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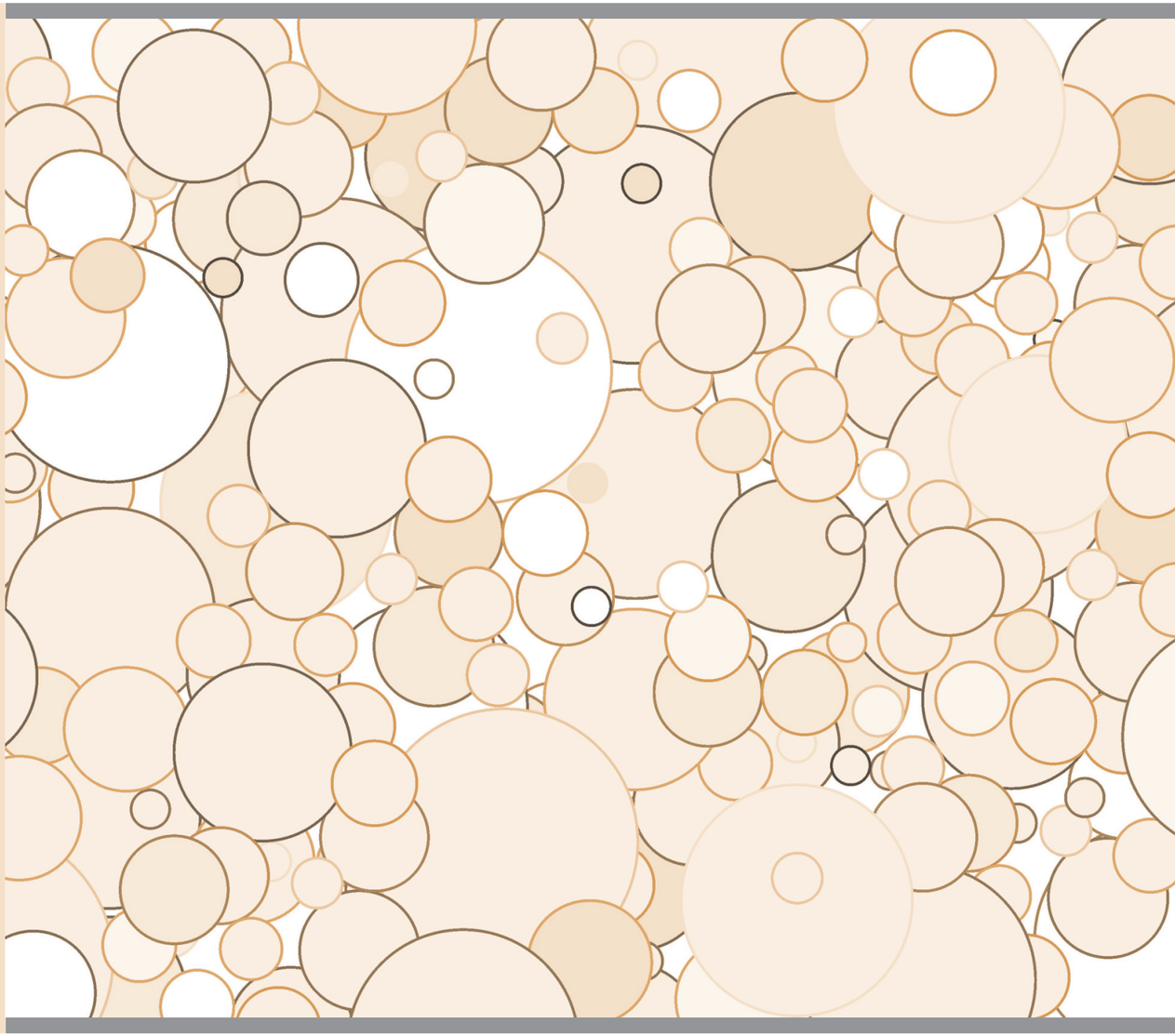

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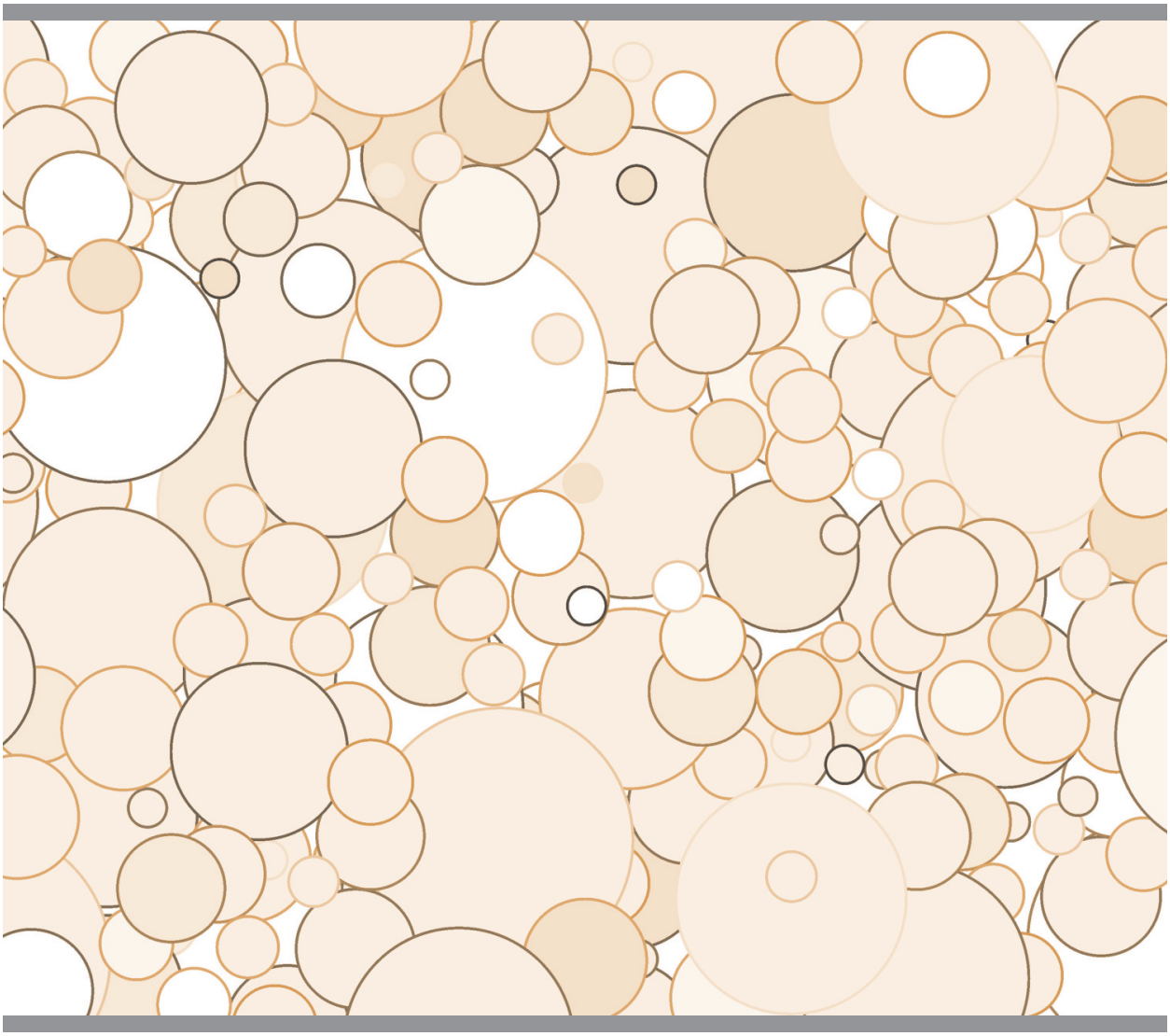

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CONTENTS

Evaluation Of Microbiological Quality And Aflatoxin M_1 (AFM_1) Contamination Of Milk Powder Samples

Sold In Nigeria Market

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Abstract: Milk, a natural liquid food, is one of the most nutritionally complete foods, adding high-quality protein, fat, milk sugar, essential minerals, and vitamins to diet. Milk could also be a source of contaminants such as microorganisms and aflatoxin M_1 (AFM_1). Aflatoxins are important toxins whose consumption could cause food borne diseases. The microbiological quality and Aflatoxin M_1 (AFM_1) contamination of twenty five milk powder samples (10 brands) imported, branded and sold in Nigerian market were evaluated. The total heterotrophic, coliform, Bacilli counts ranged from 2.0 - 8.2 $x10^1$cfu/g, 1.0 - 4.0cfu/g and 3.0 – 4.1 x 10^1cfu/g respectively. There was no detection of *Salmonella/ Shigella, Vibrio*, lactic acid bacteria, *Staphylococcus* and *E. coli*, Yeast and mould in any samples. The bacteria isolates found in the samples were *Bacillus subtilis, B. lincheniformis, B. cereus, Proteus mirabilis* and *Proteus vulgaris* among which *B. subtilis* had the highest frequency of occurrence (48.8%). Fungi were also not detected in the samples. The microbial loads of the milk samples were found to be lower than the specified standard limits (10^2 - 10^3 cfu/g for bacteria) as recommended by United State Food and Drug Administration (USFDA). The AFM_1 level ranged between 0.13 ± 0.01^y – 3.75 ± 0.01^a ppb (n = 25) and was found in all the samples tested. In approximately 80% of the samples, level of contamination was above the permissible concentration (0.5ppb) as specified by European Union (EU). About 20% contain AFM_1 at level below tolerance limit specified by FDA. There were significant differences ($P\geq0.05$) in the mean values of AFM_1 in the samples from the same brand. The detection of AFM_1 in the milk powder samples could be of public health significance and hence there is an urgent need for concerned regulatory bodies to impose necessary measures to safeguard health of consumers. In conclusion, while the microbial load of milk powder samples did not pose public health problem, the level of AFM_1 contamination called for serious attention in the country.
[Adebayo-Tayo BC., Ofosiata UC. Ebenezer AA. **Evaluation of Microbiological Quality and Aflatoxin M_1 (AFM_1) Contamination of Milk Powder Samples Sold in Nigeria Market**. *Academia Arena* 2013;5(1):1-9] (ISSN 1553-992X). http://www.sciencepub.net/academia. 1

Key words: Food-borne disease, Milk powder, *B. subtilis*, Aflatoxin, Nigeria.

Introduction

Milk is the lacteal secretion, practically free from colostrums which are obtained through complete milking of one or more healthy cows (Vasavada , 1988). Milk, a natural liquid food, is one of the most nutritionally complete foods, adding high-quality protein, fat, milk sugar, essential minerals, and vitamins to diet.

Production of milk powder is a simple process carried out on a large scale. It involves the removal of water at the lowest possible cost under stringent hygiene conditions while retaining the desirable natural properties of the milk; color, flavor, solubility and nutritional value. The conventional process for milk powders production involved: Collection of raw milk, pasteurization and centrifugation in the dairy factory. Followed by preheating, evaporation, spray drying, packaging and storage (Pearce, 2000)

Milk in the mammary gland at the site of its production does not contain bacteria. Milk becomes contaminated with bacteria that live as commensal micro floral on the teat canal, the duct that conduct milk from the mammary gland to the orifice. Bacteria such as *Bacillus cereus*, *Listeria monocytogenes*, *Yersinia enterocoltica*, *Salmonella* spp, *Escherichia coli* 0157:11 and *Campylobacter jejuni* associated with milk borne diseases have been reported 1(Vasavada , 19883; Alan and Heather , 1990). *Staphylococcus aureus* has been isolated from most samples of raw milk (Riadh , 2005) .

Also milk could also be a source of toxic substances such as aflatoxin M_1 (AFM_1). Aflatoxins are a group of naturally occurring toxins produced by moulds such as *Aspergillus flavus*. When some animals ingest aflatoxin B_1 (AFB_1) - contaminated feed, it is metabolized to AFM_1 and transferred to food materials such as milk and eggs. Aflatoxin M_1 (AFM_1) is the hydroxylated metabolite of AFB_1, found in the milk of humans and animals. They may be found in milk products obtained from livestock that have ingested contaminated feed (Polan *et al.,* 1974; Frobish et *al.,* 1986;(Rustom, 1997;Park, 2002; Bullerman , 1979; Chu , 1991). Although the potency of AFM_1 is less than that of its parent compound, it is also known to be hepatotoxic and carcinogenic (Bullerman , 1979;Chu , 1991).

More recently, aflatoxin exposure early in life has been associated with impaired growth, particularly

stunting (Gong *et al.,* 2002)
. Therefore, the presence of AFM_1 in milk and dairy products may pose a threat, mainly towards children who are considered to be the major consumer of milk and dairy products in many countries (Williams *et al.,* 2004).
This study was carried out to evaluate the microbiological quality and AFM_1 contamination of milk powder samples in Nigeria.

1. Materials and Methods

2.1 Collection of samples

Twenty five milk powder samples of different commercial brands (10 market brands) were randomly purchased from different markets in Nigeria. All the samples were imported (but packed in tin and sachet) and they were packed in Nigeria. The samples were stored in sterile plastic bag at -20^{O}C.

2.2 Laboratory Analyses

Microbiological analysis

Microbiological analysis of the samples was done using the procedure of the American Public Health Association, APHA, (1992). 1ml of the diluents (10^0, 10^1 and 10^2) were plated onto nutrient agar medium for total heterotrophic bacteria counts; MacConkey agar was used for total coliform counts; MRS agar for total lactic acid bacteria count; EMB agar for *E. coli*; and thiosulphate citrate bile salt sucrose agar for total *Vibrio* counts; *Salmonella* and *Shigella* agar for total *Salmonell*a and *Shigella* count; Trypticase soy agar for total *Bacilli* count; yeast extract agar for total yeast count, and Sabouraud dextrose agar with 1% streptomycin for total fungi count. The plates were incubated at 37^{o}C for 24hrs except for Yeast extract agar plates and SDA plates which were incubated at 28±2 for 3-7 days. Colonies were selected randomly and were characterized using morphological and biochemical tests. The identification of the microbial isolates was based on classification scheme proposed by Harrigan and McCance (1976), Buchanan and Gibbson (1974) and Collin and Lyne (1995). The identification was based essentially on morphological and biochemical reactions. Fungal isolates were identified based on their morphological and cultural characteristics as recommended by Sampson *et al.*, (1984) and Frazier and Westholf (1998).

2.3 Mycotoxin analysis

The AFM_1 analyses were performed using enzyme-linked immunosorbent assay (ELISA) kit (Ridascreen, R-Biopharm AG, Darmstadt, Germany) which is a competitive enzyme immunoassay based on antigen-antibody reaction. All chemicals used in the experiments were of analytical grade. For the determination of AFM_1 content of the samples, 10g of each powered sample was extracted with 20 mL methanol: water (70:30) using a shaker at room temperature. After centrifugation, complete removal of upper cream layer was done by aspirating using a Pasteur pipette. One hundred micro liter skimmed portion was directly applied on the AFM_1 test plate i.e. wells coated with antibodies to AFM1 and after mixing, incubated for 60 min. at room temperature in dark. Then wells were washed with buffer solution. In the next state, 100 µl of enzyme conjugate washed with buffer and 50 µl of the enzyme substrate and 50 µl of chromogen were added to wells and incubated for 30 min. at room temperature in the dark. Enzyme conjugate converted the chromogen to a blue product and then 100 µ1 of the stop solution was added to wells which lead to a yellow discoloration of the chromogen.

The optical densities were measured at 450 nm by using an ELISA 96-well microplate reader (Sunrise Gmblt, Tecan, Austria). The optical densities (OD) were then compared to those of the standards. AFM1 concentration in each sample was expressed as parts per billion (ppb).

2.4 Statistical analysis

The results of the analysis are expressed as mean ±SD. Data were analyzed by ANOVA using SAS. Sequential differences among means were calculated at the level of $P \leq 0.05$, using Duncan Multiple Range Test (Duncan, 1956).

3 Results

The microbial load in different milk powder samples is shown in Table 1. Growths were observed on nutrient agar, MacConkey agar and Trypticase soy agar. There was no detection of *Salmonella/ Shigella, Vibrio,* lactic acid bacteria, *Staphylococcus* and *E. coli*, Yeast and mould in any of the samples. The total heterotrophic count ranged from $2.0 - 8.2 \times 10^1$ cfu/g; the highest was recorded in sample D1. There was no observable microbial growth on sample E2. Twenty of the milk samples (80%) were found to have total heterotrophic plate count of ≥10 CFU/g while only five milk samples (20%) were found to have total heterotrophic plate count of ≤ 10 CFU/g. The total coliform counts ranged from 1.0 - 4.0 cfu/g with sample H2 having the highest count. Most of the samples showing high bacteria count were those packed in sachets. The total *Bacilli* count in the milk powder samples ranges from $3.0 - 4.1 \times 10^1$ cfu/g and these organisms were prevalent in all the samples except sample E2. Some of the plates were observed to be covered with microbial growth making it difficult to count (Table 1). The biochemical characteristics opf the isolates is shown in Table 2.

