50	1.0	Mixed dye
Remazol Brillian Blue BB	0.30	0.50	-	-	C.I. Reactive Blue 220
Remazol Black B	-	-	3.0	-	C.I. Reactive Black 5
Remazol Black N	-			5.0	Mixed dye
Common Salt (NaCl)	40	60	70	90	
Soda Ash (Na_2CO_3)	15	20	15	20	
Caustic Soda (NaOH)	-	-	0.5	1.0	

2.2 Dyeing method

All dyeings were performed in a specially designed pilot-scale dyeing machine built by Thies GmbH & Co., Germany. Fig. 1 shows an isothermal dyeing method selected in these studies. A 10 kg fabric sample was dyed in each run. Salt and alkali concentrations were used in accordance with the recommendations of the dye manufacturers.

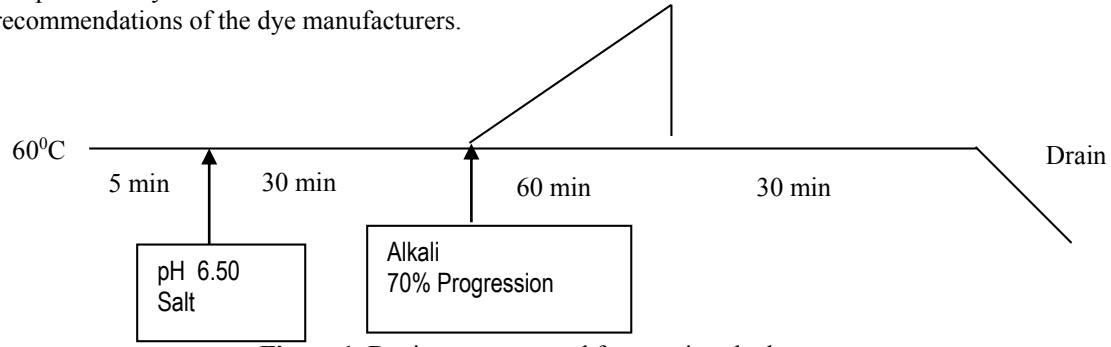

Figure 1. Dyeing process used for reactive shades

Once the fixation stage of dyeing was completed, the dyeing machine was drained, accompanied by unloading of 5 kg (half weight) of fabric. The fabric remained in the machine was washed-off using conventional washing method (Table 2). This fabric was considered as reference sample. The remaining 5 kg of fabric was subjected to ozone based wash-off regime.

Table 2. Conventional Wash-off steps

Step	Operation	Temp (^{0}C)	Water Liters (L:R 1:8)	Time (minutes)
1	Cold rinse	30	40	10
2	Cold rinse	30	40	10
3	Neutralization with Acetic Acid	30	40	10
4	Hot Wash	80	40	10
5	Soaping / Boil-off	95	40	10
6	Cold rinse	30	40	10
	Total		240	60

2.3 Application of O_3

Application of ozone in jet dyeing machine was carried out by injecting ozone gas into the washing water at the flow rate of 600 l/h using a patented method that ensured fabric protection from ozone. The detail of new method is not revealed here because of commercial confidentiality. Wash-off liquor was sampled at regular time intervals for the determination of colour reduction. Ozonation was continued until 97-100% colour removal achieved. Decrease in colour was taken as an indication of efficiency of the treatment to remove unfixed dyed from the fabric because fabric was being continuously washed-off in the same liquor. Ozone was generated by a corona discharge generator (Model OZ-50, Kaufman). An ozone analyzer (Model UVP 200, Ozonova) was used to measure the concentration of ozone in ozone/air steam. Ozone generator was capable to produce 50 grams of O_3 per hour. All studies were performed at room temperature, without altering the original pH of washing wastewater. Unutilized ozone coming out of the jet machine was destroyed in the catalyst destructor due to its toxic nature.

2.4 Analyses

The reflectance values of dyed samples were measured using a spectrophotometer (model Spectraflash 600 PLUS, Datacolor). The instrument settings were maintained as illuminant D65, 10^o standard observer, and specular component excluded. Fabric samples were folded twice to get four thicknesses. Fastness results pertaining to washing, rubbing, and perspiration were carried out using standard AATCC Test Methods (61, 8, and 15).

Following relationship was used to calculate colour removal efficiency (%) of the process:

$$D = \frac{A_0 - At}{A_0} X\ 100$$

Where D = decolorization (%), A_0 = initial absorption of dye, A_t = Absorption of dye at time t

3. Results and Discussions

3.1 Determination of optimum dose of ozone

It is of the utmost importance that optimum dose of ozone is determined in order to decolorize washing liquor in the presence of dyed material; otherwise discolouration of fixed dyes can be experienced. A pre-dyed fabric sample was exposed to ozone application using different ozone doses. Other experimental parameters were kept constant (treatment time = 45 min.; pH =10.50; ozone flow rate = 600 L/h).

The results are summarized in Figure 2. The impact of ozone concentration on fabric properties was determined in terms of change of shade.

From the Figure 2, it is evident that severe change of shade was observed when higher amount of ozone was used in wash-off liquor. This change of shade was also accompanied with white marks throughout the fabric that showed discoloration of dyes already fixed on the fabric. As the ozone out put was reduced, the change of shade was also minimized. When ozone dose was set to 166.7 mg/m (zone output 10g/hr, airflow 600LPM), no significant change of shade observed. Therefore, this amount of ozone was considered to be a safe dose for this particular experimental setup (5kg fabric; 40L liquor quantity).

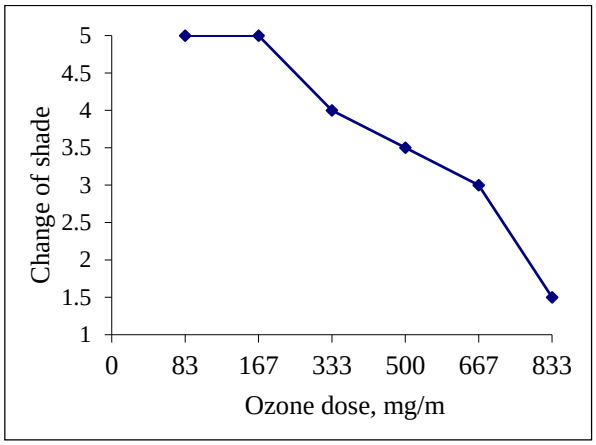

Figure 2. Impact of ozone dose on change of shade

3.2 Decolorization of hydrolyzed dyes

Table 3 presents the decolorization efficiency of ozone for various wash-off liquors.

The results showed that ozonation was an effective method for the decolourisation of all dyes, and higher than 80% colour removal was attained in the first 10 minutes. The results show that the colour removal was largely dependent on treatment time. In all cases, it was observed that the pH of wash-off liquor decreased during the ozonation process. Several researchers reported the formation of by-products of acidic nature which cause a drop in the pH of the liquor (Soares et al, 2006; Hung-Yee & Ching-Rong, 1995). The increase in conductivity was also noticed which is due to the degradation of dye molecules present in the bath (Khare et al, 2007).

A colour removal efficiency of 98% was experienced in the washing bath of Grey shade after 30 minutes of ozone treatment using ozone dose of 83 mg/min. During ozone application, the pH of the liquor was dropped from 9.70 to 7.60, whereas the conductivity increased from 13 to 27 µS/cm.

In case of Red shade dyeing, the colour of washing bath was decolourized by 80%, 86% and 91% at 10, 20, and 30 minutes of ozone applications, respectively. Compared to the washing liquor of Grey shade dyeing, this was a darker depth of shade and thus dose of ozone was enhanced to 167.0 mg/min. The liquor pH was reduced from 9.80 to 8.10 following a 30-minute ozone application. A raise in the conductivity was observed (from 58 to 78 µS/cm) which indicated that washing liquor had been decolourized.

For Navy shade dyeing, a 99% colour removal was achieved in 20 minutes of ozone application and at dose of 167 mg/min because this shade was predominantly consisted of classical C.I.Reactive Black 5 dye. This showed that C.I. Reactive Black 5 was prone to rapid degradation by ozone oxidation. Other researchers reported the similar results (He et al, 2007). For Black shade dyeing, washing liquor underwent 97% decolorization after 30 minutes of ozone application, accompanied by decraese in the pH, from 10.5 to 7.9, and increase in conductivity, from 13 to 27 µS/cm.

Table 3. Process conditions and efficiencies of ozonation to remove unfixed dyes in various wash-off liquors

Shade	Ozone Production (g/hr)	Ozone Flow (l/hr)	Ozone Dose (mg/m)	Ozone Concentration (mg/l)	Ozonation Period(min.)	Conductivity (µS/cm)	pH	Colour removal (%)
Grey	5	600	83	0.14	0	13	9.7	-
					10	15	9.4	90
					20	20	8.9	95
					30	27	7.6	98
Red	10	600	167	0.28	0	58	9.8	-
					10	62	9.5	80
					20	66	8.6	86
					30	78	8.1	91
Navy	10	600	167	0.28	0	38	10.1	-
					10	38	9.8	95
					20	45	8.8	99
Black	10	600	167	0.28	0	13	10.5	-
					10	15	9.5	87
					20	20	9.3	93
					30	27	7.9	97

3.3 Effect of ozone wash-off on quality of dyeing

Table 4 showed a comparison of colour differences values between reference sample and those washed with ozone. The results are displayed in terms of lightness/darkness (ΔL^*),chroma (Δc^*), hue Δh^*, and total colour difference ($\Delta E_{cmc\ (2:1)}$). Overall results show that colour difference in all cases is close to commercial tolerance ($\Delta E_{cmc\ (2:1)} \leq 1.0$). The results pertaining to Grey shade clearly indicated that 30 minutes of ozone application did not change the shade of ozone washed samples because smaller values of ΔL^*, Δc^*, Δh^*, *and* $\Delta E_{cmc\ (2:1)}$ were experienced, which were -0.26, 0.13, 0.10, and 0.58, respectively. For Red dyeing, the shade of ozone washed fabric sample was bit darker ($\Delta L^* = -0.98$), little brighter ($\Delta c^* = 0.50$), and found within tolerable colour difference ($\Delta E_{cmc\ (2:1)} = -1.17$). The results pertinent to Navy shade show that 20 minutes of ozone based wash-off treatment imparted minor changes to lightness ($\Delta E_{cmc\ (2:1)} = 0.58$), chroma ($\Delta c^* = 0.56$), hue ($\Delta h^* = -0.26$), and total colour difference ($\Delta E_{cmc\ (2:1)} = 0.85$). Also, in the case of Black shade, similar trend was experienced and minor colour difference values indicated that both reference and ozone treated fabric samples were identical in colour.

Colour fastness properties of reference and ozone treated fabric samples are displayed in Table 5. It was clear from the data that both reference and ozone treated samples showed comparable washing, perspiration and rubbing fastness properties. In the case of grey dyeing, samples treated with ozone showed same fastness properties (washing, perspiration and rubbing), mostly in the range of 4.5 to 5.0. In red shade fabric, half point inferior rating was observed in the wash fastness results of ozone washed sample, owing to the general difficulty of rinsing dark red shades. Based on these results, it is suggest that an extended ozone treatment time is required to get required fastness quality. The remaining two shades (Navy & Black) demonstrated similar fastness levels in both reference and ozone washed dyed samples.

Table 4. Color difference values of reference and ozone treated fabrics

Shade	ΔL^*	Δa^*	Δb^*	Δc^*	Δh^*	$\Delta E_{cmc\ (2:1)}$
Grey	-0.26	0.12	-0.10	0.12	0.10	0.58
Red	-0.98	0.49	-0.17	0.51	-0.02	1.17
Navy	0.58	-0.40	-0.47	0.56	-0.26	0.85
Black	0.76	-0.09	-0.52	0.51	-0.14	0.93

Table 5. Comparison of fastness properties

Shade	Sample	Colour fastness properties										
		Washing			Perspiration						Rubbing	
					Acidic			Alkaline				
		Staining			Staining			Staining			Wet	Dry
		cotton	polyester	nylon	cotton	polyester	nylon	cotton	polyester	nylon		
Grey	Reference	4.5	5.0	4.5	4.5	4.5	4.0	4.0	5.0	4.5	4.5	4.5
	New method	4.5	5.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5	4.5	4.5
Red	Reference	4.0	4.5	4.0	4.0	5.0	4.0	4.5	3.5	4.0	4.0	4.5
	New method	3.5	4.5	4.0	4.0	4.5	4.0	4.5	4.0	4.0	4.0	4.5
Navy	Reference	4.5	5.0	5.0	4.5	4.5	4.0	4.5	4.5	4.0	4.5	5.0
	New method	4.5	5.0	5.0	4.5	4.5	4.0	4.5	4.5	4.0	4.5	5.0
Black	Reference	4.5	4.5	4.5	3.5	4.5	4.0	4.0	4.0	4.0	3.0	4.5
	New method	4.5	4.5	4.0	4.0	4.5	4.0	3.5	4.0	4.0	3.0	4.5

3.4 Advantages and Savings

The use of ozone in wash-off offered several advantages versus the conventional wash-off:

1. Reduced water consumption was achieved due to only three fill-and-drain washes in new method. Conventional method usually employs at least six fill-and-drain washes to achieve required fastness. This translated into 50% savings in washing water.
2. Reduced process timings because 50-67% savings of time was observed in new method.
3. Reduced energy consumption because no heating was used in new method, and entire process was carried out at ambient temperature.
4. Reduced colour yield of residual wastewater because washing liquor was decolorized in the machine.

5. Due to above advantages, it is expected that overall effluent load would be much lower in colour, pH, temperature, and chemical oxygen demand, and hence making this method an eco-friendly process.

4. Conclusion

The present study evaluated a new washing and rinsing method to clear unfixed dyes from reactive dyed fabric samples. The proposed method seems to be a promising alternative to conventional wash-off process. The ozone gas was directly injected into an especially designed jet dyeing machine during wash-off, in such a way that only unfixed dyes were destroyed and fixed dyes on fabric did not undergo any discoloration or damage. The performance of the new wash-off method was investigated for number of shades and results have shown that controlled addition of ozone in wash-off liquor produced dyeings having identical colour depth and fastness. Moreover, this method considerably reduced the processing time, colour of the wastewater, and quantity of the fresh water, and consequently proved to be an eco-friendly method. Since the new method was employed at ambient temperature, therefore the cost of power is expected to be lower than that of conventional washing process.

Acknowledgements

This work was supported by Thies GmbH & Co.(Germany). The new method has been protected by international patents: US2009126124; WO/2008/138282; EP1990456; KR20080099824; JP2008280666; DE102007022265; CN101302722; BRPI0801267.

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The Analysis of Short Sea Shipping Investmentas an Alternative Solution in Addressing the Problems in the Northern Coast of Java

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Abstract

Indonesia is a vast archipelago that links to the sea and becomes one of the potential countries to be developed. One of the goals of the development is to promote Indonesia's economic activities especially in the flow of goods stated in the MP3EI document and National Logistics System. Therefore, it is necessary to study Short Sea Shipping which aims to produce feasibility study and investment strategy so it is able to support the activity in the framework to solve some problems and reduce barriers along northern coast of Java.

To conduct feasibility study and investment strategy,some data and analysis such as logistics analysis from their respective mode in terms of the flow of goods in the harborwould be needed. The analysis of comparative mode is also important to be conducted in order to know the potential costfromthe rate per unit ton ofmodesto theRORO vessel mileage.From the analyses, it can be known the feasibility of the investment and investment schemes as well as forms of cooperationfor Short Sea Shipping that can be appliedeither by the government or the private sector.

Keywords: Short Sea Shipping, Investment, Financing

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The Significant Influence of School Safety Management on School Safety in Selected International Schools in Bangkok, Thailand

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Abstract

Today, schools face new and unimaginable threats to their safety. To improve school safety appropriate leadership and management is needed, however in developing countries appropriate leadership and management is not always present. According to the United Nations Convention of the rights of a child it states that every child has the right to be safe (United Nations, 2012).

Schools are principal environments where children spend considerable amount of time during their formative years therefore, school safety should be effectively managed, promoted, and prioritized. In Thailand school safety is generally considered to be of low priority compared with other educational issues, with a lack of effective policy, and with schools struggling to justify safety costs (Srichai, 2013)

This study was conducted to determine the level of school safety in terms of the following dimensions: Safe Classrooms, Safe Facilities, Disaster and Emergency Preparedness and Bullying. This study was also conducted to determine the level of school safety management in terms of the following dimensions: Planning, Organizing, Leading and Controlling, and also to investigate the significant influence of school safety management on the dimensions of school safety. It was found that the management of school safety with regard to the dimension "Safe Classrooms" was the highest. The dimension "Bullying", was low and therefore not on the expected level. Therefore, administrators and teachers should give more attentions on providing programs and activities that gives the school chances to develop policies, programs and strategies to improving the management of bullying within the school. It was also found that the linear combinations of predictor variables (Four dimensions of school safety management) were statistically significant to influence school safety.

Keywords: School Safety Management, International Schools

1. Introduction

The purpose of this study is to study the significant influence of school safety management on School Safety in selected International Schools in Bangkok, Thailand. According to the Child Injury in Thailand report, released in August 2007(Pachernwaat Srichai, 2013). More children die from injury than from communicable and non-communicable diseases. According to this report an estimated 6,000 children die from preventable injuries each year. These injuries do not necessarily occur at school, but children do spend considerable amounts of time within the school environment, and there is also a growing demand for safe schools in Thailand (Pachernwaat Srichai, 2013). Annually recurring floods regularly prevent millions of children from attending a full year of school. Recent events have demonstrated that schools in Thailand must also be prepared for natural disasters such as the severe flooding that occurred during the 2011 monsoon season in Thailand (DEMOTIX, 2011). There is an increased risk for lesbian, gay, bi-sexual and transgender students of experiencing homophobic or transphobic bullying, due to the absence of rights to protect them. No research have been done on the impact of homophobic bullying in schools in Thailand, but the worldwide evidence available suggests it is general and prevalent (Boonmongkon, 2013). A teacher cannot physically see every action of each child at every second. Therefore, it is very important that teachers remove potential hazards. This will help create classrooms that allow students to move and play freely and safely (Hendricks, 2008) Therefore it is crucial that safe classrooms are well managed. The physical environment of school

facilities is a key factor in the overall health and safety of students. School buildings and grounds must be designed and maintained to be safe and free of hazards, and to promote learning. School policies and the code of conduct should be well managed to ensure safe classrooms, safe facilities, safe playgrounds and prevention against violence and to ensure that disaster and emergency preparedness is well managed. (New Hampshire Dept. of Education, 2012)

2. School Safety Management

The four traditional functions of management are: Planning, Organizing, Leading and Controlling (Snell, 2012). These are the four dimensions of school safety management that this study adapted.

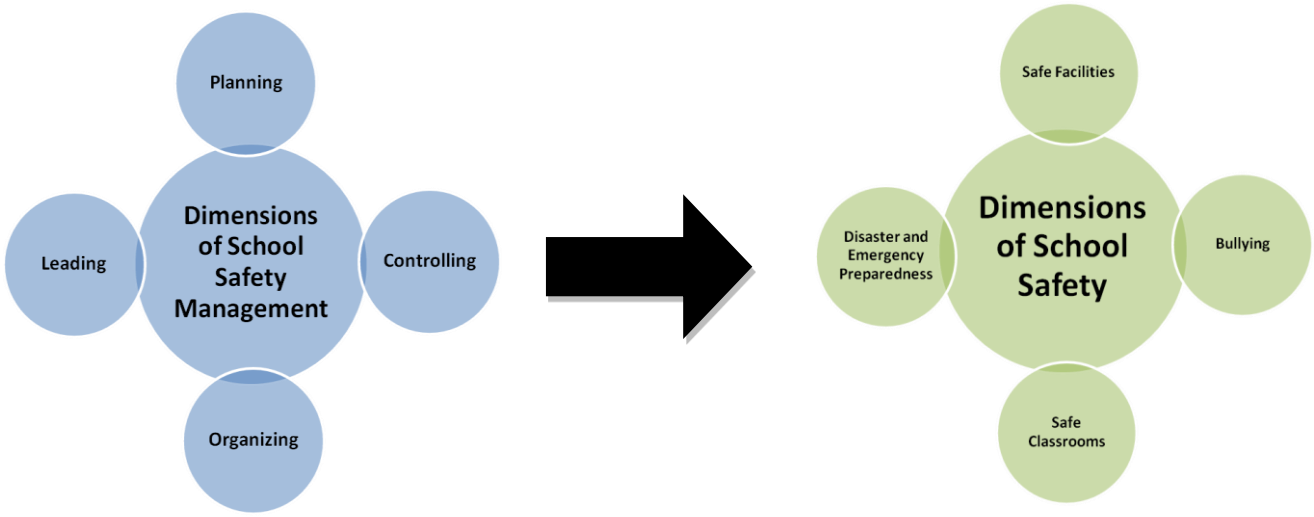
1. Planning in this study refers to management that specify the goals for school safety to be achieved, and it refers to management that decides in advance the appropriate actions needed to achieve the goals for school safety and implements it.

2. Controlling in this study refers to management that sees to it that school activities are in line with the general school policies and objectives for school safety. Management observes and reports deviations from plans and objectives for school safety and management that makes initiatives to correct deviations from plans and objectives for school safety.

3. Organizing refers to management that organizes and interacts with the municipal authorities and local community to establish a safe and orderly school environment, management that organize the resources of time, space and personnel for maximum focus on school safety.

4. Leading refers to management that motivates and communicates well with teachers regarding school safety, makes sure that the school is meeting its goals for school safety and ensures that the school is meeting its goals for school safety.

2.1 Conceptual Framework of the Study



➢ The double headed arrow pointing to the four dimensions of school safety is used to show the relationship of the variables that this study uncovered.

3. Research Methodology

3.1 Research Design

This study is descriptive research. The respondents were identified through the use of convenient sampling. The reason for convenient sampling was the location of the schools. All four of the schools that were used in this study are located close to each other. The research instrument was an opinionnaire. The opinionnaire was tested for validity and reliability. The data gathered was statistically tested and analyzed with appropriate statistical tools. The items in this opinionnaire were

validated through the use of the index of concurrence (IOC) by three experts. The recommendations on the improvement of the opinionnaire were noted and revisions were made.

3.2 Respondents of the study

The respondents of the study were administrators and teachers. Administrators consisted of school principal, vice principal and department heads. Teachers consisted of homeroom teachers and team/ assistant teachers. There were 25 teachers and 5 administrators from each of the selected International schools in Bangkok who were invited to answer the opinionnaire. The selected International schools were Keerapat International School (KPIS), Niva International School (Niva IS), Wells International School and German Swiss International School.

3.3 Sampling Design

In this study convenient sampling was elected due to the fact that all the schools are relatively close to each other. This study used descriptive survey research method with quantitative data collection and analysis. This study utilized survey design to seek the perceptions of respondents about how they observe school safety management and school safety within their school.

3.4 Instrument Development

The first phase of this study involved the completion of an opinionnaire

The second phase of this study involved the pilot-testing of the research instrument for reliability test.

The third phase of the study involved the floating of the opinionnaire.

3.5 Statistical Data Analysis

Data obtained from the opinionnaire was analyzed using the Statistical Package for Social Sciences (SPSS v16.0). The table below is an overview of this study's design, together with the research objectives.

Objectives	Statistical Technique
1. To determine the level of school safety in terms of: a. Safe Facilities, b. Safe Classrooms, c. Disaster and Emergency preparedness, d. Bullying.	Basic Statistics consist of: *Mean, S.d, c.v*, se $_{mean}$
2. To determine the level of school safety management in terms of: a. Planning, b. Organizing, c. Leading and d. Controlling	Basic Statistics consist of: *Mean, S.d, c.v*, se $_{mean}$
3. To investigate the significant influence of school safety management on the dimensions of school safety.	*Multiple regression* Analysis: Method enter and method stepwise

4. Data Analysis and Iinterpretation

4.1 Basic Statistics, Rank of the Level of School Safety.

School Safety	Rank	Basic Statistics				
		mean	s.d	s.e mean	C.V	Descriptive Equivalence
1) Safe Classrooms	1	6.68	2.16	0.21	0.2580	High
2) Safe Facilities	2	5.01	2.66	0.26	0.2883	Average
3) Disaster and Emergency Preparedness	3	5.92	3.87	0.38	0.3736	Average
4) Bullying	4	3.99	3.92	0.39	0.5619	Low

The results of data analysis in this table show that one of the components of School Safety namely Safe Classrooms are in high level with mean of 6.68 and standard deviation (s.d.) of 2.16. The Management of School Safety with regard to this component of School Safety is above the expected level.

The Safe Facilities and Disaster and Emergency Preparedness, which is two components of School Safety, is in moderate level with mean of 5.01 and 5.92 and standard deviation (s.d.) of 2.66 and 3.87. With regard to this, School Safety is within the expected level. Bullying which is the last component of School Safety is low with mean of 3.99 and standard deviation (s.d) of 3.92. The Management of School Safety with regard to this component is low and therefore not on the expected level.

The results of the dimension of school safety can be grouped into three groups according to their C.V value:

Group 1(Low): The dimension titled: “Bullying”, with a C.V value of 0.5619.

Group 2 (Average): The dimension of school safety titled: “Disaster and emergency Preparedness”, with a C.V value of 0.3736.

Group 3 (High): The dimensions of school safety titled: “Safe Classrooms and Safe Facilities”, with a C.V values of 0.2580 and 0.2883.

With regard to the grouping it can be considered that Group one should be looked into first followed by group two and then group three. By considering from C.V value, it’s found that all four dimensions of school safety were inconsistent, with C.V values between 0.2580 and 0.5619.

According to the ranking of the dimensions of school safety it can be considered that Bullying (4^{th}) is the dimension with the biggest problem followed by Disaster and emergency Preparedness (3^{rd}) and Safe Facilities (2^{nd}). Safe Classrooms (1^{st}) is ranked as number one, which indicates that it is the best when compared to the other dimensions of school safety.

4.2 Basic Statistics, Rank of the Level of School Safety Management.

School Safety	Rank	Basic Statistics				
		mean	s.d	s.e mean	C.V	Descriptive Equivalence
a)Leading	1	6.51	1.84	0.18	0.3761	High
b)Controlling	2	6.34	1.80	0.18	0.3776	High
c)Planning	3	6.19	1.18	0.12	0.3820	High
d)Organizing	4	6.23	1.21	0.12	0.3851	High

The results of data analysis in this table indicate that all four of the components of School Management are in high level with mean values between 6.19 and 6.51 and standard deviation (s.d) between 1.18

and 1.84. With regard to this, School Management is within the expected level.

The results of the dimension of school safety management can be grouped into three groups according to their C.V value:

Group 1(Low): The dimensions of school safety management titled: "Organizing and "Planning", with C.V values of 0.3851 and 0.3820.

Group 2 (Average): The dimensions of school safety management titled: "Controlling", with C.V value of 0.3776.

Group 3 (High): The dimension of school safety management titled: "Leading", with C.V value of 0.3761.

With regard to the grouping it can be considered that Group one should be looked into first followed by group two and then group three. By considering from C.V value, it's found that all four dimensions of school safety management were inconsistent, with C.V values between 0.3851 and 0.3761.

According to the ranking of the dimensions of school safety management it can be considered that Organizing (4th) is the dimension with the biggest problem followed by, Planning (3rd) and Controlling (2nd). Leading (1st) is ranked as number one, which indicates that this dimension is the best when compared to the other dimensions of school safety management.

4.3 The result of multiple regression analysis of the significant influence of School Safety management on the dimensions of School Safety in selected International Schools in Bangkok, Thailand.

School Safety	Method Enter					Method Stepwise				
	b	s.e .b	β	t	p-value	b	s.e .b	β	t	p-value
Constant	61.995	9.290	-	6.673*	.000	61.284	9.005	-	6.806*	.000
Planning	2.405	1.196	.274	2.010*	.047	-	-	-	-	-
Organizing	-.511	1.333	-.059	-.384*	-.384	-	-	-	-	-
Controlling	2.961	1.067	.513	2.776*	.007	2.666	.773	.462	6.636*	.000
Leading	-.106	.908	-.019	-.117	.907	2.233	1.114	.254	2.003*	.048
R^2	.470					.469				
F-Test	21.279*					80.071*				
p-Value	.000					.000				

*p<0.05

By using method enter of multiple regression analysis; it was found that the linear combinations of the predictor variables (five dimensions of School Safety Management) were statistically significant to influence School Safety with F value of 21.279, and p-value of 0.000. Where among the four dimensions of School Safety Management , only three of them namely "Planning", "Organizing" and "Controlling" were significant to influence School Safety with t value of 2.010*, -.384* and 2.776*.

It was also found that the coefficient of determination, R^2 , was 0.470. It means that 47.00 % of the variation in the criterion variables was accounted for by the linear combinations of the four dimensions of School Safety Management.

By using method stepwise of multiple regression analysis, it was found that only two predictor variables namely, "Controlling" and "Leading" were the necessary and sufficient dimensions to influence "School Safety" with t values of 6.636* and 2.003*. It was found also that 46.9 % of the variation on the criterion variable was accounted for by the linear combinations of the two predictor variables.

5. Findings and Recommendations

5.1 Findings

The level of School Safety as perceived by the Kindergarten, Primary and Secondary Teachers and Administrators of the selected International Schools located in Bangkok, Thailand in terms of Safe Classrooms, Safe Facilities and Disaster and Emergency Preparedness are above the expected level. It means that the Management of School Safety is well managed in terms of the three components of School Safety namely Safe Classrooms, Safe Facilities and Disaster and Emergency Preparedness. While in terms of Bullying, the level of School Safety is low. It means that the Management of School Safety is not well managed in terms of Bullying.

The level of school safety management as perceived by the Kindergarten, Primary and Secondary teachers and administrators in the selected International Schools located in Bangkok, Thailand in terms of the its four dimensions of school safety management namely Planning, Organizing, Controlling and Leading are above the expected level. It means that all four dimensions of School Safety Management are highly practiced by Administrators and teachers.

Dimensions of school safety management significantly influence school safety in the four selected international schools in Bangkok, Thailand.

5.2 Recommendations

1. The level of School Safety as perceived by the kindergarten, primary and secondary teachers and administrators in the four selected International schools is above the expected level or is in a high level. However the last dimension of school safety, Bullying, was ranked last with low level. It means that Management of School Safety is not well managed in terms of Bullying. Therefore, administrators and teachers should give more attentions on providing programs and activities that gives the school chances to develop policies, programs and strategies to improving the management of bullying within the school.

The following are things that schools can do to prevent and address Bullying:

- Schools can model kindness, empathy and respect for all living things, including people, animals and the natural environment.
- Implement professionally accepted school policies that explicitly specify that bullying on the basis of students using their own body to exert power over peers will not be tolerated.
- Implements professionally accepted school policies that explicitly specify that bullying on the basis of students that use verbal language (e.g. insults, teasing, intimidation, homophobic or racist remarks) will not be tolerated.
- Implement professionally accepted school policies that explicitly specify that bullying on the basis of students that try to hurt peers by spreading rumours or embarrass them in public will not be tolerated.
- Implement professionally accepted school policies that explicitly specify that bullying on the basis of students that make use of cell phones, instant messaging, e-mail, chat rooms or social

networking sites such as Facebook and Twitter to harass, threaten or intimidate someone will not be tolerated.