The probable organisms from the milk powder

samples were *Bacillus subtilis*, *Bacillus cereus*, *Bacillus licheniformis*, *Proteus mirabilis* and *Proteus vulgaris* as shown in Table 3. The percentage frequency of occurrence of the bacteria isolate is shown in Figure 1 in which *Bacillus subtilis* had the highest frequency of occurrence of 48.48%.

The result of Aflatoxin concentration in the milk powder samples is shown in Table 4. Aflatoxin detection using ELISA technique revealed that 100% of the milk powder samples were contaminated with AFM_I. The AFM_1 concentration ranged from 0.13^y – 3.75^a ppb with sample A3 having the highest concentration. The detected minimum and maximum level were 3.63 – 3.76 ppb in brand A, 0.75 – 0.93 ppb in brand B, 0.25 – 0.27 ppb in brand C, 0.10 – 1.28 ppb in brand D, 0.12 – 3.37ppb in brand E, 0.77 – 1.40ppb in brand F, 0.14 – 1.76ppb in brand G, 0.21 – 1.09ppb in brand H, 0.12 – 0.35ppb in brand I and 0.21 – 1.46ppb in brand J. 80% of the milk samples were contaminated with AFM_1 beyond the specified limit by FDA. The permissible level of aflatoxin in milk as approved by USFDA is 0.5 ppb. 20% of the samples had aflatoxin concentrations below the acceptable limit. There was a significant difference in AFM_1 contamination of the milk powder samples of the same brand.

Table 1: Microbial counts of the milk powdered samples

Brand Code	Sample Code	Total plate count	Total coliform count	Total Salmonella Shigella count	Total fungi count	Total yeast count	Total Vibrio count	Total Staph count	Total E. coli count	Total Bacillus count	Total LAB count
	A 1	14±0.026	-	-	-	-	-	-	-	8 ±0.015	-
	A2	9 ±0.015	-	-	-	-	-	-	-	swarm	-
A	A3	19 ±0.034	-	-	-	-	-	-	-	7±0.030	-
	B1	2 ±0.010	1	-	-	-	-	-	-	3±0.025	-
B	B2	17 ±0.026		-	-	-	-	-	-	8±0.015	-
	C1	64±0.005	-	-	-	-	-	-	-	16±0.04	-
C	C2	73 ±0.017	-	-	-	-	-	-	-	17±0.011	-
	D1	82 ±0.015	-	-	-	-	-	-	-	41±0.03	-
	D2	4 ±0.015	1	-	-	-	-	-	-	8±0.025	-
D	D3	17 ±0.017	-	-	-	-	-	-	-	7±0.015	-
	E1	19 ±0.011	-	-	-	-	-	-	-	9±0.017	-
	E2	-	-	-	-	-	-	-	-	-	-
E	E3	34 ±0.015	-	-	-	-	-	-	-	swarm	-
	F1	46 ±0.020	-	-	-	-	-	-	-	swarm	-
F	F2	23 ±0.011	-	-	-	-	-	-	-	swarm	-
	G1	39 ±0.011	-	-	-	-	-	-	-	swarm	-
	G2	27 ±0.026	-	-	-	-	-	-	-	swarm	-
G	G3	39±0.04	-	-	-	-	-	-	-	swarm	-
	H1	18 ±0.05		-	-	-	-	-	-	swarm	-
	H2	21±0.011	4	-	-	-	-	-	-	swarm	-
H	H3	23 ±0.026	-	-	-	-	-	-	-	swarm	-
	I1	12 ±0.017	-	-	-	-	-	-	-	swarm	-
I	I2	28±0.028	-	-	-	-	-	-	-	swarm	-
	J1	14±0.020	-	-	-	-	-	-	-	swarm	-
J	J2	17 ±0.026	-	-	-	-	-	-	-	swarm	-

TABLE.2 Biochemical characterizations of the isolatess

Lates	Gram	Shape	Catalase	MR	Indole	Motility	Glu	Man	Suc	Mal	Lac	Gal	Fru	Sor	Spore	Probable organism
A	+	Rod	+	-	-	+		-	+	+	-	-	+	-	+	*B. licheniformis*
B	+	Rod	+	-	-	+	-	-	+	+	-	-	+	-	+	*B. licheniformis*
C	+	Rod	+	-	-	+	+	+	+	+	+	+	+	+	+	*B. subtilis*
D1	+	Rod	+	-	-	+	+G	+	+	+	+	+	+	+	+	*B. subtilis*
D2	-	Rod	-	+	-	+	-	-	+	+	+	+	+	-	-	*P. mirabilis*
E	+	Rod	+	-	-	+	+G	+	+	+	+	+	+	+	+	*B. subtilis*
F	+	Rod	+	-	-	+	+	+	+	+	+	+	+	+	+	*B. subtilis*
G3	+	Rod	+	-	-	+	+	+	+	+	+	+	+	+	+	*B. subtilis*
G4	+	Rod	+	-	-	+	+	-	+	+	+	+	+	-	+	*B. cereus*
H1	+	Rod	+	-	-	+	+	+	+	+	+	+	+	+	+	*B. subtilis*
H7	+	Rod	+	-	-	+	+	-	+	+	+	+	+	-	+	*B. cereus*
I1	-	Rod	+	+	-	+	-	-	-	+	+	+	+	-	-	*P. vulgaris*
I4	+	Rod	-	-	-	+	+	+	+	+	-	-	+	+	+	*B. subtilis*
J	+	Rod	+	-	-	+	+G	+	+	+	+	+	+	+	+	*B. subtilis*
K	+	Rod	+	-	-	+	+G	+	+	+	+	+	+	+	+	*B. subtilis*
M	+	Rod	+	-	-	+	-	+	+	+	-	-	+	+	+	*B. licheniformis*
N	+	Rod	+	-	-	+	-	+	+	+	-	+	+	+	+	*B. licheniformis*
O	+	Rod	+	-	-	+	+	-	+	-	-	-	+	-	+	*B. cereus*
P	+	Rod	+	-	-	+	+	-	+	+	+	+	+	-	+	*B. cereus*
Q1	+	Rod	-	-	-	+	+G	+	+	+	+	+	+	+	+	*B. subtilis*
Q2	+	Rod	+	-	-	+	-	+	+	+	-	-	+	-	+	*B. licheniformis*
R2	+	Rod	+	-	-	+	-	+	+	+	+	-	+	-	+	*B. licheniformis*
R3	+	Rod	+	-	-	+	+	+	+	+	+	+	+	+	+	*B. subtilis*
S2	+	Rod	+	-	-	+	+G	+	+	+	+	+	+	+	+	*B.subtilis*
S3	+	Rod	+	-	-	+	-	-	-	+	-	-	+	-	+	*B. cereus*
T1	-	Rod	+	+	-	+	+G	+	+	+	+	+	+	+	-	*P. vulgaris*
T2	+	Rod	+	-	-	+	+G	+	+	+	+	+	+	+	+	*B.subtilis*
U	-	Rod	-	-	-	+	+G	+	+	+	+	+	+	+	-	*B.subtilis*
V2	+	Rod	+	-	-	+	+	+	+	+	-	+	+	+	+	*B. subtilis*
V4	+	Rod	+	-	-	+	-	+	+	+	-	-	+	-	+	*B. licheniformis*
W	+	Rod	+	-	-	+	-	+	+	+	-	+	+	-	+	*B. licheniformis*
X	+	Rod	+	-	-	+	+G	+	+	+	+	+	+	-	+	*B. subtilis*
Y	+	Rod	+	-	-	+	-	+	-	+	-	+	+	-	+	*B. licheniformis*

Table 3: Microorganisms associated with the milk powder samples

Brand code	Sample code	*B. subtilis*	*B. cereus*	*B. licheniformis*	*P. mirabilis*	*P. vulgaris*
	A1	–	+	–	–	
	A2	–	+	–	–	
A	A3	+	–	–	–	
	B1	+	–	–	–	
	B2	–	–	+	–	
B	B3	+	–	–	–	
	C1	+	–	–	–	
	C2	+	–	–	–	
C	C3	–	+	–	–	
	D1	+	–	–	–	
	D2	–	+	–	–	
	D3	–	–	–	+	
	D4	+	–	–	–	
D	D5	+	–	–	–	
	E1	+	–	–	–	
E	E2	–	–	+	–	
	F1	–	–	+	–	
F	F2	–	+	–	–	
	G1	–	+	–	–	
	G2	+	–	–	–	
	G3	–	–	+	–	
	G4	–	–	+	–	
G	G5	+	–	–	–	
	H1	+	–	–	–	
	H2	–	+	–	–	
	H3	–	–	–	+	
	H4	+	–	–	–	
H	H5	+	–	–	–	
	I1	+	–	–	–	
	I2	–	–	+	–	
I	I3	–	–	+	–	
	J1	+	–	–	–	
J	J2	–	–	+	–	

+ = positive, - = negative

Table 4: Total Aflatoxin M_1 concentrations (ppb) in the milk powder samples

Sample Brand	Sample code	AFM_1		
		Minimum	Maximum	Average mean/SD
A	A1	3.63	3.65	3.64 ± 0.01^{c}
	A2	3.68	3.70	3.69 ± 0.02^{b}
	A3	3.74	3.76	3.75 ± 0.01^{a}
B	B1	0.91	0.93	0.92 ± 0.01^{m}
	B2	0.75	0.79	0.77 ± 0.02^{q}
C	C1	0.25	0.27	0.26 ± 0.002^{u}
	C2	0.86	0.88	0.87 ± 001^{n}
D	D1	0.71	0.73	0.72 ± 0.01^{s}
	D2	0.10	0.99	0.69 ± 0.05^{l}
	D3	1.26	1.28	1.27 ± 0.01^{h}
E	E1	0.62	0.64	0.63 ± 0.01^{t}
	E2	3.35	3.37	3.36 ± 0.006^{d}
	E3	0.82	0.84	0.83 ± 0.005^{p}
F	F1	1.38	1.40	1.39 ± 0.002^{g}
	F2	0.77	0.79	0.78 ± 0.01^{r}
G	G1	1.04	1.06	1.05 ± 0.01^{jk}
	G2	0.14	0.16	0.15 ± 0.01^{x}
	G2	1.74	1.76	1.75 ± 0.01^{e}
H	H1	1.08	1.09	1.0833 ± 0.005^{i}
	H2	1.04	1.06	1.05 ± 0.01^{jk}
	H3	0.21	0.22	0.21 ± 0.006^{w}
I	I1	0.83	0.85	0.84 ± 0.01^{o}
	I2	0.12	0.14	0.13 ± 0.01^{y}
J	J1	0.21	0.23	0.22 ± 0.01^{v}
	J2	1.44	1.46	1.45 ± 0.01^{f}

Values followed by the same letter(s) along each column are not significantly different by Duncan's multiple range. Data are means of 3 replicates

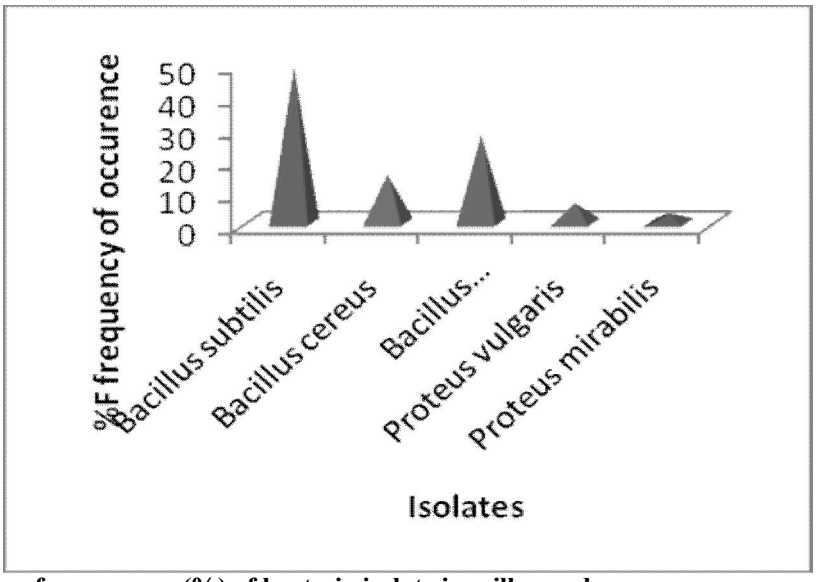

Figure 1: Frequency of occurrence (%) of bacteria isolate in milk powder

4.0 DISCUSSION

Milk powder as a good source of many nutrients consumed by both adult and children must be of good microbiological quality. Milking done under aseptic condition must be practically free from bacterial flora. Presence of different microorganisms in freshly produced milk may be due to the care employed in milking, cleaning, and handling of utensils (Alan and Heather , 1990). The result obtained shows that the sampled milk powder harbors a wide range of microorganisms. Generally, the overall assessment of the milk samples indicated that the microbial loads were within the permissible limits stated by New Zealand FDA [20], (10^{-2} - 10^{-3} cfu/g). The low incidence of microbial contamination found in this study indicates, consequently, a low contamination of the milk samples. The bacteria isolates encountered indicate possible contamination either during milking operation, transportation, storage, processing or packaging. The contamination could as well be from the environment and/ or inadequate handling and unsanitary conditions (ICMSF, 2005).

The bacterial isolates; *Bacillus subtilis*, *Bacillus cereus and Bacillus licheniformis* have been reported in the past to be found in feeds and because they are spore forming bacteria, the spores can survive the passage through the alimentary tract of dairy cow, and are excreted with feces (Klijn *et al.,* 1995; Cocolin *et al.,* 2004;Le Bourhis *et al.,* 2005).

Species of *Bacillus* are associated with the spoilage of heat-treated dairy product thereby reducing the shelf-life (Te Giffel *et al.* 1997). The spores of *Bacillus* species are ubiquitous and can be isolated from plants, beddings materials, concentrated feeds, roughages and cattle feces (Le Bourhis *et al.,* 2005).. Several studies have indicated that silage is also a significant source of contaminating milk with Bacillus spores (Vissers *et al.,* 2007b), which is due to growth of spore-forming bacteria in poorly conserved silages. Microbiological and physicochemical quality of powdered soymilk has been reported (Adebayo-Tayo *et al.,* 2009)

The presence of *Proteus* species which belong to the family of Enterobacteriaceae in the milk sample is indicative of poor sanitary condition or contamination especially of fecal nature (Collins and Lyne 1984). *Proteus sp.* has been reported as causative agent of opportunistic infection in humans and urinary tract infection, wound infection, pneumonia and septicemia and these calls for concern (Prescott *et al.,* 1992).

About 80% of the milk sample analyzed showed the presence of aflatoxins in a range higher than acceptable level set by USFDA (2001) . Though there was no trace of fungal growth in the milk samples, yet aflatoxins were detected in the milk samples. This could be as a result of feeds used in feeding the cow which might have been contaminated with aflatoxins. This result is in agreement with the report of Kiessling *et al*., (1984) who stated that the presence of mycotoxin in dairy products reflects the contamination of feedstuff. It has been stated by USFDA (2001) that the maximum aflatoxin concentration in feeds for feeding cow should not exceed 20 ppb. The concentration of aflatoxin in feeds varies with location, because it is influenced by weather conditions during harvest and feed storage practice. Due to the fact that aflatoxin are not visible neither do they have a particular flavor, therefore it is not easy to convince consumers about their existence in food. Aflatoxins have been detected in food from different researches being carried out by different individual (Bankole and Mabekoje (2003); Adebayo–Tayo BC, *et al.* (2006); and Adebayo-Tayo BC*, et al.,* (2008)

CONCLUSION

In conclusion, while the microbial load of milk powder samples do not pose public health problem, the level of AFM_1 contamination call for serious attention in the country. The presence of AFM1 in the milk powder samples can pose a public health hazard which call for a need for controlling aflatoxin contaminated feedstuff and the use of contaminated feedstuff should be prohibited. The detection of AFM_1 in the milk powder samples could be of public health significance and hence there is an urgent need for concerned regulatory bodies to impose necessary measures to safeguard health of consumers. Further research work should be carried out on milk powder and other milk products on sale in Nigerian market.

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Assessing Different methods used in distance education

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Abstract: In the earlier days of distance learning, it was most common to see distance learning used for rural students who were at a distance from an educational institution. The student might watch a telecourse on a television stations, read texts, mail in assignments and then travel to the local college to take an exam. This model is still in use, but as the technology has become more sophisticated and the cost of distance learning dropped as equipment prices dropped, the use of distance education has increased. High front-end costs prevented an early widespread adoption of electronically mediated learning. Distance learning has been aggressively adopted in many areas because it can meet specific educational needs. As the concept of accountability became accepted and laws required certain courses in high school in order for students to be admitted to state colleges, telecommunications was examined as a way to provide student access to the required courses. Many rural school districts could not afford the special teachers to conduct required courses. Distance education met this need by providing courses in schools where teachers were not available or were too costly to provide for a few students. It also fulfilled a need for teacher training and staff development in locations where experts and resources were difficult to obtain. These systems link learner communities with each other and bring a wide array of experts and information to the classroom.
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Introduction:

Enjoying and giving publicity to any of technological tools with the aim to facilitate and accelerate the training process, as well as increase the quality and quantity of knowledge quality and knowledge of a serious intelligence community needs to integrate and standardize the educational system society is.

Hence, considering the position and role of education in the third millennium on the basis of ICT is also a serious approach to the topic with the knowledge community centered on learning and general trends of technological tools to enjoy much of the information and Find the appropriate place in the information society Third Millennium That actually can be a global community and is without limit is undeniable-and-run. Guidance and therefore move in the direction of society should be education and technology for comprehensive pandemic done. Considering the above definitions and with the knowledge and attitudes towards the third millennium and the desirability and some weaknesses in the achievement of certain standards and dynamic structures in order to achieve a knowledge based society, there is. In the present circumstances to provide our information infrastructure development and integration inevitably link the elements and tools that they are as indicators of technology education and technology education will be remembered. In the new context of combining these two indicators comes to training facilities and a variety of tools that will provide guidance and development in information will be very effective.

While the effect of these two indices of body functions and its other fields (favorable to foster new ideas provides. Technologies training web-based technology as one of the most effective learning tools in educational issues have been identified and a total of E-learning as it is referred. . But if the scientific and cultural infrastructure with this technology's Day is not coordinated development of information will be obtained. This weakness caused by lack of growth and development of training required for pandemic knowledge of existing technology is. In many systems of scientific tools and capabilities needed to provide hardware and commissioning are still technological problems resulting from lack of knowledge of poverty and poor education in these centers to be seen.

In other words, the country still in the feasibility assessment and appropriate to make public the necessary training for operation and application of scientific principles and technological tools is has been done and why certain movements and sometimes non-normative point will not be able node an unlock.

The conditions and according to the capacity of developing countries and training facilities required a knowledge-based society feels is felt. If all processes in technology education and technology optimization and standardization of the Hungarian education should go, and appropriate channels that the best option in this area could benefit from state universities is capabilities.

According to the information in the development of any society should take half of the world to progress until the necessary coordination and synchronization global developments so as to accept the design structure of a knowledge-based society have a special place for the University and respect the role of education and technology was In designing a model with global standards of dynamism and flexibility at first be necessary to select a sample that the facilities and communications needed for this purpose provide action and then determine optimal cognitive deficiencies than Hammett and weaknesses push.

No doubt the experiences of implementing these standards and to develop troubleshooting information using technological tools would be much more economical. That if we develop a range of information from a city university level and conduct more successful we'll be more acceptable was. Because the utilization and application tools and step up the information they've been successful. Therefore the most important first step needed to coordinate and synchronize technology education and educational technology standards and capability in the high user acceptability of the world is also enjoyed.

Educational methods in distance learning:

Today, under the new system replaced the traditional systems of learning and learning week (ie tutoring methods, lectures) are:

- **Multimedia courses:**

These courses and widely used elements of image, communication, graphics and simulated components, animation and communication elements for guidance and tips, and talk back on course and curriculum issues are held.

- **Enhanced communication mechanisms:**

The mechanism of any texts simultaneously, and asynchronous audio-visual communications to protect you. This case allows students to practice on topics learned will give.

- **Written test:**

Thus, question and test via a distributed communication network, are corrected and returned. These exams through video conferencing support and runs**.**

-Virtual Seminar:

Thereby different groups of students in different geographical environments linked together makes.

- **Collaborative virtual laboratories:**

The laboratory of the Group's activities are supported. Workshops such as software engineering.

-Smart academic factors:

Academic factors that inform intelligent, support and guidance students pay.

Key factors in the process of distance education:

The process of remote training, the following factors contribute:

- Students:

Regardless of educational content, role and main element in the learning process students are responsible.

- Coaches and Teachers:

Success depends on a lot of educational activities the ability, skills and knowledge are the coaches and professors.

- Facilitators of communication:

Facilitator bases, as the bridge between students and mentors are. Must base expectations of teachers and educational needs of students and service coordination and communication to create.

- Support staff:

One of the important pillars of any development of distance education programs, by development group finds. Operational support staff such as student registration, copy and distribute their resources, order textbooks, security and copyright, and are responsible for the report.

- Management:

The group decision makers, builders and judges are considered to be educational and should be considered among the factors above, establish the correct relationship formation.

What is Distance Education?

Distance education is education designed for learners who live at a distance from the teaching institution or education provider. It is the enrollment and study with an educational institution that provides organized, formal learning opportunities for students. Presented in a sequential and logical order, the instruction is offered wholly or primarily by distance study, through virtually any media. Historically, its predominant medium of instruction has been printed materials, although non-print media is becoming more and more popular. It may also incorporate or make use of videotapes, CD or DVD ROM's, audio recordings, facsimiles, telephone communications, and the Internet through e-mail and Web-based delivery systems. When each lesson or segment is completed, the student makes available to

the school the assigned work for correction, grading, comment, and subject matter guidance by qualified instructors. Corrected assignments are returned to the student. This exchange fosters a personalized student-instructor relationship, which is the hallmark of distance education instruction.

Historically, most distance education courses were vocational in nature, but today courses are offered for academic, professional, and avocational purposes for students of all ages. There are numerous specialized programs, such as those for blind persons and for parents of small children with hearing impairments. Distance education is available in practically any field, from accounting to zoology. Courses are offered in gemology, high school diploma, journalism, locksmithing, child day care management, yacht design, and many fascinating subjects. Distance education courses also vary greatly in scope, level, and length. Some have a few assignments and require only a few months to complete, while others have a hundred or more lesson assignments requiring three or four years of conscientious study.

Since 1890, more than 130 million Americans have studied at DETC member institutions, including Franklin D. Roosevelt, Walter P. Chrysler, Walter Cronkite, Barry Goldwater, Charles Schulz, and many other distinguished alumni of DETC members. Unlike most distance education courses offered by traditional colleges and universities that are semester and classroom oriented, with courses offered by most of the DETC-accredited institutions you can study any time and anywhere. Distance education is especially suited for busy people who wish to increase their knowledge and skills without giving up their jobs, leaving home, or losing income. You learn while you earn. Many courses provide complete vocational training; others prepare you for upgrading in your present job, without losing wages, experience or seniority. You receive individual attention, and you work at your own pace.

In recent years, technology has played a significant role in transforming the traditional distance education school into a dynamic, interactive distance learning method using toll-free telephone lines, as well as a diverse array of personal computers, video devices, CD and DVD ROMs, online courses over the Internet, interactive devices, and other modern technological innovations. The future for distance study promises to be exciting.

Forms of distance education

In its original form, teachers using distance education traveled to remote sites and taught a class, or corresponded with students through mail, telephone, or fax machine. Individualized study has been a method of reaching the remote student for some time. Detailed course instructions are sent to the learner who performs the assigned tasks and returns the completed work to the teacher for evaluation and reassignment if necessary.

Technology has raised the quality of individualized distance instruction. The use of various forms of electronic media increases time effectiveness and improves the delivery of information. Video, audio, and computer-based applications may enhance the product received by the independent learner. Electronic delivery can occur using synchronous communication, in which class members participate at the same time, or asynchronous communication where participants are separated by time (Romiszowski, 1993).

Video/audio models of distance education include broadcast television, cable television, satellite, microwave, fiber optics, and audio graphics. The most widely used format is broadcast and cable television (Parrott, 1995). However, developments in satellite and fiber optic systems have produced other successful programs. The interactive capability of many of these networks has produced a distance classroom that is nearly identical to a regular classroom. Teachers and students can interact through both two-way video and one-way video with two-way audio systems. The recent development of Desktop Video Conferencing (DVC) which brings interactive video capability to the desktop computer, further enhances learning opportunities.

The linking of computer technology through the use of the Internet or CD-ROM with television transmission provides a potentially new dimension to distance education. This technique can link university professors to high school teachers, or to physically disabled students, in a distance setting (McLean, 1996).

Another form of interaction is the use of computer conferencing. This method utilizes asynchronous communication in such forms as an e-mail list group, an Internet discussion group, or other types of conferencing software. Asynchronous methods of communication are especially appealing to the learner who has difficulty scheduling specific time- and place-bound course work.

Conclusion:

Distance learning is expanding and examples of it are increasing dramatically. Fewer than 10 states were using distance learning in 1987; today, virtually all states have an interest or effort in distance education. Distance learning systems connect the teacher with the students when physical face-to-face interaction is not possible. Telecommunications systems carry instruction, moving information

instead of people. The technology at distant locations are important and affect how interaction takes place, what information resources are used, and how effective the system is likely to be.

Technology transports information, not people. Distances between teachers and students are bridged with an array of familiar technology as well as new information age equipment. What sets today's distance education efforts apart from previous efforts is the possibility of an interactive capacity that provides learner and teacher with needed feedback, including the opportunity to dialogue, clarify, or assess. Advances in digital compression technology may greatly expand the number of channels that can be sent over any transmission medium, doubling or even tripling channel capacity. Technologies for learning at a distance are also enlarging our definition of how students learn, where they learn, and who teaches them. No one technology is best for all situations and applications. Different technologies have different capabilities and limitations, and effective implementation will depend on matching technological capabilities to education needs.

Distance education places students and their instructors in separate locations using some form of technology to communicate and interact. The student may be located in the classroom, home, office or learning center. The instructor may be located in a media classroom, studio, office or home.

The student may receive information via satellite, microwave, or fiber optic cable, television (broadcast, cable or Instructional Television Fixed Services (ITFS), video cassette or disk, telephone - audio conferencing bridge or direct phone line, audio cassette, printed materials - text, study guide, or handout, computer - modem or floppy disk, and compressed video. Recent rapid development of technology has resulted in systems that are powerful, flexible, and increasingly affordable. The base of available information technology resources is increasing with dramatic speed. Much has been learned about connecting various forms of technology into systems, so that the ability to link systems is growing. Most distance learning systems are hybrids, combining several technologies, such as satellite, ITFS, microwave, cable, fiber optic, and computer connections.

Interactivity is accomplished via telephone (one-way video and two-way audio), two-way video or graphics interactivity, two-way computer hookups, two-way audio. Interactivity may be delayed but interaction provided by teacher telephone office hours when students can call or through time with on-site facilitators. Classes with large numbers of students have a limited amount of interactivity. Much of the activity on computer networks is on a delayed basis as well. Possibilities for audio and visual interaction are increasingly wide.

In the earlier days of distance learning, it was most common to see distance learning used for rural students who were at a distance from an educational institution. The student might watch a telecourse on a television stations, read texts, mail in assignments and then travel to the local college to take an exam. This model is still in use, but as the technology has become more sophisticated and the cost of distance learning dropped as equipment prices dropped, the use of distance education has increased.

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Differences between adult education and adult learning

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Abstract: Adult education also does not have a clear definition. In Chapter One of "The Foundations of Adult Education in Canada", the author quotes Malcolm Knowles. Knowles states that the term Adult Education refers to at least three different phenomena. "...To a set of activities...to the intellectual process by means of which adults seek, or are assisted, to learn things...[and] to the social system which is made up of individuals and organizations concerned with the education of adults." Adult illiteracy severely hinders the life chances of young children, undermines school reform, and limits the opportunities for postsecondary education. The field of adult education and literacy is plagued by confusion about definitions. Over the years definitions have evolved from provisions in federal law and initiatives of groups advocating particular methodologies or the needs of specific adult populations. The result is that definitions tend to merge statements about the goals to be achieved (e.g., improving the literacy of a particular population) with a particular means (e.g., adult basic education) to achieve the goal.
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Keywords: adult education, children education

Introduction:

Much like strategies to curb epidemic, strategies to reduce illiteracy and raise the educational attainment of Kentucky's population must include both short-term efforts to face the immediate crises as well as long-term strategies to get at the underlying causes. Short-term crises include the imperative to keep helping welfare clients make the transition from welfare to work within the constraints of federal and state mandates and the need to train workers for immediate employer demands. Long-term prevention must address the underlying, persistent problems of the state's economic structure as well as the low awareness--if not appreciation--among segments of the population of the vital connection among education, employment, and improved standards of living.

Adult who is able to recognize their needs. He is who knows what will. Refers to individual adults in their lives cross and understand their responsibilities and has accepted the role is social. Adult learners are often those that distinguish each other and have many different targets at the same time and will follow a common challenge to fulfill the goals of building self motivation vectors as educational materials to learn and use the forge.

Concept of adult education:

Several definitions of adult education has been done Community

- Adult Education is a in the following examples are given of them. conscious effort by public institutions or voluntary organizations to promote community awareness comes action.
- Adult education teaching is typically specific age group above the legal age⎫ limits as formal and informal, voluntary and at different levels of time, place
- Adult Education is a process in which people who⎫and education is presented. somehow been cut course they consciously to change or advance their skills in information and do organized activities.
- Adult education includes all formal and informal training and volunteer after⎫ school, which by experienced educators and aware of the system.

Educational materials on adult education with daily life, needs, goals, aspirations and past experiences of adults and their relationship helps to results learned in life and career are used.

What are the differences between adult education and adult learning?

- The distinction between adult learning and adult education was first explored in the 1960s by Alan Thomas and Roby Kidd. Since then, much attention has been focussed on these terms and many theorists have attempted to explain and discuss the distinction between the two.
- Some of the simpler distinctions between the two include "education tends to imply formal schooling whereas learning occurs both inside and outside of classrooms" or "learning is something which people do, while education is a social institution which provides learning opportunities for people."
- To gain further insight into the answer to this question, a closer examination of the two terms is warranted.

- The dictionary definition of learning is "the action learn (to get knowledge of a subject) or skill by study, experience or teaching" and "what is learnt or taught". With respect to adults, learning is most often related to a process that tends to occur within human groups of all kinds, ranging from families to communities.
- Learning is an activitiy that is essential for survival and is something that occurs throughout a person's lifetime. The most important role that is associated with learning is that of "member" and what is important as a distinction is the feeling that individuals learn more as members than they do as students.
- In contrast, education has a predominant preoccupation with teaching not learning. The term education is identified to be a collective response to the existence of the human capacity to learn. This capacity to learn is then directed toward objectives that have been pre-decided and relate to knowledge, skill and attitude.
- Whereas learning focuses on collective knowledge and competition between groups, education encourages individual rather than group competition. Teaching is undertaken in groups but evaluation is generally individualized.
- Education revolves around courses and programs that are time-defined and are measured or evaluated using diplomas, certificates and degrees. One of the risks or dangers that has been identified in formal education is the tendency to confuse process with outcome, leading to an enslavement of learning capacity by collective goals.
- Hopefully, by examining each term more closely, it has become clear that the terms learning and education are distinct terms in their relationship to adults. As Alan Thomas states, "the proper balance between learning and education is desirable precisely because of their contrasting processes and the significance of those processes in the meaning of learning in the world".

Comparison of adult education in various countries:

In developed countries, adult education is a form of informal education for people above 24 years is presented. In fact, a means of expanding knowledge, skills and abilities of adults. In these countries, adult education helps adults to variable conditions of political, social, economic and cultural adjustment, and pay to fix their shortcomings.

In developing countries and backward because the problems in primary education, lack of resources and facilities, poverty, social existence, economic and cultural concept of adult education is different. In such countries the concept of adult education, literacy education is.

Concept of adult education in revolutionary countries, is a combination of these two concepts. Changes in these countries due to social, political and cultural revolution, resulting from, literacy and continuing education necessary to find because of the revolution, there is cultural poverty on the other hand the implementation of development plans and the need for skilled personnel are expert. General adult education system based on economic conditions - social and cultural community is different and each specific goals will follow. General objectives of adult education and literacy in two categories is divided into professional education.

Adult characteristics:

to understand the characteristics of adult learners, their mental and physical condition should be considered in the following referred to some of them.

Operating speed:

slow reaction in adults is natural that necessarily means reducing the logic and practice skills, not due to weakness and increased awareness of natural forces and their skills.

Consciousness:

no stimulus and incentives encouraging, despite inhibiting stimuli, slow transfer rate, mental, and weak inhibitors of natural forces (mostly visual and auditory) are factors that slow reaction affect individual mental and cognitive activities, but never able to understand, understanding and learning ability (which varies with the speed of learning) is not relevant.

Health:

what is most age, longer duration is necessary to be heard by listening issue. Why is that when elderly people and old could not hear well, their confidence and vulnerable to the possibility that negative beliefs about their find, they are great. Visual abilities can be like other people, usually decreases with age.

Background of knowledge - skills and beliefs of adults:

adults, social experiences, many have already learned different values and beliefs in their pronouns have stabilized, so changes in the new act very cautiously. The idea of such a manner that skill and applying them older and longer life is, Similar resistance to accept new ideas will be more and more severe. Thus, the adult criteria for the built and paid for their ideas and beliefs that are forming. Because of these criteria and the beliefs that they are afraid of failure, Therefore, to prevent it, sometimes against the resistance of new phenomena are only the material taught and its face that make reinforced concrete and tangible interference situation is.