- Schools should have an anti-bullying policy that is regularly reviewed and revised and is made accessible so that it is understood by all.
- Provide social, emotional, and mental health support for students involved in bullying.
- Provide regular anti-bullying training for all staff, teaching and non-teaching.
- Encourage teachers to include culturally diverse people and subjects in their lessons and activities.
- Schools should also incorporate humane education lessons and activities that instil kindness and respect for all living beings. This can be done by adding bullying prevention material into the curriculum. Research indicates that human education resources, like those produces by the "American Humane Association", can help encourage empathy and compassion in students.
- The school needs to communicate with the community about Bullying. It is important that the school and the community work together to send a unified message against bullying.

2. Since the dimensions of school safety management significantly influence school safety, teachers and administrators should maintain and establish approaches on how to increase the level of school safety within the school.

3. Administrators should be more aware of their supervisory tasks especially on the teaching and learning practices of school safety.

4. Teachers need to make sure they comprehend their responsibility in school safety and keep children safe and teach students about school safety.

Therefore it is the schools responsibility to ensure that teachers and staff are trained on the schools rules and policies.

5. Future researchers could replicate this study using variables not covered by this study.

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Discrimination of Women in Construction: An Activity Theory Perspective

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Abstract

The participation of females in the general workforce is increasing in Australia however the ongoing level in the construction industry, and in particular in positions other than in administrative roles, remains relatively low. Discrimination against women working in the construction industry has been identified as a key contributor to a negative view of the industry and serves as a deterrent to females considering a career in building. The introduction of legislation such as the Workplace Gender Equality Act (2012) and the establishment of institutional support groups such as the Nation Women in Construction (NAWIC) are aimed at improving female work equity. Taking into consideration the relatively low participation rate of female workers in the construction industry despite various support mechanisms for gender equality, this paper develops a pilot study reviewing the manifestation of discrimination in the construction industry from the point of view of construction site workers. An interpretive case study was developed using Activity Theory to underpin the research findings.

Keywords: key words, Activity Theory, Australia construction industry, women and discrimination

1. Introduction

The construction industry represents a significant component of the Australian economy with gross value add (GVA) of $99.5 billion representing 6.9 per cent of the economy in 2011-2012 (PWC). According to the Australian Bureau of Statistics building activity for the March 2014 quarter was $21.82 billion. Further, the construction industry employs 1.043 million people or almost 10% of the population.

Moon (2013) reported that in 2013 the proportion of women working in the construction industry was 11.7% with a suggestion by French and Strachan (2013) that a large proportion of the participation being in the area of administration and support roles. This is in contrast to figures supplied by the Australian Bureau of Statistics (2013) which showed participation by women in the Australian workforce to be 40% in 2012.

Studies into the lack of participation in construction in the Australia have suggested several reasons why women are not engaged in construction.

A study by Francis and Prosser (2012) noted that discriminatory practices has been identified by several researchers as a negative influence in the selection of a construction career by women. Further, French and Strachan (2013, p.3) suggest that with respect to working in the construction industry "prejudice against all those not fitting the acceptable stereotype of young, white, male, working full-time, and negative attitudes towards women which acted as barriers for women". Moon (2013) notes that inequity against women such as a lack of career progression is a factor for females leaving the industry.

In Australia there have been legislated attempts to end discrimination of women in the workplace in general as well as the establishment of groups within the construction industry aimed at supporting female workers. The two main pieces of legislation aimed at equality for women in the workplace in general are the Sex Discrimination Act, 1994 and Equal opportunity for Workplace Gender Equality Act 2012.

Industry based associations have been established to provide support for women in the Australian construction industry and have been in operation for a substantial period of time. An example of this is the not-for-profit organisation the National Association for Women In Construction (NAWIC), which was established in 1995. NAWIC's list of objectives provides a clear indication of the support they provide female construction workers.

"NAWIC's objectives are:

- To unite women actively in the various areas of the construction industry for their mutual benefit
- To promote co-operation, fellowship and better understanding among members of NAWIC
- To promote education and contribute to the betterment of the construction industry
- To encourage women to pursue and establish careers in construction
- To provide members with an awareness of issues relating to the industry" (NAWIC, 2014)

Despite the legislative measures and establishment of support groups, discrimination appears to continue in the Australian Construction Industry (Moon, 2013; French and Strachan, 2013; Lingard and Lin, 2003; French, Lloyd-Walker and Crawford, 2014). For example, several researchers (such as Moon, 2013; French and Strachan, 2013; French, Lloyd-Walker and Crawford, 2014) noted that despite women and men having equal or greater educational qualifications and having more experience, women remain under promoted in comparison with men in the same organisation.

This research pilots an examination of discrimination of women in the construction industry from the perspective of a construction site. A framework is developed which describes women as part of the organisation operating on a construction site and is interpreted from a perspective of Activity Theory.

1.1 Activity Theory

Activity Theory was initiated by a group of revolutionary Russian psychologists in the 1920s and 1930s, and the theory is specifically credited to Lev Vygotsky, A. N. Leont'ev and A. R. Luria. The underpinning philosophy of this theory aimed to explain human consciousness and behaviour.

Activity Theory is the study of what humans 'do'. A 'Subject' is an individual or group of individuals involved in a common Activity. The Subject undertakes some activity in order to achieve an 'Object' (see Figure 1 below). The arrow in Figure 1 below represents the Activity, i.e. the element symbolising work. In the case study we develop, the Subject is the group of construction workers, the Object is the building to be constructed and the Activity is work done by the group in order to attain the building.

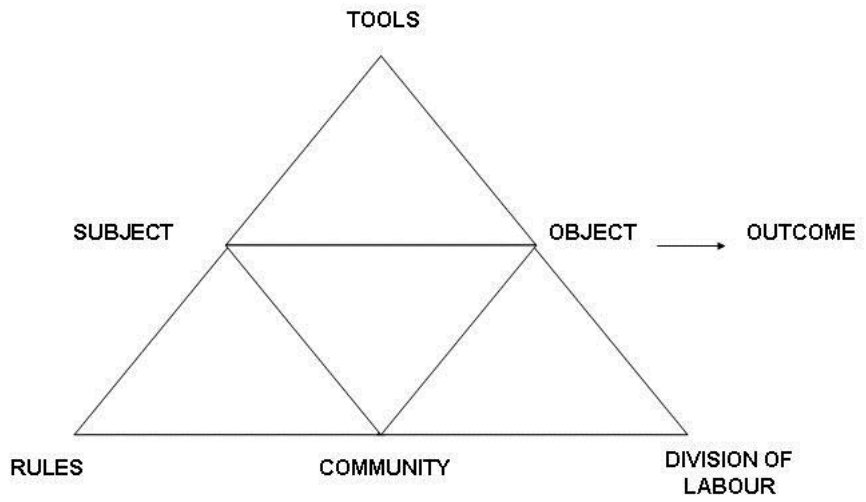

Figure 1. Model of Activity (Engestrom, 2001)

The way a group does work (an Activity) is mediated by Tools (Vygotsky, 1978). Tools provide signs that help direct the Subject in their work and in general are developed by experts in a similar area of work to that of the Subject. Vygotsky (1978, p.51) notes "when a human being ties a knot in her handkerchief as a reminder, she is, in essence, constructing the process of memorising by forcing an external object to remind her of something; she transforms remembering into an external activity."

Although the group has a certain Object in mind while participating in the Activity, the Outcome is what is produced as a result. That is although the Subject may have an initial Object in mind, the Activity may produce something different (the Outcome).

Activity Theory was further developed by Engestrom (2001) to incorporate the Community of Practice. The influence that the Community of Practice has upon an Activity is applied through Rules to which the Subject adheres. According to Kuutti (2001) "rules cover both explicit and implicit norms, conventions, and social relations within a community" (p.28).

2. Methodology and Case Study Background

The research undertaken is qualitative in nature and is cultivated around the Activity, Rules and Community of Practice Rules of workers directly participating in the construction site activity. A case study is interpreted through the lens of Activity Theory to provide a snapshot of worker attitudes based on a construction site in Sydney, Australia with respect to discrimination of female site workers. We consolidate the study by surveying 4 female workers in the case study construction company in order to gain an insight of women working in the context of the snapshot.

2.1 Context of Research

The case study organisation is a medium sized construction company operating nationally throughout Australia with an estimated annual turnover of $500 million AUD. The company is privately owned and specializes in project management for the commercial sector of the construction industry covering new constructions, refurbishments, interior fit-outs, technologies and mechanical services.

The construction site selected for the case study was a $70 million AUD residential project with approximately 100 workers participating through the lifetime of the project.

2.2 Methodology

The selection of the construction site on which we based our research was selected based on access. The primary survey was distributed to all male workers participating on a construction site at the time of data collection with a 68% response rate. The secondary (female employee) survey was developed as a comparison to the responses of the male workers on site. The female group surveyed targeted female workers in site operational roles and resulted in a response rate of 67%.

Both surveys afforded respondents the opportunity to elaborate on their answers with "open ended" responses to questions. All surveys were anonymous using a return drop box in the site office area and all points of identification in the data were desensitised.

3. Findings and Discussion

The subject case study company currently employs 31 female staff and makes up 11% of the entire company workforce. From these 31 women 13 are in company operations (working in construction project related positions) and the remaining 18 are in administrative roles such as reception, general administration, accounting, marketing and personal assistants to directors and divisional general managers.

Further, the subject case study company has ongoing accreditation for compliance with the Workplace Gender Equality Act and reports annually on gender equality indicators such as the gender composition of their workforce, equal remuneration between men and women, consultations with employees on issues concerning gender equality in the workplace and sex-based harassment and discrimination (Workplace Gender Equality Agency, 2014).

The male staff working on the subject construction site that returned a survey included sub-contracting tradesmen (15), general labour (5), administration / project management (2) as well as those that worked directly for the subject company (5) with the results of the direct response to key questions tabulated below in Table 1.

6 females were sent surveys with 4 returns with the results of their direct responses to key questions tabulated below in Table 2.

Question	Yes	No
Generally, do you feel that it is acceptable for women to work in the construction industry?	**26/27 (96%)**	**1/27 (4%)**
Do you think the construction industry should try to engage more females to work in trade and project management roles?	**26/27 (96%)**	**1/27 (4%)**
Have you ever worked on a construction site with a female and noticed any sort of discrimination against her?	**19/27 (70%)**	**8/27 (30%)**

Table 1. Male Construction Site Workers

Question	Yes	No
Before entering the construction industry, did you have concerns about being discriminated against as a female working within a male dominated environment?	**1/4 (25%)**	**3/4 (75%)**
At some point in your career, have you experienced some degree of discrimination against you, personally, as a female working within the construction industry?	**3/4 (75%)**	**1/4 (25%)**
On a professional level, do you feel that male colleagues have the same level of respect for you as they do for males working in a similar role to you?	**2/4 (50%)**	**2/4 (50%)**

Table 2. Female Employees of Construction Company

3.1 Discussion

Considering the survey responses in Survey 1, it appears that the attitude of male construction workers is positive towards an inclusion of women working on construction sites with only 1 respondent indicating that women should not be working on construction sites with the same respondent the only indicator that the construction industry should not engage more females in trade or project management roles.

Despite the positive result towards women working in construction women, both the surveys indicated that discrimination continues to occur. 70% of the male respondents noted that they had observed discrimination against women workers in construction and 3 out of the 4 women had experienced discrimination first hand.

The on-going discrimination of women becomes more salient with the open-ended responses in Survey 1. Several respondents in this survey, although indicating it was acceptable for women to work on construction sites also made derogatory comments such as they would prefer them to work on site as it gives them something to look at or qualifies their response saying that it depends on what they are doing. Examples of responses include:

- Work is “too physical for them… not strong enough, waste of companies time and money, men can do it faster”
- It’s acceptable to have women in the construction industry “because sometimes its good to look at women instead of filthy men all day… I just think women have a different make up compared to men being. Being more sensitive and emotional to issues that can arise in the building industry”
- Women “breaks the monotony” on construction sites and women are as competent as men in construction “depending on what job”
- Women on site provide “something goo d to look at… They think different”
- Acceptability of women working in construction “depends if there (sic) working on site or office”

The open responses in Survey 1 and 2 highlighted examples of discrimination. One description of discrimination that was submitted by a female construction worker in Survey 2 noted:

> "When I was the manager of a team I had to hire an employee on almost 50K more than myself a year at the direction of my boss, the money was about right as that was what the market demanded at the time, I was significantly more qualified and more experienced and was constantly supervising him as he required more education. I requested a pay review and was asked in front of a group of senior managers (all men) why I thought I was worth that much and then I was told once that I couldn't get paid more because I didn't have a husband, children or a mortgage so didn't need the money (this man was serious too). It took 6 months of persistence from me and then a subsequent resignation for them to turn around and pay me properly – I know this was due to being a women. I have many, many more stories of discrimination however this was the one that was hardest for me to deal with and fight for as I felt alone and discriminated against."

Activity theory notes that both Tools and the Rules which mediate the Subject in their Activity, are cultural-historic in nature. Engestom and Miettinen (1999) noted that "according to Activity theory, any local activity resorts to some historically formed mediating artefacts, cultural resources that are common in the society at large… Local, concrete activities, therefore, are simultaneously unique and general, momentary and durable. In their unique ways, they solve problems by using general cultural means created by previous generations." (P.8) If the discrimination of women in construction work site is cultural-historic and intertwined with the Community of Practice then remnants of this implicit Rule would exist in the initiation of the project.

Research by Er and Lawrence (2011) developed a model of Activity Theory identifying a third category of mediation on the Subject in their Activity, that being the Environment. This mediating factor encapsulates the environment in which the Subject is immersed at the time of their Activity. This includes the conditions applied to the place of work, both physical and contextual. An example of the physical is the information available at the point of work which supports decision making such as other non-organisational personnel. Contextual conditions such as the urgency with which work is required to be completed, was also found to influence the way the Subject approaches an Activity.

The Community of Practice, Divisions of Labour and Rules have been described as the organisation in which the Subject operates, with the Subject being the focus group or individual of interest (Barab et. al, 2001; Engestrom, 2008). The applied legislation to gender equity in the workplace sits outside the organisation. It is an Environmental factor as it is a requirement applied to the Subject from outside the Community of Practice.

Other organisational theories such as Autopoiesis (Maturana and Varella and Bergman) comment that change in an organisation can be initiated by a change in the environment however the change to accommodate an environmental change must come from within the organisation itself. Change management theories such as Diffusion of Innovation (Rogers,) see successful adoption of an innovation, such as acceptance and valuing of female participation in construction industry roles, is subject to the diffusion of this innovation by a homophilous champion. That is, the message that women are acceptable and valued in construction roles needs to be championed by highly regarded leaders who are viewed by other male construction workers as being from the same background. The homophilous leader might not necessarily be the head of the organisation but someone who other site staff respect and classify as being from the same grouping (another site worker rather than management).

Applying the above theoretical concepts into our case study, we observe that at the initiation of the construction project the Subject (construction site workers) have the policies associated with equity for women applied as a requirement of company compliance with legislation. The large majority of construction site workers in the case study acknowledge gender equality requirements. Several of construction site workers exhibited signs indicating that compliance could be superficial. This is supported by the data in Survey 2 which revealed that 3 out of the 4 females working in the case study company experiencing discrimination. The on-going discrimination of female workers in the subject case study does not appear to be an issue associated with company management as they are complying with anti-discrimination and equal opportunity for women legislation. For effective change however, the diffusion of equity for women in construction work requires support from homophilous leadership.

Organisation management could potentially support eliminating gender-based discrimination. If women are seen as a separate identifiable grouping then they may be subjected to continued discrimination despite government legislation. Researchers such as Miller (1999) found that intolerance of identifiable individual groups occurs within an organisation and can potentially be greater in times of success.

These researchers believe that success will reinforce a manager's convictions about which skills and parties have contributed to the success of the organisation. Miller (1999) noted that the "managers are likely to attribute success to their own policies because this attribute flatters them, highlights their good judgement, and enhances their status" (Miller, p.97). The subject case study construction company has in recent times experienced success having been awarded several large projects.

Miller's theory on intolerance and identifiable groups indicates that company management can potentially assist gender equity through either promoting the inclusion of women in the group attributed with success in the company or eliminating women as an identifiable group. This action would be additional with the on-going compliance with equal employment of women legislation.

Both the support by homophilous leadership and intolerance of women as an identifiable group within the organisation of construction projects are hypothetical models to be tested in future research.

4. Conclusion

The research describe in this paper was a pilot study examining how discrimination towards female workers on construction sites is manifested. The results showed that the large majority of male construction workers on the subject case study site supported females working on construction projects. Interpreting the findings through Activity Theory indicates that despite organisations complying with female equity legislation, the effect on equality between male and female workers on construction sites is however superficial to many workers.

The legislation enforcing equity is considered to be an Environmental factor whereas the effective management of equity requires change from within the organisation itself in order to break away from cultural-historic discrimination of females working on the construction site.

Two possibilities for effective organisational change are suggested, the first being developing support for gender equity by homophilous leadership. A second proposal is dismantling the visualisation of female construction workers as either a separate identifiable group and, or negatively identifiable group. The testing of the suggested organisational change for effective gender equity on construction sites is to be considered in future research. The effectiveness of these organisational changes are areas of potential future research.

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Value-Based Pricing: Value Factors for Public University's Educational Programme Fees

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Abstract

In moving towards University Autonomy, Public Universities have to be more creative in generating funds to finance their activities. Charging educational fees is a means of generating revenues. Hence, the concept of Public Universities offering educational services based on value for money is proposed. In order for the government or other stakeholders to purchase the services, objective and consistent measures to determine educational programme price across various universities need to be established. Drawn upon the belief that understanding value and customer value creation is a critical means in building up organization's competitive advantage, the paper suggests value based pricing as a way to determine educational programme fees. Using Gamage et al.'s (2008) institution value dimensions (academic, non-academic and facilities aspects), several value creating factors are proposed. The significance of these factors may vary among Universities and therefore, can be perceived as differentiating values in determining their educational programme fee.

Keywords: educational programme fee, value-based pricing, value factors

1. Introduction

In the recent years, higher educational reforms in most countries have given various implications on educational system. Higher expectation on the quality of educational system has pressured Governments immensely to allocate more funds to support demanding public University activities. This in turns has created incentives for governments and universities to look for alternative modes and means of financing higher education activities. Amongst the many approaches include corporatization of universities, granting autonomy to universities to be more creative in generating funds to sustain their operations. These objectives can be realized through the devolution of major financial decision made by the government to the universities. With sufficient control over the financial management, universities' leadership may be able to meet the challenges of the changing situation. At the same time, the universities can rapidly respond to societal expectations, implement its strategic plan and ensure long term viability.

Charging educational fees is a means of funding the programmes. Considering that the decision by which tuition fees are established are critical for its potential implications on higher education accessibility and its impact on social and equity justice, it has to be done wisely and justifiable. There are various types of fees involved in providing educational services, though the distinction between the fees is often imprecise. A tuition fee generally refers to a mandatory charge levied upon students covering some portion of the general underlying costs of instruction. A fee, on the other hand refers to a charge levied to recover all or most of the expenses associated with a particular institutionally-provided good or service that is frequently partaken of by some but not all student and that might, in other circumstances, be privately provided. Thus, charges are associated with non-instructional programmes or services such as the costs of food and lodging, or of health and transportation services, would normally fall under the category of fee (Marcucci & Johnstone 2007). The tuition policy of a country is generally dependent on a law or other type of legal instrument that provides the basis for charging or for prohibiting educational fees. In countries such as the United States, Canada, Japan, India, South Korea, Philippines and some of the Anglophone nations in Africa, the national and/or state policies require that moderate tuition fees are set for all public higher educational institutions (Johnstone 1992). Whereas others, such as Chile and South Korea, the individual institutions are authorised to set their own fees (Marcucci & Johnstone 2007).

In moving towards University Autonomy, the concept of Public Universities offering educational services based on value for money is proposed. In order for the government or other stakeholders to

purchase the services, objective and consistent measures to determine educational programme price across various universities need to be established. However, there is scarce literature analyzing the underlying factors and measures in setting the tuition fee (Coates 2009; Cubillo et al. 2006). Existing literature mainly focused on issues relating to tuition policies with no regards on identifying factors that makes up tuition charges. This paper thus looks at educational programme pricing method and subsequently suggests factors to be considered in the pricing decision to support the University Autonomy pathway.

2. Pricing Methods for University Educational Program

Pricing methods is the explicit steps and procedure by which pricing decisions are established (Oxenfeldt 1983). A comprehensive review of the literature of pricing in service sectors has identified various pricing practices which generally fall into three main categories, namely cost-based, competition-based and demand-based as detailed out in Table 1

Table 1. Pricing Methods for Services

No	Pricing Methods	Description
1.	Cost-based methods	Cost-plus method – a profit margin is added on the service's average cost.
		Target return pricing – the price is determined at the point that yields the firm's target rate of return on investment.
		Break-even analysis – the price is determined at the point where total revenues are equal to total costs.
		Contribution analysis – a deviation from break even analysis where only the direct costs of a product or service are taken into consideration.
		Marginal pricing – the price is set below total and variable costs so as to cover only marginal costs.
2.	Competition-based methods	Pricing similar to competitors or according to the market's average prices
		Pricing above competitors
		Price below competitors
		Pricing according to dominant price in the market – the leader's price that is adopted by the rest of the companies in the market
3.	Value-based pricing	Perceived value pricing – the price is based on customer's perceptions of value.
		Value pricing – a fairly low price is set for a high quality service
		Pricing according to customer's needs – the price is set so as to satisfy customers' needs

Adapted: Avlonitis and Indounas (2005)

Among all the pricing techniques, empirical findings consistently demonstrate the popularity of cost-plus approach (Avlonitis & Indounas 2005; Zeithaml & Bitner 1996), which is mainly attributed to its simplicity, ease of use and practicality of the technique. A different finding was reported where competitor-based pricing is the dominant pricing method used to determine higher educational programme fees (Maelah et al. 2012). Through competition-based pricing, each programme fee is set within the competitive market price range. Although researchers suggest the superiority of value-based pricing to other methods (e.g. Liozu et al. 2012; Ingenbleek et al. 2003; Fox & Gregory 2004), the adoption of such pricing method in the market is relatively limited. Similarly Maelah et al. (2012) reported that only 20 per cent of the higher learning institutions use value-based pricing. An explanation for the slow progress is mainly attributed to the lack of practical and theoretical knowledge pertaining to the value-based concept.

Regardless of its unpopularity, Despite the fact, understanding value and customer value creation is a critical means in building up organization's competitive advantage (see Ulaga & Chacour 2001; Anderson & Narus 2004). Realising the challenges faced by public universities in generating revenues along with the radical customer changes in their perceptions on quality education, this paper proposes the adoption of value-based pricing methods as a way to determine educational programme fees.

3. Value-Based Pricing and Educational Programme

Value based pricing is a price setting strategy based upon customer's perceive value, not the actual cost

of the product, the market price, competitors prices or even historical price (Sarokolaee et al. 2012). The value is determined based on customers' expectation of the goods and its costs in comparison to the competitors. In other word, the customers' cognition is used as the key factor in pricing decision, without suggesting low prices for the product or service. This notion is in accordance with decision-making theory emphasising that making decision based on intuition is a viable and acceptable approach in today's business context (Liozu & Hinterhuber 2012). A thorough scientific process in analyzing the intuition is important in making pricing decision (Dane & Pratt 2007).

Conceptually, value is often perceived as a function of the benefits that the customer receives in view of the costs incurred to obtain the expected benefits (Ingenbleek et al. 2010). It is the net difference between perceived benefits and sacrifices. Likewise a similar view is applicable to the product/service provider, there are costs incurred in order to create value. The value management view when costs are only allocated to added value activities are crucial to spur higher efficiency, cost effective and enhanced quality. Value components of learning are indeed important for quality assurance in higher education. Literature has tied that the distinct characteristics and image of a University as an important element to maintain their competitiveness in the market (Chapman 1981). Joseph and Joseph (2000) identified that good faculty, academic reputation, quality education, special programme (niche areas), size, location, costs and availability of athletic facilities and social activities as the most important factors in choosing an educational institution. Generally, quality of academic staff and educational programs are the most important quality service factor (Developing a Higher Education Brand Index for Malaysia, 2010; Gamage et al. 2008; Gatfield 2000). A recent study was carried out to identify factors that determine the customers' perceived value of higher quality education. Table 2 ranks the importance of factors reflecting the perceived quality (Developing a Higher Education Brand Index for Malaysia 2010).

Table 2. Ranking of Factors in Institution Dimension

Rank	Items	Mean	Std Dev
1	Highly qualified lecturers	5.85	1.334
2	Excellent lecturers	5.83	1.340
3	Marketability of graduates	5.76	1.325
4	Strong academic reputation	5.71	1.316
5	Good research infrastructure	5.69	1.291
6	Reasonable tuition fees	5.67	1.396
7	World class learning infrastructure	5.66	1.300
8	Adequate learning support	5.62	1.288
9	Effective support system	5.61	1.317
10	World class teaching infrastructure	5.60	1.389
11	Efficient administrative staff	5.59	1.348
12	Modern support facilities	5.58	1.313
13	Availability of financial support	5.52	1.460
14	Innovative curriculum	5.49	1.311
15	Modern campus	5.48	1.329
16	Innovative delivery method	5.48	1.328
17	Many international students	5.36	1.443
	Overall mean	5.6122	1.034

Source: Developing a Higher Education Brand Index for Malaysia (2010)

Meanwhile, Gamage et al. (2008) suggests the importance of institution value dimensions based on the following categories:

a) Academic aspect (e.g., academic staff, quality program, University reputation)

b) Non-academic aspect (e.g. counselling support services, job placement services, financial assistance)

c) Facilities aspect (e.g. teaching and learning facilities, athletic facilities; student organizations).

The significance of these factors may vary among Universities. Since these factors are often associated with perceived quality of educational programs, such information is used by potential students as their choice criteria in selecting a respective University. The Universities, on the other hand, may perceive

these factors as differentiating values and therefore can be taken into consideration in determining their educational programme fee.

4. Proposed Value Factors

Besides actual costs, there are other factors that can have significant influence on the pricing determination. These are financial and non-financial factors which are most likely not accounted in the cost calculation considering due to its subjective nature. The value creating factors for quality higher education are discussed next using Gamage et al.'s (2008) classification scheme.

4.1 Academic Aspect

a) Academic Staffing – as an education centre, having highly qualified, richly experienced and masters of their field of studies is a value factor. The number of doctorate academic staff comprising of Professors, Associate Professor, Senior Lecturers and Lecturers represents the capacity and the quality of University academics .

b) Academic programs - offering various educational programs in Social Science, Science and Medical and Health disciplines indicate the academic strength of the University. The education programme offered need to be designed to meet the requirements of all industries while maintaining a strong and valuable self-esteem imbued with a strong sense of good character. Recognitions on the curriculums by the international professional bodies is another added advantage. Besides evaluating the educational programme output, the quality of teaching/learning process should also be accounted. Among possible factors are:

- Lecturer-student ratio where a class should have an optimum number of students. Having too many students may indicate low teaching quality, while too little student may suggest ineffective management. Thus, a standard set by an independent agency could be adopted as a benchmark for optimum lecturer-student ratio.
- Offering of joint programmes (e.g. a programme offered by Education Faculty with Engineering Faculty) often inculcate extra knowledge and marketable value to student upon graduation. Generally such programme demand extra resources that should be be part of pricing determination factor.
- Material cost mainly for postgraduate research programmes, normally funded by research grants or other funds that are not part of the educational programme cost, should also be a value factor.

c) University's Reputation - recognition for excellent University's reputation base on its excellent track record in educational program, community engagement and internationalisation is a value image indicator to the University.

4.2 Non-Academic Aspect

a) Student Support Services – availability of departments in University which provides direct services to the students. The department generally functions by ensuring that the integrated education system fulfils the target through the numerous guidance and education embedded in extracurricular activities which include sports, arts and leadership. The department also plays the role as the advisory body, facilitator and manages matters related to the welfare of the students in general. Having effective student support system is part of providing quality education.

b) Location and size of the University are additional value factors in pricing setting decision.

4.3 Facilities Aspect

Availability of modern teaching/learning facilities and infrastructure is important in delivering high quality educational programme. Among added value support facilities to the programme are

a) Soft-skill enhancement training - as part of the curriculum in improving the marketability of graduates as well as helping overcome the problem of unemployed graduates.

b) World class teaching facilities - a conductive academic environment coupled with good libraries and computing facilities enhance the learning quality in a University. With the state-of-the-art and holistic ICT infrastructure, University may provide world class learning and teaching environment for the students.

c) Student Clubs and Associations – through involvement in clubs and associations activities are likely to generate high-quality learning process which is important for high-quality education. The idea touches on broader aspects of teaching, developing student experience and learners' lives beyond

University. The concept of student co-curricular engagement is based on the premise that learning is influenced by how an individual participates in educationally purposeful activities.

d) Availability of other facilities for students such as medical services, housing unit, athletic facilities, transportation services and security.

Obviously, these factors have direct effects on graduates study experience and their quality. Even so it is not easy to attach the monetary value to each factor. According to Gail and Swire (2006) the initial step in calculating the value is to infer the worth of the University's comparative advantages and disadvantages (Gail and Swire 2006). Through customer value accounting, value of the service rendered and the competitors can be measured. Next, by comparing the overall performance of educational programme in the market and the strengths University command, it gives a justification of the price premium reflecting by the superior educational experience offered. The pricing premium is necessary to ensure in sustaining the long term benefits of value-based pricing (Sarokolaee et al. 2012).

5. Conclusion

Educational programme pricing is becoming a critical agenda particularly among Public University since educational fee represent significant portion of University's income. Recognizing the extensive resources invested (i.e. qualified academic staff and world class teaching/learning infrastructure) in providing quality education, the sacrifices should be considered as value creating factors. Accordingly, the paper suggests Public University educational programme value factors highlighting distinct strong point of the University. The challenge is to measure or even define the value factor (Anderson & Narus, 1998; Liozu et al., 2012). It certainly cannot be determine for sure. Even if the value of an educational programme can be determined with certainty, it remains a disagreement as to the monetary value should be assigned to the value. The value can only be estimated that is far from objectives. Thus, the implementation of value-based pricing must vary from one University to another University. Apparently the subjectivity issue raise another concern on how to calculate the value of the factor in the determining the public University educational program fee and therefore probing more research to be undertaken to propose a possible solution.

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Relationship of Self-efficacy and Occupational Stress among Faculty Members of Selected Higher Educational Institutions in Lipa City

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Abstract

The study determined the relationship of college teacher's level self-efficacy and their level of occupational stress. It also determined significant difference on the respondent's level of self-efficacy when grouped according to their profile variable and described the respondents in terms of their level of occupational stress. Moreover, significant relation between their level of self-efficacy and level of occupational stress were considered and be able to proposed a faculty development activities that could enhance their level of self-efficacy to help them lessen if not totally eradicate their occupational stress.

The researcher used the descriptive method. Data were gathered from a total of 350 full time college teachers of different colleges and universities in Lipa City, Batangas, Philippines. Random sampling was used to identify the respondents. The instrument was patterned from the New General Self-Efficacy Scale and General Self-Efficacy Scale Questionnaire, and Maslach Stress/Burnout Inventory to gather the needed data. Frequency/percentage, chi-square test, and Pearson's r were used to statistically treat the data.

The result of the study showed that majority of the respondents were female, 21 to 25 years old, single, teaching in different colleges/universities, teaching for 21- 24 hours per week and with a monthly income of Php15,000 to Php19,000 a month. There is a significant and non significant association on the respondent's level of self–efficacy and their profile variables. Also, the respondents have a high level of self-efficacy and they exhibited handicap level of occupational stress. There is also a significant and non significant correlation between the respondent's level of self-efficacy and their level of occupational stress.