Issues Beyond the Department of Adult Education and Literacy

Beyond the issues relating directly to DAEL(Department of Adult Education and Literacy),

the task force heard a number of concerns about the Commonwealth's overall approach to adult literacy.

- Lack of coherent statewide leadership and coordination among multiple complementary initiatives aimed at the same problem.
- Lack of continuity in state leadership. Cited in particular was the difficulty sustaining a high level commitment to the issue long enough to make a difference because of changes in priorities of the state's political leaders. A high level of turnover in the leadership of the Department of Adult Education and Literacy has also contributed to the instability.
- Tendency to think of adult education as a separate categorical program rather than a strategy that cuts across the mission and responsibility of multiple Commonwealth programs and initiatives (e.g., early childhood education, welfare reform, economic development, and corrections).

Conclusion:

To improve the quality of life, learning materials should reinforce the skills they acquired previous. This material should have access to information and provide new technology. should also have to make learning more fun. Additional materials should provide opportunities for literacy skills to read and to strengthen their cognitive awareness.

Track materials (continued) which increased literacy skills and knowledge gained is also effective in enriching learning environment for learners are important. Participatory materials to ensure the participation of learners in the learning process and codification are included out of class activities, dialogue, role playing, etc.

In traditional programs that the principles of psychology and curriculum planning, less attention is the form of content presentation ie codification and providing books, original format and have the dominant form, while for adult content that could have valuable experience in addition to writing, other ways also be provided Affect the selection of pictures and images related to the concepts and content produced by including them.

Learning activities such as activities outside the classroom, dialogue, role playing and ... Another type of content is presented. Duties are placed on the learner, a resource for developing knowledge, skills and insights he considered.

Curriculum content only from the training provided to learners or not, but put together their learning through activities that can inform or does, skills and attitude to achieve. In this case, apart from learning that the assays taught learners directly to sustainable and effective learning occurs in his.

Another way of providing content that is educational activities outside the learning environment possible for learning more and better enables adult learners. For example, hits, field trip experiences for learners or transfer is provided, develop knowledge, insight and skills they will.

To ensure that science curriculum and educational aspects, according to community needs and audiences, application form is provided or not, the content selection criteria should be considered. These criteria is being include knowledge, effectiveness, flexibility, diversity, relevance and practical learning

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Differential Sensitivity Of Nitrogen-Fixing, Azolla Microphylla To Organochlorine And Organophosphate Insecticide

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Abstract: The development of the intensive agriculture in our country between 1960 and 1990 totally over passed the aspect connected with the negative impact of the toxic chemical compounds on the air, water and soil. Using chemical products as nutrients, fertilizers and pesticides, we believe that we attack our safety and we must know the effects of pesticides from these compounds. Application of pesticides in the paddy fields has deleterious effects on non-target organisms including Azolla which are photosynthesizing and nitrogen fixing micro-organisms contributing significantly towards soil fertility and crop yield. Pesticide contamination in the paddy fields has manifested into a serious global environmental concern. Present study was aimed to study the comparative effect of two such pesticides, a well-known species of Azolla, Azolla Microphylla were selected for their stress responses to an Organochlorine insecticide - Endosulfan, and Organophosphate insecticide-Monocrotophos with reference to their growth, Free radicals, Antioxidant enzymes and metabolites. Azolla microphylla strains were adversely affected by the insecticide doses and inhibition was dose dependent. But the highest decrease was seen in case of organochlorine insecticides. Pesticide treatment with increasing doses accelerated the formation of reactive oxygen species progressively, whereby an enhanced Antioxidant enzymes and metabolites were noticed in A. microphylla. On the other hand, increased amount of proline in all the insecticide treated concentrations was indicative of stressed activities of the organisms. In this work the effect of the insecticides on Azolla microphylla resulted in growth inhibition, a decline of physiological and biochemical activities but the highest effect was shown in case of organochlorine insecticide which is commonly used in the rice fields.
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Keywords: Biochemical metabolites, Enzymes, Pigments, Antioxidant, Free radicals.

Introduction

Baron Justus von Liebig, a German scientist in the mid-19th century, showed that nutrients are essential for plant life. Knowing the nutrients required to grow plants is only one aspect of successful crop production. Optimum yield also requires knowing the rate to apply, the method and time of application, the source of nutrients to use, and how the elements are influenced by soil and climatic conditions. The development of the intensive agriculture in our country between 1960 and 1990 totally over passed the aspect connected with the negative impact of the chemical compounds toxic on the plants, air, water and soil. As one of the consequences of pesticide pollution in soil, water and air, plants are contaminated by pesticides. Many authors examined the inhibitory effect of pesticide compounds on growth and the performance of photosynthetic apparatus of plants. The inherent nitrogen fixing capacity of indigenous Azolla is one of the most important factors aiding in the process of biological nitrogen fixation in rice field ecosystems (Kaushik 1978).Due to their distinctiveness of atmospheric nitrogen fixation, these organisms form an excellent material for investigation by ecologists, physiologists, biochemists and molecular biologists. The *Azolla-Anabaena* association is important agronomically owing to its capacity to fix atmospheric nitrogen at cheaper and faster rates and making it available to crop plants (Waseem Raja *et al.,* 2012). Moreover, pesticides are mainly synthetic organic compounds that are introduced into the environment to control selected pests (Mellanby 1978). Although pesticides are indispensable to the modern agricultural practice, the biological use of these pesticides over the years have resulted in problems caused by their interactions with the biological systems in the environment and have deleterious effects on algae by influencing soil algal growth, photosynthesis, nitrogen fixation, biochemical composition, and metabolic activities (Pankratz *et al 2003*). Pesticides are often used in agriculture to protect human beings from the insect vectors of disease-causing pathogens, to protect crop plants from competition with abundant but unwanted other plants species, and to protect crop plants and

livestock from diseases and depredations by fungi, insects, mites, and rodents (Freedman, 1995). However, an undesirable side effect from the use of pesticides is that they enter into freshwater ecosystems by spray, drift, leaching, run-off, or accidental spills (Van der Werf, 1996). It is therefore important to assess the adverse effects the pesticides may have on non-target organisms in aquatic ecosystems (Peterson et al., 1994).

At present many progressive farmers and non-governmental organizations are employing *Azolla* as an invaluable input in agriculture and some of them are actively engaged in its popularization as biofertilizer, green manure, poultry feed and fodder. However, certain key scientific issues need to be addressed to make the system more compatible with the present day need and demand. *Azolla* is a heterosporus, free floating, fast growing nitrogen fixing aquatic fern and is widespread in fresh water habitat of India, Sri Lanka, Japan, China and Philippines. *Azolla* is a suitably called as green gold (Wagner 1973) because it is economically important as an animal feed, medicine (Wagner 1973), hydrogen fuel, biogas producer, weed Controller as well as a biofertilizer. *Azolla* seems to help sustain the soil nitrogen supply by returning nitrogen to quantities roughly equal to those extracted from the soil by the rice plant. (Waseem Raja *et al.,* 2011)Although, numbers of studies have been carried out regarding physiological and biochemical effects of pesticide individually on cyanobacteria, algae and higher plants and animals, however, their comperative effects are still poorly known. The major contribution of *Azolla* is in nitrogen economy in paddy field, and its sensitivity towards pesticide and has created interest to study the response of *Azolla* under these stresses. As far as our knowledge goes, no report is available regarding the changes in growth and other properties of *Azolla* when the two stresses are imposed. Therefore, an attempt was made to investigate the effect of Endosulfan and monocrotophos on Biomass, free radicals and antioxidant metabolism of *Azolla microphylla*.

Materials and methoids

Plant material Organism and growth conditions

Azolla microphylla were collected locally from paddy fields near Allahabad. Plants were washed and cleaned of contamination organisms. The plants were surface sterilized with a solution of mercuric chloride (0.1% for 30 min) and were dipped immediately into a large volume of sterile distilled water. Plants were then transferred into dishes containing combined-N free 2/5 strength sterile Hoagland's medium (Peters and Mayne, 1980) and 0.04mM ferrous ion as Fe-EDTA, pH 5.6.The cultures were grown at 26 ^{o} C under a 16:8 (light: dark) photoperiod with light from a combination of incandescent and cool white light fluorescent lamps at a photon fluence rate of 95 μmol $m^{-2}s^{-1}$. Fronds were routinely transferred into fresh medium twice a week to maintain plants in a sterile state. Log phase plants were used for experiments.

Growth estimation

Azolla microphylla plants were rinsed in an aerated iso-osmotic solution of sorbitol were blotted dry on filter paper and weighed to represent their fresh weight (FW). Dry weight (DW) was determined by drying the samples in a hot air oven at 60^0C for 24 h to a constant weight.

Estimation of superoxide radical

Superoxide (O_2^-) 10 n was measured as described by (Elstner and Heupel 1976) by monitoring the nitrite formation from hydroxylamine in the presence of O_2^- *Azolla* fronds of 0.2 gm were weighed and crushed in 2 ml of 65 mM potassium phosphate suffer (Ph 7.8) and centrifuged at 5000 rpm for 10 minutes. The reaction mixture contained 0.9 ml of 65 mM phosphate buffer, 0.1 ml of 10 mM hydroxylamine hydrochloride and 1 ml of the supernatant. After incubation of 25^0C for 20 min, 17 mM sulfanilamide and 7 mM α-nephtylamine were added to the incubation mixture ethyl ether in some volume was added and centrifuged once again at 1500 rpm for 5 min. the absorbance in the aquous solution was read at 530 nm.

Estimation of Lipid peroxidation

For the determination of lipid peroxidation value in *Azolla microphylla* (Heath and Packer 1968) method was followed. 0.3 gm *Azolla* frond was cursched in 5 ml of 50 ml phosphate buffer and then centrifuged. To the 1 ml supernant 4 ml TCA-TBA solution was added (24 gm TCA + 0.6 gm TBA + 120 ml D.W). Than the reaction mixture was heated on 90^0C water bath for 20 minutes then quickly cooled in ice bath.Then again centrifuged for 10 minutes in high speed centrifuge. Then the absorbance was read at 532 and 600 nm.

Estimation of Electrolyte leakage

It is indispensable to any biological system to have electrolytes dissolve in their cell fluid and it is also essential to the cells to protect them any leakage. But when a cell experience any sort of stress the protective membrane lasts its capacity results in leakage of electrolytes, the electrolyte leakage has evaluated according to (Dionisio Sese and Tobita 1998) procedure was followed.

Estimation of Proline

Proline content in treated and untreated fronds was estimated according to the method of (Bates *et al.,* 1973). Fresh *Azolla* fronds (100 mg) were crushed in 3 % (w/v) aqueous sulfosalicylic acid, centrifuged at 10,000 g for 10 min and then mixed with 3 % (w/v) glacial acetic acid and acid ninhydrin. Samples were heated for 1 h in a water bath at 95 ºC, cooled and extracted with 4 ml toluene by vortexing for 1 min with a test tube mixer. The toluene layer was then separated with the help of a pipette and the absorbance was read at 520 nm using toluene as blank. The amount of proline in sample was obtained by comparing with standard curve.

Estimation of Ascorbic acid

Ascorbic acid is an important chemical antioxidant which is responsible for the non-enzymatic scavenging of superoxide radical and hydrogen peroxide, its estimation is based on the formation of pink coloured complex due to the reduction of dinitrophenylhydrazine by ascorbic acid to phenyl hydrazene in acidic medium. It is estimated by the method given by (Mukherjee and Choudhary 1983).

Estimation of flavonoids

The flavonoids were determined according to the method of (Mirecki and Teramura 1984). The fronds (0.2gm) were weighed and extracted in acidified methanol: HCl (99:1) the homogenate was incubated at 4^0C for 24 hrs. The homogenate was centrifuged for 10 minutes and absorbance of extract was measured at 530 nm.

Estimation of Superoxide dismutase (E.C. 1.15.1.1)

Suproxide dismutase (SOD) activity was assayed according to method of (Giannopolitis and

Ries 1977). SOD catalyze the dismulation of suproxide radical (O_2) to hydrogen .0.2 gm of *Azolla* was weighed and crushed in 100 mm phosphate buffer. The homogenate was centrifuged for 15 minutes at 800 rpm. The supernant was used as the enzyme source. The reaction mixture (3 ml) contained 63rm P-nitroblue, tetrozolium chloride, 0.05 m Na_2 CO_3 (Ph10.2); 13 mm L-methlonine; 1.3 µm riboflavin and 0.1 ml of crude enzyme mixture. The reaction was carried out at 25^0C under fluorescent lamp. The rate of reaction was measured by the difference in increase in absorbance at 560 nm in the presence or absence of enzyme. The unit of suproxide dismutase activity was defined as the amount of enzyme which caused at 50% inhibition of the reaction observed in absence of enzyme. For the blank the reaction was run in dark.

Estimation of Peroxidase activity (E.C 1.11.1.7)

Peroxidiase activity (POD) was assayed by the method of different (Gahagen ,*et al.,* 1976). 0.2 gm treated and untreated fronds were weight and crushed in 2 ml of 100 mm phosphate buffer. The homogenate was centrifuged at 8000 rpm for 15 minutes. The supernant contained the enzyme extract. The reaction mixture (3 ml) was made up of 1 ml 25 mM H_2O_2, 1 ml, 100 mM pyrogallol prepared in distilled water and 1 ml enzyme extract. After mixing with the reaction mixture change in optical density was recorded at 430 nm for 2-3 minute.

Estimation of Catalase activity (E.C 1.11.1.6)

Catalase (CAT)activity was determined polarographically by the method of (Egashira *et al.,* 1989) *Azolla* fronds were weighed and crushed in 50 mM phosphate buffer and centrifuged at 8000 rpm for 10 minutes. In each sample catalase activity was determined by following O_2 evolution for 1 min after the addition of 1 ml phosphate buffer 50 mM containing 50mM H_2 O_2. To this 1 ml extract was added then absorbance was read at 240 nm for 1 – 2 minutes.

Statistical analysis

All the data obtained of *Azolla microphylla* in terms of growth, free radicals, antioxidant enzymes and metabolites in response to different levels of endosulfan and Monocrotophos were statistically analysed for their significance. An analysis of variance (ANOVA) was performed using SPSS 10 program. The significance was tested at 0.05 (5%) level. Values presented in the text indicate mean values± of five replicates.

Result and discussion

An attempt was made in this part to study the effect of various concentrations of endosulfan and monocrotophos on Az0lla Microphylla. Final results are represented in the histogramic figures. Insecticides exposure can lead to various physiological and biochemical changes within plant cells causing numerous changes in the cell structure and function. The growth (dry weight) of *Azolla microphylla* was drastically inhibited at 400 ppm. But the highest reduction of growth was seen in case of endosulfan at 400 ppm in comparison to monocrotophos. at 800 ppm after 6 days of inoculation. The data on dry weight is graphically depicted in fig.1. Endosulfan and monocrotophos treated plants shows reduction in dry weight on increasing concentration as compare to control. Dry weight was reduced by 7%, 13% and 25% at 25ppm, 50ppm and 100ppm in case of endosulfan and by 6%,

10% and 20% in case of monocrotophos at same concentration. Further there was gradual decrease in dry weight as concentration of pesticide increases. In this study also endosulfan has more deterimental effect than monocrotophos.. Reduction in fresh weight and dry weight was clear after six days of incubation at different concentration in ppm of endosulfan and monocrotophos. Kalita (1997), has demonstrated that high concentration of melathion inhibit the growth of *Azolla pinnata*. and recently by (Waseem Raja *et al* 2012). Has shown the reduction of growth by monocrotophos toxicity. The reduction in dry weight and fresh weight by endosulfan and monocrotophos might be due to chemical which effects the tissue binding process in *Azolla* at higher concentrations. This may also be caused by the disturbance with Hill reaction and electron transport system in photosynthesis as has been observed in spinach due to application of an insecticide methyl parathion (Moreland and Novitzky, 1984).

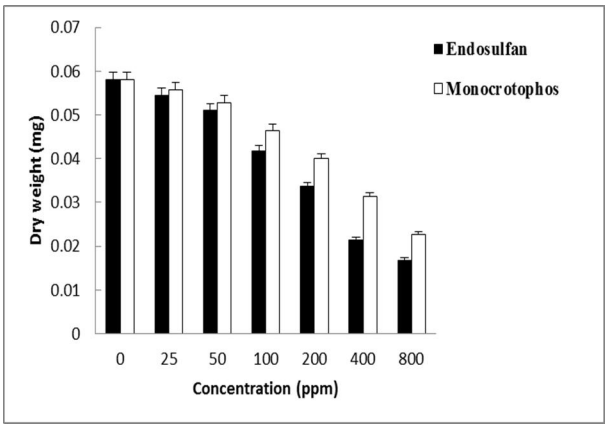

Fig.1: Effect of Endosulfan and Monocrotophos toxicity on Dry Weight of *Azolla microphylla*. Data are means ± standard error of two independent experiments and all the values are significant at P<0.05.

The result of superoxide radicle analysis are graphically depicted in the fig.2.The cellular level of superoxide was analyzed in *Azolla microphylla* treated with endosulfan and monocrotophos. The O_2^- level increases by 6%, 15% and 24% at 25ppm, 50ppm and 100ppm and by 2%, 8%, and 13% at same concentrations in case of endosulfan and monocrotophos respectively. Further there was a gradual increase in O_2^- as concentration increase. A significantly higher levels of accumulation was noticed in endosulfan treated plants as it increase O_2^- level by 90% and 61% at 800ppm in endosulfan and monocrotophos respectively. In this study increased free radical generation was found in *Azolla microphylla* under endosulfan and monocrotophos stress as indicating in the malonedialdehyde production which is similar to the effect of pesticide and heavy metal stress in higher plants. (Alia and Pardha Saradhi, 1991., Somashekaraiah *et al*., 1992. Mahalingam and Fedoroff, 2003., Jaleel, *et al*., 2008).

Malondialdehyde (MDA) accumulation is considered as an important parameters to measure the rate of lipid peroxidation. The observed data of the present investigation are graphically depicted in fig.3, a significant increase in MDA level was observed in both endosulfan and monocrotophos treated plants as compare to control.The MDA content of endosulfan treated plant increased by 44%, 73% and 105% at 25ppm, 50ppm, 100ppm however in monocrotophos treated plants, the increase in MDA content increase by 14%, 45% and 88% at same concentration. Further there was a gradual increase in MDA concentration as the concentration of pesticide increase. The study reveals that endosulfan exert more stress on *Azolla microphylla* and increase MDA content more as compare to monocrotophos. During the stress conditions, the polyunsaturated fatty acids (PUSFAs) of the membrane were peroxidised due to ETS dependent formation of reactive oxygen species and produced MDA (Boo and Jung, 1999). (Fig.3)shows that MDA content was highest in highest doses of pesticides indicating a higher degree of lipid peroxidation under pesticide stress.

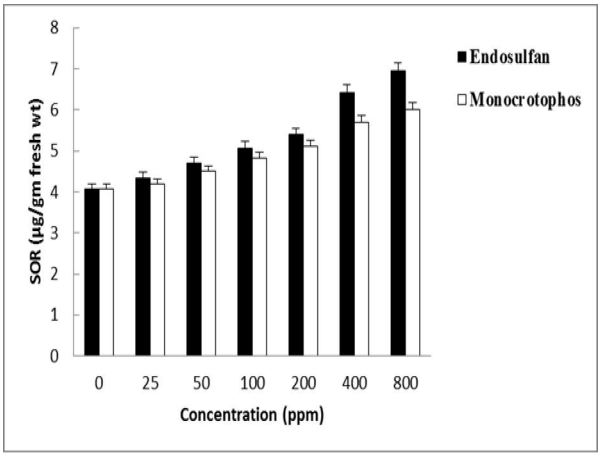

Fig.2: Effect of Endosulfan and Monocrotophos toxicity on Superoxide Radicle content of *Azolla microphylla*. Data are means ± standard error of two independent experiments and all the values are significant at P<0.05.

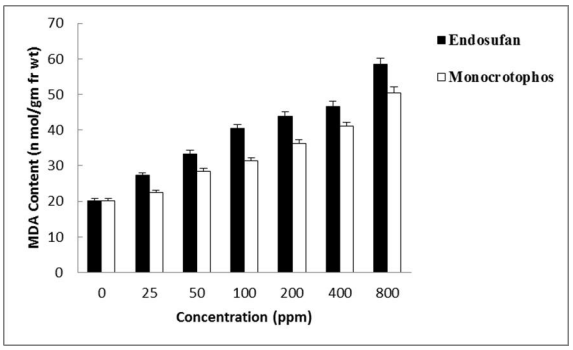

Fig.3: Effect of Endosulfan and Monocrotophos toxicity on Lipid peroxidation of *Azolla microphylla*. Data are means ± standard error of two independent experiments and all the values are significant at P<0.05.

Membrane stability is the widely used criterion to assess the damage due to pesticide induced stress. The percentage of electrolyte leakage is graphically depicted fig.4. Electrolyte leakage was found to increase significantly with increasing concentration of endosulfan and monocrotophos maximum leakage was observed at 800ppm. However, the percentage of electrolyte leakage was higher in endosulfan treated plants (1 to 4 folds) as compared to monocrotophos (1 to 3 folds). Thus enhanced lipid peroxidation lead to increased. Electrolyte leakage due to cell membrane damage (Rai, *et al*., 1998). It was presumed that the extinct of membrane damage was so severe in such species where electrolyte leakage was highest (in percentage) under stress condition. Low level of electrolyte leakage and MDA content at low doses of pesticides (in ppm) may be one of the reasons for the observed tolerance of *Azolla microphylla*.

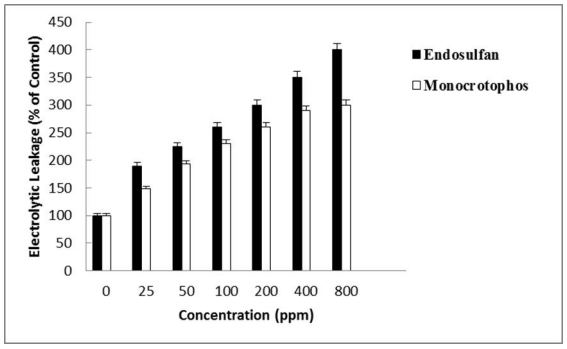

Fig.4: Effect of endosulfan and monocrotophos toxicity on Electrolytic leakage (Electrolyte leakage in untreated control was 12%). Data are means ± S.E. of two independent experiments and all values are significant at P<0.05.

Proline is an important non-enzymatic antioxidant compound and accumulation of proline is considered as a physiological response due to many environmental stresses. Proline was analyzed at the 6^{th} days in plant treated with different concentration of endosulfan and monocrotophos and experimental findings are graphically arranged in fig.5. As the concentration of endosulfan and monocrotohpos increase, there is a significant and progressive increase in proline accumulation as compare to control. The cellular proline content of endosulfan treated plants was increased upto 309% as compared to an increase of 247% in monocrotophos treated plants at 800 ppm. The present study help to percieve that the higher concentration of endosulfan is exerting more stress on *Azolla microphylla* and as a result the proline accumulation is increased more in endosulfan as compare to monocrotophos treated plants. The aromatic amino acid proline act as a free radical scavenger to overcome the oxidative stress by preventing the membrane damage and protein denaturation (Reddy, *et al*., 2004). Hyper accumulation of proline in plants can be co-related with detoxification against any stress induced oxidative stress (Foyer, *et al*.,1994).

The data on ascorbic acid content is graphically depicted in Fig.6. Ascorbic acid content increases as the concentration of pesticides increases. The ascorbic acid content increase by 10%, 90%, 30% and 42% in case of endosulfan at 25ppm, 50ppm, 100ppm and 200ppm and by 5%, 12%, 23% and 31% in case mococrotophas at same concentration. Beyond 200ppm there was a gradual decrease in both the pesticide. This study reveals that ascorbic acid increases up to certain limit and then decreases. A significant increase in ascorbic acid (Vitamin C) content in fronds of *Azolla microphylla* was observed in response to pesticide stress. Ascorbic acid an important antioxidant, which react not only with H_2O_2but also with O_2^-, OH^- and lipid hydroperoxidases (Reddy *et al*. 2004). Triazole-treatment increased the ascorbic acid content in tomato seedlings (Senaratna, *et al* .,1988).

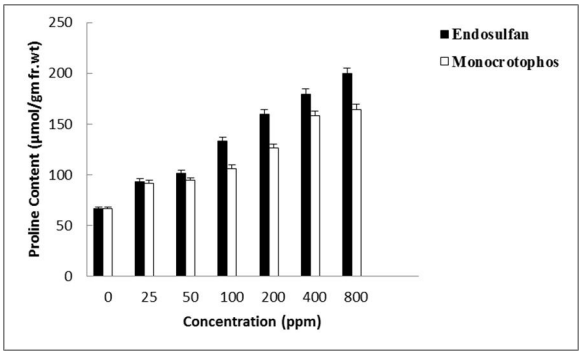

Fig.5: Effect of Endosulfan and Monocrotophos toxicity on Proline content of *Azolla microphylla*. Data are means ± standard error of two independent experiments and all the values are significant at P<0.05.

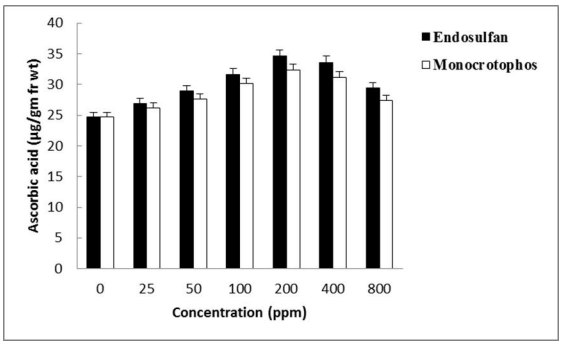

Fig.6: Effect of Endosulfan and Monocrotophos toxicity on Ascorbic acid content of *Azolla microphylla*. Data are means ± standard error of two independent experiments and all the values are significant at P<0.05.

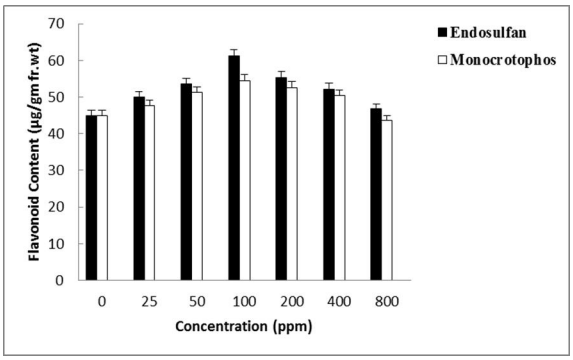

Fig.7: Effect of Endosulfan and Monocrotophos toxicity on Flavonoid Content of *Azolla microphylla*. Data are means ± standard error of two independent experiments and all the values are significant at P<0.05.

Increase or decrease in the amount of flavonoids may be favourable to an organisms in an environment like pesticide exposure. Flavonoid content was analysed at the 6th day in plants treated with different concentration of endosulfan and monocrotophos and the observation are arranged graphically in fig.7.From the observed data it is evident that as the concentration of endosulfan and monocrotophos increase there is gradual increase in flavonoid content by 10%, 21% and 35% at 25ppm, 50ppm and 100ppm and by 6%, 17% and 26% at same concentration. Further there was gradual decrease in flavonoid content as the concentration of pesticides increases so flavonoid content increases up to certain limit of concentration. Since these also act as antioxidant metabolite. Bores, *et al.,* (1990) reported effective free radical capacity of flavonoids.. Boling *et al*. (2001) observed increased tolerance to high light stress in pea and bean plants due to increase in flavonoid content. Brawn (1991) reported that the epidermal layer of oat seedling accumulated large amount of UV absorving pigment flavonoid and anthocyanin during early development which gave a better protection against UV-B.

The conversion of superoxide anion to H_2O_2 facilitated by the enzyme superoxide dismutase. In the current investigation the data observed for SOD is graphically depicted in fig.8. As the endosulfan and monocrotophos stress increases the SOD concentration also increase progressively by 8%, 88%, 31% and 45% at 25ppm, 50ppm, 100ppm and 200ppm and by 5%, 13%, 25% and 33% at same concentration respectively. But beyond 200ppm there was a gradual decrease in SOD concentration by both the pesticide as compared respectively as compared to 200ppm. This study reveals that effect on SOD concentration is in dose dependent manner. Both the pesticides were found to enhance the activity of superoxide dismutase which catalises the disproportunate of O_2^- to O_2 and H_2O_2 and is considered often to be the first line of defence against reactive oxygen species Superoxide dismutase activity is also considered to be an indirect measure to O_2^- production and hence the extent of oxidative damage. Superoxide dismutase is prominent

biomarker of defense against oxidative stress. The increase superoxide dismutase activity after pesticide treatment can be explained in the light of the report of Rabinowich and Fridovich (1985) and Li *et al*. (2005).

The result of this enzymes analyzes are graphically depicted in fig.9. The peroxidase activity increases progressively by 15%, 30% and 55% at 25ppm, 50ppm and 100ppm and by 10%, 23% and 42% in case of monocrotophos at same concentration. Beyond 100ppm there was a gradual decrease in peroxidase activity as concentration increases so effect on POD content is in dose dependent manner. The peroxidase activity decreases by 5% in compression to control in case of endosulfan. So effect of endosulfan was more determental than mnocrotophos. The treatment of endosulfan and monocrotophos might have resulted into the formation of (ROS) reactive oxygen species. Our result is in agreement with the results of Halliwell and Gutterdg (1994), Die *et al*. (1997) and Die *et al.(* 2006) as they have worked on different stresses.

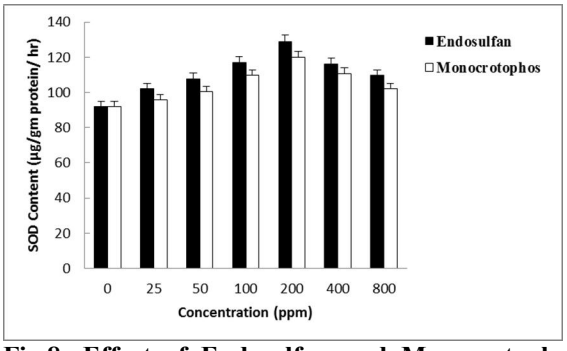

Fig.8: Effect of Endosulfan and Monocrotophos toxicity on Superoxide Dismutase content of *Azolla microphylla*. Data are means ± standard error of two independent experiments and all the values are significant at P<0.05.

The data on catalase activity is graphically depicted in fig.10. Catalase activity increase due to increase in the concentration of endosulfan and monocrotophos but the catalase increase up to certain concentration, then it decreases. The catalase activity increases by 3%, 10% and 17% at 25ppm, 50ppm and 100ppm in endosulfan and by 0%, 7% and 12% at same concentration in case of monocrotophos. In both the cases catalase decrease beyond 100ppm as the concentration of endosulfan and monocrotophos increases. Reduction was maximum at 800ppm as catalase activity reduced up to 5% and 10% respectively in comparison to control. A significant rise of catalase activity of *Azolla microphylla* following pesticide treatment suggest that experimental organism synthesize a good amount of catalase to scavenge the excess of O_2^- and H_2O_2. The catalase activity under pesticide treatment in our findings was also supported by Zeeshan (2002) and Prasad *et al*. (2005).

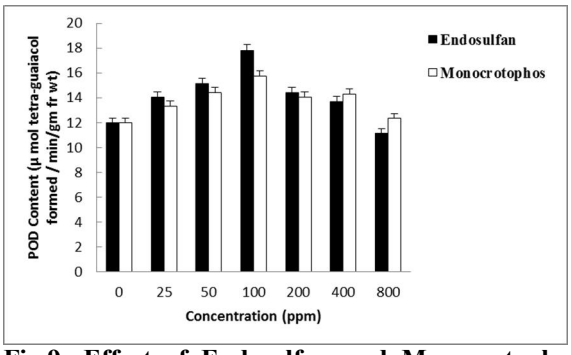

Fig.9: Effect of Endosulfan and Monocrotophos toxicity on Peroxidase content of *Azolla microphylla*. Data are means ± standard error of two independent experiments and all the values are significant at P<0.05.

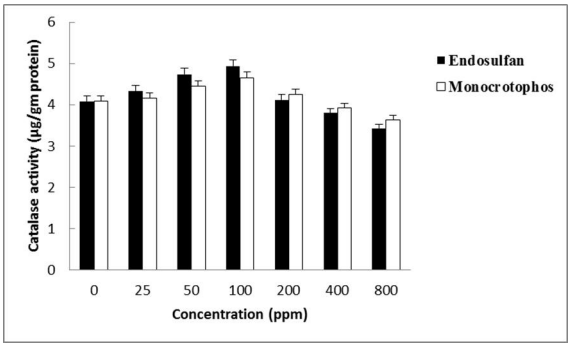

Fig.10: Effect of Endosulfan and Monocrotophos toxicity on Catalase activity of *Azolla microphylla*. Data are means ± standard error of two independent experiments and all the values are significant at P<0.05.

Conclusion

In the present study the deleterious effect of endosulfan (chlorinated insecticide) was found to be more than monocrotophos (organophosphorus insecticide) with respect to overall growth of *Azolla microphylla*. The *Azolla microphylla* although shows reduction in growth it is quite good in resisting stress caused by endosulfan and monocrotophos. The reactive oxygen species and activity of antioxidants have enhanced the resistance capacity of *Azolla microphylla* to insecticides (endosulfan and monocrotophos). The superoxide dismutase, catalase and peroxidase activities are stimulated by insecticide treatment so that these can be used as sensitive biomarker for early warning of insecticide pollution. The protective action of proline was enhanced at all treatments The environmental hazards

of pesticides would be intensified far greater than expected in the soils already contaminated with pesticide which in turn affect the productivity of *Azolla* plants under field conditions. Under the present study the role of antioxidants in increasing the resistance of *Azolla microphylla* to endosulfan and monocrotophos is evident, however more study to conform our findings at molecular level is suggested.