In light of the foregoing findings, faculty development activities were proposed by the researcher to help college teachers enhance their level of self-efficacy to help them lessen if not totally eradicate their occupational stress.

Keywords: self-efficacy, occupational stress, college teachers

1. Introduction

Three out of every four workers describe their work as stressful and the number one stressor in their lives. The problem is not limited to these shores. Occupational stress has been defined as a "global epidemic" by the United Nations International Labor Organization (Maxon, 2013). Teaching as one of these jobs is definitely not spared from these phenomena; considering that it is one of the most complicated jobs today.

Teaching profession has never been so challenging and demanding as it has become now, specifically, teaching in the tertiary level. A teacher has to do the mantle of a lucid communicator, a fair evaluator, an adept manager, a strict disciplinarian, a healing therapist and a skill full team leader. At times, a teacher also plays the role of a surrogate parent. Include in the long list the good relations that a teacher has to establish not only with the students and their parents but they also have to maintain a good working relationship with their colleagues and superiors because if not, those people will germinate stress in the workplace. But these are only few among the long list of work stressors among college professors. It demands broad knowledge of subject matter, curriculum, and standards; enthusiasm, a caring attitude, a love of learning, knowledge of discipline, and classroom management techniques; and a desire to make difference in the lives of young people.

With the very demanding nature of being a teacher only efficacious teachers have probably the space in the field of college teaching. Highly efficacious teachers are those who tend to be more open to new ideas, more willing to experiment with new methods to better meet the needs of their students, and to

become more committed to teaching. They persist when things do not go smoothly and are more resilient in the face of setbacks. And they tend to be less critical of students who make errors and to work longer with a student who is struggling. Having these characteristics they are less likely to experience occupational stress (Woolfok - Hoy, 2003).

Occupational or work-related stress is the response people may have when presented with work demands and pressures which challenge their ability to cope. Often stressor can lead to physiological reaction that can strain a person physically as well as mentally. Variety of factors contribute to workplace stress such as excessive workload, isolation, extensive hours worked, toxic environment, management bullying, harassment, and lack of opportunities or motivation to advancement in one's skill level.

There are different categories associated with occupational stress which includes; factors unique to the job, role in the organization, career development, interpersonal work relationships, and organizational structure or climate. These individual categories demonstrate that stress can occur specifically when a conflict arises from job demands of the employee and the employee itself. If not handled properly, the stress becomes distress.

Distress is a prevalent and costly problem in today's workplace. About one-third of the workers have report to have high level of stress. With continued distress at the workplace, workers will develop psychological disorders such as depression, anxiety, and post- traumatic stress disorder; other types of emotional strain such as dissatisfaction, fatigue, and tension; and maladaptive behaviours such as aggression, and substance abuse, and cognitive impairment; such as concentration and memory problems. In turn, these conditions may lead to poor work performance, higher absenteeism, and less work productivity or even injury. Job stress is also associated with various biological reactions that may lead ultimately to compromised health, such as cardiovascular disease, or in extreme cases-death (Prim,2005).

Alarmed with these revelations on the negative effect of stress to one's psychological and physiological well-being, the researcher who is a college teacher prompted to determine the level of self efficacy of college teacher's as it determines their susceptibility to stress. With this view, coming up with the proposed faculty development activities that could enhance their self-efficacy to lessen if not totally eradicate their occupational stress is deemed necessary.

2. Objectives of the Study

1. To determine the profile of the respondents in terms of age, sex, civil status, type of school, total teaching hours per week and gross monthly income;

2. To assess the respondent's level of self-efficacy in terms of mastery experience, vicarious experience, verbal persuasion, and emotional state;

3. To assess the respondents' level of occupational stress;

4. To determine if there are significant association on the respondents' level of self-efficacy and their profile variables;

5. To determine if there is any significant correlation between the respondents' level of self-efficacy and level of occupational stress.

Hypothesis:

Ho 1: There is no significant association on the respondents' level of self-efficacy and their profile variables.

Ha 1: There is significant association on the respondents' level of self-efficacy and their profile variables.

Ho 2: There is no significant correlation between the respondents' level of self-efficacy and level of occupational stress.

Ha 2: There is significant correlation between the respondents' level of self-efficacy and level of occupational stress.

3. Materials and Method

The researcher used the descriptive method. Data were gathered from a total of 350 full time college teachers that comes from the different colleges and universities in Lipa City during the SY2012-2013. The instrument was patterned from the New General Self-Efficacy Scale and General Self-Efficacy Scale Questionnaire, and Maslach Stress/Burnout Inventory to gather the needed data to come up with the forgoing results. Frequency/percentage, chi-square test, and Pearson's r were used to statistically treat the data.

4. Results and Discussions

4.1 Profile of the Respondents in terms of age, sex, civil status, type of school, total teaching hours per week, and gross monthly income.

4.1.1 Age

Based from the results, most of the respondents which is composed of 104 or 30% belonged to the age group of 21-25 years followed by the age group 36-40 which is composed of 51 or 14%. There are also those who belonged to the age bracket of 31-35 and 46-50 which is both composed of 44 or 13% followed closely by the age bracket of 41-45 which is composed of 42 or 12% and age bracket of 26-30 which is composed of 40 or 11% . The last group is from 51 and above which is composed of 25 or 7%. As based on observations, there are new breeds of college professors nowadays and they are those whose age bracket belonged to 21-25.This age range is the time when employees start to appreciate the career they have chosen. This is also the age bracket that was found busy making commitments, taking on responsibilities and focusing their energies on attainment of goals. On the other hand, it was also observed that aged teachers are now becoming out of the scene, they either availed early retirement to start another career which is less demanding but more rewarding.

4.1.2 Sex

Female dominated the teaching profession which is composed of 247 or 71% as against their male counterpart which is composed of 103 or 71% of the respondents. This result tends to show that teaching is more inviting or appealing to female. Moreover, results tend to confirm that teaching is a female dominated profession.

4.1.3 Civil Status

Majority of the respondents are single as shown by 192 or 55% of the respondents followed by married which is composed of 132 or 37%. There are also 16 or 5% who are widow/widower and 10 or 3% who are separated. As based on results many single nowadays are joining the teaching profession. This could probably because of the lucrative compensation package being received by college professors nowadays. It could also be attributed to the fact that teaching is a very taxing and time consuming profession which can best be addressed by single individuals. Moreover, married professionals have to make balance between work and family, leaving them little time for their family and vice versa.

4.1.4 Type of School

Majority of the respondents are from private colleges/universities as revealed by 250 or 71% compared to 100 or 29% from public colleges/universities. This result can be attributed to the fact that there are more private colleges/universities in Lipa City as compared to public colleges/universities.

4.1.5 Total Teaching Hours per Week

In terms of total teaching hours per week, out of 350 college professors 228 or 65% are teaching for 21-24 hours. There are also 95 or 27% who are teaching for 25 hour and above. Twenty-seven or 8% are teaching for 17-20 hours. As based on interview, college professors in both public and private have a regular load that ranges between 21 to 24 teaching hours per week. In excess of 24 hours is considered overload and commands additional pay. This could probably one of the reasons why there are teachers who are willing to teach more than the required regular teaching hours.

4.1.6 Gross Monthly Income

Most of the respondents are receiving a gross salary of Php15,000-19,000 a month which is composed of 106 or 30% followed by those who are receiving Php20,000-24,000 which is composed of 73 or 21%. There are 64 or 18% who are receiving Php10,000-14,000 and those who are receiving Php30,000 and above which is composed of 56 or 16 % followed by 51 or 15% who are receiving

Php25,000-29,000. It is very pleasing to note that there is no college professor that receives a gross salary of below Php10,000. As based on interview the entry level of college professors in private colleges and universities is Php10,000 and above, quite large amount but relatively little when compared to public colleges and universities that pays as much as Php20,000-24,000 per month as entry level plus other benefits. With these data at hand, it can be concluded that college teaching is a high paying job compared to other professions.

4.2 Respondents Level of Self-Efficacy in terms of Mastery Experience, Vicarious Experience, Verbal Persuasion, and Emotional State.

4.2.1 Mastery Experience

Respondent's level of self-efficacy in terms of mastery experience revealed that the college professors have high level of self-efficacy with a frequency of 170 or 48% of the respondents. There are also 129 or 37% whose level of self efficacy is very high and there is only a frequency of 41 or 12% whose level of self efficacy in terms of mastery experience that registered low and 10 or 3% that registered very low. This result tends to show that the college teachers are probably able to manage and solve difficult problems and usually find several solutions to address the problem. Further, these teachers are able to teach successfully relevant subject contents to even the most difficult students.

4.2.2 Vicarious Experience

Respondent's level of self-efficacy in terms of vicarious experience showed that 149 or 42% vicarious experience is high. There are also 142 or 41% whose vicarious experience is very high, 49 or 14% whose vicarious experience is low and 10 or 3% whose vicarious experience is very low. . This result tends to show that the college teachers are probably able and willing to exert positive influence on both personal and academic development of even the most difficult students. As explained by Bandura (2000), strong self-efficacy is developed from one's own personal success, an occasional failure may not have negative effects. However, self-efficacy based on observing others succeed will diminish rapidly if observers subsequently have unsuccessful experience of their own.

4.2.3 Verbal Persuasion

Respondent's level of self efficacy in terms of verbal persuasion is high as revealed by the frequency of 172 or 49%. There are also 130 or 37% whose verbal persuasion is very high, 43 or 12.29% whose verbal persuasion is low and there are only 10 or 3% who exhibited very low self- efficacy in terms of verbal persuasion. This result tends to show that college teachers are probably able to stick to their standards and accomplish their goals. They are also able to develop creative ways to cope with system constraints and continue to teach well. According to Bandura(2000), teachers experience high self-efficacy when they are told that they are trustworthy. College teachers whom students believe trustworthy can put to best foot forward.

4.2.4 Emotional State

Respondent's level of self efficacy in terms of emotional state is high as revealed by the frequency of 161 or 46%. There are also 150 or 43% whose emotional arousal is very high, 29 or 8% and only 10 or 3% who exhibited low self- efficacy in terms of emotional state. This result tends to show that college professors can probably remain calm when facing difficulties since they can rely on their coping abilities, they know how to handle unforeseen situations and can maintain a positive relationship with parents of students, even when tensions arise.

3.Respondent's Level of Occupational Stress

Majority of the respondents are stressed on the handicapped level as revealed with the frequency of 229 or 66%. There are also 64 or 18% who are stressed on the damaging level and only 47 or 13% who experience favorable level of stress but there are still 10 or 3% who experience a low level of stress. This result tends to show that teachers experience a combination of strenuous and unhappy state of mind. It could mean that they can not properly handle their thoughts, emotions, and time management on the way they deal with problems that caused them to be stressed on a handicapped and damaging level. Based on observation, occupational stress can be attributed to the very demanding school requirements nowadays which includes Outcome Based Education and Research Based Instructions among others.

4. *Difference on the Respondents' Level of Self-efficacy when Grouped according to their Profile Variable.*

It was found out that the level of self-efficacy of the college teachers in terms of mastery experience has no significant association as revealed by the computed chi-square value of 19.90 and 2.32 with p-value of .34and .51 in terms of age and sex respectively, which are all higher than .05 at 5% level of significance. This could mean that whether young or old, male or female college teacher's performance may succeed or fail at times. Result showed that there is significant association on the level of self-efficacy as revealed by the computed chi-square of 23.20, 15.57, 66.43 and 298.32 with p-value of .006, .001, .000, and .000, civil status, type of school, total teaching hours per week and monthly income respectively which are all less than the .05 at 5% level of significance. This could mean that college teachers' mastery experience differ in terms of their civil status, type of school, number of teaching hours per week and gross monthly income. Based on results, married teachers have the highest level while widow/widower exhibited lowest level of self –efficacy in terms of mastery experience. It could be that married teachers can always solve difficult problem compared to those widow/widower because of the support they get from their respective partners. Further, it was revealed that those college teachers in the public colleges/universities have the higher level of self-efficacy in terms of mastery experience as compared to those teachers teaching in the private colleges/universities. It could be attributed to the fact that college teachers in the public college/universities are secured compared to those who are in private. It was also revealed that those college teachers who are teaching for 25 hours and above per week have the highest level of self-efficacy while those teaching 17-20 hours have the lowest level in terms of mastery experience. This result may imply that college teachers who have overload are more enthusiastic to perform their task and this could be attributed to the additional compensation that they received. Moreover, it was revealed that those teachers who receive Php30,000 and above have the highest level while those who receive Php10,000-14,000 have the lowest level of self efficacy in terms of mastery experience. Results tend to imply that those who earned big may contribute more in the success of accomplishing their tasks.

Considering the level of self-efficacy in terms of vicarious experience, result showed that there is a significant and non significant association between them. As revealed by the computed chi square value of 17.96 and 6.76 with p-value of .46 and .08 for age and sex respectively which are both higher than .05 at 5% level of significance, then level of self efficacy in terms of vicarious experience do not significantly differ with respect to age and sex. This could mean that whether young or old, male or female, they both have the capacity to teach even the most difficult students. But as revealed by the chi square value of 19.02, 14.12, 70.36 and 150.07 with p-value of .03, .003, .000 and .000 for civil status, type of school, gross monthly income and number of teaching hours per week respectively which are all lower than .05 at 5% level of significance, then significant association between level of self-efficacy in terms of vicarious experience with respect to the aforementioned profile variables were found to have significant association. It was revealed that single teachers have high level of self-efficacy in terms of vicarious experience and separated has the lowest while in terms of type of school, college teachers from the public have higher level compared to those college teachers in the private. It could be attributed to the fact that college public teachers felt secured because of the clear cut government policy on retirement benefits compared to their private counterparts. It was also found out that those who are teaching 25 hours and above per week have a higher level of self-efficacy in terms of vicarious experience compare to those who are teaching 17-20 hours per week who have lower level of self efficacy in terms of vicarious experience. This result could be attributed to the fact that in majority of the cases the salary that the college teachers are receiving is directly proportional in terms of their teaching hours per week. Further, this result may imply that college teachers who have overload are more capable of motivating their students, probably because of the inspiration they got from the extra income they've got from their overload.

Results showed that the level of self –efficacy in terms of verbal persuasion also revealed a significant and non significant association. The level of self-efficacy of college teachers in terms of verbal persuasion has no significant association in terms of age, sex, civil status, and type of school. This was revealed by the chi square value of 11.17, .99. 7.89, and 2.74 and p-value of .89, .80, .55, and .43 in terms of age, sex, civil status, and type of school respectively which are all greater than .05 at 5% level of significance. This means that the level of self efficacy of the college teachers in terms of verbal persuasion does not vary significantly when grouped according to their age and sex, civil status and type of school. Otherwise is found on number of teaching hours per week and monthly income. Result showed significant association as revealed by the chi square value of 20.40 and 50.81 with a p-value of .002 and .000 which are all less than the .05 at 5% level of significance. This could mean that college teacher's verbal persuasion differ in terms of total teaching hours per week and monthly

income. It was revealed in terms of number of teaching hours per week, those that are teaching for 25 hours and above have higher level of self-efficacy in terms of verbal persuasion while those teaching for only 17-20 have a lower level of self efficacy which is again related to gross monthly income which shows that those who are receiving a monthly salary of more than Php30,000 have higher level of self efficacy while those that are receiving Php10,000-14,000 have lower level of self-efficacy in terms of verbal persuasion. It could be that those who are receiving relatively higher income can successfully accomplish a task through the use of suggestion, exhortation of self instruction as compare to those who are receiving a relatively low salary.

With regards to self-efficacy of the college teachers in terms of emotional state, significant and non significant association were found. The level of self-efficacy of college teachers in terms of emotional state is found to have no association in terms of sex as shown in the chi square value of 4.67 and a p-value of .02 which is higher than .05 at 5% level of significance. This means that the level of self-efficacy of the college teachers in terms of emotional state do not vary significantly when grouped according to their sex. Otherwise is found on age, civil status, type of school, teaching hours per week, and monthly income with chi square value of 39.16, 21.22,43.68, 103.57, and 205.47 respectively with a p-value of .003, .01, .000, and .000 which are all less than .05 at 5% level of significance. This means that the level of self-efficacy of the college teachers differs in terms of their age, civil status, type of school, total teaching hours per week and gross monthly income. As based on results, it was found out that those within the age bracket of 26-30 have the highest level of self efficacy in terms of emotional state and those within the age bracket of 41-45 have the lowest level. It could mean that younger generation college teachers can now able to keep calm when facing difficulties and they are able to handle unforeseen situations which were found otherwise in the older generations. It was also found out that male have higher level of self efficacy in terms of emotional state as compared their female counterpart. It could be that male teachers can maintain their composure and continue to teach well even if there is destructions coming from their students. This result contradicts to that of Maslach et. al (2001) who found out that female generally scores higher in emotional exhaustion. Further, married college teachers have the highest level of self-efficacy in terms of emotional state, while the separated exhibited the lowest level. It could be that married college teachers can maintain a positive relationship even when tension arises compared to those who are separated. It was supported by Uncu (2007) who pointed out that married couple appear to be in a better position in terms of emotional intelligence, for marriage is an institution that involves understanding emotions, empathy and social cohesion concepts in the context of emotional intelligence. Moreover, it was found out that those college teachers in the public colleges/universities have higher level of self-efficacy in terms of emotional state compared to those who are teaching in private. It could be attributed to the fact that college teachers in the public college/universities are secured compared to those who are in private. College teachers who are teaching for 25 hours and above per week have the highest level of self-efficacy in terms of emotional state while those who are teaching 17-20 hours per week exhibited the lowest level. College teachers who receive Php30,000 and above have the highest level of self-efficacy while the those who receive Php10,000-14,000 have the lowest level in terms of emotional state. This result could be attributed that the salary that the salary of college teachers is directly proportional in terms of the teaching hours per week. This result may imply that college teachers who have overload are more capable of motivating their students, probably because of the extra money they got from overload.

5. Relation between the Respondents' Level of Self Efficacy and their Level of Occupational Stress.

In terms of mastery experience as shown in the p- value of .78 which is greater than .05 at 5% level of significance, it was revealed that there is no significant correlation between college teacher's of mastery experience and their level of occupational stress. This means that the college teachers' level of self-efficacy in terms of mastery experience do not significantly relates to their level of occupational stress. It was also revealed by Pearson's r value of .015, which shows that there is a negligible positive association between mastery experience and their level of occupational stress. This could mean that even those college teachers who have a high level of self efficacy can also be prone to a high level of stress.

It was revealed in terms of vicarious experience as shown in the p- value of .510 which is greater than .05 at 5% level of significance that there is no significant correlation between the college teacher's mastery experience and occupational stress. This means that the college teacher's level of self efficacy with respect to vicarious experience do not significantly relates to their level of stress. But as revealed by Pearson's r value of -.04, there is a negative association between vicarious experience and level of

occupational stress which could mean that higher level of vicarious experience will result to low level of stress or vice versa.

As revealed in terms of verbal persuasion as shown in the p -value of .04 which is less than .05 at 5% level of significance which leads to the rejection of null hypothesis. This means that the college teacher's level of self efficacy with respect to verbal persuasion significantly relates to their level of occupational stress. It was also revealed by Pearson's r value of -.108 that there is a negative association between verbal persuasion and occupational stress which means that those college teachers with higher verbal persuasion are less likely to be stressed or vice versa. It could mean that those college teachers who confidently dealt efficiently with unexpected events are less likely to be stressed. Also, college teachers can be easily fooled by empty praise and encouragement especially when they are stressed. These finds connections from Vaezi (2011), who said that enhancing teachers' self efficacy tends to have a positive influence on diminishing their stress by verbal persuasion.

In terms of emotional state, it was shown in the p value of .837 which is higher than .05 at 5% level of significance, there is no significant correlation between emotional state and level of occupational stress. This means that college teachers' level of self efficacy with respect to emotional state do not significantly relates to their level of occupational stress. It could mean that there are college teachers who experience heightened psychological activity and extreme emotions when stressed and cannot remain calm and maintain their composures. It was also revealed by Pearson's r value of .011 that there is a negligible positive association between emotional state and level of occupational stress therefore it could also be said that occupational stress is independent in terms of emotional state.

6.Proposed Faculty Development Activities Enhance to Enhance Self-efficacy.

Based on results, several faculty development activities were proposed to enhance the level of self-efficacy to lessen if not totally eradicate the occupational stress encountered by the college teachers. **(See the attached PROPOSED FACULTY DEVELOPMENT ACTIVITIES THAT AIMS TO ENHANCE SELF-EFFICACY)**

4. Conclusion

Most of the respondents' belonged to age group of 21-25 years old, female single, teaching in the private higher educational institutions, teaching for 21-24 hours a week, and with a monthly income between Php15,000 – Php24,000. Most of them have a high level of self-efficacy but majority of them are stressed on the average level.

There is significant and non-significant association between the respondents' level of self-efficacy and their profile variables. Also, there is significant and non significant correlation between the respondents' level of self-efficacy and their level of occupational stress.

The proposed faculty development activities to be undertaken by the college teachers are believed to enhance their level of self efficacy which, in turn can help them lessen if not totally eradicate their level occupational stress.

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Myth on Aggression among Batangueños: A Psychological Inquiry

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Abstract

The study is a psychological inquiry on the myth on aggression among Batangueños. The researchers aimed to analyze the aggression among respondents of the study. The study was participated by 159 inmates with charges of index crimes and selected through convenient sampling. The study identified the level of aggression in terms of the major components of aggression: namely the Physical Aggression, Verbal Aggression, Anger, Hostility and General Aggression level using standardized aggression questionnaire by Buss and Perry.

The results showed that majority of the respondents were 18-35 years old, single, residing at District I and elementary graduates. Dominant numbers of Murder cases were identified and the respondents were incarcerated for 1-3 years and did not have police records. The Batangueño inmates have had below average level of aggression in terms of physical, verbal, anger, and hostility. Anger, revenge, and envy were the most common reason for their detention. The respondents did not differ in their assessment towards their physical aggression, anger and general aggressive behavior when grouped according to their profile variables. However, the respondents differed significantly in verbal aggression in terms of number of relatives with police record and also differed significantly in hostile behavior in terms of residence and number of relatives with police record.

Keywords: Aggression, Inmates, Index Crimes, Batangueños

1. Introduction

Batangas is one of the distinguished provinces of the Philippines known for its unwavering dedication in preserving the freedom of the republic, thus it is identified as the "Cradle of Heroes and Nationalists". It is a title earned through the works of Batangueño revolutionary leaders, who contributed much to the Philippine libertarian movement during the latter half of the 19th century (www.batangas.gov.ph).

Batangueños are often identified as *Barako* by fellow Filipinos. According to Magsino (2007) of the Philippine Center for Investigative Journalism, the word *barako* has three meanings: the strong-flavored and robust brew of the *liberica* coffee; the sex-driven adult male boar ready for breeding; and that certain brand of Batangueño, the rough and tough Filipino male from the province of Batangas. All three possess virility, strength, and fearlessness. All three carry within the pride of the Batangueños, who claim these qualities exclusively as their own.

Evangelista and Solis (2012), noted from their study about the concept of *Barako* among Batangueños and Pampangueños, the physical descriptions of *barako* included "matipuno," "malaki ang katawan" and "malakas" while non-physical descriptions were "matapang," "walang kinatatakutan" and bully.

Notions about the characteristic traits of Batangueños were associated with aggression or violence. Consequently, the Batangas Police Provincial Director, PS/Supt. Rosauro V. Acio assumed that the increasing trend of index crimes in the province were due to the inherited aggression among Batangueños as stated in Peace and Order Council Meeting in Provincila Capitol of Batangas. There is no scientific study that would suffice this hypothesis, but the figures suggested that occurrences of aggression existed within the province.

According to the three years crime statistics recorded by the Batangas Police Provincial Office, year

2009 have the highest documentation of index crime rates. Physical injury topped consisting of 1, 523 incidents followed by murder with 313. In 2010, a difference of 931 occurrences for index crimes were recorded, changes in figures were evident, but the leading crimes still aligned consistently. Based on Batangas CBMS survey in 2010, household members became victims of murder, theft, rape, abuse or physical injury regardless of place of occurrence of the crime.

Though decreasing numbers in index crimes being recorded in the previous years, murder rates in the province maintained its incidences and even abruptly increased in 2011, and during the first quarter of 2012, 54% of index crimes were recorded in the province with 431 counts. In a comparative index crime distribution during the first quarters of 2011 and 2012, index crimes recorded in 2012 decreased 31 counts with higher prevalence of murder, physical injury, and rape. Theft maintained its 23% and cattle rustling with 1% of the total index crime, while homicide, carnapping, and robbery decreased in their occurrences from 1% to 3% of the total index crime in the province.

Criminal behavior and aggression has always been a focus for psychologists due to the age old debate between nature and nurture (Jones, 2005). Furthermore, Psychology as a science intended to explain kinds of behavior based on the psychological theories. The researchers recognized this opportunity to elucidate the existence of aggression among Batangueños.

Regardless of numerous theories available to describe the source of aggression, there was no specific literature that discussed aggression which focused on Philippine setting. Available materials were based on assumptions and opinions. Furthermore, the researchers aimed to describe the nature of aggression through different perspectives and theories that may explain this pattern of aggressive behavior of the Batangueños. Thus, the study sought to identify the following:

1. The profile of the respondents in terms of age; civil status; residence; educational attainment; charged crime; length of stay in the jail and number of relatives with police records.

2. The levels of aggressive behavior of selected Batangueño inmates.

3. The reason/s cited that provoked the respondents to resort to the charged crime against them.

4. The comparison on the level of aggressive behavior of selected inmates when grouped according to profile variables.

1.1 Hypothesis of the Study

The study was guided by the null hypothesis:

There are no significant differences on the patterns of aggressive behavior of selected inmates when grouped according to profile variables.

2. Methodology

In this study, the researchers used descriptive research design in presenting the results of the study. The researchers both applied qualitative and quantitative methods. Qualitative method was used to analyze the interviews using different psychological theories while quantitative method was utilized in interpretation of the standardized survey questionnaire. Furthermore, quantitative method was used to interpret the profile of the respondents, the level of their aggression and levels of aggressive behavior of selected inmates compared when grouped according to profile variables. The qualitative method was applied in the analysis of reasons provided by the respondents that provoked them to resort in their alleged crimes.

The researchers used purposive sampling for the respondents of the study. The selected respondents of the study were the inmates of the Batangas Province from the four districts of Batangas. The study utilized one hundred fifty-nine (159) respondents from different jails in the province. The researchers were able to gather data from the provincial jail, two municipal jails and three city jails a total of six (6) jail institutions with the highest records of admitted detainees in the province.

The respondents were Batangueños, male or female, born and raised in Batangas, who committed index crimes specifically murder, homicide, rape, theft, robbery, and physical injury. The respondents were detainees accused before the court that were temporarily confined in such jails while undergoing investigation, and waiting final judgment of the court.

The data gathering instrument used composed of three parts as follows:

The first part consisted of the profile of respondents such as jail address/districts, sex, age, civil status,

residence, educational attainment, charged case, length of stay in jail and number of family member/s with police record/s.

The second part was the standardized Aggression Questionnaire by Buss and Perry (1992). It measured the level of aggression in its' four components namely physical aggression, verbal aggression, anger, hostility and general aggression. It was published by Western Psychological Service in Los Angeles, California.

It represented a revision of the Buss-Durkee Hostility Inventory (BDHI), including revisions of the response format and item content to improve clarity. Although, as with the Buss-Durkee scale, items for 6 a priori subscales were initially included in this measure, item-level factor analyses across three samples confirmed the presence of only 4 factors, involving Physical Aggression, Verbal Aggression, Anger, Hostility and Over-all Aggression (pmbcii.psy.cmu.edu).

The third part of the instrument was the interview question designed to determine the respondents' attitude in handling situations of aggression. It was a 7-item interview questionnaire primarily intended to find out their perception towards aggression, their cultural knowledge about aggression, their experiences about aggression, managing aggression and their reasons of imprisonments.

In coordination with the PNP Police Provincial Office, the researchers were able to collect data from different jail institutions in the province of Batangas. The researchers allotted one to two days per jail for data gathering.

During the data collection, respondents came in two batches with a maximum of 20 persons each. This instruction varied depending on the number of the available respondents. The first two parts of the questionnaire was administrated after establishing the rapport. The rapport included the introduction of the researchers about the study and introducing themselves. The third part of the survey questionnaire was administered one by one. Cell phones, picture taking, and voice recording was prohibited within the vicinity of the jail so the researchers take down notes for the answers of the respondents for the last part.

After the data gathering, the researchers proceeded to the scoring of responses for the second part of the questionnaire and consolidated the collected information. Statistics analyses were then applied and interpreted the results.

2.1 Statistical Treatment

Percentage was used to determine the proportion of the respondents' profile such as Jail address/districts, sex, age, civil status, residence, educational attainment, charged case, length of stay in jail and number of family member/s with police record/s and reasons cited of the respondents for their commitment of crime.

Chi-square was used to determine the relationship between the patterns of aggressive behavior of the respondents in terms of their profile.

3. Results and Discussion

It shows the profile of the respondents in terms of their age, civil status, residence, educational attainment, charged case, length of stay in jail and number of family member/s with police record/s. It also provides the patterns of aggression among the respondents such as aggression, verbal aggression, anger, hostility and general level of aggression. The reason/s cited by the respondents that resulted to the crime charged against them. Finally, the significant difference on the patterns of aggression of the inmates in terms of their profile is illustrated.

3.1 Profile of respondents

Age

In terms of age, 54 % or 86 of the inmates fell on the 18 to 35 years old level, 44% or 70 inmates belonged to 36 to 65 years old and only 2% or 3 inmates fit in 66 years old and above. The inmates were mostly in their adolescence age, which have been consistent with the statistics provided by the correctional facilities in the Philippines. Fonagy (2002), said that adolescence possess the means, the opportunity, and the motive. Crime tends to peak in adolescence or early adulthood and then generally declines with age (Mannheim 1965).

Civil Status

The civil status of the inmates composed of 48% or 77 single, 41% or 65 married, 7% or 11 separated, and 4% or 6 widows. These findings reflected in the research showed the early involvement of youth to the crimes in the province. Technically single inmates within the age bracket of 18 to 35 years old, actually teenage parents and the other portion admitted that they were not able to find partner because of imprisonment.

Residence

Inmates from district I had the highest number with 28% or 45 respondents, followed by district III with 41 respondents or 25.8%, district II with 40 or 25.2% and district IV with 33 or 21% of the respondents of the study. Population pressures and a shortage of land and jobs in rural areas had produced a steady internal migration to the cities. This urbanization of a traditionally agrarian society was commonly mentioned as cause for increased crime rates (www.mongabay.com).

Educational Attainment

The majority of the inmates were elementary graduate having 26.4% or 42 of the total number of respondents, followed by high school graduate with 40 or 25.4%, high school undergraduate with 20.8% or 33 inmates, elementary undergraduate with 23 or 14.5%, college undergraduate with eight respondents comprising of 5% of the respondents, vocational graduate with 4.4% or seven of the respondents, college graduate with four or 2.5% and only two or 1.3% are illiterate.

The following studies stated in www.all4ed.org support the findings of the profile of the respondents: lower educational attainment levels increased the likelihood that individuals, particularly males, would be arrested and/or incarcerated. (Harlow, 2003). A ten percent increase in the male graduation rate would reduce murder and assault arrest rates by about 20 percent, motor vehicle theft by 13 percent, and arson by 8 percent. (Moretti, 2005); criminal behaviour that begins during youth could continue into adulthood. By keeping adolescents in the classroom and off the streets, later criminal activity may be avoided (Lochner & Moretti, 2004).