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Causes Of Dropouts In Education Zone Khag District Budgam

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Abstract: The present study has been carried on causes of dropouts in education zone Khag District Budgam. (1) Most of the schools are not accessible to people. The national policy on education and right to education had guaranteed education for all which seems far reality in this Zone. (2) Most of the schools have very less teacher student ratio, which has a direct impact on the performance of these schools. Moreover, the extracurricular activities are altogether lacking in these schools. (3) The study showed the total dropout of students from year 2010 to 2011 in two classes i.e. 6th and 7th as 61. (4) There has been very less enrollment of girls in the Schools and among girls the dropout has been high in lower classes while as the dropout among boys is higher in higher classes. (5) The Middle School Hamchipora has the highest percentage of dropouts from the class 7th to 8th in year 2010–2011. (6) Most of the dropouts were found engaged with the traditional occupation of cattle grazing in high altitude areas as cattle grazing are their traditional and one of the major livelihood options. (7) Some of the areas which are at high altitude, in most of the other areas dropouts were found to be engaged with agricultural practices. (8) It was found that many dropouts were "job card holders" under MGNREGA.
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Key words: Dropout, Education Zone, Budgam, enrolment and middle schools.

Introduction

Education is the main plank of progress. Societies and nations can progress only by the promotion and progress of education sector. The education system in ancient times was not an organized system but was based on what we call it as Gurukul system where the whole educational system was controlled, organized and operated by the individual teacher himself. Besides the education system was primarily religious/ ethical in character. The education in India was restricted to the upper castes which according to the Indian Varna system were declared as Dvijaor twice born with the advancement of society the education came out of Gurukuls and was institutionalized first by the Buddhist's Vihara/Monestry system and then in the medieval period by the Maktaba, Madrasa and Khanka system of Muslims. The dawn of modernity revolutionized the education sector. The advancement in science and technology forced the nation states to prepare for the universalization of education. Even though western education was introduced in Indian subcontinent by the European colonial masters but it was not universalized even after pressures from nationalists and the promises from British government because of the colonial character of their governments.

After the overthrow of colonial government the independent India began to provide serious attention towards the progress of education. The policy of downward filtration, an idea forwarded by Lord Macaulay in his famous minute in 1835 was abandoned and serious efforts were made for the universalization of education. To achieve this target of free and compulsory education for all in the age group of 6-14 years many steps were taken. A considerable progress was made in terms of increase in types of educational institutions, volume of enrolment and diversification and sophistication of educational programs. Various schemes were launched by the State and Centre governments to provide education at the door steps of children. The growing political and military importance of India also forced her to achieve the badly needed target of 100% literacy rate and it was for the same purpose that ministry of Human Resource Development became very active in providing much kind of facilities to attract children towards the school. In addition to free education, many additional measures were taken to attract the children towards the educational institutions. Free distribution of books, uniforms and mid-day meals were in one or the other way the steps to attract the children towards educational institutions. In spite of the above mentioned measures taken at governmental and non-governmental level, India is not yet in a position to achieve its goal of 100% literacy. One third (1/3) of the population is in the grip of illiteracy. In spite of the enrolment drives launched by the schools under different schemes, nothing tangible seems to have been done as they become the victim of wastage or stagnation before they could get the elementary education. A global calculation of wastage and stagnation indicates that out of 100 children who are

admitted in grade-i about 45 reach grade-iv and 37 reach grade-v. Relatively large number of girls dropout and more than two-third dropout before reaching grade-III and is significantly greater in rural groups than in urban groups.

Dropout percentage is of a considerable extent in all the developing countries and fairly small in developed countries. However the general trend over the past few years in the developing countries is that of a gradual decline. The highest wastage on account of dropout takes place in the region of Latin America followed by the region of south Asia, Africa and Asia. The rates of developing countries in general and south Asia in particular are influenced by high wastage in

India. Furthermore the grade wise occur in grade-I. In developed countries, the per capita income is much higher in comparison to developing countries where wastage is minimal. During the period (1960-1975) primary school enrolment in developed countries almost doubled. The main factor for this trend lies in the fact that by 1960the majority of the developed countries had almost reached a state of completion of universalization of primary education, while the majority of developing countries at this stage had a low enrolment base and moreover, this was accompanied by significant increase in child population in developing countries. The government of India is viewing with concern the fact that even after half a century, the constitutional directive contained in the article 45 which enjoins "the state shall provide free and compulsory education for all children until they complete the age of 14 years has not been achieved. No doubt many committees and commissions have been constituted to look in to the dropout problem. Schools have started to launch enrolment drive every year but nothing tangible seems to have been done with respect to those children who had already been admitted in schools to retain them till they get at least elementary education.

The Problem in the history of Indian education, it was the Hartog Committee (1929) which first drew pointed attention to the widespread prevalence in the system of elementary education, of wastage, stagnation and lapse in to illiteracy. Using the latest statistics then available, it pointed out that out of 533,878 pupils who were studying in class-I in 1922-23, 161,228 reached class II in 1923-24, 86,846 reached class III in 1924-25, 55,794 in class IV in 1925-26 and only 33,858 or 18 out of 100 children who had entered the school five years before reached class Vin 1926-27. This reduction the committee pointed out was mainly due to two causes, wastage and stagnation. The national education commission 1964-66 estimated that as against 100 children enrolled in class-I there were only 20 in class IV in 1911-12, in 1946-47 this increased to 39 but dropped to 37 in 1964-66. The commission thus concluded that the wastage is very high at the lower primary stage about 50% for boys and 62% for girls. While discussing the dropout problem at elementary stage, the national policy on education 1986 pointed out approximately 95% of children in 6-11 years of age group and 50% 11-14 of age are enrolled in school, the corresponding figure for girls being 77% and 36% respectively. As against to this, still nearly 60% children dropout between class I-V and 75% between class i-viii. The modified National Policy on Education 1992 has also shown its concern on the appalling dimensions of educational wastage the incidence being 50% for boys and 70 % for girls at primary level Because of the huge dropout percentage, the gravity of the problem increased and it attracted the attention of different scholars and researchers in India and abroad. Some scholars and researchers like Kline (1993) reported a high percentage of about 39.6% of dropout. Thorndike (1908) found 81.7% had dropped before reaching IX grade.

Ayres (1909) reported on the basis of his findings that only 10% of students under investigation could reach the high school level. Bowners (1920) indicated that in 20 cities during the period of 1907-1918, 40 % of the number of dropouts were found existing before the VIII grade. Mcneely (193 8) studied the dropout problem in 25 institutions during the period 1931-35 and obtained the percentage as high as 62%. Wolyle's (1954) studied 41 institutions during the period 1948-52 revealed the rate of incidence of dropouts as 52%. The Directorate of Education of the Maharashtra State (1960) discovered that 414 out of every 1000 students had left the school before completing class IV. Sharma and Sapra (1969) indicated that the total dropout rate up to I-VIII standards has been computed as 80%. Chikermane (1972) carried out a study in 13 villages around Gargoti has pointed out that total wastage in primary education is about 68%. Leelavathy (1973) reported the incidence of wastage and stagnation of about 32.4% of the pupils admitted left the school wasting a few years of schooling, 75% of these dropped out from I-VIII standards. Rather (1985) has carried a study on dropout incidence among elementary school children in J&K state (India) and found that girls were having higher dropout incidence than boys. Higher dropout ratio was found in the primary classes than middle classes and estimated average dropout rate ranges from 36% to 69%. Yet in a recent research report financed by national council of educational research and training, New Delhi, Rather (1994) has reported the incidence among Kashmiri boys 60% and 68% in girls at elementary stage. Not satisfied with mere estimates of educational wastage, some researchers ventured to delve deep in to the problem and attempted at locating the causes leading

to dropout behavior. Among them some have studied the factors leading to school like Dresheer (1954) Sharma and Sapra (1969) Desai (1970) Nayal (1983) Rather (1985). While as some researchers confined their researches to the 'family variables' only and tried to explain the causes of drop age emanating from family background. Mention may be made of Sharma and Sapra (1969) Tiwari (1970) Das (1970) Mehta (1974) Nayal (1983) these researchers have tried to trace the origin of these causes from two variables only i.e. school and family background.

But the matter of the fact is that it is not only school variable and the type of the family on whom the responsibility of the children's withdrawal from school can be laid, there are other variables which play the most important role in the development of healthy attitude in the children.1 The parental education, teachers and parents attitude towards child, presence of competition, social milieu and general awareness about broader virtues and values of education also play and important role. How a child behaves as he behaves and to what extent he is able to maintain relationships with his friends and peers is directly concerned with the pupil.

The dropout problem is becoming serious day by day as the large numbers of children leave the school before completing the elementary education. The dropouts are dangerous not only for themselves in terms of their future developments but also for the society and nation as a whole. Besides they are easily outrun by the exploiters and anti-social elements for their petty interests. On the one hand schools are reformed at government and non-government levels and quality education is made available to the children at the doorsteps but the dropout problem continues which made the fact clear that other variables other than school variables are important which has to be reached out in order to eradicate this evil. The huge educational wastage amounts to a big loss of nation's scarce monetary resources. Pandit in his study (1970) estimated that 2.5 million pupils completed class VIII education in 1963-64 amounting to total expenditure of Rs 181 Crores out of these 59 crores accounted for dropout and 20 Crores went in to financing stagnation. If these early leavers are identified in time and proper measures are taken, then the Nation's monetary resources could be saved from going waste.

Again these dropouts are not only a drain on the national exchequer but they put a big threat to the wastage of human resources. Our country like other developing countries is in need of developing potential and talent for its progress. It has been observed in research that majority of pupil who dropout possess high creativity. In the universities of California and Barkley researchers have found that a good number of high creative in music, in dramatics etc. have all been dropouts (Raina1977). Dropouts are easily outrun by others in the job market not to talk of their contribution to the society. They become burden not only to themselves but also to the society at large. It has been observed that dropouts are lacking warm social relations thereby they develop several kinds of socio-psychological pathologies and deviate to different undesirable directions like truancy, absenteeism and dropping out of school, Gronlund (1959), Moreno (1953), Jennings (1950), Kerrester, Bonney (1943) and Rather (1985).

As the problem intensified day by day and took the shape of an epidemic the result was the rush of scholars towards the issue. But as mentioned above they either simply concentrated on the statistical data and came out with a heap of material showing only the intensity of problem or searched out some common causes leading towards dropouts. They either attempted to trace the origin of the cause of dropouts from family or school background. So the other important variables which play an important role in the overall behavior of the child were ignored. The personal and social adjustments of the child were ignored and were not given the attention which it deserves. It is the social and personal variables which play an important role in the healthy attitude of the child and thus affects his/her educational behavior. It may be pointed out here next to family adjustments social adjustment occupies the most important place in the life of the child. The personality of and grows if he/she can function satisfactorily in social or group situation. Dissatisfaction which grows in number of ways resulted in unbalanced growth of personality. So in the light of above discussion it seems worthwhile to undertake a study in which the personal and social adjustment of dropouts will be investigated. Thus the incidence of dropouts among the students in relation to their personal and social adjustments is quite relevant topic for research.

Operational Definitions:

Dropouts:

Those students who fail to complete the first eight years of compulsory education.

Elementary Education:

The formal education that is being imparted to the children up to the class 8th is called formal education.

Objectives:

The main objectives of the study are:

1. To analyze the male and female dropouts at elementary level in zone Khag of District Budgam.

2. To study and analyze the trend of dropouts at elementary level in zone Khag of District Budgam.
3. To study the causes of dropouts at elementary level in zone Khag of District Budgam.

Hypotheses

For the investigation of the present study, following hypothesis has been testified:

1. There is a significant difference between male and female children at the elementary level in zone Khage of District Budgam.
2. There is no significant difference between agrarian economy and causes of dropout at elementary level in zone Khage of District Budgam.
3. Monetary base and causes of dropouts are highly correlated with each other.

Methodology adopted

For the present investigation the investigator first of all got the permission from the Zonal Education Officer (ZEO) of the zone Khag of District Budgam and then the respective heads of the different institutions of the same zone. The investigator makes a list of the 36 Middle Schools of the said zone and then randomly selected 11 schools among them. Then the researcher visited the selected schools and after discussing in details the main objectives of the program with the teachers of these schools, the researcher collected the necessary information regarding the dropouts in 2010 and 2011 in these Middle Schools (MS).

Sample

The sample chosen by investigator included the two classes viz. class VI and VII for 2010 and classes VII and VIII for 2011. The sampling type was random probability. The home address of the dropouts was collected from the school records in order to facilitate the search for the living samples of the study. Few case studies were collected from the dropouts, wherein the observation and informal interview technique was used.

Tools and Techniques used

1. Informal interviews
2. Observation.
3. Collection of School enrolment data.

The findings of the present study are based on the primary sources; the data was collected from different schools of educational zone Khag, to access the enrolment of students in various classes and dropouts thereof. The data collection involved the random probability sampling technique. Hence, eleven schools of the zone were selected for reference. The significance of the data collection was to identify the nature of dropouts and their causes specifically in these schools and particularly in entire Zone Khag of district Budgam.

Khag zone is educationally backward due to its topographic nature. Most of the schools are not present in accessible areas, which reflect the communication gap between people and these schools. Moreover, some schools are situated on high altitudes with lack of proper infrastructural facilities. These schools have very less student-teacher ratio which was observed during the visit to these schools. The ratio has direct ramifications on the academic climate in these schools as adjoining areas are not sensitized enough to educate their children. It reflects the meager role of the teachers outside the teaching practice. The recreation is envisaged as one of the basic rights of children as recreation in schools is particularly focused by the CRC 1989. However, the present study found the absence of recreation in these schools, which has also direct impact on students particularly retention of children in these schools.

Enrollment of Students

In order to identify the no of dropouts in sample, the data was collected in terms to identify them in two years. The table 1.1 depicts the total no of students enrolled in 6^{th} and 7^{th} class during the year 2010. However, to identify the no of students leaving the studies (dropouts) from 6^{th} to 7^{th} was assessed by collecting the data of students enrolled in 7^{th} and 8^{th} classes in 2011 respectively. The total no of students enrolled in 6^{th} and 7^{th} in the selected eleven schools in the year 2010 was 316 and 322 respectively. Whereas the total no of students enrolled in the 7^{th} and 8^{th} in the selected eleven schools in the year 2011 was 285 and 282 respectively.

Table 1.1 shows the total enrolled students in the class 6th and 7th in the different selected schools of the zone Khag of district Budgam in the year 2010.

S. No.	Name of the School	Class 6th	Class 7th
1.	MS Drang	20	25
2.	MsShuplian	29	28
3.	MS Shunglipora	35	30
4.	MS Hamchipora	I8	28
5.	MS Malpora	15	20
6.	MS Lachmanpora	20	22
7.	MS Boys Khag	45	40
8.	MS Sitaharan	35	33
9.	MS Charihara	27	31
10.	MS Sugin	40	27
11.	MS Khangripora	32	38
Total		**316**	**322**

Table 1.2 Shows the total enrolled students in the year 2011 in the class 7th and 8th in the different selected schools of the zone Khag of the district Budgam.

S. No.	Name of the School	Class 7th	Class 8th
1.	MS Drang	18	23
2.	MsShuplian	27	27
3.	MS Shunglipora	34	26
4.	MS Hamchipora	16	24
5.	MS Malpora	14	19
6.	MS Lachmanpora	17	20
7.	MS Boys Khag	40	37
8.	MS Sitaharan	28	30
9.	MS Charihara	23	17
10.	MS Sugin	38	24
11.	MS Khangripora	30	35
Total		**285**	**282**

No. and Percentage of Dropouts

As inferred from the table 1.3 and 1.4 the total no of dropouts from class 6th to 7th in year 2010 -2011 has been 31 whereas in class 7th to 8th in year 2010-2011 is 30. The table 1.3 has tried to reflect on the different percentages of dropouts from year 2010-2011 in class 6th to 7th. As inferred it was found that MS Sitaharan has the highest percentage (20%) of dropouts while as MS Shonglipora has the lowest percentage (2.86%) of dropouts. Further analyzing the data it was found that six middle schools are having the dropout percentage more than 10% which reflects the gravity of the problem. Since the highest percentage of dropouts was found in those schools where the people are marginalized as accustomed with traditional livelihood options. The rate of child labour has been significant in terms of their traditional livelihood patterns. The easily available livelihood makes it more convenient for such children to leave studies and join the traditional occupation. One of the traditional occupations as was identified and observed was cattle grazing and timber smuggling.

Table 1.3 Shows the total number and percentage of dropouts from class 6th to 7th in years 2010 to 2011 respectively.

Name of the School	Total roll in Class 6th in the year 2010	Total roll in Class7th in the year 2011	No. of dropouts	Percentage of dropouts
MS Drang	20	18	02	10%
MS Shuplian	29	27	02	6.90%
MS Shunglipora	35	34	01	2.86%
MS Hamchipora	I8	16	02	11.12%
MS Malpora	15	14	01	6.66%
MS Lachmanpora	20	17	03	15%
MS Boys Khag	45	40	05	11.12%
MS Sitaharan	35	28	07	20%
MS Charihara	27	23	04	14.81%
MS Sugin	40	38	02	5%
MS Khangripora	32	30	02	6.25%
Total	316	294	31	--

The analysis of the data reflects that MS Hamchipora has the highest percentage of dropouts from the class 7th to 8th in year 2010 – 2011. Moreover, MS Hamchipora has also recorded the high percentage in other classes as illustrated in the table 1.3. The middle school Shuplian has the lowest percentage of dropout from the class 7th to 8th in between years 2010 to 2011. Moreover, the data reflects very less percentage of dropouts in higher classes as compared to lower classes, which can be analyzed by the fact that only 4 schools have the dropout percentage more than 10% as compared to 6 schools as depicted in table 1.3. Besides, the number of dropouts in higher classes is also low as compared to lower classes.

Table 1.4 shows the total number and percentage of dropouts from class 7th to 8th in years 2010 to 2011 respectively.

S.No.	Name of the School	Total roll in Class 7th in the year 2010	Total roll in Class 8th in the year 2011	No of dropouts	Percentage of dropouts.
1.	MS Drang	25	23	02	8%
2.	MsShuplian	28	27	01	3.57%
3.	MS Shunglipora	30	26	04	13.34%
4.	MS Hamchipora	28	24	04	14.28%
5.	MS Malpora	20	19	01	5%
6.	MS Lachmanpora	22	20	02	9.09%
7.	MS Boys Khag	40	37	03	7.5%
8.	MS Sitaharan	33	30	03	9.09%
9.	MS Charihara	31	27	04	12.90%
10.	MS Sugi	27	24	03	11.12%
11	MS Khangripora	38	35	03	7.90%
Total		322	282	30	--

Gender Analysis of Dropouts:

On analyzing the data in terms of gender, it was found that dropout percentage was more in boys than in girls. The ratio of dropouts among boys and girls in the classes 6th to 7th is near about 3:1 (table 1.5) whereas in the classes 7th to 8th it is 3:2 (table 1.6) which reflects the nature of the problem among boys. The primary obligation of boys is to involve themselves in to livelihood, hence considered as one of the important areas for this increasing trend. However, the other factor that shows the less percentage of girls as dropouts are due to the fact that overall no of enrolled girls is low in these schools.

Table 1.5 shows the number of dropouts among boys and girls from class 6th to 7th in years 2010 to 2011 respectively.

S. No.	Name of the School	Dropout Boys	Dropout Girls
1.	MS Drang	02	--
2.	MsShuplian	01	01
3.	MS Shunglipora	01	--
4.	MS Hamchipora	01	01
5.	MS Malpora	01	---
6.	MS Lachmanpora	02	01
7.	MS Boys Khag	05	--
8.	MS Sitaharan	04	03
9.	MS Charihara	03	01
10.	MS Sugin	02	--
11.	MS Khangripora	01	01
Total		**23**	**08**

Table 1.6 shows the number of dropouts among boys and girls from class 7th to 8th in years 2010 to 2011 respectively.

S. No.	Name of the School	Dropout Boys	Dropout Girls
1.	MS Drang	01	01
2.	MsShuplian	01	--
3.	MS Shunglipora	03	01
4.	MS Hamchipora	02	02
5.	MS Malpora	01	---
6.	MS Lachmanpora	01	01
7.	MS Boys Khag	02	01
8.	MS Sitaharan	02	01
9.	MS Charihara	02	02
10.	MS Sugin	02	01
11.	MS Khangripora	01	02
Total		**18**	**12**

Enrollment in terms of Gender

The other analysis was done in terms to identify the total number of students enrolled in the 6th class in these Schools. It was found that 316 students were studying in class 6th in the year 2010. The number of boys has been significantly higher as compared to girls, while the total number of boys enrolled in these schools was 251 the total number of girls in these schools was only 65. The total enrollment ratio between boys and girl has been around 4:1 respectively (table 1.7). The number of boys has been also higher as compared to girls in class 7th in the year 2010, while the total number of boys enrolled in these schools was 255 the total number of girls in these schools was only 67. The total enrollment ratio between boys and girl has also been around 4:1 respectively (table 1.8). It clearly reflects the poor Scenario of girl child education in the Khag Zone. The poor status is the result of the dropout of girls in early Classes as compared to boys. Most of the girls are forced to leave their studies in early due to the fact communities are more conservative in nature. The tradition and customs have compelled such families either not to enroll their daughters or force

them for early exit from schools. Meanwhile, the girls which are enrolled in these schools are belonging to service class and educated families. It will not be an exaggeration to mention that most of the communities in Khag zone have practice of early marriages especially among girls. It serves as one of the major reasons for the early exit of girls from school as they are forced for early marriages. Moreover, it was observed that schools have not played any significant role in sensitizing the adjoining communities so that, the people of these communities would have realized importance of education. It becomes necessary to inculcate the development of children through education in contemporary world.

Table1.7: Gender wise enrollment in CLASS 6th in the year 2010

S. No.	Name of the School	Total roll in Class 6th in the year 2010	No. of Boys	No. of Girls
1.	MS Drang	20	13	07
2.	MsShuplian	29	20	09
3.	MS Shunglipora	35	28	07
4.	MS Hamchipora	I8	13	05
5.	MS Malpora	15	12	03
6.	MS Lachmanpora	20	15	05
7.	MS Boys Khag	45	45	--
8.	MS Sitaharan	35	27	08
9.	MS Charihara	27	23	04
10.	MS Sugin	40	30	10
11.	MS Khangripora	32	25	07
Total		**316**	**251**	**65**

Table1.8 Gender wise enrollment in Class 7th in the year 2010

S. No.	Name of the School	Total roll in Class 7th in the year 2010	No. of Boys	No. of Girls
1.	MS Drang	25	20	05
2.	MsShuplian	28	22	06
3.	MS Shunglipora	30	23	07
4.	MS Hamchipora	28	20	08
5.	MS Malpora	20	15	05
6.	MS Lachmanpora	22	15	07
7.	MS Boys Khag	40	40	--
8.	MS Sitaharan	33	25	08
9.	MS Charihara	31	24	07
10.	MS Sugin	27	21	06
11.	MS Khangripora	38	30	08

Major findings of the study

1. The study reveals the Khag zone as educational backward with little enrolment of students. Most of the schools are not accessible to people. The national policy on education and right to education had guaranteed education for all which seems far reality in this Zone.
2. Most of the schools have very less teacher student ratio, which has a direct impact on the performance of these schools. Moreover, the extracurricular activities are altogether lacking in these schools having direct influence on the motivation of children in school.
3. The study showed the total dropout of students from year 2010 to 2011 in two

classes i.e. 6th and 7th as 61. It depicts the overall dropout from each class in a year as around 30 students. Meanwhile, the total dropout percentage for each class in a school is 10.7%. This shows the mean dropout percentage from each class in a given year. It clearly shows the magnitude of dropout in Zone Khag.

4. There has been very less enrollment of girls in the Schools and among girls the dropout has been high in lower classes while as the dropout among boys is higher in higher classes. Much of this problem is owed to the conservative nature of people and their traditional occupational profile.
5. The Middle School Hamchipora has the highest percentage of dropouts from the class 7th to 8th in year 2010 – 2011. Moreover, MS Hamchipora has also recorded the high percentage in other classes as illustrated in the table 1.3. The middle school Shuplian has the lowest percentage of dropout from the class 7th to 8th in between years 2010 to 2011. Further analyzing it was found the Schools in backward areas had highest percentage of dropouts.
6. As observed during the data collection, most of the dropouts were found engaged with the traditional occupation of cattle grazing in high altitude areas as cattle grazing are their traditional and one of the major livelihood options.
7. Except some of the areas which are at high altitude, in most of the other areas dropouts were found to be engaged with agricultural practices. Since, these communities are stagnant due to extreme poverty; their only livelihood is based on the tradition agricultural practices. Hence they confine their children in such activities to manpower their human resource. Moreover, the agricultural sector of this area is traditional and is lacking the modern agricultural techniques, which marks the additional requirement of human resource to which unfortunately the children are involved.
8. The area is also marked with huge number of children without parental care, which has been due to high intensity armed conflict from last two decade. The no. of children without parental care is significant with survival problems. It has forced such children to leave studies and to find out some menial jobs for their survival. There is absence of any governmental support for such children and even if there are some provisions they are not reaching to this vulnerable section.
9. In recent years the government has started various developmental activities, in particular MGNREGA, was started in the concerned district in the year 2009. It was found that many dropouts were "job card holders" under MGNREGA. Meanwhile these dropouts are now being employed in various developmental projects. It is worth to mention that these children being too little to their age for such jobs are still continuing their work in the developmental projects under MGNREGA. Despite having very little age they are being provided with job cards illegally.
10. The conservative nature of parents has also been one of the major areas of concern. Being illiterate or socially backward they continue their trifling role on the development of children, which has the direct ramifications on increasing trend of dropout in the zone.

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Assessment of Environmental Knowledge, Awareness and Practices of College Students in Government Sheikhul Alam Degree College Budgam, J&K

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Abstract: The present study focused on the Assessment of Environmental Knowledge, Awareness and Practices of college students in Government Sheikhul Alam Degree College Budgam, J&K. Television and radio are conservation out of their interests and hobbies in watching television and listening to radio. Other sources in information are newspapers, textbooks and magazines which shows the availability of these reading materials in the school. Teachers do not integrate well environmental issues, concepts and protection and conservation practices in their daily lessons or throughout the teaching-learning process. Likewise, their parents and friends are not those environmentally-oriented citizens to share them the knowledge of protecting and conserving the environment. The students are too much exposed to information technology like internet. In the performance of students in the achievement test only two among 120 students are excellent who got the highest scores, most of them performed poor, and some performed very poor.

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Key Words: Environmental Knowledge, Awareness, Practices, college, Budgam Jammu and Kashmir.

Introduction

The environment continues to experience environmental stresses. Industries, households and other infrastructures are releasing wastes and continuously that threaten the atmosphere as well as agricultural lands, surface ground waters. Supplies coming from natural resources such as forest products that include wildlife, timber, clean water and medicines become limited while petroleum and minerals are hard to find. The demand for water, food, energy, housing, space, transportation and other basic necessities continue to grow as population increases. More environmental problems already occur; lost of biodiversity, ozone layer depletion, pollution in air, water and land, flood, landslide, global warming and climate change. In addition, interest of people often times come in conflict over the use of resources resulting to crime. These environmental problems together with the social, political, economical and technological changes that are going on the country have created greater demands and challenges to the educational sector. The curriculum at college level in a particular situation has been expected to reflect these changes. The curriculum needs to provide the necessary knowledge, skills and values that will help the learners not only to cope with and adapt to these changes but also to help solve these environmental problems. One of the strategies used to respond to these problems is incorporation or integration of environmental concepts into the curricula and other educational programs. The strategy of promoting effective teaching and learning must be included for the learners to acquire understanding that enable them to accept stewardship and participate in the development and maintenance of an ecological and sustainable society. The protection and improvement of the environment have, therefore become imperative goals of education, because it is the means through which society prepares its citizenry to carry out their responsibility. Schools are the basin where people are molded, the training ground which instills necessary attitudes and mindsets that would serve as the core towards proper living in a demanding world. If this integration will be implemented, it is envisioned that within the next decades, a great majority of citizens will think and act with a sense of responsibility to care for, protect and improve environmental quality that is conducive to the well-being and to support our economy for national development. Keeping this fact in view this investigator decided to take up a piece of research pertaining to the assessment of environmental knowledge at higher education level.

Significance of the study

In 1972, the UN Conference on the human Environment in Stockholm called for UNESCO to work with all the appropriate UN agencies, international non-governmental organizations, and the 148 UN member nations to develop a program for promoting environmental education around the world (Stapp, 1979). That led to the preparation of numerous working papers, the creation of UNESCO's International Environmental Education Programme, and to the 1975 International Workshop on Environmental Education in Belgrade

(UNESCO, 1977). At that Workshop, 96 participants and observers from 60 countries, equally distributed among fine UNESCO regions, unanimously adopted The Belgrade Charter. The charter includes the following goal statement, which also serves as a definition of environmental education. "The goal of environmental education is to develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively towards solution of current problems and the prevention of new ones". (UNESCO-UNEP, 1976)

The 1976 UNESCO statement was further refined during a 1977 UNESCO-UN Environment Programme (UNEP) Intergovernmental Conference at Tbilisi, then in the former U.S.S.R., at which it was concluded that the general public should be expected to achieve the following objectives:

1. To help social groups and individual acquire an awareness of, and sensitivity to, the total environment and its allied problems.
2. To help social groups and individuals gain a variety of experience in, and acquire basic understanding of, the environment and its associate problems.
3. To help social group and individuals acquire a set of values and feelings of concern for the environment, and the motivation for actively participating in environmental improvement and protection.
4. To help social groups and individuals acquire the skills for solving environmental problems.
5. To provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems (UNESCO, 1978).

These objectives have been reaffirmed at numerous subsequent international meetings. The Belgrade and Tbilisi statements taken together have become the most widely recognized definition of environmental education. It describes the end goal as well as experiences, strategies and processes important for developing environmental literacy (e.g. UNESCO, 1978; Hart, 1981) To conclude Environmental Education is a learning process that increase knowledge of people and awareness about the environment and associated challenges, develops the necessary skills and expertise to address these challenges, and fosters attitudes, motivation and commitments to make informed decisions and take responsible action.

Keeping in view the nature and importance of Environmental Education present study determines if environmental concepts are integrated in the lessons taught in the basic education curriculum and if the students practice environmental protection and conservation practices. It serves as guide to local government leaders, environment sector and school administrators for the monitoring of science curriculum in the integration of environmental concept. It will also encourage them to put up school projects such as recycling centers or recovery facilities as support to practice more environmental protection and conservation activities. This study will also serve as information for the public about the problems of the environment and the need to address these problems by involving the youth. Most importantly, it will encourage students and readers to practice environmental protection and conservation activities if they have enough knowledge and understanding about the environment.

Objectives:

The study was conducted to determine the knowledge acquired by the college students on the environment, their awareness regarding the problems of environment, issues and protection and conservation practices. The study was conducted with following major objectives:

1. To study the students awareness about the different environmental problems, issues, and protection and conservation practices.
2. To ascertain the student's sources of information about these environmental problems, issues and protection and conservation practices.
3. To ascertain the level of understanding of the students on environmental concepts, problems and issues.

Table 1 Sources of information of the respondents

Source of Information	No. of Respondents	Percentage	Ranking
Television	105	87.50%	1
Radio	85	70.83%	2
Newspaper	65	54.17%	3
Textbooks	57	47.50%	4
Magazines	48	40%	5
Others: Teachers, parents and friends	45	37.50%	6
Internet	34	28.33%	7
Journals	29	24.17%	8

The sources of information among the respondents as shown in the above mentioned table are the television, radio as the top ranks with 105 or 87.50% or 70.83% respectively. This implies that students become aware in environmental protection and conservation out of their interest and their hobbies in watching television and listening to radio. Other sources of information are the newspaper with 65 or 54.17% among the respondents, textbooks as the 4th rank with 57 or 47.50% and magazines by 48 or 40%. Only 45 or 37.50% respondents consider their teachers, parents and friends their source of information. This indicates that teachers do not integrate well environmental issues, concepts, protection and conservation in their daily lessons or throughout teaching-learning activities. Likewise, parents and friends are not environmental-oriented citizens to share them the knowledge of protecting and conserving the environment. Among their sources of information, internet and journals are the least mentioned sources of information with 34 or 28.33% and 27 or 24.17% respectively. In addition to journal containing environment related topics are not always within their reach or available to gain much knowledge and environmental concepts, issues and protection conservation.

In performance of students in the achievement tests as shown in the table 2 below, only four or 3.83% are excellent who got the highest scores that fall between 81-100. Twenty or 16.67% and 44 or 36.67% of the students have very satisfactory performance with scores between 61-80 and 41-60 respectively.

Table 2 Performance of the Students in the Achievement Test Scores Frequency Percentage Description

Scores	Frequency	Percentage	Description
81-100	04	03.33	Excellent
61-80	20	16.67	Very satisfactory
41-60	44	36.67	Satisfactory
21-40	33	27.50	Poor
0-20	19	15.83	Very poor
Total	120	100	-

Most of the students 44 or 33.67% performed satisfactory in the achievement test in which their scores fall between 0-20 and performed very poor. 33 or 27.50% student's performance on the achievement tests of Environmental awareness is poor. The table showed that less than half number of students lack the knowledge about environment issues, concepts, protection and conservation of the environment as well.