Charged Crime

The distribution of the cases charged against the inmates comprised of 55.3% or 88 inmates with murder case, both homicide and rape cases had 11.9% or 19 o respondents, theft with 6.9% or 11 cases, 8.8% or 14 inmates had a robbery case, physical injury had 6 or 3.8% and direct assault with 2 or 1.3% of the total respondents.

According to the three years record of Batangas Police Provincial Office, index crime increased during 2009 and 2010, physical injury and murder is most frequent index crime prevailed in the province in decreasing number. Declining number of index crime was recorded in 2011 but the same ranking of crime prevalence was documented, murder cases suddenly increased in the same year.

Length of stay in the jail

The length of stay or imprisonment of the inmates below 1 year consisted of 36 respondents or 22.6%, inmates with at least 1 to 3 years of detainment had the highest figure with 61 or 38.4 inmates, 4 to 6 years had 30 or 18.9 respondents, 7 to 10 years had 28 or 17.6%, and above 11 years of imprisonment had 4 or 2.5%.

According to the respondents, length of their incarceration was due to a long chain of hearing postponement and slow processing of their cases. There were respondents who admitted that they could not afford the service of private lawyers that could help them to prioritize their cases.

Number of Relatives with Police Records

Majority of the respondents did not have relatives with police records with 101 or 63.5% of the respondents of the study. Forty-nine or 38.8% of the respondents have at least 1 to 3 relative/s with police record/s, seven respondents or 4.4% have 4 to 6 relative/s with police record/s, two respondents or 1.3% have 7 to 10 relative/s with police record/s. none of the respondents have 11 and above number of relative/s with police record/s.

Inmates with family members who have police/criminal records were due to their involvement for same crime the held responsible. Father and son, and sibling relationship among inmates were noticeable. Parental criminality appears to be strongly correlated with an increased risk of a child of developing conduct problems and later criminal involvement (www.justice.govt.nz).

3.2. Patterns of Aggressive Behavior of Selected Batangueño Inmates

Level of Physical Aggression of Respondents

Majority of the respondents have a below average level of physical aggression with a total of 94 or 59.1 % while 65 respondents or 40.9 % of the respondents have an above average level of physical aggression. Information gathered from the interview revealed that most of the Batangueños were not physically aggressive. Tracing on where family they came from, most of them came from a family where good relationships among members existed. They often avoided fights within the family and always tried to control the urge to hit one another when they were angry.

Based also on the interview, the respondents who have above average level of physical aggression came from the family which members' displayed physical aggression. Because they grew up in a family where members hurt each other physically whenever they were angry, they also became physically aggressive because this was the usual scenario they are exposed to.

The family where the respondents came from have the big impact on what kind of person they became, whether they were aggressive or non-aggressive. It could be explained by the social learning theory of Bandura. Social Learning Theorists, such as Bandura (1965), claim that aggressive behaviour was learned through observing and imitating aggressive models. The social learning theory was the behaviour theory relevant to criminology. Albert Bandura believed that aggression was learned through a process called behaviour modelling. He believed that individuals do not actually inherit violent tendencies, but they modelled them after three principles (Bandura, 1976: p. 204).Under this theory, social influences, such as role models and reinforcement, and situational factors, contribute to learning and expressing aggressive behavior.

Since the respondents grew up either on a family whose members always displays aggressive behaviour towards each other or on the family where members have a good relationship with each other, the family where they came from became the foundation of their aggressive behaviour. The reason is that they considered their family members as their role-model.

Level of Verbal Aggression of the Respondents

Most of the respondents with a total of 132 or 83 % of the respondents have a below average level of verbal aggression while 27 or 17 % of the respondents have an above average level of verbal aggression. Majority of the respondents have a below average level of anger. Below average level of anger was present to those people who less likely experience emotion that involves a strong uncomfortable and emotional response to a perceived provocation. They were good in handling anger and they were also good in handling situations.

Findings from the interview showed that respondents with below average level of anger have an effective anger-management. Some of the respondents were assertive to express feelings of anger in a way that is respectful of other people. Most the respondents learned how to control their anger by learning behavioral strategies like calming themselves and walking away to the one they were angry with to avoid serious fights. They made an attempt to address the behavior that they found frustrating or anger provoking rather than made an attack on the other person.

Most of the respondents often kept themselves in silence rather than saying words that could hurt someone or offended them when they were angry. They preferred to be alone and away from someone they were angry with so they could avoid hot arguments and verbal fights. They also came from a family where disputes between family members were settled through nice and smooth conversation without shouting, yelling and nagging to each other. The respondents used sublimation as a defense mechanism that allowed them to act out unacceptable impulses by converting those behaviors into a more acceptable form. Freud believed that sublimation was a sign of maturity that allows people to function normally in socially acceptable ways (www.psychology.about.com).

Level of Anger of the Respondents

A total of 84 or 52.8 % of the respondents have below average level of anger while 63 or 39.6 % of the respondents have an above average level of anger and 12 or 7.5 % of the respondents have an average level of anger. Majority of the respondents have a below average level of anger. Below average level of anger was present to those people who less likely experience emotion that involves a strong uncomfortable and emotional response to a perceived provocation. They were good in handling anger and they were also good in handling situations.

Level of Hostility of the Respondents

Respondents who have above average level of hostility have a total of 53 or 33.3 % while 106 or 66.7 % of the respondents have a below average level of hostility as shown in the table below.

It is noted that respondents who considered their anger aggressive behaviour as inherited from their parents utilized a defense mechanism which was Identification. Identification occurred when a person changed apparent facets of their personality such that they appeared to be more like other people. This process may be to be copy specific people or it may be to change to an idealized prototype. Areas of identification may include external elements, such as clothing and hair styles (which may be chosen without consciously realizing the influences that are at play) as well as internal factors such as beliefs, values and attitudes (www.changing minds.com). In the case of the respondents, they believed that they become aggressive because they identified themselves to their parents who were in one way or another was also aggressive in handling anger.

There were also some respondents who believed that the only effective way to express anger was through aggression. It was commonly thought that anger was something that built and escalated to the point of an aggressive outburst. And thus; anger can automatically lead to Aggression which could also be noted by what (Martinez, 2012) have stated**.**

According to Matthews & Norris, (2002), one of the reasons why we became hostile was because some of us form biases and misconceptions on the intent of other person when they did something to us. In some situations we became hostile and thus, developed a hostile attribution bias. Hostile attribution bias describes a tendency to interpret the intent of others who create negative feelings for the individual as hostile when social cues fail to indicate a clear intent. The hostile attribution bias can influence aggressive behaviour by way of reactive aggression, which is aggression in response to prior provocation (Halligan, Healy & Murray, 2008). When we misinterpret what others did to us and view their actions in a negative way, it serves as provocation and we were more likely to display aggressive acts towards them. The hostile attribution bias that the respondents made against other person on social situations could negatively influence their aggressive behaviour.

Level of General Aggression of the Respondents

Out of 159 respondents 49 or 30.8 % of the respondents have an above average level of general aggression and 110 or 69.2 % of the respondents have a below average level of general aggression. In general, the greater number of the respondents have a below average level of general aggression. Individuals with Average Level of Aggression have a below average level of anger, hostility, verbal aggression and physical aggression. They may less likely manifest a forceful behaviour, action, or attitude that was expressed physically, verbally, or symbolically. Individuals having this were infrequently prone to be involved in fights, troubles and arguments. On the brighter side, the researchers found that some of the respondents were aggressive not in a violent ways but in a positive ways.

The perceptions' of Batangueños about aggression was something that motivated them to attain their dreams and goals in their life. They have the hardwork and perseverance to attain such dreams and goals in order for them to have a better life. Most of them coped up with aggression using idealization. In Psychoanalytic view, Idealization was the over-estimation of the desirable qualities and underestimation of the limitations of a desired thing. We also tend to idealize those things that we have chosen or acquired. Idealizing allowed us to confirm our decisions as being wise and intelligent as we played up the good things we have chosen and downplay detracting factors. We thus cope with potentially dissonant thoughts that we have made a wrong decision. It also made us feel better to pay attention to things we desired that spent our time thinking about less pleasant things. Playing up the good things and pushing down the bad things also created a contrast that made the good things seemed even better.

The respondents did everything just to make all their dreams possible and they really became aggressive in life playing up the good things such as being aggressive in a positive way at the same time bearing in mind that when aggression was too much or when we were overly aggressive it also brought us detracting factors. According to Keitel,(2012), being enthusiastic and aggressive was a desirable quality. Being 'over-enthusiastic' or 'overly-aggressive' can convey a 'mixed bag' of emotions to the us such as--being desperate, anxious, hyperactive, and perhaps, troubled.

3.3 Reasons Cited by the Respondents that Resulted to the Charged Crime Against Them

Table 1. Reasons Cited by Respondents that Resulted to Charged Crime Against Them

Reasons	Number of Respondents	Percentage (%)	Rank
Anger, Revenge, Envy	29	18.23	1
Case Denied	27	17	2
Self Defence	26	16.35	3
Influence of Alcohol and/or Drugs	21	13.2	4
Protection for the Family	20	12.6	5
Poverty, Financial Needs	16	10	6
Fraternity or Gang war	12	7.54	7
Infidelity of Partner (Jealousy)	3	1.9	8
Provoked	2	1.25	9.5
Neighbour Quarrel	2	1.25	9.5
Sibling Rivalry	1	.65	11
Total	**159**	**100**	

Anger, revenge, and envy were the frequent reason cited by the respondents that resulted to the crimes with 18.23% or a total of 29 inmates from the total population sample. Twenty-seven or 17% of the inmates denied that they were the perpetrator of the crime; instead they said that they were just accused but innocent.

Meanwhile, 26 or 16.35% of the total respondents stated that they commit the crime or motivated to perform the crime due to self-protection. According to the inmates, it was a call of survival, they were forced to commit the crime to protect themselves, or else they will die as a victim. Influence of alcohol and/or drugs is also noted, having 13.2 % or 21 respondents admitted that they were drunk and/or under the influence of prohibited drugs. Sixteen inmates or 20 respondents stated that they were provoked to commit the crime to protect their family from familial feud or from another crime. Ten percent or 16 respondents declared that they committed the crime due to poverty or financial needs — as a means of living. Peer pressure, fraternity or gang war was also recorded with twelve or 7.54% of the total population as one of the reasons of committing crimes. Both sibling rivalry, infidelity of partner, and being paranoid or tempted, had 1.9% with 3 respondents each, and lastly, neighbour quarrel with 1.25% or two inmates was least frequent reason cited by the respondents why they were charged of the crime against them.

3.4 Patterns of aggressive behavior of selected inmates compare when grouped according to profile variables

Since the p-values of .33, .67, .34, .82, .28, .27 and .91 were higher than .05 level of significance, then the computed values of 2.26, 1.58, 3.38, 3.68, 9.80, 5.17 and .53 were found to be not significant. This could also mean that the inmates did not differ on their assessment towards their physical aggressive behavior when grouped according to their profile variables.

In comparison with the article written by Tremblay, (2012), studies showed that chronic physical aggression is associated with social factors, namely mothers' young age at first delivery, low education, history of behavior problems, smoking during pregnancy, and low income. Inadequate parenting, conflict in the house, and parental mental health and substance abuse issues are also associated with children's chronic physical aggression. The consequences of aggressive acts become more serious with age as children become stronger and are less supervised. Chronic physical aggression is a serious social concern because of its individual and social costs.

One of the social factors also leading to aggressive behavior of an individual was the home culture. On the study of Garcia (et. al, 2010), It was found that individuals with low and high negative reciprocity beliefs engaged in greater levels of physical and workplace aggression under conditions of high but not low prior exposure to aggressive home culture.

The inmates did not differ on their assessment towards their verbal aggressive behavior when grouped according to their sex, age, civil status, residence, educational attainment, case and length of stay in the jail. But the respondents differed on their assessment towards their verbal aggressive behavior when grouped according to their number of relatives with police records, since the p-values of .007 is lower than .05 level of significance.

Based on the findings it could be assumed that there was a familial influence when it comes to the respondents' level of verbal aggression because the more number of relatives with police records they have, the verbally aggressive they were.

The inmates do not differ on their assessment towards their anger aggressive behavior when grouped according to their profile variables.

In contrast to the findings that there are no differences on the level of anger among the respondents as to age, Schafer, (2011), explore the difference of teenage life than adulthood, and found that the teenage years are difficult to get through. Physical and emotional changes occur at a rapid pace, and the need for acceptance gains importance in an individual's life. Hormones take over, emotions run high and every teen has to learn how to cope with the new changes. They are also learning to get along with others and discovering their own self-awareness. Learning to adapt to these changes can create anger and sometimes even aggression. Physical changes can result in anger and confusion as hormone levels begin to change in boys and girls.

According to the American Academy of Child and Adolescent Psychiatry, some of these factors include, being the victim of physical abuse and/or sexual abuse, exposure to violence in the home and/or community, genetic (family heredity) factors, exposure to violence in media, combination of stressful family socioeconomic factors (poverty, severe deprivation, marital breakup, single parenting, unemployment, loss of support from extended family) or brain damage from head injury.

Physical and emotional aspects factor into feelings of anger or aggression in teenagers. According to ParentingaTeenager.net, "It is no surprise that our teens might become overloaded with stress. Teenagers have poor coping skills, and getting angry is the only way they know how to avoid feeling sad, hurt, or afraid." Teens act out when they feel rejected, and sometimes feelings of anger can turn into aggression. Girls tend to act on this anger by verbally expressing themselves, while boys tend to express themselves physically.

While the difference of hostility of the respondents in terms of their profile as shown in the table 18, suggest that the inmates differed on their assessment towards their hostile aggressive behavior when grouped according to their age, civil status, educational attainment, case and length of stay in the jail.

Writing about the importance of childhood years in the formation of individuals, Saul (Saul as quoted in Buss, 1961) claims that, "Hostility is a disease of development and has its chief source within the personality. The distortions which cause it may be in the excessive demands or hostile images insofar as an individual's whole way of thinking and outlook are warped by the persisting emotional effects of unwholesome childhood influences."

But the respondents did not differ on their assessment towards their hostile aggressive behavior when grouped according to their sex, residence and number of relatives with police records, since the p-values of.71, .18, and .77 were all higher than .05 level of significance.

In contrast to the result that there was no gender difference on hostility among the respondents, the study conducted by Jay et al., (2007) where data from ethnically diverse and representative sample of young adults reveals clear gender differences and, at least for short-tempered anger, decreasing levels of anger with increasing socio-economic status. They found that prior exposure to violent events, prior exposure to other forms of social stress, and certain personal attributes were found to be significant antecedents of both hostility and short-tempered forms of anger proneness.

The inmates did not differ on their assessment towards their general aggressive behavior when grouped according to their age, civil status, residence, educational attainment, case, length of stay in the jail, and number of relatives with police records.

A central sociological problem was the extent to which genetics and the environment influence human behavior. Whether aggression was inherited or not, was it nature to an individual or nurtured. According to Schmitz, (2003), multivariate analyses indicated that measures of the social environment sometimes reduced or eliminated apparent genetic effects. In comparison with genetic indicators, social variables were usually stronger predictors of depression and alcohol use and abuse.

Additional research finding contrary to this was the debate between genetic and environmental influences on antisocial or criminal behavior had to deal with the age of the individual. Research seemed consistent in recognizing that heritability influences adult behavior more than environmental influences, but that for children and adolescents the environment was the most significant factor influencing their behavior (Rhee & Waldman, 2002). As an adult, we have the ability to choose the environment in which to live and this will either positively or negatively reinforce our personality traits, such as aggressiveness. However, children and adolescents are limited to the extent of choosing an environment, which accounts for the greater influence of environmental factors in childhood behaviors.

Thus on the twin studies that were also conducted by (Joseph, 2001), also on the basis of comparing identical twins and their rates of criminal behavior with the rates of criminal behavior of fraternal twins. He concluded therefore that in respect to common crime, hereditary factors are of little significance.

According to the study of Schmitz, (2003), the family environment is critical to the upbringing of a child and if problems exist then the child is most likely to suffer the consequences. Prior research on the relationship between family environment and child behavior characterizes a child's well-being with a positive and caring parent-child relationship, a stimulating home environment, and consistent disciplinary techniques. Families with poor communication and weak family bonds have been shown to have a correlation with children's development of aggressive/criminal behavior (Garnefski & Okma, 1996). Therefore it seems obvious to conclude that those families who are less financially sound, perhaps have more children, and who are unable to consistently punish their children will have a greater likelihood of promoting an environment that will influence antisocial or delinquent behavior.

4. Conclusions

From the aforementioned findings the researchers concluded that:

1. Majority of the respondents were aged 18-35 years old, single, and resides on District I. Most of them were elementary graduate, murder was mainly the case charged against them, and they have been inside the jail for less than a year with no relatives with police records.

2. The Batangueño inmates have below average level of aggression in terms of physical, verbal, anger and hostility.

3. Anger, revenge, and envy were the most common reason for their incarceration.

4. The respondents did not differ on their assessment towards their physical aggression, anger and general aggressive behavior when grouped according to their profile variables. However, the respondents differed significantly in verbal aggression in terms of number of relatives with police record and also differ significantly in hostile behavior in terms of sex, residence and number of relatives with police record.

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DPSIR Framework towards Sustainability of Mineral Water Abstraction Governance in Malaysia

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Abstract

This article discusses the development of the "Drivers, Pressure, State, Impact and Response (DPSIR) as an added tool to govern the Malaysian mineral water abstraction sustainably. The objectives were to assess and improvise the existing governance of mineral water abstraction as well as develop a policy ensuring sustainability of groundwater resource. The framework was adopted to fit the local criteria and environment. The study was explanatory in nature as it investigates item of each DPSIR construct. This framework is to guide stakeholders in upgrading existing management system and develop new groundwater management with necessary aspects. The items are important as guidance to stakeholders and public in the aspects of consumption along with maintaining the quality and sustainability of the finite resource. Results showed thirteen sub-constructs in the framework development. The study will put forward recommendations to ensure improvisation and enhancement for better control of the resource.

Keywords: abstraction, DPSIR framework, mineral water, sustainability

1. Introduction

The purpose of this article is to focus in developing a framework with item generation specifying on mineral water abstraction. The framework would be the foundation of developing the sub-constructs and items of Drivers Pressure State Impact Responses (DPSIR) framework. As such, the process of identifying the significant elements is the basic and fundamental challenge of the research. This article is divided into several sections. Section one is the introduction followed by section two explaining on the background of DPSIR. Section three would discuss on the methodology of the study. Section four would lay out the findings and followed by the discussions. Lastly the conclusion puts forward recommendations as well as the conclusion of the research.

Increase in mineral water consumption has made groundwater one of the important environmental and human health issues in Malaysia (Mohamed *et al.*, 2009). groundwater is the source of bottled mineral water in this country (Rahman, 2009) which is exported as well. It has become a norm in Malaysia to rely on bottled mineral water for quenching thirst, travelling and a source during water rationing. Thus, this paper focuses on the abstraction of groundwater by mineral water industries to ensure the governance and management as well as the compliance in Malaysia are in accordance with the concept of sustainability.

Compared to surface water, groundwater in Malaysia is without any specific or using unanimous guidelines according to recharge rate or categories (Razak and Karim, 2009). Currently, agencies involved with groundwater abstractions regarding mineral water industry are the Mineral and Geoscience Department (MGD), Ministry of Health (MOH) and state water authorities. As it is, no single body was appointed to carry the responsibility for groundwater planning, developing, regulating and managing the abundant resource. As a result, groundwater development activities are not coordinated among the water agencies be it from the state or federal government (Usali and Ismail, 2010; Rahman, 2009; Razak and Karim, 2009; Desa and Shafie, 2003). As according to Directive No. 5.1: National Policy on the Environment (NPE), 2002, all policymaking and environmental issues addressed should be streamlined and coordinated within departments or ministries and between state

and federal. Therefore, this research aims for effective and efficient implementation of mineral water governance which would be put forward towards a bigger picture of groundwater abstraction in the country.

2. Method

This research adopts qualitative research method through exploratory research as there are currently limited studies on the sustainability of groundwater abstraction governance in Malaysia. In order to fill the gap, first the researchers tried to develop the elements needed in effective governance that requires assessing and analysing national and international policies, government documents, books and published journals. Second, interviews with groundwater stakeholders' namely mineral water operators, legislators and state water authorities were conducted. The triangulation method was used to validate the data collected as well as understanding the research problem. It also serves the purpose of reducing the disadvantages of one method with the other. Those data analysed are then put into respective constructs.

2.1 The study site

This study focuses only on the abstraction of mineral water factories and its governance in the West of Malaysia, better known as the peninsular Malaysia based on several reasons. First, there is only one mineral water factory each in the East of Malaysia of Sabah and Sarawak. Second, the main groundwater usage in Sabah and Sarawak are for domestic purposes which do require any registration or involving any fees therefore formal documentation of the usage is non existent. Third, some of the industries approached were reluctant and refused to contribute to this study.

It is critical to understand the difference of geographical and regional characteristics in formulating management measures and development to fit local conditions (Geng *et al*., 2014). Therefore it is imperative to set the indicators and attributes of the relationship and interdependent between human and nature. The mineral water case study demonstrates the practicality and reasonability of the proposed framework and provides a reference for an effective governance of groundwater throughout the country.

The country, Malaysia lies near the equatorial zone and governed by the north-east and south-west monsoon. Its average temperature throughout the year is 27^{o}C although it now unpredictable with the global warming affecting the temperature throughout the world. In addition, the humidity throughout is high, about 80% and a high rate of evaporation with rainfall more than 3000 millimeter (mm).

The highest population throughout the country is in the central region of the peninsular between 4,400,100 – 5,500,000 people. Central region is of Selangor, Kuala Lumpur and Putrajaya. Meanwhile, the highest number of water consumption is in Selangor followed by Johor and Perak and the least user is Perlis (IACES, 2013).

2.2 Adopted Framework

This study is specifically based on the Drivers, Pressure, State, Impacts and Response (DPSIR) model, adjusted by the European Environment Agency (EEA) from the Pressure State Response (PSR) model of OECD. The original PSR model strictly emphasised on sustainable management of water resources. The researcher chose the DPSIR model framework as it tracks environmental progress and factors of the said problem or research which will assist in structuring complex data in an integrative way (Pinto *et al*., 2013). Considering that ensuring good, sustainable groundwater governance and management is a critical aspect to be concerned with (Maliva and Missimer, 2012; Palacio, 2009; Shah *et al*., 2009 and Pierce, 2006). The framework describes relationships between the origins of a problem and consequences of each element. It is meant to improve the system and take into account implemented policies and management of past and the future. This adaptation of the model is universal to other environmental elements such as forests resources, ozone layer depletion etc.

Figure 1.1 below shows how the model links the areas and help with decision-making with the addition where it shows the link of environmental issues to groundwater over abstraction. The framework is consisted by five constructs representing 'drivers', 'pressure', 'state', 'impact' and 'response' which are being explained in detail in the following sections.

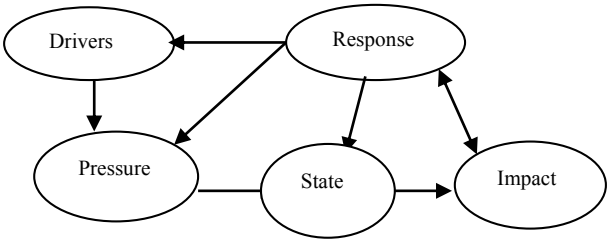

Figure 1. Conceptual Framework of Environment Using DPSIR
Source: European Environment Agency (EEA).

2.2.1 Drivers (D)

Identified drivers were divided into two categories; natural and human induced (Pinto *et al*., 2013). Both may cause direct or indirect changes to groundwater resources. The natural causes may not be controlled whereas the anthropogenic can certainly be controlled.

2.2.2 Pressures (P)

The DPSIR model considers human activities the major pressures to the environment that affects the quality and quantity of natural resources (Pinto *et al*., 2013). Pressure is the direct effect and quantifiable driver to the system. Pressures are factored by drivers to the environmental state. It is an effect that causes changes the flow or quality of groundwater.

The pressures identified for this research are based on the identification of the items that need to be managed for sustainable abstraction of groundwater resources: 1) water abstraction/regulation; 2) water demand; 3) water quality and 4) land-use patterns. These pressures, in single form or combined, may cause distress to the groundwater system that may lead to unsustainability.

2.2.3 State (S)

Two main components of the state are the quality and quantity of groundwater resources. It depicts the condition of groundwater especially from anthropogenic processes. This includes decreasing of groundwater recharge, groundwater level as well as groundwater quality degradation.

2.2.4 Impacts (I)

Three main categories were considered for the impacts of groundwater; the physical, quality and economic changes of the groundwater status. It covers the physical, chemical or biological changes of groundwater as well as impact towards the industries.

2.2.5 Responses (R)

Responses are measures taken by the managements or legilators to address drivers, pressures, states and impacts. It is a creation of a system, substitutes or modification of drivers to reduce pressures on groundwater resource. Then, society responds to the changes through environmental and economic policies as well as awareness and behaviour change (societal response). As Knuppe and Pahl-Wostl (2011) stressed, effective approaches to groundwater governance are effective through several mechanism approaches. These approaches or responses should include coordination and cooperation within governance regimes as well as long-term view and solutions by considering uncertainties such as global climate change and evolving systems.

3. Results and Discussion

Research findings show that there are respectively thirteen sub-constructs identified with items in the DPSIR for sustainable mineral water abstraction. Items generated were from literatures (local and international document analysis), by interviews with the experts from stakeholders selected as well as in-situ observations and confirmed by the triangulation method. These inputs were the basis in constructing the list of sub-constructs. They are namely:

3.1 Drivers

The main drivers considered for the mineral water study are natural and anthropogenic drivers. Natural drivers may be caused by climate change and precipitation factor. The anthropogenic factors are such; increase in population and urbanisation that drove groundwater resources into changes. The changes triggered by the drivers may cause severe disaster causing detrimental effects to human and environment (Jha, 2013). These changes and pollution possess significant impacts on freshwater

resources and their availability.

3.1.1 Natural drivers

Groundwater recharge depends on the precipitation of water mainly rainwater upon the earth. Malaysia is influenced by monsoon seasons; dry weather and heavy rainfall which are the base of mean annual temperatures and annual precipitation. In 2010, the mean annual precipitation ranged between 1785 to 3070.9 mm while in 2011 the range was between 23 and 428 mm (Figure 2). The difference in the amount of precipitation between those two years is quite vast. On the other hand, mean annual temperatures varied between 35.6 and 14.0°C in 2011. Data were obtained from the national meteorological department for the year 2010 and 2011.

Global warming or climate change is also a common factor in this decade towards water demand and usage. The change is expected to increase and complicate groundwater usage thus stresses the aquifers (Jha, 2013). The situation is the most severe long-term threat to development especially to the developing and low-income countries. They would suffer the most and vulnerable. From the interview, there are mineral water operators who are affected by the drought season in mid year that they have to increase the production during rainy season to compensate the loss. These operators are mainly located at flat terrains with low water table receiving rainfall less than 2200mm per year.

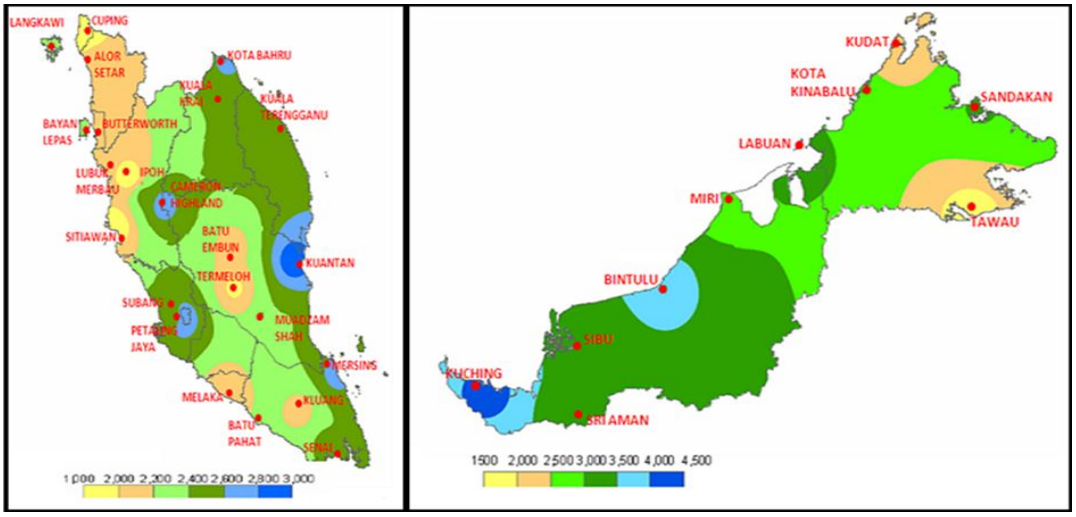

Figure 2. Annual mean precipitation 2011
Source: Meteorological Department

3.1.2 Anthropogenic Drivers

Anthropogenic drivers are divided into three categories: demographic, economic and ecological (Pinto *et al*., 2013). The information for these sub-constructs was obtained from stakeholders of national institutions such as MGD, MOH, statistical department and the mineral water industry *per se*.

a. Demographic Drivers

Demographic drivers are factored by population number and urbanisation. It is a proxy for daily demand and water usage. Other important demographic drivers are the policies and managements that determine groundwater system implemented by administrative organisations responsible (Pinto *et al*., 2013).

The annual population growth rate in Malaysia has since increase from 1970 to 2010 (IACES, 2013). An increase of 5.3% was recorded from the year of 2006 to 2010. The population density in 2000 and 2010 both showed the same pattern with the highest number in Kuala Lumpur and the least in Sarawak. Urban areas in Kuala Lumpur, Selangor and Johor Bahru overall experienced increase in population of 62.9% in 2006 and 71% in 2010 (IACES, 2013). It was also predicted by 2040, Malaysian population growth is expected to increase to 38.6 million (Ismail and Mohammed Karim, 2010). The rapid urbanisation and economy has led people to migrate to the cities. This resulted in land developments and infrastructures for the urban population. The developments, changes of lifestyles and cultural preferences led to over usage and affecting the current water sector (MyWP, 2011).

Analysis from the interview showed that the mineral water demand locally has increased tremendously

since year 2000. The higher usage is mostly in the urban areas and during special celebrated occasions. As an example, during voting seasons, the demand for bottled mineral water all over the country were extremely high as politicians' distributed free mineral water during campaigns plus the public bought the mineral water to keep hydrated.

b. Economic Drivers

The main activities considered in the economic drivers' assessment: industrialisation and tourism. These economic drivers may cause severe stress to aquifers (Jha, 2013). The main parameters assessed from the mineral water industry are inclusive of: 1) the total number of production units; 2) employment numbers and; 3) water availability which plays a role behind the economic factors. These have led to more pressure on groundwater resources due to increasing demand for industrial usage and industrial effluents (MyWP, 2011).

This was proven from the findings of the research showing the amount of groundwater abstraction parallels with the increasing number of industries between the year 2006 to 2010 (Figure 3). The groundwater abstraction amount was taken from all types of industries registered to abstract groundwater in the state of Selangor. The Industrial Production Index (IPI) index was obtained from the Malaysian national statistics department. The bigger the factories are the bigger amount of abstraction of groundwater and the bigger supply of bottled water produced. Keeping in mind, the more number of years operating, the higher number of supplies is.

Figure 3. Percentages of Water Abstraction Amount with IPI

c. Ecological Drivers

The ecological drivers on the other hand, include the volume of water abstracted, land boundaries and water quality over the years.

Surface water withdrawals at 1995 according to sectors are highest by agriculture (77%) followed by industry (13%) and last by domestic users (11%), (Earth Trends, 2003). Malaysia in the meantime, exist 35 industrial and 5 agricultural registered usages for groundwater (Ismail and Karim, 2010). The groundwater usage by industries includes those for mineral water bottling and cooling sytem. However, there are many unregistered groundwater usages especially for agriculture industry.

Each water operators are given allocation amounts of abstraction from previous pumping tests. The allocations given are to control the abstraction within the capacity of surrounding area. There are certain cases where the limits were bridge but it was not reported. This scenario happened because the operators wanted to produce more supply at a certain time given and did not report as they would not want any action taken towards them.

Surface water quality on the other hand is also a driver towards groundwater usages. The deteriorating quality and scarcity drove the demands and supply from another water source. Thus far from analysis throughout Malaysia, the tremendous hike in demand towards bottled mineral water was caused by water supply distruption and unsatisfactory quality of water in certain states.

3.2 Pressures

In order to assess the environmental pressures on groundwater in this country, the author tried to link between the driving forces and pressures. The pressures identified involved in the mineral water abstraction are the i) water supply; ii) water demand and; iii) the quality of current water supply which is surface water.

3.2.1Water Supply

Most of Malaysian water supply comes from surface water sources followed by dams and groundwater. The source of the surface water comes from rain especially during the Northeast season. However, urban water supplies are getting scarce and water rationings are experienced quite often. More people and industries are now relying on water alternatives other than surface water and that is where groundwater comes in. From the findings, in the state of Kelantan, most of the water comes from groundwater sources as the surface water quality is unreliable. The state's capital Kota Bharu is using 100% of its water supply especially for domestic purposes from groundwater. At present, 60 of Malaysian groundwater wells were estimated for domestic utilisation (Ismail and Karim, 2010). Selangor has 300 wells registered under the state water authority and Kedah has only 85 wells. From those number of wells registered, only two factories in Selangor uses groundwater for mineral water bottling and only one in Kedah. The total groundwater usage overall is 446 MLD in 2010 which was predicted to increase by 20% in 2020 reaching 3,304 MLD. This makes it around 0.000428 bcm per day with 0.156 bcm per year which is considered small.

3.2.2Water Demand

In 2010, the water requirement for the country will increase from 13,216 MLD to 16, 520 MLD by 2020. The main water users are the population, agriculture, industry, and tourism. Based on the National Water Resources Statistics (NWRS) 2000-2050, the water demand and the industries are expected to increase by 63%. Also, bottled mineral water demand is higher in urban areas compared to the outskirts. The demand is ranked as follows; (1) hypermarkets (2) companies (3) petrol stations. Generally it shows that Malaysian citizen who bought the bottled water are concerned with the quality of water and the bottled water is more accessible everywhere. At the same time, using bottled mineral water is a way to promote the buyer's company. Therefore, groundwater resources must be developed and managed to ensure social, economic and environmental development is sustainable in every manner.

3.2.3Deteriorating Quality of Surface Water

Pressures on the mineral water system identified include water pollution or quality. More than 90% of Malaysia's water supply comes from rivers and streams. The major sources of pollution for both surface water and groundwater include discharges from sewage treatment plants, agriculture and domestic sewage. Indirectly the pollution causes clean water supply crisis. Changes in land cover or land use, through land reclamation and use intensification, directly impacted water quality. These activities include land alterations to accommodate the industry or infrastructures.

More than 40% of the rivers in Malaysia in 2007 are slightly polluted or polluted (Usali and Ismail, 2010). It is something to be concerned as the pollution from above rivers might infiltrate to groundwater through the water cycle. Even changes in the quality of groundwater can affect the surface water bodies in their capability of ecosystem support (Dillon, 2009).

3.3 Status

To suit the groundwater reseach, researchers use the word status rather than state to better describe the condition of groundwater. It is also to avoid confusion on the meaning of state. The United Nations Economic and Social Council in Geneva in 1997 stated, the world faces water quantity and quality problems largely as a result of poor management. It interconnects with the declining biodiversity, desertification and pollution of the environment.

3.3.1 Water Quality

Groundwater can be polluted if the soil above the aquifer is permeable. It is usually taken for granted as infiltration process would naturally cleanse the water through soil but it would not purify chemical pollutants. Landfills, septic tanks, underground gas tanks, fertilisers and pesticides are the usual polluters for groundwater. Generally, the chemical tested for groundwater quality in Malaysia are pH, temperature, Total Dissolved Solid (TDS) and dissolved oxygen (DO) depending on the reason of usage and departments in charge.

This issue should concern all the government agencies, policy makers and local communities. As the polluted water seeps through slowly, so does the flow of the groundwater underneath and as any other type of environmental pollution, it does not have any boundaries. Thus, it is certainly not sustainable for our young generation to use.

Water deterioration is caused by many factors such as the industry and agriculture. DOE has applied the WQI to assess the river water quality to detect changes and identify the source of pollution. There are five classes in which the WQI are based from Class I to V. WQI main parameters i.e Biochemical oxygen demand (BOD), chemical oxygen demand (COD), Ammoniacal Nitrogen (NH3N), Suspended solids (SS), pH and Dissolved oxygen (DO). Overall, the quality status of Malaysian river basins are majority in class III based on the Malaysian water quality index (WQI). This was one of the main reason people are searching for other water resources such as groundwater which has high quality and lower treatment needed.

From the findings of the mineral water operators however, some factories had cases of pollution in their water quality. They detected some small changes in the nitrogen, phosphorous and pH readings. When these happen, reports have to be sent to the state water authorities and the MOH. They will send people to do monitoring. If the readings are still a concern, then the factory would have to stop production until the matter settles.

3.3.2 Water Quantity

The surface water was directly impacted by the drought season especially in high density areas. Water supply in the state of Selangor for these past few years was badly affected that had led to the whole state water rationing. The water rationing has directly impacted major industries. Many industries searches for alternative ways such as relocate which would cost them very high capital and another choice is to use groundwater which is much cheaper.

Water quantity analysis focuses mainly on the amount of abstraction in each mineral water industry in a year. The data obtained were from the mineral water operators and state water authorities. State water authorities according to the enactment, demanded the mineral water operators to do water pumping test every 5 years while MOH every 3 years. This action is to analyse the level and control the water table.

Meanwhile, the Internal Renewable Water Resources (IRWR) had estimated Malaysian groundwater recharge from 1997 to 2001 was at 64 cubic kilometres (km^3) (Earth Trends, 2003). The recharge estimated for the whole Asian continent at the same duration was at 2,472 km^3. The amount is huge compared to other continents which need to be managed sustainably.

The analysis showed that the mineral water operators abided by the rules of abstraction limit. There were a few occasions by some operators where they breached the limits. When found, they were given warnings and monitored closely. However, many of the legislators are short of staff whereby the monitorings were not done effectively.

3.4 Impacts

Impacts from groundwater abstraction may differ according to type of industry and amount of usage. It would also concern the surrounding users or non-users. The findings for this paper includes from the literatures and interviews with the various stakeholders. Findings showed the impacts of groundwater abstraction for mineral water bottling are categorised according to two; direct and indirect impacts (Table 1). The direct impacts related to groundwater would include decline in water table, land subsidence, saline water intrusion and infrastructure damage. Those changes may then indirectly affect public health, economic and social performance of societies.

In a more detailed scale, these impacts can be divided into groups of three according to type of impacts namely physical, quality and economic impacts. The physical impacts are more towards the environment; movements of earth, soil, river system, lowering of water table and all surrounding the well area. Quality impacts are the consequences towards the groundwater quality which includes higher turbidity, changes in pH and higher mineral content. Economic impact affects mainly on groundwater consumers especially the industrial sectors which would hike up the pumping cost or lowering the number of bottles sold.

Table 1. Impacts of groundwater over abstraction for mineral water bottling

Direct impacts	Industry Households Urban supply Ecological impacts	Physical	Drop of water table Sea water intrusion Land subsidence Changes in the hydrological system Food supply disruption
		Quality	Higher turbidity Changes in water quality parameters Impurities in water
Indirect impacts	Aesthetic value Public health Tourisms/ ecotourism Research/ education Biodiversity assets	Economic	Hike up pumping costs Less bottles produced

3.5 Response

The response by society or policymakers is the result of an undesired impact and can affect any part of the chain between drivers and impacts .Two main factors were considered:

3.5.1Policies and directives

Decision-making process in groundwater resource management should be included to permanently care for the resource through institutional and legal reforms and stakeholder participation. Should be included is water supply management to cater for water demand and management of water resources within the carrying capacity (MyWP, 2011).

3.5.2Management actions

The conceptual overview of the flow in groundwater abstraction by the mineral water bottling is to establish baseline scenarios for analysis. This approach provides a comprehensive analysis of the groundwater system and its importance to the industries and public mainly. The ultimate aims were to contribute to the knowledge of the groundwater sustainabilityand management and to make inferences for management-related issues that were or could be implemented.

Managing water and its resources includes planning, development and sustainable supply. In the Tenth Malaysian Plan (10MP) milestone, the government was ensuring to put water supply security in line with the rapid economic development, urbanisation and population growth. Also planned was the expansion of country's IWRM in planning, managing and rehabilitating water resources according to natural geographic boundary regardless of administrative boundary. Research and development were planned to intensify water resources area in support of water sector for national economy

4. Conclusion

Aiming to integrate impacts and possible solutions, the DPSIR framework can be an effective tool to relate groundwater usages to the management system (Turner *et al*., 2000). By its implementation we were able to identify the main relevant variables that can determine the sustainability of groundwater.

As water resources are becoming precious goods, there is a need for further regulation in Malaysia to avoid management failures. Likewise, the increasing anthropogenic activities have led to higher water

extractions, and possible higher water stresses. This implies the increase demand for food, water supply, water usage, and wastewater discharges. These changes and impacts ultimately reduce the overall ecosystem services. When the demand for certain services increases, human actions are often accompanied by the modification of ecosystems to increase their provisioning capacity. In general, water consumption increased with population and GDP (Pinto *et al.*, 2013).

It is a major challenge to manage the sustainability of natural resources especially transboundary water such as groundwater. The increasing environmental issues and the effects to the water system had enforced a more prominent role throughout the world. This national level of governance would determine the national policy and significant impacts in the future (Vannevel, 2010) that would require all level of coperation.

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Do National Human Development Levels and ICT Diffusion Curtail Fatal Occupational Injuries? Panel Data of OECD

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Abstract

Fatal occupational injuries (FOI) have bad impact not only on employees but also on firms. Moreover, high costs of FOI form a heavy burden for national budgets and stain the name of country. Human Development Level (HDL) as a determinant of living standards in a country can be an important factor reducing FOI. Similarly, information and communication technologies (ICT) diffusion is considered a good means of occupational training and risk awareness. The nations having high ICT diffusion may decrease the risk of FOI. This study aims to explore the impact of national HDL and ICT diffusion on the rate of FOI. We develop a panel data regression model based on a sample of OECD countries and find that the higher HDL and ICT diffusion causes the lower risk of fatal occupational accidents. The paper will be of interest to the key stakeholders: the governments, authorities and the media.

Keywords: Fatal Occupational Injuries, Human Development Level, Information and Communication Technologies, OECD Countries, Panel Data Analysis

1. Introduction

Prior to industrial revolution the occupational safety and health was thought to be the responsibility of individual employee. Parallel with the progress of industrial revolution in the 19th century work place injuries became more widespread since larger than accustomed and dangerous machinery caused many accidents and injuries. Besides, by the time, manufacturing moved to larger plants. Increasing number of workers per plant required increased need for supervision (Lehto & Buck 2008). Throughout the industrialization era occupational injuries are tried to be controlled by the way of supervision and strict instructions developed by the management. Legal responsibility of the incidents came into the domain of work place instead of employee gradually in time. In contemporary work place environment, the importance of human capital is considered one of the most important assets of organizations competitive power. Occupational injuries are regarded as a very significant factor harming positive organizational climate, reputation and competitive power. Thus, organizations try to diminish the frequency and probability of occupational injuries.

Worldwide, hazardous conditions in the workplace were responsible for a minimum of 312,000 fatal unintentional occupational injuries annually (Concha-Barrientos et al. 2005). Although the nature of occupational injuries is considered to be a phenomenon between employee and employer the regulatory function of the governments play very important role between these two parties. It is reported that most of the occupational safety and health regulation in OECD Member countries is realized and forced by courtesy of governmental policies and interventions. Especially during the 1970s governments' legislative efforts to make workplaces more humanized was commonplace for many countries. These efforts have oriented enterprises to allocate resources to issue of occupational health and safety (OECD 1989).

From macro point of view the annual toll of fatal occupational injuries (FOI) which is accumulation of one or two at a time, can be bigger than the death toll of the most traumatic disasters enormously effecting societies such as September 11 in US or war in Iraq or Afghanistan. This cumulative figures of fatal situations as consequences of preventable incidents lead to the thousands of work place deaths

and millions of workplace injuries in the world (Stout & Linn 2002). The rate of FOI is not homogenous among the nations (Takala, 1999). Figure 1 shows mean of rate of fatal occupational injuries per 100,000 workers (2000-2008) of 21 OECD Nations.

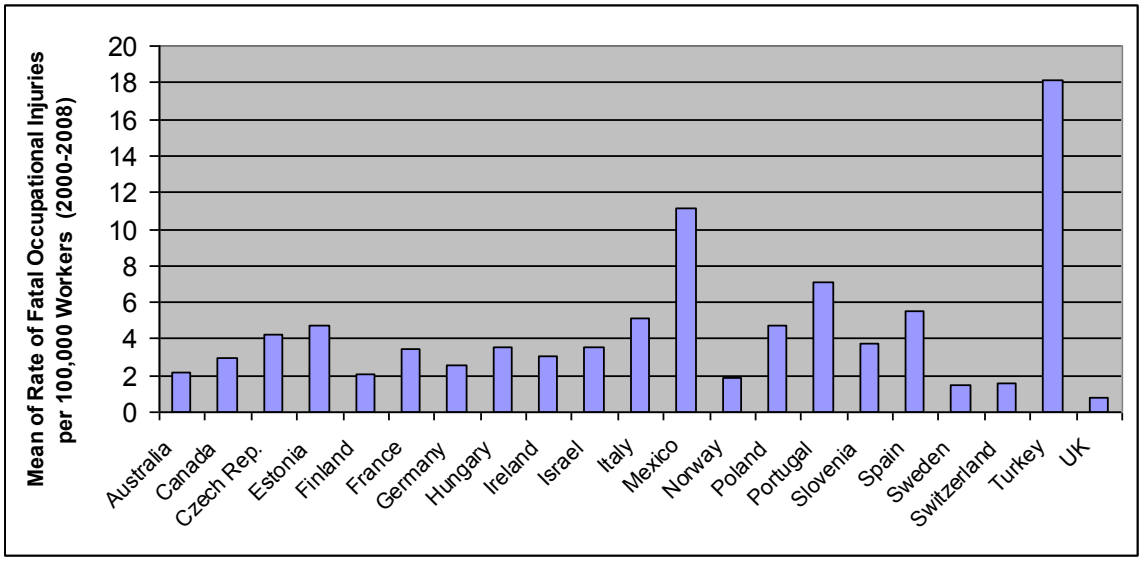

Figure 1. Means of Rate of Fatal Occupational Injuries per 100,000 Workers (2000-2008) of 21 OECD Nations

This non-homogeneity connote that there may be some macro level factors effecting the rate of national FOI. Why are some countries exposed to higher rates of FOI while others enjoy lower? A research, based on an analysis covering the data from three countries (New Zealand, Australia, and the United States) exploring the variance in the rates of national rates of FOI among these three countries, claims that much of the difference between countries is accounted for by differences in industry distribution and the level of riskiness of these industries are mainly different (Feyer et al. 2001). We think that this analysis may be correct but not enough to explain the difference among the countries. Due to lack of data and almost impossible to collect data from different industries from different countries we decided investigate country related factors on occupational injuries and chose two composite variables which we believe to be effective on the phenomenon. Thus, we decided to employ two international composite indexes that are prepared to grade countries in terms of some criteria in order to explain above mentioned variation. First is human development (HD) index which aims to measure and scale the HD level of countries. Second is information and communication technology (ICT) index which designed for measuring and scaling countries' ICT diffusion level.

With a holistic approach Dembe, Erickson, Delbos and Banks (2005) established a framework for the factors influencing occupational injuries. In the model the missing part was the environment in which organizations try to survive. So, we add the environment with two country based variables to framework in Figure 2.

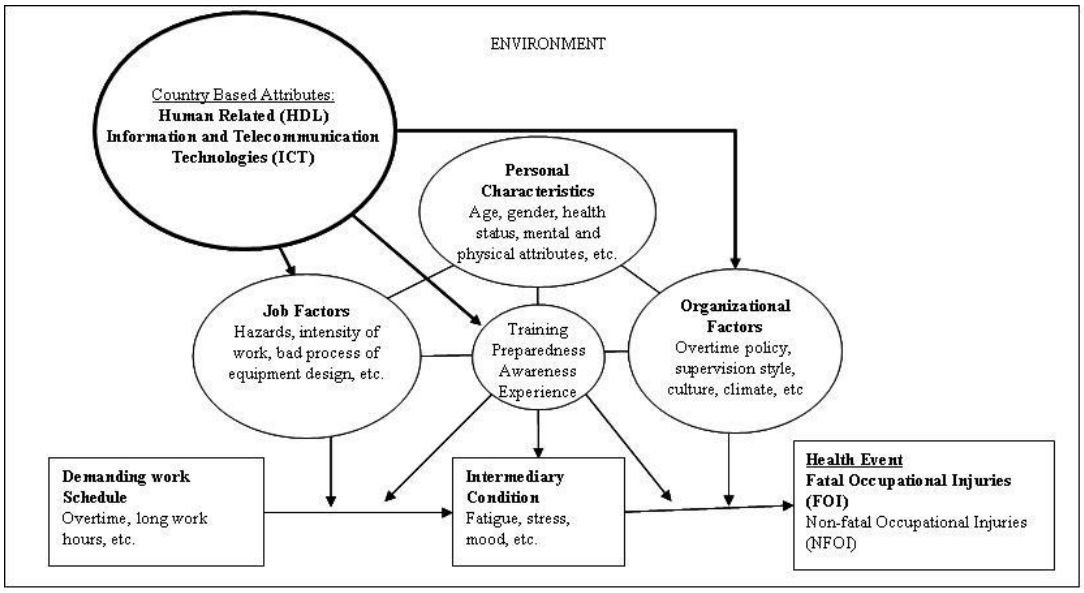

Figure 2. Overall framework for the predecessors of occupational injuries (Modified from Dembe, *et al*. 2005)

Here we also exclude non-fatal occupational injuries (NFOI) from the scope of our study since the data collection procedures of different countries about NFOI and the data which can be obtained is considered as not objective, difficult to measure, non-standardized among countries and unreliable even for basic comparison efforts (OECD 2007; Ahn, Bena & Bailer 2004; Driscoll *et al*. 2005). On the other hand, the fatal occupational accident rates reported to the International Labour Office are extended to the total employed workforce in countries and regions (Takala 1999). We decide that FOI is more robust and reliable variable since method of collecting this datum is almost same throughout nations.

In many studies the predecessors of occupational injuries are scrutinized especially in micro level analyses (Ghosh, Bhattacherjee & Chau 2004; Aderaw, Engdaw & Tadesse 2011; Buica *et al*. 2012). Here from a different angle we try to investigate the impacts of national ICT diffusion and HDL on preventing fatal occupational injuries. We haven't encountered any study investigating the variance of FOI based on panel data of the country properties or investigating the effect of ICT competency and HDL on national FOI rates. Thus, this work is significant as the first study incorporating those composite variables in order to give insight to governments which are struggling to lower the rate of FOI.

2. Literature Review

2.1. ICT and Injury Prevention

Communication has a central role in exchanging information between one or more participants in almost all human activities and tasks. By talking, writing, and various forms of non-verbal communication humans communicate with each other. People's interaction with machines, tools and computers and other devices and products is considered as means of communication too (Lehto & Buck 2008: 632). The technologies or methods supporting the communication skills among humans and devices are tried to be developed. Information and communication systems of work place are the infrastructure and base for all those technologies and applications aiming to support information exchange among the agents.

As a general view information technologies change some organizational attributes. Information technologies can facilitate flattening of hierarchies by broadening the distribution of information to remote corners of the organization in order to empower employees and promote the efficiency of management. The empowerment of employees through information and knowledge diffusion and encouraging them to participate in decision processes can develop good attitudes and behaviors towards organization. This workforce endowed with situational awareness and knowledge about the work processes can provide organizations with faster and more accurate decisions (Laudon & Laudon

2010: 117). Similarly, Wolf claims that ICT competency in African SMEs improves efficiency and increase productivity (Wolf 2001).

When we look from ergonomic design perspective computers and computer networks are used in order to support design processes. Safer and efficient product and process designs can be done using simulation capabilities providing crews of people or individual human operators with problem solving techniques (Lehto & Buck 2008: 440). Using these tools in the Internet, many professionals from all around the world may participate to design and analysis efforts. On the other hand, from training point of view training simulators are widely used in many industries in order to make critical operators acquire skills about the tasks (Lehto & Buck 2008: 450). These systems are also used as distributed and comprised of many end systems connected to Internet. They give opportunity to establish real time emergency or combat training to different individuals all around the world.

The importance of management information systems in progressing occupational health and safety is promoted and supported since it has catalyzing effect on broadening and speeding up the access to information and knowledge, establishing greater participation of employees and reducing information asymmetry and preventing monopolization of opportunities and at the same time allows excluded groups to participate into the game. Namely, it brakes the vicious cycle of "success to successful" (Kenny 1995; Kenny 2009; Baliamoune-Lutz 2003; Sherehiy & Karwowski 2006).

Organizations employ safety networks, which mainly work on the available computer network of the workplace, including different sorts of sensors, logical processors and control software in order to minimize the risk of injuries and hazards in the workplace (Macdonald 2004; Johnsen 2012) and while driving in the traffic (Rieker & Burton 2006; Rodgers *et al*. 2010). Similarly, effective communication systems are also considered as a significant positive factor for enhancing safety in the workplace (Sari 2001; Hofmann & Stetzer 1998). They basically provide automated control of risky machineries or machinery groups in case of any hazard before it turn into an incident.

It is also advocated that information systems based occupational health and safety training can make workers be better and faster aware of the dangers, along with what to do and what not to do than conventional methods (Mavrikakis, Mantas & Diomidous 2007; Evia 2011; Chan, Chan & Chen 2013). In order to estimate potential accident risks in the systems, information systems are proposed and used (Kamardeen 2009; Kang *et al*. 2013). Information systems are also used as early warning systems for preventing injuries in different industries (Martin *et al*. 2008; Larkin *et al*. 2010).

Knowledge sharing and collaboration in the business environment is considered as one of the most important aspects for sustainable organizational success. Internet based search and learning is reported as a very common way of vocational knowledge sharing and learning in different countries and industries (Saint-Onge 2005; Payne 2008; Akbas 2011). Safety related knowledge sharing and transfer to community is another domain which is successfully employed information systems based technologies (Winkel *et al.* 2012).

In the literature we find only one study, covering the situation in South Korea, claiming that national ICT diffusion rate have a very positive connection to occupational safety and negative connection to occupational injuries. It is reported that the intensity of ICT investments and the number of Internet subscribers in South Korea shows a negative correlation with fatal occupational injuries based on longitudinal data covering 1990-1999 term (Hwang, Hur & Choi 2004).

Under the lights of abovementioned studies supporting the fact that ICT diffusion in organizations has a reducing impact on the probability of occupational injuries, we believe that national ICT diffusion may have negative effect on the rate of national fatal occupational injury rate. Here we suppose that ICT score of a country can show the ICT diffusion. Thus, we develop the hypothesis below:

H_1: National ICT score has significant negative impact on the rate of national fatal occupational accidents.

2.2. Human Development Level and Injury Prevention

Human development means an environment lets them to create lives in accord with their desires and interest. From this point of view, human beings are considered as the most important and valuable assets of nations. It fosters the understanding of empowering people in order to reach much more

alternatives, to make decisions with freewill, to access knowledge, better nutrition and health services are important aspects but not enough. It also advises also providing people with secure livelihoods, physical security against crime and violence, leisure hours to refresh, political and cultural freedoms. Human development concept aims to provide people with a proper environment making them to enjoy long, healthy and satisfactory lives. Consequently, humans can develop their capabilities to participate in production in such an environment (UNDP 2011).

In order to explore and track the human development levels of the nations, United Nations Development Program (UNDP) has prepared Human Development Reports since 1990. Because it is very hard to admit that national income is fairly divided and distributed to population and investments are optimized on behalf of living and future population in a country, the rise or fall in national incomes is not a robust indicator of human development level. UNDP suggests an index namely the Human Development Index as proxy for the human development levels of the world nations in this report. The Human Development Index Score (HDIS) measures the average achievements in a country in terms of three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living. The HDIS is the geometric mean of normalized indices measuring achievements in each dimension (UNDP 2011). For details see Klugman, Rodríguez and Choi (2011).

It is considered that healthy individuals mostly have resistance against occupational accidents. Well-being makes them easily better focus on their vocational tasks and diminishes the probability of accidents (Aderaw, Engdaw & Tadesse 2011). Education is another important factor for individual's cognitive capacity and awareness. Cognitive capacity and awareness are very valuable aspects which may decrease the rate of occupational injuries. Individual having higher level of cognitive capacity probably may better know himself/herself and other persons around and technical systems in the work environment. If this capability is supported by the training concerning the work related task. The awareness and knowledge of employee may reach the level which can save himself or herself from accidents or even may give him/her the insight to prevent accidents. Work experience, training, intrinsic motivation, job autonomy, location, and management support influence are reported to be significant factors empowering employees and motivating them to exploit more knowledge related to safe work (Nesheim & Gressgård 2014). Many of the abovementioned studies about impact of ICT on occupational safety reports the facilitating role of ICT on learning, training, gaining awareness processes (Sorine, Walls & Trinkleback 2001; Akbas 2011; Evia 2011; Chan, Chan & Chen, 2013).

Living standards of employees are another important factor for the success in work life (Piha *et al.* 2012). A satisfactory income provides individuals at least decent life standards which make him/her and family happy and robust. A decent life standard can be defined as a threshold for employee self-integration. Under the assumption of employees having no self-integration is probably fail to be aware of the risks and learn the measures which should be taken in order to secure safety in work place. Thus, we develop the hypothesis below:

H_2: Nation's human development level score has significant negative impact on the rate of fatal occupational injuries.

3. Data Collection and Method

In this research, due to the lack of data about some of Organization for Economic Co-operation and Development (OECD) countries, intersection of valid data from three different databases are collected and valid annual data for the period of 2000–2008 belonging to 21 OECD countries (Australia, Canada, Czech Republic, Estonia, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Mexico, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, Turkey and UK) are used. The data of fatal occupational injuries related to 21 OECD countries are gathered from International Labor Organization official website (ILO 2008).

In order to measure HDL we use Human Development Index (HDI) -a composite measurement including education, literacy, and income component- data belonging to 2000-2008 term is gathered from United Nations Development Programme formal website (UNDP 2011). As an international specialized agency of United Nations for information and communication technologies (ICT) since 1947, International Telecommunication Union (ITU) develops the technical standards and endeavors for improving access to ICT. ITU prepares and publishes a composite index for measuring the ICT

capability of countries since 2008. Due to lack of the ICT index data for our study related to 2000–2008 term, we cannot employ ICT index data. To measure national ICT capability, we use the mean of five core statistics (fixed (wired)-broadband subscriptions per 100 inhabitants, fixed-telephone subscriptions per 100 inhabitants, fixed (wired) Internet subscriptions per 100 inhabitants, percentage of Individuals using the Internet and mobile-cellular telephone subscriptions per 100 inhabitants) as an indicator of ICT capability published in its official website since 2000 (ITU 2011). The descriptive statistics of the data is presented in Table 1.

Table 1. Descriptive Statistics of Data Set

	Rate of Fatal Occupational Injuries Per 100 000 Workers (2000-2008 Term of OECD 21 Countries)				ICT Score (2000-2008 Term of OECD-21 Countries)				HDI Score (2000-2008 Term of OECD-21 Countries)			
Country	**Mean**	**S.D.**	**Max**	**Min**	**Mean**	**S.D.**	**Max**	**Min**	**Mean**	**S.D.**	**Max**	**Min**
Australia	2,178	0,211	2,600	2,000	44,013	7,966	54,322	33,144	0,924	0,007	0,933	0,914
Canada	2,933	0,343	3,400	2,300	43,492	5,992	51,886	33,282	0,877	0,007	0,886	0,867
Czech Rep.	4,267	0,587	5,200	3,400	37,614	10,205	50,778	18,824	0,827	0,016	0,844	0,801
Estonia	4,736	1,080	6,200	3,200	39,987	12,274	54,774	22,939	0,794	0,020	0,816	0,762
Finland	2,076	0,223	2,400	1,700	49,278	7,911	59,642	35,396	0,854	0,016	0,871	0,825
France	3,489	0,609	4,400	2,700	40,773	9,842	55,912	26,124	0,849	0,012	0,867	0,834
Germany	2,604	0,361	3,050	2,040	49,033	10,704	63,873	33,168	0,873	0,009	0,885	0,860
Hungary	3,579	0,479	4,210	3,010	32,527	11,131	48,526	15,304	0,791	0,013	0,804	0,767
Ireland	3,056	0,648	4,200	2,200	42,741	9,176	55,196	29,288	0,878	0,015	0,896	0,855
Israel	3,570	0,632	4,300	2,600	43,512	8,404	55,880	31,621	0,857	0,010	0,870	0,842
Italy	5,111	0,928	7,000	4,000	44,362	7,903	53,968	31,054	0,837	0,008	0,850	0,825
Mexico	11,111	1,453	14,000	9,000	15,034	6,089	24,472	6,532	0,722	0,017	0,745	0,698
Norway	1,844	0,361	2,500	1,300	52,732	7,008	61,212	40,790	0,924	0,012	0,937	0,906
Poland	4,737	0,314	5,200	4,300	27,907	11,748	43,967	11,423	0,771	0,011	0,788	0,753
Portugal	7,124	1,065	8,700	5,614	38,365	7,728	48,752	27,075	0,778	0,005	0,789	0,773
Slovenia	3,779	0,922	5,100	2,600	39,443	8,440	50,378	24,824	0,807	0,016	0,828	0,780
Spain	5,478	1,980	9,200	3,300	39,099	9,293	51,194	24,898	0,844	0,011	0,861	0,828
Sweden	1,489	0,127	1,700	1,300	57,546	7,929	64,854	42,828	0,888	0,006	0,899	0,880
Switzerland	1,600	0,391	2,300	1,100	55,293	8,026	66,126	41,774	0,866	0,006	0,876	0,859
Turkey	18,133	4,624	24,600	12,300	22,005	7,106	33,638	12,306	0,652	0,017	0,674	0,629
UK	0,756	0,101	0,900	0,600	50,713	10,097	63,586	34,970	0,837	0,009	0,847	0,823

In this study, in order to test hypotheses (H_1 and H_2) and investigate the explanatory power of independent variables (ICT and HDI) on dependent variable (FOI), we conduct panel data regression for OECD-21 countries for the period of 2000-2008. Since the variables in the regression model have different measurement units (e.g. FOI (fatal injuries/100,000 employees), ICT (0-100 point), HDI (0.000-1.000 point), we propose a logarithmic panel data (time-series cross-section) regression model as indicated in Equation 1. At first we employ exponential smoothing to variables and then we conduct logarithmic scale for data normalization.

$$\ln FOI_{it} = \beta_0 + \beta_1 \ln ICT_{it} + \beta_2 \ln HDI_{it} + \varepsilon_{it} \qquad (1)$$

lnFOI$_{it}$ *: The natural logarithm of FOI value of i^{th} country related to t^{th} term.*

lnICT$_{it}$ *: The natural logarithm of ICT Score of i^{th} country related to t^{th} term.*

lnHDI$_{it}$ *: The natural logarithm of HDI Score of i^{th} country related to t^{th} term.*

ε_{it} *: is the error (residual) term in the panel data regression model.*

4. Econometric Analysis

The main objective of our study is to scrutinize whether there is a relationship of ICT and HDI on OFI in OECD-21 countries for 2000-2008 term using panel data regression.

Panel data analysis is commonly used for last decade and primary form of panel data regression differs from a regular time-series or cross-section regression in that it has a double subscript on its variables as presented in Equation 2 (Baltagi 2005: 11).

$$y_{it} = \alpha + X'_{it}\beta + u_{it} \quad i = 1,...,N; \quad t = 1,...,T \qquad (2)$$

with i indicating households, countries, firms etc. and t expressing time. The i subscript, shows the cross-section dimension whereas t expresses the time-series dimension. α is a scalar, β is $K \times 1$ and X_{it} is the it th observation on K explanatory variables and u_{it} is error term. At firstly, to achieve our objective in this study, we control whether all series in the panel regression model stationary by using panel unit root test and we employ panel data regression.

4.1. Panel Unit Root Test

In panel data regression, firstly, the panel unit root test must be performed for determining whether the relevant variables are stationary. If variables are non-stationary, it may cause to spurious regressions in regression analysis (Baltagi 2005: 237). There are two types of panel unit root tests. If the persistent parameters are common across cross-section, this type of process is named as common unit root test. Levin, Lin and Chu (LLC) develop a common unit root process by using this assumption (Levin, Lin & Chu 2002). On the other hand, if the persistent parameters freely move across cross section, this type of unit root process is named as individual unit root process. The IPS (Im, Pesaran and Shin 2003), Fisher-ADF and Fisher-PP tests are based on this form. The common and individual unit root tests' results are presented in Table 2.

Table 2. Results of Panel Unit Root Test**

	Common Unit Root Test		**Individual Unit Root Tests**					
	Levin Lin &Chu		Im, Pesaran and Shin		ADF Fisher Chi-square		PP Fisher Chi-square	
Vaiables	Statistic	p	Statistic	p	Statistic	P	Statistic	p
				Level				
lnFOI	-6.76087	0.0000*	-5.44443	0.0000*	121.056	0.0000*	196.666	0.0000*
lnICT	-7.82423	0.0000*	-4.37862	0.0000*	79.7129	0.0004*	141.023	0.0000*
lnHDI	-2.88282	0.0020*	-7.88972	0.0000*	126.176	0.000*	244.820	0.0000*

Null Hypothesis: Unit Root

(*) : The test values are significant at α=0.01 level.

(**): Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. Automatic lag length selection based on SIC

It can be seen in Table 2 that all variables are stationary in level form. It means that the null hypothesis is reject at α=0.01 significance level for all variables. Namely, we can conduct panel data regression for the model indicated in Equation 1.

4.2. Hausman's Specification Test

In panel data regression, one of main challenge facing a researcher is: Which model is better, Fixed Effects or Random Effects? If it is proposed that error component ε_{it} and the X_{it}'s are uncorrelated ($E(\varepsilon_{it}/X_{it}) = 0$), Random Effects (RE) may be proper and if ε_{it} and the X_{it}'s are correlated ($E(\varepsilon_{it}/X_{it}) \neq 0$), Fixed Effects (FE) may be proper. Because, if the individual error component ε_{it} and one or more regressors are correlated, the RE estimators are biased and whereas FE estimators are unbiased (Gujariti 2004: 650). Thus, it is substantial to have a method for testing this assumption. Hausman (1978) suggests a test based on the difference between the random effects and fixed effects

estimates named "The Hausman test". This test provides a statistically significant difference for testing the random effects assumption (Wooldridge 2002:288).

4.3. Model Estimation and Results

Hausman test is performed and according to the test result expressed in Table 3, it can be interpreted that the null hypothesis "supposing random effects model is appropriate" is significantly accepted. In summary, we determine that the RE specification is more appropriate than RE specification. The Random Effects (OLS) specification's results are indicated in Table 3 comprehensively.

Table 3. Panel Data Regression Summary

Coefficients	Model (RE)
Constant (β_0)	**9.489014**
	(26.42008)*
lnICT (β_1)	**-0.183784**
	(-2.120728)**
lnHDI (β_2)	**-11.90912**
	(-13.00002)*
Sample	21 countries
Periods	9
Observations	189
R^2	0.7769
Adjusted R^2	0.7745
F	323.8859*
Hausman Test	1.085683***
Heteroscedasticity Wald (χ^2)	322.92♠
Autocorrelation (Baltagi-Wu LBI Test)	1.0508627▲

Notes:

t- statistics are showed in parenthesis. The test values indicated (*) and (**) are significant at α=0.01 and α=0.05 level respectively. (***): Null Hypothesis is Random Effects model. The null hypothesis is accepted at α=0.01 level.

(♠) : A modified Wald test for groupwise heteroscedasticity is performed for heteroscedasticity (see Greene [52] pp.323).

Null Hypothesis: There is heteroscedasticity in the model. The null hypothesis is rejected at α=0.01 level.

(▲) : Baltagi-Wu LBI test for autocorrelation in panel data is used (see Baltagi [53] pp. 89-91).

Null Hypothesis: No first-order autocorrelation. The null hypothesis is accepted α=0.01 level.

To test whether there is an autocorrelation in the model, we conduct a simple test improved by Baltagi and Wu (1999) and we interpret from results that there is no autocorrelation problem in the models. For detecting heteroscedasticity in the model, we employ a modified Wald test for groupwise heteroscedasticity announced by Greene (2003: 323) and conclude that there is no heteroscedasticity in the models.

Random Effects regression model is significant at α=0.01 As regards the adjusted R^2, the RE model have high explanatory power (0.7745). For examining the effects of ICT and HDI variables over OI comprehensively, the coefficients of regression model are indicated in Table 3. According to t-statistics all coefficients in the regression model are significant at 5% significance level. It can be conclude that there is a proper specification for the model. The sign of the coefficients are compatible with our theory based on literature. In the theory we develop, our expectation for dependent/independent variables is that the more increase in independent variables, the more decrease in dependent variable. The

relationship between dependent and independent variables is presented in Figure 3.

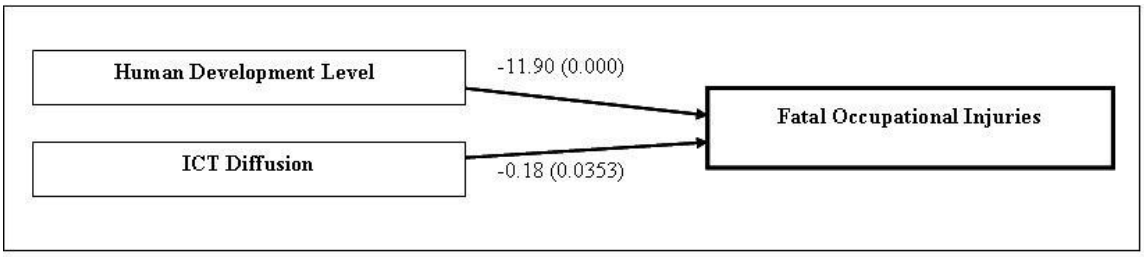

Figure 3. Statistically supported longitudinal associations among research variables

5. Conclusion and Discussion

FOI can be defined as fatal injuries caused by and take place in working environment. Many lives have been lost because of these accidents. In micro level empirical researches we may find some determinants of FOI as it is mentioned above. But in this paper, we try to investigate the relationship of HDL and ICT capabilities to FOI. We use the data of OECD countries.

HDL is considered as one of the most important indicators concerning the life standards of a nation. It is a composite variable having three different dimensions namely education, life expectancy and income. As it can be clearly seen, HDL may have significant impact on many macro variables. As it has been previously determined, the educational and training level and situational awareness of labor are significantly effective on diminishing the rate of occupational accidents. We think that, in macro level, the nations with high level of human development are less prone to occupational accidents and consequently less likely to face more frequent FOI.

On the other hand, ICT capability of a nation is considered as an important aspect fostering or catalyzing the process of education and training since it has a limitless power on collecting, storing, retrieving and disseminating shortly managing information.

Therefore, to test the impact of two composite variables on FOI of nations we apply panel data analysis for a period of nine years data. We find that FOI is negatively and significantly sensitive to both two independent variables. In detail, the negative impact of HDL on FOI is much more powerful than the impact of ICT. We may refer here that national safety culture and climate can be developed and progressed by the way investments to increase development of people living in the country and ICT diffusion in order to support and/or catalyze the processes of training, learning, increasing awareness.

The multivariate regression model is also found to be significant. Thus, we can say that HDL and ICT diffusion of a nation can be significantly decrease the risk of FOI. So, we can conclude that if a government who aims to minimize the risk of lethal occupational injuries has to find ways to increase its level of human development first. Second, we can say that the government should pursue the process of acquiring much more ICT capabilities. Here we test the associations among variables using longitudinal data and analysis. Thus, we can also conclude that the impact of both variables is not limited with cross-sectional characteristics of data or analysis. This means that the relationships suggested covers short and long run time periods.

6. Limitations and Recommendations for Future Studies

We have to denote that this analysis and interpretations are limited to the 21 OECD countries' data for nine years period between 2000 and 2008. So, significant and long term associations among the variables may not be valid for another time frame or other countries in the world. We also have to denote that the findings in this study are probabilistic. All above mentioned limitations of this study should be taken in consideration before making generalization. For future works we can recommend to researchers to include many other variables such as economic freedom, labor rights and occupational accidents prevention legislations and practices in the panel data analysis in order to foster the explanatory power.

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Employment of Graduates in Faculty of Education and Psychology at University of Tehran

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Abstract

This research reviewed graduate employment in Faculty of Education and Psychology at University of Tehran (FEPUT) in Iran. Mixed method was conducted. Results indicated percentage of unemployment and obligation for continuing more education in the field of educational planning and management was the most, but job fitness was the least. Job fitness in some fields was better. Employment in public sector in the field of education of exceptional children was more than 50 percent. Duration of unemployment was different. Annual salary was between $4000- $5000. Job prospectus in the field of education of exceptional children was good and job prospectus in the field of educational planning was weak. Networks were the main strategy for job search. The role of academic and non-academic factors in employability of graduates was almost equal. Result of online interview was similar to above findings.

Keywords: employment, graduate, field of study, university, Iran.

1. Introduction

Students have career advancement in mind when entering higher education: It is believed to improve one's overall future prospects, and especially one's employability (Yang, 2010). From this belief, individuals decide to maximize their degree. Therefore, pursuing higher education creates a clear expectation of a better job and salary after graduation. In spite of anxiety about employment following graduation among university students and the high level of graduate unemployment (Green, 1989), it has not attracted enough attention in the academic literature. One way in which we can develop useful and current information is to examine the situation of graduates in the form of case study. For example, Tomlinson (2007, 2008) studied student attitudes towards the labor market, and the importance of educational credentials to their future careers in the UK. Taylor and Pick (2008) studied the work orientations of Australian university students. The research in these two countries indicates that while university students are still considered "knowledge workers", they face challenges in finding employment because the labor market for students is so congested and competitive. McQuaid and Lindsay (2005) believe that employability has recently emerged as an embracing objective; directing national and supranational policies toward addressing unemployment crises. It has forced politicians all around the world to encounter new challenges (Salehi and Baradaran, 2006). In this context, Iran has faced serious challenges. More than 270,000 Iranian students have graduated from universities each year, adding to the demand for jobs. But labor market is unable to provide it (Azizi and Hoseyni, 2006). The unemployment rate for graduates in Iran was estimated to be 14-21 percent on basis of the field of study (Alibeigi and Zarafshani, 2006). Of course, in a research it is not possible to study situation of all majors. So, in this research, I focus on the graduates of education and psychology in Iran in order to see how their situation in labor market is.

2. Review of literature

2.1 Factors in employability of graduate

Success in finding satisfactory job is influenced by many factors, the most significant factor being the student's field of study (Alberta Career Development and Employment, 1991b; Martinez, Sedlacek, and Bachhuber, 1987). Second is higher degree. Although bachelor degree holders in the field of psychology and related areas can become research assistance and fulltime staff, graduate degrees offer

more opportunities for advancement (Lioyd, 2000). Third are knowledge, abilities, passion, personal characteristics and transferable skills such as interpersonal skills, communication skills, computer literacy and thinking skills. Forth is personal management such as organizational skills, money management skills, time management skills. Fifth are work specific skills that usually learned through some form of training and through observation and practice (Government of Canada, 2009a). Sixth is making positive connections through people or networking. By networking graduates can get support for their job search. More importantly, they can learn about job opening (Government of Canada, 2009b).

2.2 Job search strategies

Graduates do experience difficulty in finding suitable employment that matches their interests and skills (Canadian Occupational Projection System, 1990). In Iran Pezeshki Rad et al (2005) found a significant positive relationship between teaching skills of educators and content of education with job abilities of graduates. Mirkamali (1993) found that job competencies have been conceptualized in a way that encapsulates respondents' views on a number of issues such as job fitness and job satisfaction. According to Kutter & Morgan (2007), knowing professors, involving in research, seeking internships, getting work experience and engaging in extracurricular activities are the main tips for success. According to booklet of Government of Alberta (2008) main factors in preparing for work search are as follow: identifying of personal skills, recognizing of accomplishments, understanding of workplace preferences and finding desirable work opportunities and employers. In this regard, job search strategies are also effective. Some job search strategies can be:1)studying about employment fields,2)searching the internet,3)talking to people,4)attending workshops, 5)registering with private employment agencies,6)hearing about work opportunities through friends,7)contacting executive search firms,8)posting resume to employers, 9)approaching employers directly and asking about job openings,10)using the services of campus (Government of Canada, 2007).Clement(2007)mentioned other ways such as student teaching office and college career center and reading the advertisement and newspapers. These strategies can be a good source for job openings in large cities.

2.3 Employment in the field of education and psychology

There is no question that obtaining a university education enhances employment outcomes for graduates. Even allowing for temporary downturns in the economy, unemployment rates for university graduates are significantly lower than for those who lack university training (Alberta Career Development and Employment, 1991a, 1991b; 1981). In the field of education and related areas changes occurring in the academic marketplace have affected teacher supply and demand. The decade of the 1970 recorded changes for elementary and secondary schools teachers. New teachers faced a tight labor market, and many could not find teaching jobs (Fine, 2005). According to Bureau of Labor Statistics (2004) percent of employment of salary workers in the field of education and psychology, in year of 2002 is as follow:

Education administrators, elementary and secondary school (1.6), education administrators, postsecondary (1.0) professional and related occupations (65.5), clinical, counseling, and school psychologists (0.3), educational, vocational, and school counselors (1.4), school social workers (0.3), post secondary teachers (12.1), preschool teachers (0.5), kindergarten teachers (1.2), elementary school teachers (11.4), middle school teachers (4.6), secondary school teachers (7.8), vocational education teachers, secondary school (0.8), special education teachers in all levels (3.3), adult literacy and remedial education (0.4) librarians (1.1), instructional coordinators (0.5), teacher assistants (8.4), and other teachers (4.0). Median annual earnings of teachers in 2002-2003 ranged from $39,810 to 44,340; the lowest 10 percent earned $24,960 to $29,850; the top 10 percent earned $62,890 to $8530. Private school teachers generally earn less than public school teachers (Fine, 2005). Many organizations including military, social service agencies and nonprofit agencies offer a range of opportunities for psychologists in all disciplines in a variety of areas, including personnel selection, training, leadership and team effectiveness, as well as clinical settings (Kutter & Morgan, 2007), human services worker, social worker and substance abuse counselor (Bureau of Labor Statistics, 2004).

In the field of education and psychology, some graduate conduct research to expand the knowledge base, others practice or apply the findings to help people and communities, and many do both as scientist–practitioners. Clearly, graduates in the field of education, engage in a variety of activities. For example, graduates with bachelor's degree may assist with research but remain under supervision (Kutter & Morgan, 2007).

In this article, the situation of employment has been studied. As this research is explanatory, the findings provide a basis for decision makers in higher education. A quantitative analysis was conducted to assess situation of employment. Based on the findings, I developed an online interview that was administered in a qualitative study to another sample.

3. Research question

There are many clear reasons to do this research that mention all of them are impossible. The main reason is the situation of graduate unemployment that has become increasingly severe in recent years. In 2003, 750000 students failed to find work upon graduating; this figure had reached almost 2 million by 2009, or 32% of recent graduates (Zhao & Huang, 2010, p. 2). Li, Ding and Morgan (2008, p. 269) reported an overall rate of confirmed employment at graduation of over 60%, citing a nationwide 2003 Peking University survey at different higher education institute**.** In fact, the high rate of graduate unemployment is one of the most unique features of its labor market (Alberta Career Development and Employment, 1991a & b)**.** This research investigates the situation of employment of young graduates (aged 35 and below) in the field of education and psychology in terms of case study in Iran. In this research, I focus on situation of B. Ed graduates employment in FEPUT**.** The B. Ed degree in the FEPUT is a 135 credit, four-year program that prepares students to careers such as teacher, principal, counselor, librarian and educational technologist (University of Tehran, 2012). But, it seems that with regard to weak links between university education and labor market, graduates are not qualified to apply for these careers. Therefore, the present research tries to answer the following question:

How is situation of B. Ed graduate employment in FEPUT in Iran?

4. Methods

4.1 Quantitative analysis

Statistical society includes 904 B. Ed graduates in FEPU. In 1944, FEPU was created. It is one of the largest faculties in Iran with seven teaching departments and over 70 full time professors, 50 support staff and 25 part-time sessional instructors and educate more than 1500 undergraduate students and 2000 graduate students. The sample size for questionnaire was calculated using *Cochran* formula. It shows a sample of 132 (82 employed and 50 unemployed) is significantly representative for a population of 904. The analysis draws on data from graduates in 2001-2008. Data gathered by the author from a sample of B. Ed graduates by Questionnaire (appendix 1) between October 2010 and March 2011. The questionnaire used is comprised of 18. Questionnaire was reviewed for construct and validity by a panel of experts consisting of five faculty members in FEPU. After incorporating comments and inputs offered by the panel into the questionnaire, it was pilot tested to ascertain reliability using 39 students (not participating in the main study) in two different times. Reliability of the instrument was calculated 0.98. A total of 160 questionnaires were distributed and a total of 144 questionnaires were returned, giving an overall response rate of 90%. 12 questionnaires were omitted because of the uncompleted responses. The themes of questionnaire were individual and family characteristics, highest level of education, place of employment, duration of unemployment, job search strategies, factors of employability, annual salary, fitness of field of study and job prospectus of field of study.

According to Livanos (2010) Employed are considered those individuals that during the week worked 1 hour and Unemployed are those who during the same period did not had a job but were eligible and were actively seeking for employment. At the present research, employed are considered those individuals that during the week worked in the form of full-time with salary and unemployed are those who during the same period did not had a job but were eligible and were actively seeking for full-time job with salary. A stratified random sampling technique was employed, with field of study in Education and Psychology being the categorical variable in each field of study.

4.2 Results of quantitative analysis

Graduates were asked by questionnaire about their employment. Percentage of employment in 2001 is approximately three times in 2008, while number of graduates in 2001 is approximately twice in 2008 (table 1).

Table1. distribution of graduates and percent of employment according year of graduation

Field of study/year	2001	2002	2003	2004	2005	2006	2007	2008	
Education of exceptional children	17	25	22	7	20	5	17	-	-
Educational Technology	18	4	20	11	-	2	12	-	
Clinical psychology	31	20	31	33	16	32	30	20	
Library science	34	26	32	26	18	36	22	-	-
Educational planning and management	38	25	9	26	8	23	4	25	
Counseling	29	28	25	32	4	15	7	18	
Total	167	128	139	135	66	77	106	86	-
Percent of employment	35.3	15.3	11.8	8.2	7.1	2.4	8.2	11.8	

Table 2 indicates the results of *t* test for significant difference between the two groups of employed and unemployed graduates. T 0.349-values obtained with 125 degrees of freedom and mean difference 0.12-an alpha value of 0.05 is not really meaningful. The average difference between two groups couldn't be generalized to a significant difference and would be acceptable (table 2).

Table 2. situation of academic achievement of unemployment and employment graduates

Job situation	n	mean	sd	se	t	df	p	mean difference	se
Employed	82	15.84	1.75	1.95					
					0.349	125	0.72	0.12	0.32
Unemployed	50	15.96	1.69	.25					

Sd = standard deviation se=standard error

Unemployment in the field of educational planning and management (61%) and educational technology (55%) is considerable. Job fitness in the field of library is high. But, in the field of educational planning and management is low. Employment in public sector in the field of education of exceptional children and counseling is more than other areas. And finally obligation for continuing more education in the field of educational planning and management is the highest.

Table 3. Situation of unemployment, level of employment (part-time or full-time), job fitness, employment in public sector (EPS) and obligation for continuing more education (OCME) by percent

Field of study	unemployment	part-time	full-time	job fitness	EPS	OCME
Education of exceptional children	32	15	85	69	80	55
Educational Technology	55	33	68	41	44	69
Clinical psychology	34	21	79	66	70	45
Library science	20	41	59	77	56	41
Educational planning and management	61	5	95	36	55	72
Counseling	26	-	100	74	80	29

According to table 4, duration of unemployment is the most in the field of educational planning and management.

Table 4. Duration of graduate unemployment by percent

Field of study	less than 1 year	1-2 years	2-3 years	more than 3 years
Education of exceptional children	24	26	27	23
Educational Technology	9	23	15	53
Clinical psychology	19	26	35	20
Library science	23	27	24	26
Educational planning and management	2	15	21	62
Counseling	12	33	15	40

The level of income is similar greatly among graduates. Few graduates experienced more than $6000

and less than $4000 as an annual salary. The median annual salary range was between $4000 and $6000 (table 5).

Table 5. Annual salary of employed graduate by percent

Field of study	less than $4000	$4000-$5000	$5001-$6000	more than-$6000
Education of exceptional children	10	55	26	9
Educational Technology	18	62	17	3
Clinical psychology	11	61	21	7
Library science	15	65	18	2
Educational planning and management	24	36	15	25
Counseling	5	65	16	4

Job prospectus of graduates in the field of exceptional children education is the best and job prospectus of graduates in the field of educational planning is the worst (table 6).

Table 6. Job prospectus of graduate by percent

Field of study	excellent	good	bad
Education of exceptional c	33	41	26
Educational Technology	12	22	66
Clinical psychology	30	42	28
Library science	20	29	51
Educational planning and managment	2	27	71
Counseling	29	30	41

As table 7 shows, networks are the main strategy for job search and sending out the CV to employers is not basic strategy for majority of graduates.

Table 7. Job search strategies of graduates by percent

Field of study	Newspaper	Networks	campus	CV	others
Education of exceptional children	23	51	11	2	13
Educational Technology	12	55	9	1	23
Clinical psychology	25	49	19	4	3
Library science	2	29	51	3	15
Educational planning and management	2	27	71	-	-
Counseling	29	30	41	-	-

According to table 8, the role of academic and non-academic factors in employability of graduate is almost equal.

Table 8. Factors of employability of graduate by percent

Field of study	Academic factors	Non-academic factors
Education of exceptional children	57	43
Educational Technology	49	51
Clinical psychology	59	41
Library science	61	39
Educational planning and management	51	49
Counseling	51	49

4.3 Qualitative analysis

The purpose of the qualitative analysis was to explain results of quantitative analysis. Research question was the same as quantitative analysis.

A link to an online survey was posted for graduates of FEPU in the years of 2001 - 2008**.** Graduates were also invited to share the link. Of the 904 graduates in population, 33 graduates responded to the open-ended question form directly. 6 graduates did not provide completed responses.

Although 18 questions for questionnaire summarized into 8 questions in online interview form, but a preliminary coding scheme was provided based on the grounded theory approach (Glaser and Strauss, 1967; Patton, 2002). Coding of the data took place in two phases. A list of codes was performed in the first phase. The coding scheme consisted of nine key themes (see appendix 2).

To validate the coding scheme and establish inter-rater reliability, two graduates trained in content analysis evaluated and coded each sentence independently. After corrections to the coding scheme, inter-rater reliability was satisfactory at .97.

There were 14 males and 19 females. Field of study of the participants was Education of exceptional children, Educational Technology, Clinical psychology, Counseling, Library science and Educational planning and management. The employment positions for the sample were as follows: 6 teachers, 10 in education sector with administrative and consulting duties, 4 in industry sector, 10 participants were unemployed, two were self-employed and one was taking time out of paid employment to focus on home and family responsibilities. Data gathered by online interview (appendix 2) between May 2011 and October 2011.

4.4 Results of qualitative analysis

The result of online interview indicated obligation of graduates- regardless their field of study- for continuing education is high. Job fitness in some field such as Education of exceptional children, Clinical psychology, library and counseling was better than other fields.

Employment of graduate in public sector was more than private sector and self - employment. Most of graduates referred, "employment in public sector in Iran is better than private sector or self – employment." One of graduate explains, "At the first I wanted to employ in public sector with annual salary $1000. Employment was important for me because it could be guarante my job prospectus." But only one graduate explains, "I like being my own boss because having flexible hours allows me to spend time with my family and my friends."

Duration of graduate unemployment in all interviews was more than one year. As one graduate explains, "I didn't know how get started. So, I talked to a great professor about it. He suggested me about some workshops by Faculty of Entrepreneurship. I went there and learned about career planning. I also learned about myself. I found myself by using the computer." Some graduate referred that they had part – time job before their employment and conducted research and studied to develop their knowledge, others distributed research questionnaire in order to gathering data and many were completely unemployment.

According to interviews annual salary of employed graduate was between $3700- $4800. This finding is a little bit different from than obtained results of questionnaire.

According to interviews job prospectus of graduate was not satisfaction.

All graduates referred to networks as an important strategy for job search. As one graduate explains, "My first big opportunity was from personal contacts." Others note, "I think not only I need a network I also need to using it. Using the services of a campus in the field of Educational planning and management, Library science and Counseling was mentioned frequently. Other common strategy was newspaper advertisements. Graduates referred that sending out resumes is the least effective of the job search strategies.

The role of non-academic factors in employability of graduates was noticeable.

As one graduate explains, "Good marks were important if the graduates wanted to continue their study. It is not important for finding job. Non-academic activities, such as part-time employment and connect to popular persons were seen as basic factor for the career opportunities. They referred this activities had reinforced their employability through the expanding of a network of contacts.

5. Discussion

Findings of mixed method at the present study indicated that situation of employment of graduates in the field of education and psychology increasingly had been limited While Alberta Career Development and Employment (1991a & b) reported the high rate of graduate unemployment as one of the most unique features of its labor market. It is probably this situation in Iran relates to following factors:

A. Social demand for higher education in Iran and government obligation to responding to these demands.

B. Expansion of different kinds of higher education institutions in Iran

C. Budget limitations for staffing in public sector

Findings of present study indicated unemployment and obligation for continuing more education in the field of educational planning and management was more than of the other courses but job fitness in this field was less than of the other fields. While Kutter & Morgan (2007) reported graduates in the field of education, engage in a variety of activities.

It is probably that this problem relates to nature of the course of study in Iran universities, because there is no course of study on title of "educational planning and management" at level of undergraduate in other countries. But in Iran at the big and small universities has been presented this field of study in level of undergraduate.

According to findings of present study, job fitness in some fields such as Education of exceptional children, Clinical psychology, library and counseling was better than other fields. It seems these fields have multiple implications in Iranian society. In this regard Kutter & Morgan (2007) and Bureau of Labor Statistics, (2004) referred that many organizations offer a range of opportunities for psychologists in all disciplines in a variety of areas, including personnel selection, training, leadership and team effectiveness, as well as clinical settings human services worker, social worker and substance abuse counselor. Also Lioyd (2000) believes that bachelor degree holders in the field of psychology and related areas can become research assistance and fulltime staff, graduate certificate offer more opportunities for advancement.

Findings of present study showed employment in public sector in all fields of study exception of Educational technology was more than 50 percent. It seems willingness to employment in public sector in Iran is the first priority because there is no policy for deposal of personnel in public sector.

Findings of present study indicated duration of unemployment was the most in the field of educational planning and management and the least in the field of education of exceptional children. Moreover, job prospectus of graduates in the field of education of exceptional children was the best and job prospectus of graduates in the field of educational planning and management was the worst. In this regard I can say there is a supportive organization for exceptional children in Iran. Most of graduates in the field of "education of exceptional children" will be employed in this organization but there is no coordination between educational institutes and schools with departments of educational planning and management for their graduates.

Findings of present study indicated Annual salary of majority of graduates was between $4000- $5000. Graduates of educational planning and management had more annual salary in comparison of others. Fine (2005) reported Median annual earnings of teachers in 2002-2003 ranged from $39,810 to 44,340. This difference relates to Iranian money value in comparison of dollar. Now, one Dollar (American money) is 34000 Rial (Iranian money).

Networks were the main strategy for job search. The role of academic and non-academic factors in employability of graduates was almost equal. It seems that recommendation for more information can be useful for graduate employment in most cases but non-academic factors and professional nepotism is destructive.

6. Conclusion

(a Developing the private sector

(b Renewing the curriculum in the field of educational planning and management at level of undergraduate.

(c Linking between labor market and higher education with more emphasis on the field of educational planning and management and also educational technology.

(d Developing and implementing the evaluation system of employee with more emphasis on public sector.

(e Developing the culture of part-time and voluntary employment.

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Appendix 1: Questionnaire

Dear graduate

Please read each question and answer to them in the provided space. You can leave each question that you would NOT like to answer.

1. First name:

2. Second name:

3. Gender:

4. Age:

5. Father's education:

6. Mother's education:

7. Your family size (including you):

8. Field of study:

9. The highest level of education that you ideally would like to complete:

M.A☐ Ph. D☐ Post doc☐

10. Date of Graduation:

unemployment ☐ ☐ Job situation: occupying 11.

If occupying, kind of job public ☐ private☐ self-employed☐ 12. Unemployment, duration of unemployment: If 13.

If occupying, Fitness of your course of study with your job: 14.

Very high☐ very☐ little☐ never☐

If employment, annual salary: 15.

16. Job prospectus of your course of study excellent good weak

17. What were your job search strategies?

a. Newspaper advertisement

b. Networks

c. Services of a campus recruitment office

d. Sending out resumes directly to potential employers

e. Doing information interviews

f. Accessing government employment agencies

18. What are the factors that influence on Employability?

a. Non-academic activities, such as summer and part-time employment, taking part in student associations

b. Academic activities such as good marks and content of curriculum

Thank you for your participation.

Good luck

Appendix 2: Online interview with employed graduates

Dear graduate

With regard to previous appointment, please response to each question. You can leave each question that you would NOT like to answer.

1. At first if it is possible, introduce yourself and tell about your individual and family characteristics

2. What is the highest level of education that you ideally would like to complete?

Where are you occupying (for example public**,** private or self employed)? 3. Duration of your

4. What were your job search strategies (for example: newspaper, network, campus, contact, interviews or government employment agencies?

5. What are the factors that influence on Employability?

6.What is your annual salary?

7. How is the fitness of your course of study with your job and what element of your undergraduate training do you use in your work?

8. What is the job prospectus of your course of study?

Thank you for your participation.

Good luck

Development of Zero Food Waste Management for Small Scale Food Establishment in Maginhawa Street, Quezon City: A Proposed Program

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Abstract

In food and beverage industry in the Philippines, few restaurant businesses are engaged in the practice of "greening" that will subject towards new sustainable standards but none of the existing restaurant businesses in the country has been practicing the Zero Food Waste Management. The study aims to contribute by developing a program on Zero Food Waste Management that can benefit the food establishments in Maginhawa Street, Quezon City. To be able to achieve this, the model of waste hierarchy was used as a pattern in developing the program. It is consist of three categories namely Avoidance and minimization, Reuse, recovery and recycling and Bulk disposal. Based from the findings, the following practices can be used in the program; Store condiments properly, ensure proper food storage techniques, practice first-in-first-out, consider secondary uses for excess food, precycle, avoid packaging waste, buy products with reusable container, treat wastes before disposal, segregate wastes using color coded garbage bags and dispose chemical equipment properly.

Keywords: Zero Food Waste Management, Waste Hierarchy, Avoidance and Minimization, Reuse, Recovery, and Recycling, Bulk Disposal

1. Introduction

In food and beverage industry, some restaurant establishments all over the world have been practicing the zero waste movement. An example of it is the Sandwich Me In in Chicago owned by Chef Justin Vraney. It is a quick-service lunch spot that has been using many sustainability practices of zero waste since opening in 2012. What makes them different is that their entire waste output for 2 years, which is 8 gallons of trash, is just equivalent to what other typical restaurants‟ waste generated in just an hour and some of those trashes came from the customers, usually paper cups. A local artist in Chicago picked up and used the bag of trash to transform it into a sculpture. Vraney followed the five R‟s in implementing the zero waste operation: reuse, reduce, recycle, reject and refuse. The execution of these steps helped reach his goals of zero waste as well as energy sustainability in his restaurant. This year in September, a country‟s first ever zero waste restaurant will open in Brighton, United Kingdom. Chef Douglas McMaster is the owner of Silo, a 50-seat restaurant offering six staple dishes every day. McMaster said that key is to utilize the natural ingredients where they were originated, especially in the local farms. People should be more aware of the kind of food that they eat. They would rather choose natural ingredients that are not infused with chemicals and those are what McMaster wants to impose according to his will.

In the Philippines, the Zero-waste practice was first implemented by the local government unit, residents, as well as the business establishment owners especially the restaurant firms in Las Piñas. In Alaminos, Pangasinan, people also took part to support the Zero-waste movement in partnership with the Global Alliance for Incinerator Alternatives (GAIA) in 2009. Alaminos is at the forefront of implementing the Philippines‟ decentralized waste management law. They have established comprehensive Zero-waste strategies. Through their planning process that was brought together; they have created Zero-waste plans at the village level. They conducted comprehensive survey and workshops to locals to determine the existing practices of Zero-waste management throughout the municipality.

The Philippines‟ hospitality industry has already started promoting the green hotels that will subject towards new sustainable standards in the industry. Two Philippine hotels received awards at the

ASEAN Green Hotel Recognition, with the criteria of environmental policy and actions for hotel operations, use of green products, collaboration with community and local organizations, human resource development, solid waste management, energy and water efficiency, air quality management, noise pollution control, waste water treatment and management, and toxic and chemical substance disposal management. The good thing about the establishment of green hotels is that they do not only save energy and nature, but also they do earn profit for it. Taking systematic steps to reduce negative environmental impacts of the operations will lead to a business‟ sustainability. In food and beverage industry of the country, there are also some restaurant businesses that practice "greening" but none of the existing restaurant businesses in the country has been practicing the Zero Food Waste Management. The purpose of the study is to contribute by developing a proposed program on the Zero Food Waste strategies that can benefit the food establishments in Maginhawa Street, Quezon City.

2. Theoretical Framework

Figure 1. Theoretical Framework
Model of Waste Hierarchy by Dr. Sarah Liao, JP

The first priority is avoidance and minimization, this action means to address the problem and to encourage people to reduce waste generation as much as possible. The target of avoidance and minimization is to reduce the production of waste generated by changing the behavior of people regarding their waste management. Discouraging wasteful habits is the first step. Waste charging is the key strategy in waste avoidance and minimization. It provides a significant effect on changing behavior and puts in place the "polluter-pays" principle. By putting a price on generating waste, it can induce change in people‟s wasteful habits. The charge will be imposed only on mixed waste, which is the remainder after reusable and recyclable materials are taken out (Liao, 2014). The next priority is to maximize the reuse, recovery and recycling of suitable recyclable materials. This method is an effective measure that serves as an alternative to disposing of waste materials. Through reuse, recovery and recycling, people would achieve the most efficient use of resources and materials while producing as little waste as possible. Once the possibilities of waste avoidance, minimization and recycling have been exhausted, we must properly treat and reduce the volume of residual waste through appropriate treatment technologies. It is a commonly accepted principle that all waste should be properly treated prior to disposal at landfills to prevent long-term liabilities. The direct disposal of untreated solid waste causes leachate and landfill gas (LFG) emission, and would result in long-term environmental burden. Biodegradable wastes like kitchen and restaurant waste are known to create LFG and leachate. LFG is malodorous and potentially suffocating, flammable and explosive. Leachate is highly polluting and, if not properly controlled, may seriously contaminate water bodies through infiltration or direct discharge of leachate. The decomposition of biodegradable waste is a slow and non- homogenous process. This results in differential settlement of the landfill surface that may lead to slope instability problems for many years. We must save our precious landfill capacity and reserve it for inert or

unavoidable waste. A ban on biodegradable waste, proposed to be introduced in the longer term, allows landfills to last longer and makes them less of a long- term environmental burden. Landfill disposal bans have sound economic reasons. They not only ease the pressure on landfill space, but also ensure a stable and long-term source of recyclable materials for the recycling industry or the second-hand goods market. They will focus on products that can easily be separated from the main waste stream and have a recycling value or proper treatment outlets.

In this study, the model of Waste Hierarchy by Dr. Sarah Liao, JP will be used as a guide in developing a Zero Food Waste Management Program for selected small scale food establishment in Maginhawa Street, Quezon City. This program can benefit businesses as they would be aware on how to maximize the use of their resources while producing small amount of waste. It will encourage businesses to practice Zero Food Waste Management as well as contribute to environmental preservation.

3. Conceptual Framework

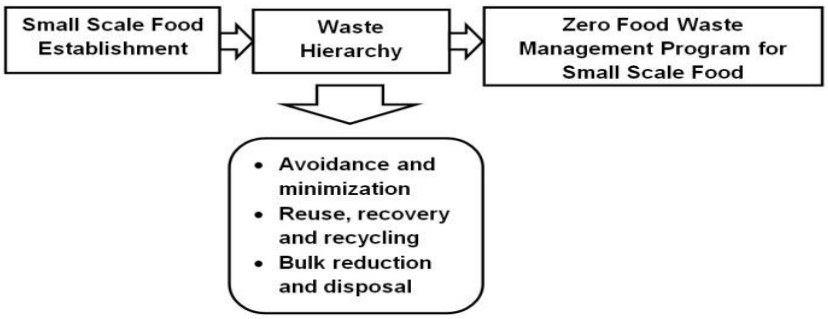

Figure 2. Conceptual Framework

Small Scale Food Establishment is owned by one or a small number of individuals. This food establishment located in Maginhawa Street, Quezon City focused on students as their main market. In this study, the establishment‟s waste practices are the main subject. The researchers will be conducting surveys and interviews on their food waste management practices.

Avoidance and minimization will be adopted from the previous theory as the first action to change the behavior of small scale food establishment to their waste management. Reuse, recovery and recycling will be the second option in the waste management by maximizing the waste which cannot be avoided in the first action. Wastes are salvage to another product before disposing. Bulk reduction and disposal of waste that cannot be handled by the first and second option will lead to proper disposing by treating it properly to avoid contamination of the environment.

Undergoing the waste hierarchy system goes to a Zero Food Waste Management Program for small scale food establishment. A plan determining all the possible ways to minimize all the waste they produce on a daily basis. Cert/.ain rules and regulations are also implanted based on REPUBLIC ACT NO. 9003.

4. Literature

The size of a food establishment was characterized by the number of meals they serve per day and by the number of employees. In general, the assumption is that as the number of meals a food establishment serves or the number of employees increases, so too does the amount of food waste it recycles. (W.K. Okazaki et al., 2008) There are several qualifications to be considered as a small scale food establishment. It generates minimum income annually. For store location, it can only hold small group of customers. When it comes to the selection of food, it is limited and the price range is cheaper. Small businesses often generate small quantities of waste which are unattractive to waste carriers. Most recycling companies typically require specific amounts of materials to be available before collection (Maclaren & Yu, 1997).

Biodegradable Waste accounts for approximately 55% of the overall food processing waste (Biffaward, 2004). However, biodegradable materials when landfilled produce methane (CH4), a powerful greenhouse gas that contributes to the phenomenon of global warming (Gilberg et al., 2005) throwing away leads to health hazards, safety issues and loss of the valuable resources.(K. Rajendran et al.,

2013)

According to the waste management hierarchy, the wastes should follow "reduce, reuse, recycle and recover energy" before it is dumped into the landfills (K. Rajendran et al., 2013). (Cummings, 1997) developed a hierarchy model of hospitality solid waste management. The model introduces five levels for waste minimization including commit to waste minimization, purchase with eco-intelligence, use efficiently to generate less waste, reuse waste materials and segregate and recycle waste. Several companies are enthusiastic about the idea of recycling but the problem is they are lacking information to get started, as stated by (Apotheker, 1995) Motivation, time, guidelines and reliable information are much needed by small businesses to execute the said environmental practice (Horobin & Long, 1996). A key factor that can lead to the success of this practice is the cooperation of the employees as well as the management (K. Rajendran et al., 2013). In Borås, each household is given a booklet by the municipality which contains how to handle different wastes. Approximately, 130 different materials are listed in the booklet, so that the citizens could look what to be done with a particular waste (K. Rajendran et al., 2013). Several methods could be used by the council to get the message across, including: sending brochures or leaflets summarizing why solid waste management is important and how it should be achieved, providing site visits to advise entrepreneurs about how they could reduce their wastes and organizing training sessions or seminars for entrepreneurs to be trained and educated. (H.R.I. Radwan et al., 2010). Another example to educate entrepreneurs regarding the waste disposal practices is by providing a program of waste minimization and recycling that can be a significant advantage to business operators for its potential not only to reduce disposal costs but also to assist the business in complying with future regulations (Cummings &Cummings, 1991) and to protect the environment from the destructive impacts associated with landfill (H.R.I. Radwan et al., 2010). (Cummings, 1997; Trung & Kumar, 2005) it is necessary for the staff to have knowledge and training regarding the practice of minimization as well as providing them compensation and incentives to increase their eagerness to commit to the program.

(Cummings, 1997) indicated that customers can play an important role in a business‟ waste recycling program by not contaminating waste with food .A range of methods can be used to encourage customers to segregate their recyclable materials, i.e. providing another bin in the room or near lifts for recyclable materials (Hayward, 1994) indicated that customers‟ attitudes towards the environmental issues had changed positively. (Geller,Winett, and Everett, 1982) previously indicated that providing monetary incentives is the most effective mean of motivating people towards recycling. There are also many countries undertaking the principle of "pay as you throw" to encourage waste reduction activities (Fullerton & Kinnaman, 1996). An example is that by incorporating garbage collection fees, easy access to recycling stations, and awareness campaigns, the recycling rates in Sweden has increased significantly in the recent years. Some laws have also been formulated with respect to this regard, including a ban on landfilling combustible waste since 2002 and organic wastes since 2005 (K. Rajendran et al., 2013). Some suggested that if the council could reduce the charge for collecting recyclables or at least provide some kinds of incentives – prizes, certificates or stickers -– it would be sufficient encouragement for most entrepreneurs. (H.R.I. Radwan et al., 2009)

Prevention is the elimination of waste before it is actually created. Minimisation is the reduction of waste during the life cycle of the product. (Baker & Vandepeer, 2004). One effective way of zero food waste management aside from reusing, reducing and recycling is the avoidance and minimization of wastes. (Radwan, Jones & Minoli 2010) have stated that their company has put into operation different actions in minimizing wastes such as efficiently using their available resources and having cook as you order meals. According to this hierarchy, reduction of waste should be the top priority of waste management solutions. (R. Darlington et al, 2009) Reduction of waste aims to reduce the generation of waste at source through efficient use of materials, better design and reduced operational costs (Monkhouse and Farmer, 2003). The primary consideration was the minimization of overproduction waste, which was found to contribute not only to the volume of wastes produced but also substantially to costs of wastes. (R. Darlington et al, 2009) Overproduction wastes constitute significant cost to the company as materials and resources in manufacturing are wasted given that the finished (prepared) product no-longer has an end customer (R. Darlington et al, 2009).

In high income countries such as Singapore, about 44.4% of solid waste is recycled. In the middle income countries, the percentage of waste recycled is about 12%, and it is approximately 8–11% for the rest of ASEAN. (U. Nguyen Ngoc & H. Schnitzer, 2009)

According to (Fitzpatrick et al., 2010) Biorefinery is derived from the words biomass and refinery. The

organic fraction of the waste materials also can be regarded as biomass. The ultimate goal is to produce a variety of products from different biomass feedstocks through a combination of technologies. Biorefineries defines it as the sustainable processing of biomass into a spectrum of marketable products and energy. (Cherubini, 2010) the examples of biorefinery products are energy, fuels, chemical products, construction materials, high value food, cosmetic or medical products (Lyko et al. 2009). Biofertilizer has usually been applied to soil as a soil amendment. Conditioner, moisturizer and providing nutrients and effective microorganism to further nourish the soil properties. Biofertilizer can be produced from organic vegetables market solid waste (Suthar. 2009), agricultural materials (Roca-Perez et al. 2009) and animal manures (Suthar. 2010) Such as cow dung, chicken and goat manure and sewage sludge (Roca-Perez. Et al. 2009)

Waste such as biodegradable fractions of the municipal solid waste lignocelluloses residues and animal waste can also be processed to produce animal feed as reported in many studies. (Pinancho et al. 2006; Guillermo et al. 2006; Hassan et al. 1986; Sancho et al., 2004)

It is stated by Barclay, Buckley, and Lundbo (2006) that the commitment of the staff to the waste minimization program is important for it to materialize. It is also suggested that the staff should be provided with tools in segregating waste such as labeled trash bins and training on reducing and recycling wastes. According to (Repa, 2005), one can extend the landfill life and reduce the disposal cost through recycling food wastes or other types of solid wastes.

Reuse is a process of putting waste materials back into use so that they do not go into the waste stream. Recovery is the retrieval of a part of the value of the materials through recycling and energy recovery. (Baker & Vandepeer, 2004). The second preferred option is to reuse products and parts/components with minimal processing for the same purpose for which they were conceived in the first place. (Monkhouse and Farmer, 2003). Reuse was considered a significant way of preventing waste materials from entering the waste stream. (H.R.I. Radwan et al., 2010) The most common methods by which these improvements may be made come in the form of elimination of the need for intermediary packaging, and double packaging of products and components. (R. Darlington et al, 2009)

Recycling is the third preferred option, where used/scrap materials are reprocessed in order to recover value from waste. (Monkhouse and Farmer, 2003). Recycling can play an important role in waste management by diverting material from landfills (W.K. Okazaki et al., 2008). (Repa, 2005) Recycling food waste or other types of solid waste can extend landfill life and reduce disposal costs. Wastes which could not be recycled are recovered through biological and thermal treatment in form of biogas, bio fertilizer, electricity and district heat. (K. Rajendran et al., 2013).

A range of barriers often face small businesses in recycling their waste, including lack of space, inconvenience and time constraints (Bacot, McCoy, & Plagman-Galvin, 2002). Many small business operators have very little interest in reducing and/or recycling waste, believing that such activities are too expensive and time-consuming (Chan & Lam, 2001).

Waste should only be landfilled when the use of a better waste treatment option is not possible (Waste Directive 2006/12/EC, 2006). Bulk wastes are associated with the preparation of ingredients and may include inedible parts of the ingredient, such as stems, leaves, bones, excess animal fat etc., along with contaminated materials or ingredients, such as outer layers of vegetables that are spoiled and even soil or debris on the ingredient that is removed by washing or mechanical means. (R. Darlington et al, 2009) Bulk organic wastes (BOW) are somewhat inevitable when processing foods that are harvested along with inedible parts (R. Darlington et al, 2009).

Currently million tons of organic food wastes are being disposed off into the environment which have high potential to be converted into various high value bioproducts such as bioenergy, biofertilizer, biomaterials and animal feed. (Alawi Sulaiman et al. 2012)

Apotheker (1995) identified 13 ways for local government to enhance small businesses‟ recycling collection; among these are cluster collections from geographically concentrated businesses, imposing a charge for municipal waste collection, developing markets for recycled materials, making waste carriers and producers aware of the benefits of implementing recycling programs and working in partnership with the private sector to encourage small businesses‟ recycling collection. Smil (2004) it is needed to intensify their practice in composting biodegradable materials to nourish the land for agricultural purposes. They have gone from artificial fertilizer to healthier and organic compost. Composting is considered an effective way for disposing of waste with high organic content, i.e. food waste (Department of the Environment, Transport and the Regions, 1999). It is an odour-free process,

normally taking between three and six months, depending on how the materials are handled. The period can be reduced by turning over the composting materials regularly (Brunt, Dean, & Patrick, 1985).

Traditionally, pig farmers collected food waste from businesses and households to feed to their pigs. pigs. Funding for this research was provided by the US and Hawaii Departments of Agriculture (USDA and HDA). The two agencies are tasked with licensing swine production facilities that use food waste as feed and monitoring their food waste cooking practices to ensure compliance with the Federal Swine Health Protection Act. USDA and HDA were interested in identifying pig farmers who were accepting food waste but were not licensed to use it as feed. (W.K. Okazaki et al., 2008)

The municipality also provides white and black bags for every household for free. All compostable waste is collected in black bags, while other waste goes in white bags for combustion. The black bags and other organic flows are sent to biological treatment for production of biogas. (K. Rajendran et al., 2013)

The journals used in the study have several similarities. First, the issues regarding waste disposal leading to health hazards. Open dumping causes bad odor and produces gas which is bad for the health. It can produce air pollution. According to C. R. Compton, et al., (2012), air pollution typically results from the direct release of gaseous and particulate wastes to the atmosphere; however, the indirect disposal of liquid and solid wastes can add substantially to the burden of the atmosphere, if appropriate disposal processes are not applied. Familiar examples of waste disposal measures which use the atmosphere for disposal are in the burning of combustible materials, either in or outside of incinerators, and in the storage by open-ponding of petrochemical wastes, with resulting evaporative losses. He added, there is a lack of sufficient knowledge about the relationship between solid waste, air pollution and human disease. Agricultural activities produce many types of wastes in their daily operations such as biological waste, solid waste, hazardous waste, and waste water. Second, waste is a wealthy source. Although waste is considered as unwanted materials which are discarded from a variety of sources, it can contain many reusable substances of high value. What one considers waste may not be waste for another person. In other words, some wastes are not totally useless. Waste can be transformed into value added products leading to more profitable business. As stated by K. E. Noll, et al. (2012), resource recovery typically involves recycle and reuse, either with or without pretreatment for sanitization before reuse. Each growth of hazardous waste which is recycled has value, and represents a growth of material not requiring detoxification and/or ultimate disposal.

The journals have different waste reduction programs. According to Uyen Nguyen Ngoc (2009), Human activities produce waste and the amounts are likely to increase as the demand for quality of life increases. Today‟s rate in the Southeast Asian Nations (ASEANs) is alarming, posing a challenge to governments regarding environmental pollution in the recent years. The expectation is that eventually waste treatment and waste prevention approaches will develop towards sustainable waste management solutions. He added, there have been many considerations on the development of waste management methods to protect the environment towards the aim of „sustainability‟. Starting from disposal and end-of pipe treatment, the issue moved into waste prevention, waste minimization, cleaner production, and then approached zero emissions systems. Sustainable solutions for waste management are also based on this pathway. The starting point of these solutions can be identified by: environmentally sound management of waste, and then applying zero emissions industrial ecosystems, including agrobased industrial systems. Of course reusing, recycling, and composting are encouraged. This journal illustrates environmentally sustainable solutions to diminish overall environmental burdens. These solutions are not singular. It is a combination of solution depending on the variety of waste. The best way to minimize waste is to practice reuse, recycle and recover before it is dumped into a landfill which reduces the amount of waste requiring disposal. By considering garbage collection fees, easy access to recycling stations, and awareness campaigns, the recycling rates in Sweden has increased significantly in the recent years. Some laws have also been implemented including a ban on landfilling combustible waste since 2002 and organic wastes since 2005. Reducing landfill, recovering fuel from the waste and recycling is a part of sustainable waste management mechanism. Proper temperature control is needed to minimize the odor in the landfill.

In terms of its relevance, the journals used as a reference in the study can be considered as a helpful tool in forming the ideas. Through careful analysis of the journal, the researchers were able to identify the different waste disposal problems as well as the variety of waste reduction program. According to Dr. Sarah Liao, JP (2014), the bleak fact is that we need to generate less waste. Here in the Philippines, what‟s lacking is the effort in contributing to the waste reduction programs. Through this study, the

researchers can encourage small scale food establishment to apply different waste reduction programs to benefit not just their businesses but as well as the environment.

5. Methodology

The descriptive method of research was employed for this study. According to Dr. Y.P. Aggarwal (2008), descriptive research is dedicated to the gathering of information about existing circumstances or situations for the purpose of description and interpretation. This type of research method is not simply gathering and tabulating facts but includes proper analyses, interpretation, comparisons, identification of trends and relationships. The significance of this research method is that it provides information useful to the solutions of the problems in the study. Under the descriptive research is the quantitative research approach and this was used by the researchers in interpreting the collected data. Quantitative Research is used to quantify the problem by way of generating numerical data or data that can be transformed into useable statistics. It is used to quantify attitudes, opinions, behaviours, and other defined variables – and generalize results from a larger sample population and it uses measurable data to create facts. (Susan E. Wyse, 2011) To conduct the gathering of information, survey questionnaire was used as an instrument due to the nature of the study. To define survey research, it is a specific type of field study that involves the collection of data from a sample of elements drawn from a well-defined population through the use of a questionnaire. (Babbie, 1990; Fowler, 1988; Frey, 1989; Lavrakas, 1993; Weisberg, Krosnick, & Bowen, 1996) Generally, surveys are standardized to ensure that they are valid and reliable for the representation of a larger population. Surveys are suitable for use in the study since they are indeed accurate and thus provide practical information about the insights of the respondents as well as the Zero Food Waste practices of the selected small scale food establishments in Maginhawa Street, Quezon City. In this study, a survey is conducted to be able to know exactly the level of awareness as well as the applicability of the respondents when it comes to the Zero Food Waste practices in their food establishments.

The qualified respondents for the selection of the sample would be the owner of each small scale food establishment in Maginhawa Street, Quezon City. The researchers have carefully selected the sample as representative of the whole population from which it was drawn.

The sampling technique being used in the selection of the respondents was Judgmental Sampling. According to (Black, 2010, p.225), judgmental sampling is a non-probability sampling method in which the elements preferred for the sample are selected by the judgment of the researchers. Through this research method, researchers often believe that they can obtain a representative sample by using a sound judgement, which will result in saving time and money. In judgement sampling researcher depend on their own judgement in selecting members of population to participate in the study. This sampling technique is the most applicable due to the nature of the study.

The researchers have chosen 50 respondents for the questionnaire survey. The researchers worked on the questionnaires that will measure their level of awareness and applicability of their business in terms of Zero Food Waste practices. After collecting the questionnaires, all the responses will be interpreted and analyzed by the researchers.

The study utilized the descriptive method of research. The technique that was used under descriptive method is the survey approach which is commonly used to explore opinions according to respondents that can represent a whole population. A survey is a research approach for collecting information from a selected group of people using standardized questionnaires or interviews (Innovation insights, 2006). The survey approach is a study that involves adequate and accurate interpretation of findings. Face-to-face interview is an important method in getting sources of information. With this type of approach, it enables the researchers to know how the small scale food establishments are dealing with their food waste. According to Creswell (1994), the descriptive method of research is to gather information about the present existing condition. Since this study is focused on the development of Zero Food Waste Management Program for small scale food establishments in Maginhawa Street, Quezon City, the descriptive method is the most appropriate method to use. The researchers opted to use this kind of research considering the desire to acquire first hand data from the respondents so as to formulate rational waste management programs which is suitable for them.

The researchers" contingency plan is to expand the scope of the respondents in order to have more information in developing a Zero Food Waste Management Program. Instead of having small scale food establishments in Maginhawa Street as the scope of the respondents, the researchers decided to

include the side streets of Maginhawa consisting of Malingap Street and Magiting Street. It also offer various number of food establishments and considered as new Maginhawa Street.

The research instrument used by the researchers is questionnaire. A questionnaire is clearly defined as a structured technique to collect the primary data. It is generally a series of written questions for which the respondents has to provide the answers (Bell 1999). It is used by the researchers to be able to measure the level of awareness and the applicability of the food waste practices to their small- scaled food establishment.

The questionnaire used by the researchers was patterned in the Simplified Waste Hierarchy as its Theoretical Framework. Categorize based its first priority Avoidance and minimization or Food maximization, Reuse, recovery and recycle down to Bulk disposal.

The researchers asked professors from English, HRM/ TRM and Business course professors for the validation of the questionnaire. The results were there are several things to be edited such as the specification of what mark to use in answering the questionnaire, another is that to check the proper spacing for the listed food waste practices, and also to check and correct the typographical errors in the questionnaire. And lastly, to change words that are too technical for the convenience of our respondents. The researchers conducted a pre- testing of the questionnaire which was participated on by 15 small scale food establishments around University Belt. While the respondents were answering, they were timed the moment that they had started until they were able to finish the questionnaire for the researchers to be able to keep track on how fast the questionnaire can be answered. After the results had been tallied, it shows that three of the respondents were able to finish answering the questionnaire for three minutes.

The questionnaire contains a list of waste management practices divided into three parts: food maximization, reduce, reuse, recycle and bulk reduction, which was patterned from the simplified waste hierarchy in the theoretical framework. The researchers have used the Likert scale which consists of rates: 4 as very high, 3 as high, 2 as low and 1 as very low in terms on the respondent's level of awareness regarding the listed waste management practices while 4- extremely applicable, 3- moderately applicable, 2- somewhat applicable, 1- slightly applicable and 0- not at all applicable for the applicability level of the practices for the food establishments. The business name, signature, and the start and end time were also asked in the questionnaire for the researchers to keep track on them.

Table 1. The Four- Point Likert Scale for Awareness

SCALE	RANGE	INTERPRETATIONS
1	0.01 - 1.00	Very Low
2	1.01 - 2.00	Low
3	2.01 - 3.00	High
4	3.01 - 4.00	Very High

Table 2. The Four- Point Likert Scale for Applicability

SCALE	RANGE	INTERPRETATIONS
0	0	Not at all applicable
1	0.01 - 1.00	Slightly applicable
2	1.01 - 2.00	Somewhat applicable
3	2.01 - 3.00	Moderately applicable
4	3.01 - 4.00	Extremely applicable

6. Conclusion

This study is focused on the development of a zero food waste management program. The research also aimed to measure the level of awareness of small scale food establishments in Maginhawa St., Quezon City regarding food waste disposal management practices. The researchers listed three categories of this practices such as Food Maximization, Reuse, Recover, Recyle and Bulk Disposal. Based from the result of the survey about food maximization, most of the respondents were aware of ensuring proper storage techniques. In order to reduce spoilage, food products should be stored in proper condition e.g. temperature. Most of the respondents were not aware of storing leftovers properly that are still good to be sold the following day and changing serving sizes and garnishes. In the practice of reuse, recover and recycle, most the respondents were aware of buying products with reusable container such as condiment bottles that can be refilled and considering secondary uses for excess food. Most of the

respondents were not aware of precycling which is the buying of ingredients with less packaging or with more recyclable packaging. Lastly, in the practice of bulk disposal, most of the respondents were aware of segregating wastes using color coded garbage bags such as yellow, green and black and most of them were not aware of burying biodegradable wastes and treating wastes before disposal.

Another objective is to measure the level of applicability of food waste disposal practices to the small scale food establishments in Maginhawa Street, Quezon City. Based from the result of the survey regarding food maximization, the most applicable food waste practice was practicing first-in-first-out (FIFO method) which means giving priority to use older products before it expires. The least applicable practices were storing leftovers properly that are still good to be sold the following day, reduce over-purchasing of food to ensure that you only purchase what you need when you need it, changing serving sizes and garnishes and buying odd fruits and vegetables. In the practice of reuse, recover and recycle, the most applicable practice was buying products with reusable container such as condiment bottles that can be refilled. The least applicable practice was using leftovers by turning them into exciting new dishes. Lastly, in the practice of bulk disposal, the most applicable practice was segregating wastes using color coded garbage bags such as yellow, green and black and the least applicable was donating edible but unsalable food to community organizations.

The researchers of the present study recommend the future researchers to consider having more participants to be included in their study because it is more ideal to have a larger sample in ensuring the dependability of the results. The future researchers are also advised to consider bigger establishments such as franchised food establishments as the subject of the study given that they contribute greater number of wastes compared to smaller establishments. The researchers also recommend having the study conducted at a different budding food destination such as Kapitolyo in Pasig. Since the current researchers aimed to develop a zero waste management program for small scale food establishments, the future researchers should also consider giving practices or ways that can help the greening process of waste disposal of small scale food establishments that can greatly help the environment. Future researchers may also take advertisements for consideration to raise the level of awareness of aspiring entrepreneurs in zero waste management practices that can be significantly useful in lessening their expenses as well as helping the environment. The future researchers may also consider developing zero waste management programs that can highly be applicable to not just small scale food establishments but also other hospitality- related establishments such as hotels, spas and resorts.

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Determination of Experimental Uncertainties

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Abstract

Safety of geotechnical structures is one of the leading problems in the industry. Plenty of methods were developed to analyze the stability of geotechnical structures; limit equilibrium methods, finite element methods and finite difference methods are among them. Several geotechnical laboratory experiments have to be conducted to determine input parameters for these programs. Nevertheless, the exact values of measured variables are rarely known, since experiments have intrinsic errors, due to instrumentation, data acquisition system and environmental effects. For these reasons, determination of true values requires estimation of experimental errors, which are referred to as uncertainties. In this study, it was intended to determine uncertainty in material properties obtained from laboratory experiments.

Keywords: Epistemic uncertainty, aletory uncertainty, bias, experimental error

1. Introduction

1.1 Problem Statement

Experimentation is the procedure of testing and determination of a parameter, or effect. Experiments are necessary parts of engineering and science. Experimental uncertainty prediction is required in design, both when calibrating or validating simulation methods and using data directly. Determination of uncertainty in the analysis of computer models is essential to take into consideration possible ranges of outputs or scenario implications (Swiler et al., 2009).

Recent efforts are focused on uniform application and reporting of experimental uncertainty assessment (Pengra & Dillman, 2009). The ability to evaluate the impact of uncertainty in the decision is crucial (Swiler et al., 2009). Moreover, Stern et al. (1999) stated the importance of integration of uncertainty analyses into all phases of testing; and incorporation of correlated bias errors and methods for small sample sizes; and complete documentation of uncertainty for each test.

1.2 Accuracy and Uncertainty

Uncertainties are generally categorized as aleatory or epistemic. Epistemic uncertainty is associated with a lack of knowledge of the quantities or processes identified with the system; it can be subjective, is reducible and may be identified with model uncertainty (Hudson, 2013). Aleatory uncertainty is the inherent variation in the physical system; it is stochastic, irreducible uncertainty (Cao et al., 2009). Aleatoric uncertainty is presumed to be the intrinsic randomness of a phenomenon (Kiureghian & Ditlevsen, 2007).

There are two basic kinds of epistemic uncertainty, systematic and random uncertainties. Systematic uncertainties are those due to faults in the measuring instrument or in the techniques used in the experiment (Pengra & Dillman, 2009). Duzgun et al. (2002) stated that the systematic uncertainties stem from the discrepancies between laboratory and in situ conditions. Additional sampling may not decrease this type of uncertainty, since the same test conditions is likely to persist (Duzgun et al., 2002).

Random uncertainties are associated with unpredictable variations in the experimental conditions or are due to deficiencies in defining the quantity being measured. Although a measurement is taken under the same conditions, random effects from various sources influence the measured value (Birch, 2003). Random uncertainty means that several measurements of a quantity will not always give the same value but will spread around a mean value. The mean value will be much closer to the real value than any individual measurement (Pengra & Dillman, 2009).

Random uncertainties are much easier to deal with and to quantify. However, there is no general procedure for estimating the magnitude of systematic uncertainties. If an experiment has low systematic uncertainty, it is said to be accurate (Pengra & Dillman, 2009). If an experiment has low random uncertainty, it is said to be precise. Obviously, an experiment can be precise but inaccurate or accurate but imprecise (Pengra & Dillman, 2009). The accuracy of a measurement indicates the closeness of an experimentally determined value of a quantity to its true value (Stern et al., 1999). Error is the difference between the experimentally determined value and the true value (Stern et al., 1999). The total error is composed of two components: bias error and precision error. An error is classified as precision error if it contributes to the scatter of the data; otherwise, it is bias error.

Table 1. The characteristics of epistemic and aleatory uncertainty (Hudson, 2013)

Epistemic Uncertainty	Aleatory Uncertainty
Subjective uncertainty, reducible uncertainty	Random uncertainty, irreducible uncertainty
Due to lack of knowledge of processes or quantities	Due to chance, intrinsic randomness in the system
Reducible through further investigation	Modelled via probability, statistics
Reducible through expert information	Not reducible through expert information
Generally has one value, but this is not known	Generally has more than one value
Conceptually resolvable	Conceptually not resolvable
Can be expressed as a probability distribution (Bayesian approach)	Usually expressed as a probability density or cumulative distribution function
Sensitivity analysis can reduce epistemic uncertainty	Sensitivity analysis can reduce aleatory uncertainty using probability density functions

2. Laboratory Experiments

In the context of this study, uncertainty in the results of laboratory experiments, performed for the stability assessment of a tailings dam, was calculated.

Aleatoric, epistemic and total uncertainty values for the experiment results were computed according to equations (1) to (5).

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i \quad (1)$$

$$s_x^2 = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2 \quad (2)$$

$$\delta_x = {s_x}/{\bar{x}} \text{ or } \sigma_{\bar{x}} = {s_x}/{\sqrt{n}} \quad (3)$$

$$\Delta_x = {\sigma_{\bar{x}}}/{\bar{x}} = {\delta_x}/{\sqrt{n}} \quad (4)$$

$$\Omega_x \cong \sqrt{\Delta_x^2 + \delta_x^2} \quad (5)$$

$\bar{x}$: Sample mean

s_x^2: Sample variance

δ_x: Uncertainty due to inherent randomness (Aleatoric uncertainty)

Δ_x: Uncertainty due to random sampling (Epistemic uncertainty)

Ω_x: Total Uncertainty in the prediction of X

n: Number of repeated experiments

x_i: Obtained material property with the laboratory experiment

$\sigma_{\bar{x}}$: Standard deviation of the mean value

Performed laboratory experiments include specific gravity, Atterberg limits and moisture content test on soil material and density-porosity test on rock material. Experiment results are tabulated through Table 2 to Table 5. For the uncertainty analysis in this paper, it was assumed that the measurements were made with calibrated instruments for which all known systematic errors have been removed. However, this is not the case even for the most carefully calibrated instruments.

Table 2. Specific gravity of soil samples (Tanriseven, 2012)

Sample No	Specific gravity	Sample No	Specific gravity
1	2.91	7	2.83
2	2.94	8	2.84
3	2.89	9	2.86
4	2.87	10	2.91
5	2.89	11	2.84
6	2.89	12	2.88

Table 3. Atterberg limits of soil samples (Tanriseven, 2012)

Sample No	LL	PL	PI
1	30	19	11
2	28	18	8
3	26	18	10
4	30	18	12
5	29	19	12
6	30	18	10
7	27	20	8
8	28	19	11
9	29	18	9

Table 4. Moisture content of soil samples (Tanriseven, 2012)

Sample No	Moisture content %	Sample No	Moisture content %
1	9.20	7	10.91
2	10.30	8	10.27
3	8.88	9	10.34
4	8.46	10	10.03
5	8.33	11	8.55
6	7.31	12	9.35

Table 5. Dry density and porosity of rock samples (Tanriseven, 2012)

Sample No	Dry Dens. (g/cm^3)	Porosity %	Sample No	Dry Dens. (g/cm^3)	Porosity %
1	3.06	0.90	18	2.81	2.28
2	3.06	0.76	19	2.81	1.41
3	3.11	0.76	20	2.71	3.02
4	3.11	0.77	21	2.43	7.24
5	3.20	0.78	22	2.46	7.59
6	2.89	1.53	23	2.50	4.65
7	2.89	1.41	24	2.53	4.36
8	2.89	0.96	25	2.54	4.34
9	2.89	1.06	26	2.46	7.12
10	2.88	1.63	27	2.55	4.48
11	2.88	1.51	28	2.49	5.13
12	2.82	2.56	29	2.54	4.57
13	2.77	2.57	30	2.51	5.16
14	2.83	2.60	31	2.47	6.54
15	3.12	1.20	32	2.48	6.95
16	2.91	1.08	33	2.50	4.62
17	2.82	1.95	34	2.53	4.73

In order to determine the outliers in the data, boxplot of the results of the experiments were obtained in MATLAB. Figure 1 to Figure 5 shows the output of the MATLAB. The central mark is the median of the sample; the lower and upper edges of the box are the 25^{th} and 75^{th} percentiles, respectively. The whiskers extend to the most extreme data points the algorithm considers to be not outliers, and the outliers are plotted individually (MATLAB Tutorial).

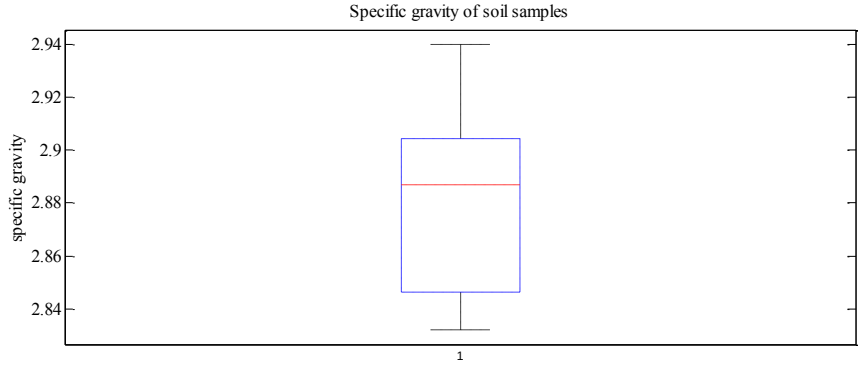

Figure 1. Boxplot of specific gravity results

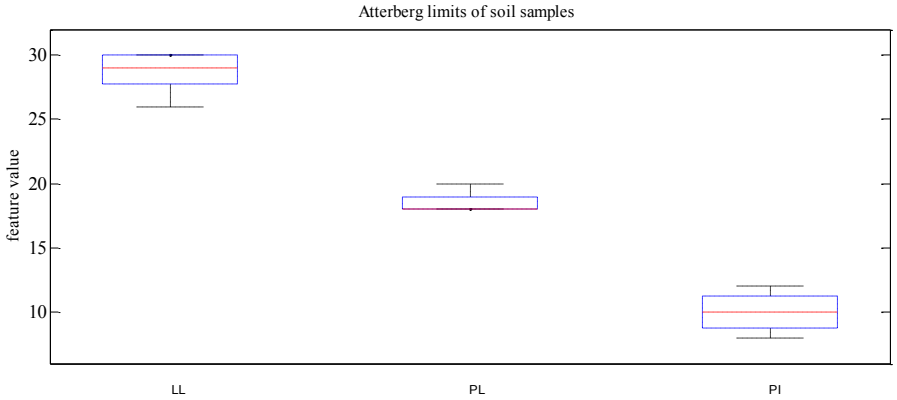

Figure 2. Boxplot of Atterberg limits results

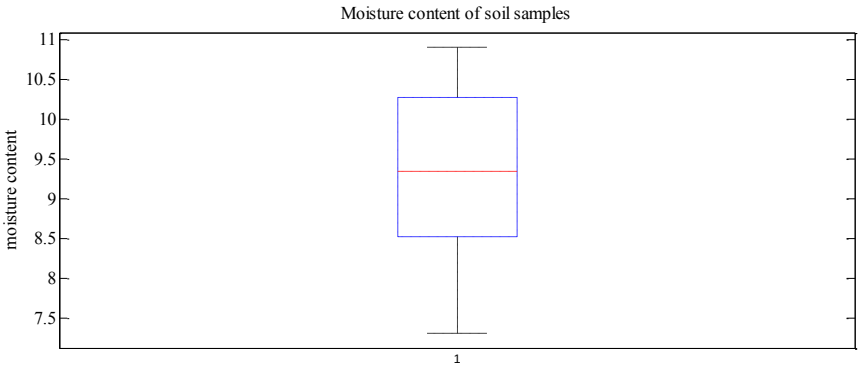

Figure 3. Boxplot of moisture content results

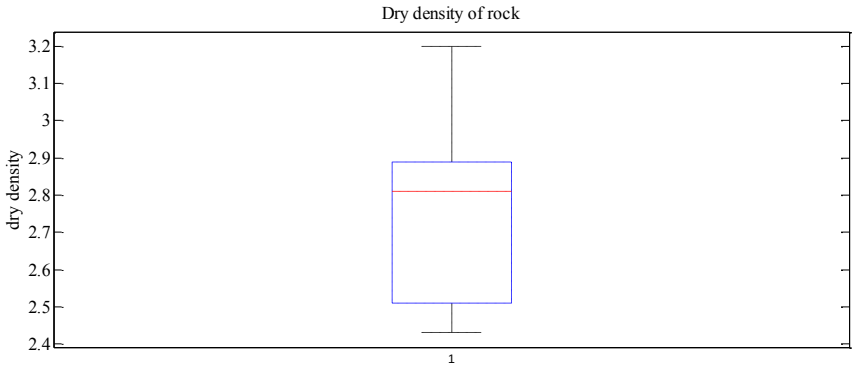

Figure 4. Boxplot of dry density values

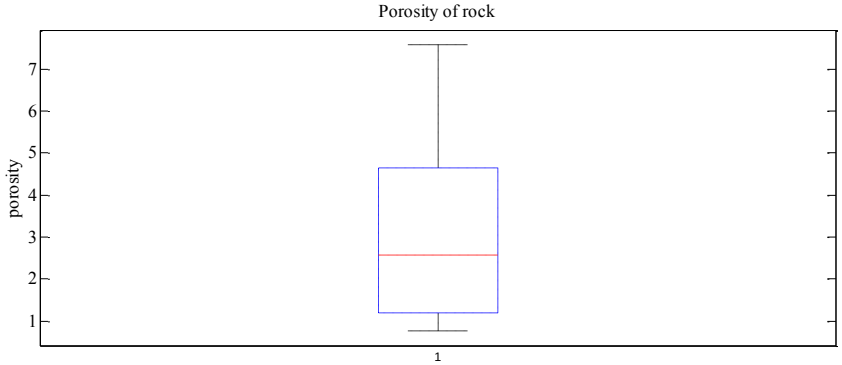

Figure 5. Boxplot of porosity values

3. Results

After inspecting the boxplot graphs of the experiments, it is clearly seen that there is no outlier at none of the experiments. Therefore, all of the obtained data will be used in calculating the uncertainty. Sample mean, sample variance, inherent randomness uncertainty (aleatoric uncertainty), sampling error (epistemic uncertainty) and total uncertainty values for all of the parameters are given in Table 6. Sampling error is smaller than inherent randomness uncertainty for all experiments.

Table 6. Results of the calculations

	Specific gravity	LL	PL	PI	Moisture content	Dry density	Porosity
Sample mean, $\bar{x}$	2.88	28.56	18.56	10.11	9.33 %	2.75 g/cm^3	3.18 %
Sample variance, $s_{\bar{x}}^2$	0.0011	2.03	0.53	2.36	1.14 %	0.06 g/cm^3	4.90 %
Std. dev. of the mean, $\sigma_{\bar{x}}$	0.0098	0.4747	0.2422	0.5122	0.3077 %	0.0406 g/cm^3	0.3796 %
Aleatoric uncertainty, δ_x	0.0115	0.05	0.04	0.15	0.11	0.09	0.70
Epistemic uncertainty, Δ_x	3.32x10^{-3}	0.02	0.01	0.05	0.03	0.02	0.12
Total uncertainty, Ω_x	0.012	0.05	0.04	0.16	0.12	0.09	0.71

4. Stating the Results with Uncertainty

Uncertainty of a result is commonly stated in two ways; in terms of standard deviation of the mean ($\sigma_{\bar{x}}$) or in terms of a percent or fractional uncertainty (Pengra & Dillman, 2009). $\sigma_{\bar{x}}$ (standard deviation of the mean has the same units as x while Ω_x(total uncertainty) is unitless, this must be taken into consideration when stating the results. Unless otherwise instructed, the result must be stated with the standard deviation of the mean (Pengra & Dillman, 2009). In the representation of the result $\sigma_{\bar{x}}$ should have more commonly 1 digit or 2 digits (Pengra & Dillman, 2009). If $\sigma_{\bar{x}}$ is particularly large, significant digits are eliminated (Pengra & Dillman, 2009). However, if $\sigma_{\bar{x}}$ is much smaller than the smallest digit of the measurement, then the smallest digit of $\sigma_{\bar{x}}$ is assumed as 1 (Pengra & Dillman, 2009). In other words, $\sigma_{\bar{x}}$ is needed to be rounded to the least significant digit in the measurement.

By using the data in Table 6, representation of the results of the experiments is as follows.

Specific gravity: 2.88 ± 0.01

LL: 28.56 ± 0.47

PL: 18.56 ± 0.24

PI: 10.11 ± 0.51

Moisture content, %: 9.33 ± 0.31

Dry density, g/cm^3: 2.75 ± 0.04

Porosity, %: 3.18 ± 0.38

5.Conclusion

In this study uncertainties that are difficult to measure was identified and the following conclusions could be drawn. Uncertainty values are in the range of 0.012 and 0.705. Maximum uncertainty is obtained for porosity and minimum uncertainty is obtained for specific gravity. Most precise result is obtained for specific gravity. Environmental effects such as room temperature, soil or rock temperature or any difference in composition of the sample might be resulted in uncertainty values. Uncertainty could never be eliminated completely. However, attentive care may minimize the uncertainty. In conclusion, uncertainty of the results of the experiments should be calculated. Birch (2003) indicated that there is a requirement for the estimation and reporting of uncertainty of measurements by all accredited laboratories. Moreover, it was stated that the estimation of the uncertainty of a measurement allows to compare equivalent results from different laboratories or within the same laboratory, or to compare the results with reference values given in the literature. Availability of this information might help to avoid unnecessary repetition of tests if differences are insignificant (Birch, 2003). Despite individual errors of the experiments being low, they may end up with a considerable total error.

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Emotional Status and Network-Based Welfare of Older Adults in Russia

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Abstract

The study covers the effects of the information and technological revolution on the shifts in the social structure of the contemporary Russian society. It analyzes the influence of the unprecedented demographic changes on the dynamics and structure of the sustainable welfare, as well as the new hierarchy of older adults' needs.

The authors have introduced the concepts of "emotional status" and "network-based welfare" that enable to assess the psychological perception of the reality and the synergetic effect from socialization through network technology. The study justifies the necessity of integrating older adults in the Internet community for widening their opportunities of social self-identification and realizing multiple segments of the human potential.

Keywords: network-based welfare, sovereignty of older adults, social shifts, informational and technological revolution, social policy.

1. Introduction

The current stage in development of information technologies (IT) has the key influence on all modernization aspects of the Russian society. Their implications can be seen in the transformation of the social structure, the profound changes in the age structure, professional and general educational level, the public consciousness of older adults. The market development has been accompanied by drastic changes in the social life of older adults and resulted in rethinking the role and place of older adults in the society and, eventually, the possibility, limits, and criteria of their welfare.

Older adults are the most socially vulnerable group of the population. They need a guaranteed decent life and health care. The unprecedented demographic changes associated with increase of longevity are observed in the 21st century all over the world. The aging of population is the key trend since older adults (aged 60 years or older) will make up more than one fifth of the total world population (22 %). Their number will reach 2.03 billion people against 809 million at the present time (11 %) [1].

In Russia, the informational and technological revolution is clearly associated with the highly intensive modernization processes and computerization of households which entail increasing expenses for additional individual goods and services. Costs for searching and acquiring information and "transactions costs" in general are expected to grow further [2]. The opportunities for increasing the information industry in Russia will be implemented at a quickened pace. The introduction of information technologies in all areas of the social and economic life will go beyond the relatively moderate limits.

2. Emotional Status as the Integral Welfare Index

The rapid aging of the population in general and high labour activity of older adults in particular result in more intense aging of workforce. Even today, middle and elderly-aged employees clearly prevail in the labour market [3], which is confirmed by the monitoring of the socioeconomic status of older adults in Russia [4]. In 2013, older adults of working age reached the employment level of 29.2%. This trend demonstrates a shortage of high-level specialists among younger adults and a deficit of highly skilled specialists in general in Russia.

The deficit of highly skilled human resources can be significantly softened by enhancing health and working ability of the working population (15-60 years), as well as by creating decent work conditions for older adults (60-80 years) [5. p. 59].

The informatization in Russia has improved the living conditions of older adults to a certain degree. Such improvements concern nutrition, clothes, durable goods, health support, housing conditions, transport services, social security and medical care, environmental condition. As a result, the balance between satisfied and essential needs of older adults was achieved. The welfare of older adults is the integral assessment of all life aspects which shows how "better" they have lived a certain period of their life [6. p. 102-106].

In our opinion, assessment of their welfare should be based on the whole set of socioeconomic indicators that reflect its essential qualities in a varying degree. However, we suppose that the emotional status as fixed subjective information is the subjective reflection of a personal sense of happiness and peace, mental and emotional comfort of an individual. The growth of income and associated improvement of older adults' life have facilitated the significant strengthening of consumer sentiment, the gradual departure from the traditional values oriented at economy and austerity, as well as the clear destruction of group and collective identity, development of individualization and self-actualization [7. p. 57]. The emotional status is structured by integral indicators, factors of the institutional environment, and features of the psycho-emotional space. The network technologies and the opportunities of the global network Internet play a key role in enhancing the emotional status in the Russian society.

3. Network-Based Welfare of Older Adults

The actualization of the socioeconomic problems associated with the expanding informational and technological revolution has given rise to a new approach to the objectives of the national socioeconomic policy. Under the current conditions, this policy has the following key aspects as related to the social welfare: 1) "welfare programs" (in the narrow sense of this word – the social security and insurance system) 2) system of social services and public housing construction; 3) business cycle policy and government regulation of economic growth; 4) environmental management.

The social security system includes five basic types of programs under which monetary benefits and medical services are provided: 1) retirement, disability and survivor's benefits; 2) sickness and maternity benefits; 3) employment injury benefits; 4) unemployment benefits; 5) family benefits.

In the context of new industrialization, Russia needs to initiate "socialization" of its laws, large-scale social reforms at the national government and corporate level. Corporate welfare programs (pension funds, group forms of insurance) play a significant role as an additional tool for attracting highly skilled specialists, including older adults; a tool for tying them to a company; a method to improve "human relations", the partnership environment; a tool of publicity and promoting the "social face" of a company.

A number of large companies in Russia strive to use non-monetary tools to stimulate their employees for more efficient work, try to enhance their loyalty and commitment to corporate ideals through socialization of employee-employer relations. The most common tool of such a policy is the non-government pension security system which has been rapidly developing in Russia. A certain part of large business companies have concluded agreements for additional pension security of their employees with non-government pension funds and often create their own funds. This has allowed them to improve motivation for work, to increase future retirement benefits and to save on taxes since the funds directed to non-government pension funds for additional security of their employees are not subject to the individual income tax. In general, the quality of older adults' life is increasing. This is confirmed e.g. by the dynamics of the Global AgeWath Index calculated by the international non-governmental organization "HelpAge International" jointly with the United Nations Fund for Population Activities (UNFPA). At this stage, the study covers 96 countries for which the internationally comparable statistical data are available. These countries make up 90% of the world's population aged 60 years or older [8]. According to the study, in 2014 the Global AgeWath Index of Russian older adults increased by 13 points as compared with 2013, – Russia jumped from the 78th place to the 65th one.

There are several parameters of the emotional status. Firstly, older adults show a significantly greater demand for high-quality, environmentally sound and vitamin-rich food products. A greater availability of food products is a positive parameter of its quality assessment. Secondly, among non-food products the priority is given to a wide range of consumer electronics and clothing made of natural fabrics. New technologies are finding their way to the personal consumption sector and give rise to the real

technological revolution in this area. Thirdly, the requirements for quality of housing as the priority value are significantly increasing. Fourthly, various services (information, tourist, etc) satisfying needs of older adults play an increasingly more important role in the personal consumption structure. Fifthly, the requirements for life quality and conditions of older adults are increasing as well. Sixthly, the response to the environmental situation and pollution is becoming stronger.

All these signs as a whole shape the new model, the modified personal consumption structure for older adults. We define this process as the socialization of the emotional status in the network economy. It entails additional costs for purchasing goods and services of higher quality, improvement of living conditions, and enhancement of the environmental comfort. In the context of the network-based welfare, the technological structure of older adults' personal property and the utility maximization patterns are considerably changing. The needs of older adults are constantly growing and act as the incentive and impetus to broaden a range of products and services, to improve their quality and quantity.

With the development of the market economy and strengthening the role of information technologies in the Russian society, the information needs associated with new opportunities are growing and give a rise to the new human model which is more typical of the network society. These ideas are reflected in some socioeconomics studies [9, 10]. The development of the network space is clearly a key IT trend which naturally represents the most advanced directions of social virtualization.

Nowadays, the wide access to information provides more opportunities to older adults, and the utility maximization is achieved at a higher level of its satisfaction. In the context of the transition to the information society, "the task to produce essential goods is becoming a trivially simple due to the technological progress and the economic development [11. p. 96]. The information needs begin to dominate in the coordinates of the information society: "they can be satisfied through activities of such sectors that are capable to provide information facilitating extension of knowledge, growth of human creativity, and enrichment of personal culture" [12. p. 16].

Various information flows have become an indispensable element of older adults' everyday life. The global use of Internet is the evidence of informatization in the life of the contemporary society. Information available in Internet is universal. The synthesis of cybernetics and telecommunications (via phone, TV, satellite) create prerequisites and conditions for the fundamental enrichment of collective, group and individual information activity, as well as for broadening the social interaction. The opportunities for developing the network-based welfare of older adults are associated with the further technological improvement of Internet technologies, their transformation into more efficient advanced trends of social networks.

The socioeconomic changes in Russia have created the open society and information abundance. It is the first time for many years that older adults have a choice of information. Nowadays, over a half of Russian households are connected to Internet. More comfortable information conditions have been provided to these citizens. In addition to the possibility to receive digital TV programs at a higher quality, they are provided with a lot of diverse information services, including news and announcement, schedules for all modes of transport, medical consultations, commercial advertisements, and other pragmatic data). The combination of information into the unified "guide" will ensure the quick and easy access to information on goods and services. Internet not only assumes many functions of the market but also integrates them with other functions: 1) identification, order and purchase of goods and services; 2) making all financial settlements; 3) support of business and personal relations; 4) work and study based on the concept of continuous learning; 5) arts and hobbies; 6) virtual travels in the cyberspace; 7) entertainment. Among older adults who use a smartphone (i.e. a phone connected to the mobile Internet) at least for one week, only a negligible number return to conventional cell phones (i.e. only for calls and SMS). This suggests that they change their consumption model for telecommunication services and create a new comfort zone which is not easy to leave. It is very difficult to imagine that a user of mobile communications will reject such important opportunities – to have almost all knowledge available to the humanity: from online encyclopedia to art collections of the world's best museums. Or that they reject a lot of conveniences – to rapidly lay a route from A to B in an unknown territory, to pay community charges not leaving home, to watch a match of their favorite team or a popular serial if they have no time to reach a TV set. And this is only a few examples of how the mobile Internet can make the life of any human being more bright, interesting and comfortable.

Taking this into account, producers of smartphones have launched a line of special gadgets for older adults. Their interface is specially designed to be conveniently used by this age category of citizens. This demonstrates that the qualitative shifts are becoming more and more tangible – mainly due to the fact that Internet, mobile phones and digital technologies offer new opportunities to older adults. It can be said that patterns of using different new information sources are crucially changing and, equally, time consumed for mass communication is evidently increasing [13. p. 60-67]. Here, the expanding capabilities of older adults are becoming an inexhaustible resource [14. p. 56].

The emotional status of older adults is intimately connected with intensity, synchronicity, mobility, and publicity of information in Internet. It substantially enriches the information basis for many everyday activities in various areas of the family life and recreation. It enriches family and interpersonal relations which are typical of older adults.

The network expectations of older adults encompass a diversity of wishes: to know more about the history of their community, region, country, world, etc.; to share opinions about books they have read; to take advice from experienced people; to take classes in housekeeping, horticulture, floriculture, arts and other useful crafts; to watch online sessions of the local government and parliament; to learn foreign languages; to consult with physicians and take advice for medical treatment and disease prevention; to acquire skills in using personal computers, mobile phones, and tablets; to take part in online tournaments and competitions (e.g. various games); to regularly watch special TV programs aimed at resolving conflicts and facilitate mutual understanding between generations; to enjoy documentary films about history, conventional and contemporary art and culture in Russian and other countries, etc.

Nowadays, there are special network resources designed for older adults. For example, the social network Strana Pensioneriya has been created and is successfully functioning. Older adults willingly share information and experience on a wide spectrum of topics: online earning options and using special-purpose software, travels to different countries and discussion of fashion for older adults, etc. [15]. Nevertheless, the opinion that Internet is an essential need for older adults is still not common in Russia, although foreign countries have finally settled this issue long ago [16]. All civilized western countries have dozens of websites and social networks for older adults. This is also the case for Oriental countries. For example, the Chinese search engine *Baidu.com* launched the special version for older users. It differs from the "basic" *Baidu* both by design with bigger fonts and content. The website contains links to different sections such as classical poetry, revolutionary songs, calligraphy, poultry breeding, etc. – everything which is traditionally interesting to the older part of the Chinese society. Chinese people over fifty years of age make up less than 5% of network users. However, *Baidu* offers services to different allocated groups of users – sight-impaired persons, children, older adults.

Among all other things, one of the key demands shown by older adults for network technologies is associated with the interest in genetically modified organisms (GMO) and genetically modified food products. It is no secret that older adults in Russia make up the bulk of households involved in family farming and creating a demand for seeds and tillage equipment. On the one hand, the modern technologies in this area – biotechnologies – are the wanted elements of cropping farms, but, on the other hand, there is a great information vacuum as related to safety of using them in agriculture. An increasing number of retirees and aging of the population aggravate this problem since the welfare of older adults is associated with the possibility to engage in their labour of love and to provide themselves and their families with safe food. This is often connected with tillage and growing food in their own (private) land plots.

An increasing demand for network information technologies is partially explained by distribution of information about risks of using GMOs for food production. In particular, the studies of professor Seralini shock with their conclusions: he has proved that test rats receiving genetically modified maize face some serious health problems [17].

In addition to the strong evidence of Seralini that GMOs may be hazardous for food production, there are many other negative consequences from increasing use of genetically modified organisms in the food industry: reduction of plant biodiversity; chemical pollution of fertile soils because of increasing herbicide volumes and concentrations; risks of higher GMO-specific mutagenic activity.

The welfare of older adults is equally associated with access to high-quality and health food, high-technology medical care, reduction of disease risks, and access to information which allows them to minimize some risks. Such minimization may be connected with the possibility to control some

negative trends resulting from the increasing scientific and technological progress in a number of specialized branches or, at least, to be aware of the latest scientific achievements and risks of introducing them into the real economy.

Using the network technologies and generating queries to the network space, older adults have the opportunity to satisfy a bulk of such queries. The practice shows that older adults consistently consider Internet as the means of dialogue, bidirectional communications between individuals acting as an independent party or an intermediary between the population and local authorities. Older adults think that Internet is the important source of local information, regional historical studies, medical knowledge, and practical health data. A share of Internet users among older adults is a quite considerable parameter. Internet facilitates distribution of cultural information, increase in the cultural and educational level, personal enrichment of older adults, acts as a tool for developing interests (hobbies) and acquiring practical skills; activates a participation in local self-government; is of great benefit for education of children. Finally, Internet develops contacts between older adults, especially in the immediate, neighboring environment (new acquaintances, new subjects and topics for discussion, showing more attention to each other, exchange of greetings in the street, etc.). The easy of access and information requests makes Internet a very efficient and promising mass service for older adults.

4. Conclusion

New technologies are finding their way into everyday lives of older adults and, even at early stages, enjoy the all-round support from the government, private firms and non-profit-making organizations. Searches for efficient social technological solutions are based on economic factors. An increasing competition, the need to stimulate the individual and aggregate demand for innovative technologies push all entrepreneurs to act more efficiently. Their strategies are based on the attempts to free information processes from the fundamental imperatives of the socioeconomic development. It cannot be said that information technologies are capable to drastically change the basic socioeconomic attitudes of older adults, but some positive shifts are evident.

Older adults represent the disadvantaged portion of the Russian society – more educated but less well-off than the remainder of the population. Their social and cultural privileges have the direct influence on the content and structure of their information needs, on the motivation to use new technologies. Older adults are the more democratic group and better serve the purposes of the information society. As long as the retirement insurance is used as a tool for simple reproduction of labour-power, the restrictions associated with a slow growth of social and cultural needs will remain.

Therefore, the development of the information society in Russia has the direct influence on degree of emotional comfort and enhanced emotional status of older adults, as well as the possibility to comfortably participate in various network societies.

The authors of this study suppose that the concept of emotional status institutionally clears up the concept "general welfare of older adults" and is especially beneficial for criterial reasoning of the latter one.

The key properties and criteria of the emotional status include personification which is combined with the most tangible and sensible form of perception – the subjective perception. The subjective perception is a certain integral indicator which is eventually determined by the emotional status itself, i.e. expresses all aspects of the individual's life satisfaction.

The research contribution of the authors is the attempt to summarize the methods for identifying the emotional status and the tools enriching its etymological status. It is not intended to be exhaustive. We are willing to share experience to consolidate efforts in studying such a complex phenomenon as the network-based welfare and the emotional status of older adults and, therefore, to gain an understanding of similarities and differences of these concepts and their real implications in various places of the world.

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