However in terms of the mean scores of the students, the computed value is 43 approximately which falls between 41-60 scores as shown in the above mentioned table which indicated that the level of understanding of the students in the protecting and conserving the environment is satisfactory. They may know what is happening in the environment and the ways to protect it but they did not do anything to solve problems related to environment.

Conclusions:

1. The respondents are aware about environmental concepts, issues, problems, protection and conservation practices from the different sources. Television and radio are conservation out of their interests and hobbies in watching television and listening to radio. Other sources in information are newspapers, textbooks and magazines which shows the availability of these reading materials in the school.
2. Among their sources of information, teachers, parents, friends, internet and journal are the least mentioned sources of information. This indicates that teachers do not integrate well environmental issues, concepts and protection and conservation practices in their daily lessons or throughout the teaching-learning process. Likewise, their parents and friends are not those environmentally-oriented citizens to share them the knowledge of protecting and conserving the environment. In addition to journal containing environment-related topics are not always within their reach or available to gain much knowledge on environmental concepts, problems, issues, protection and conservation. The students are too much exposed to information technology like internet.
3. In the performance of students in the achievement test only two (4) among 120 students are excellent who got the highest scores, most of them performed poor, and some performed very poor. It shows that they have low level of understanding about the different environmental issues, problems, protection and conservation practices. They lack much of the knowledge to help in solving environmental problems and practices relating environmental protection, conservation. But in terms of the average mean score of the students, it indicated that their level of understanding in protecting and conserving the

environment is problems, issues and concepts but they lack the proper values to help or contribute to solve environmental problems.

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Adult Learning in agricultural education

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Abstract: Your assessment process should be transparent and allow for ongoing feedback from and to the learners. Remember these adult learners want to improve their skills in managing money and are not necessarily interested in formal recognition or being ranked against their peers in the group. Where possible, presenters should emphasize from the start that no-one is going to 'fail' the program. Even where students are seeking formal certification of their achievement, presenters can advise that there is no competition between the learners in the group or between an individual and the topic material – it's all achievable and everyone can make it work for them. Your program should employ methodologies so that your trainers establish a friendly, open atmosphere that shows the participants they will help them learn rather than present as 'experts' imparting knowledge. No-one engages well with a trainer/teacher who is just 'showing off' what they know. Financial services have a plethora of jargon and complicated ideas that can put many lay people off. Exposing this sort of terminology and explaining it in simple terms – or deciding whether some of it needs exposure at all – is paramount to keeping your learner's trust and interest.
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Keywords: adult learning, education.

Introduction:

Adult illiteracy is like a disease that infects virtually every dimension of Kentucky life. Adult illiteracy saps the energy and capability of Kentucky's people and its economy. Adult illiteracy feeds the state's unemployment, its welfare rolls, and the correctional institutions. Adult illiteracy severely hinders the life chances of young children, undermines school reform, and limits the opportunities for postsecondary education. to understand the characteristics of adult learners, their mental and physical condition should be considered in the following referred to some of them.

Operating speed:

Slow reaction in adults is natural that necessarily means reducing the logic and practice skills, not due to weakness and increased awareness of natural forces and their skills.

Consciousness:

No stimulus and incentives encouraging, despite inhibiting stimuli, slow transfer rate, mental, and weak inhibitors of natural forces (mostly visual and auditory) are factors that slow reaction affect individual mental and cognitive activities, but never able to understand, understanding and learning ability (which varies with the speed of learning) is not relevant.

Health:

What is most age, longer duration is necessary to be heard by listening issue. Why is that when elderly people and old could not hear well, their confidence and vulnerable to the possibility that negative beliefs about their find, they are great. Visual abilities can be like other people, usually decreases with age.

Background of knowledge - skills and beliefs of adults:

Adults, social experiences, many have already learned different values and beliefs in their pronouns have stabilized, so changes in the new act very cautiously. The idea of such a manner that skill and applying them older and longer life is, Similar resistance to accept new ideas will be more and more severe. Thus, the adult criteria for the built and paid for their ideas and beliefs that are forming. Because of these criteria and the beliefs that they are afraid of failure, Therefore, to prevent it, sometimes against the resistance of new phenomena are only the material taught and its face that make reinforced concrete and tangible interference situation is.

Classification of Adult Education

1. reading and writing literacy level
2. Technical and professional education, people are ready for work
3. in the field of health, behavior and health in the family
4. tutorials political, social, religious. Operating political social goals
5. to satisfy emotional needs and entertainment, like art, literature and the like

3) HOW DO ADULTS LEARN?

Your program needs to account for:
• Motivation of the learner;
• Reinforcement of the skills and knowledge being developed;
• Retention of key learning; and,
• Transference of what is learnt to new situations.

Motivation

Adults learn most effectively when they have an inner motivation to develop a new skill or gain new knowledge. They resist learning material if it is forced on them, or if the only reason given is that the material will, in some vague way, be "good for them to know." Adults need to know why they are being asked to learn something; and they definitely will want to know what the benefits will be before they begin learning. This means the best motivators for adult learners are explicit interest and self benefit. If they can be shown that the program will benefit them pragmatically and practically, they will learn better, and the benefits will be much longer lasting. Typical motivations include a desire for better handling of personal money matters, say in retirement, wanting a new or first job, promotion, job enrichment, a need to reinforce old skills in say, handling credit or learn new ones, a need to adapt to community changes such as on-line banking and so on. Remember the tone of the program should be motivating. Your program should employ methodologies so that your trainers establish a friendly, open atmosphere that shows the participants they will help them learn rather than present as 'experts' imparting knowledge. No-one engages well with a trainer/teacher who is just 'showing off' what they know. Financial services have a plethora of jargon and complicated ideas that can put many lay people off. Exposing this sort of terminology and explaining it in simple terms – or deciding whether some of it needs exposure at all – is paramount to keeping your learner's trust and interest.

Appropriate level of difficulty

The degree of difficulty of your financial literacy program should be set high enough to expose all the essential elements of the topic and challenge learners to succeed, but not so high that they become frustrated by information overload. Too much financial industry terminology strung together can be a complete turn off for people who may already struggle with the fundamentals – is it really a necessary part of the skills they need?

So start with financial information and techniques that relate directly to the learner's own personal needs and wants. Personal budgeting is always useful and less complicated than say, comparing mortgage options. Don't make what could be a lesser used skill so important in the program it de-motivates the learners and loses their interest.

Motivational reward does not necessarily have to be in the monetary sphere; it can be simply a demonstration of social or workplace benefits to be realised from new financial management skills. Older participants could perhaps learn how to help their children with financial decisions. People could be shown how to utilise better financial planning in a club or society they belong to. Its about improving whole of life experiences not just direct monetary reward. The overall thrust of the program should be motivating and, like all good teaching and learning programs, course material should ensure other key adult learning elements are covered.

Reinforcement

As we know reinforcement is a very necessary part of any teaching/learning process. Through it, trainers encourage correct modes of behaviour and performance and discourage bad habits. Your program should use both reinforcement techniques throughout. Positive reinforcement is normally used when participants learn new skills. As implied, positive reinforcement is "good" and reinforces "good" (or positive) behaviour. Negative reinforcement is useful in trying to change bad habits or inappropriate modes of behaviour. The intention is extinction -- that is, the trainer uses negative reinforcement until the "bad" behaviour disappears or the learner understands why past practice is not beneficial to them. Examples could be ensuring participants always compare different rates of interest available to them before signing up for any new debt (a positive reinforcement) and not considering credit purchases that leave them with no income safety net for unforeseen circumstances (negative reinforcement).

Retention

Learners must retain what the program delivers to them in order to benefit from the learning. In order for participants to retain the information taught, they must see a meaning or purpose for that information. They must also understand and be able to interpret and apply the information in their own real life contexts. Understanding includes their ability to assign the correct degree of importance to the material and its application in the future. The amount of retention is always directly affected by the degree of original learning. In other words if the learners did not learn the material well initially, they will not retain it well either. Retention by the participants is directly affected by their amount of practice during the learning. After the students demonstrate they can apply new financial skills, they should be urged to practice in their own time and for their own personal needs to retain and maintain the desired performance.

Transference

Transfer of learning is the result of training and is simply the ability to use the information taught in your program but in new settings and contexts. As with reinforcement, both types of transfer: positive and negative should be used in the program approach. Positive transference, like positive reinforcement, occurs when the learner uses the skill learnt in your program. It is very important for any learner's orientation to the new skills they develop that they can practice in their own situations. Using knowledge from financial literacy training to work out the best way to use (or not use) credit in their lives is an important tool that many participants could use immediately. Participants can check how much credit debt they have, what interest they are paying and what alternatives there may be. Negative transference, again like negative reinforcement, occurs when the learners applying the skill do not do what they are told not to do. This also results in a positive (desired) outcome. This means it's important to find out what the participants in your program have been using their new skills for. Check to see if they are applying the techniques properly or whether they have misunderstood a key aspect of the program. Once wrong information is absorbed and used again and again it simply becomes another bad habit that could make financial decision-making worse instead of better.

Transference is most likely to occur in the following situations:

• **Association**: participants can associate the new information with something that they already know. What skills have the learners already mastered that they can bring to bear on better financial planning for example? Perhaps they have a hobby where it is necessary to access information from written materials or the Internet and the same skills could be used to obtain and analyse better financial data to use in their budgeting.

• **Similarity**: the information is similar to material that participants already know; that is, it revisits a logical framework or pattern. Using calendars or electronic planners to plan future holidays, work shifts etc can be transferred to setting up a long-term budget planner for financial payments and income.

• **Critical attribute element**: the information learned contains elements that are extremely beneficial (critical) in personal life or in the workplace. Try to reinforce the importance of aspects of the financial literacy program to the learner's own goals, whether these are in their home life, getting a job or improving their prospects in work they already have. People can even start their own small business ventures if they have the financial skills to work out the costs and benefits first.

Conclusion

In traditional programs that the principles of psychology and curriculum planning, less attention is the form of content presentation ie codification and providing books, original format and have the dominant form, while for adult content that could have valuable experience in addition to writing, other ways also be provided Affect the selection of pictures and images related to the concepts and content produced by including them.

Learning activities such as activities outside the classroom, dialogue, role playing and ... Another type of content is presented. Duties are placed on the learner, a resource for developing knowledge, skills and insights he considered.

Curriculum content only from the training provided to learners or not, but put together their learning through activities that can inform or does, skills and attitude to achieve. In this case, apart from learning that the assays taught learners directly to sustainable and effective learning occurs in his.

Another way of providing content that is educational activities outside the learning environment possible for learning more and better enables adult learners. For example, hits, field trip experiences for learners or transfer is provided, develop knowledge, insight and skills they will.

To ensure that science curriculum and educational aspects, according to community needs and audiences, application form is provided or not, the content selection criteria should be considered. These criteria is being include knowledge, effectiveness, flexibility, diversity, relevance and practical learning

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The importance of Empowerment of rural women

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Abstract: However rural women play major role to produce food at all over the world, but rarely enjoy of extension services. Wherever, rural women as producers of food productions and family supervisor, have little contact with extension services organizations, so their problems and needs would reflect at extensional information feedback, rarely. Therefore agricultural research institutions wouldn't be able to create and develop technology, suitable for their needs. Global surveys show that about 5% of total extension resources, at all over the world dedicated to programs for female farmers, but women form just 15% of extension personnel of world. Some extensional issues that traditionally belong to women, such as economy of family, are supported very little that receive just about 1% of total extension resources of agriculture.

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Keywords: empowerment, rural women.

Introduction:

Rural women constitute about half of the world's population and in the world production supply they have energetic communion and constitute a great part of agriculture workforce. They constitute% 50 of the workforce and they participate in the production of half of the foods in the agriculture section. As an example the rural women constitute about 70 to% 80 of agriculture workforce in sub-Saharan Africa, %65 in Asia, %45 in Latin American & Caribbean, %80 in Nigeria & Tunisia and %80 in India, but their role in production system is the men's supplements roles and this causes a big responsibility inside their mother & wife duties and it takes a great time and energy of them. Studies in this field show that women spend about two thirds of their time for production, management & organize of their house as the men spend only one third of their time for such things. (Varzegar & Azizi 1367).

In the development countries, rural societies which are poverty for geographic reasons such as being far from urban societies or because of mountainous of zone and also as the roads are impassable and some other reason, they became deprived of many human development programs. Unfortunately these societies are suffering of mortality because of poverty but what is clear here is that we can't attribute such privation to geography and nature of the zone. Every country is tying to solve such critical conditions by applying depoverty policies. (Bakhshoodeh and Salami, 2005)

Poverty spreading in village is a global issue. According to the Fao finding about % 75 of world's poor people that are more than 1 milliard people are living in rural zone and more than % 70 of this poverty people are women. As the most of the people who are poor are living in village and are women is the reason for insufficiency of rural development programs.

One of the other basic barriers in development of rural women is their independent inaccessibility to get credits for investment in their job. Although their illiteracy is the big barrier to use of bank credits, but this view that women are dependent people that their husband should decide about their financial decisions is the other reason that rural women couldn't access to official credits. Maybe these barriers are the reason why rural women are happy about applying micro-credit thought in village. (Najafi, 2007).

Having investment (capital) independency enforce people to think about economic from different angles. He should study the ways for using capital, he must consult with authority and experienced people and he will investigate about relevant markets. Such things will help him to be authoritative & independent. But how rural women can get such independency? Are the women created inherently for housekeeping, parenting and working or is there any opportunity for rural women to show their skills in economic & social development?

It seems that experiences which are obtained from performing financial programs in some villages in the developing countries could answer clearly to such questions.

A glimpse to previous planning about rural development in the world shows that from 1950 many developing countries understood that the main reason for making their economic growth (development) slowly in their countries is the weakness of investment in the agriculture part. Although many countries by patterning from developed societies have proceeded to improve & develop their industrial agriculture part and by this action not only had irreparable damages to many traditional farmers but also the main problem (the lack of capital sources) is also remained in the rural regions. (Rahimi, 2001).

Rural women empowerment:

The empowerment is equality that women for financial self-reliance and self-sufficiency can obtain by controlling their emotional decisions. The empowerment can be defined as an evolution and development of activity through private organizations that guides empowerment in the society toward economic improvement.

Empowerment is a process through which people can do activities to conquest on development obstacles that enable them to assign their destiny.

The word empowerment is not the meaning of overcome to main in equalities so it is different with the word self-reliance. (Ruhal amin, 2010).

Empowerment enable person to overcome any difficulties by a suitable management. Finally we can say empowerment provide energy to conquest on mental problems & outer difficulties.

On conclusion we can give a suitable definition to women's empowerment as this: the process of realization of women about themselves (and also the men's realization about them) for the thing they want or have to do.

It should be reminded that the main point should be attended in women's ability is the omission of subjective & social problems and providing economic & social communion for women in all aspects. The mean of women communion is their presence in all of village affairs such as making decision, presence in organization & councils that includes their communion in all economic & social aspects. (Araghzadeh, 2002)

If rural women could provide a job for them by getting credits, loan and other financial convenience, through their income they can get self-reliance or financial independency and we will see social, cultural & economic change in village. The question here is that if these changes have positive or negative aspects in the village? It's natural that every change in social phenomenon has both positive and negative aspect, but which is Important here is that which aspect is more than the other and it depends to different condition in various societies. In our rural society there is an especial social & cultural kind that it's outcome maybe different and in some case inconsistent. With these actions rural women could be in idealistic economic condition and they could live with out dependency to their husband's income. In most of the villages in Iran there is patriarchy in the families which is not acceptable for the most of the rural people and groups. When rural women became financially independent, it's acceptable to see its cultural & social outcomes.

Giving the right that women make decision, independency to their family, increasing the cultural knowledge among them& making relation with new institutions, having independency in making decision about marriage, occupation, migration & something like this are the right that women have got it.

Women by getting these rights can make change in the rural cultural & social issues which make disfunction & crudity in their family's relation. However, rural women's self-reliance has caused improvement in the economic, social & cultural issues. For solving women's self-reliance problems we can do these activities:

- Giving promotional services for increasing rural women's skills in various fields.
- Giving promotional instructions to men for believing their women's economic role & their women opportunity to participate in all economic, authority & … aspects.
- Increasing rural women's knowledge in all social, political, cultural & economic fields.
- Making use of micro-credits programs to motivate & support women for doing economic affairs better & finally to make women self-reliance.

Criteria of empowering women:

Enabling as a theory of policy making for women, in it present five criteria:

Welfare, access, Concientisation, participation and control.

1- welfare criteria :

In this criteria, men and women as human resources of development should enjoy of desirable welfare conditions and equality (Paknazar, 2000).

Most of timing developmental programs, have worked on base of women's welfare. They have considered and provided some services for women who were passive recipient of these services. But these services were limited to physical needs and mostly were considered to revive their role of productivity, again. sometimes , it has been said that this approach has begun at colonial era and has considered women from poor country and intended services for them that dose not exceed from that poverty level . Agricultural and industrial projects were designed for men and social programs for women and children. Most of welfare programs were inadequate or its success was limited. Considerable point in this criteria is that men and women as human resources of development should enjoy equality and desirable welfare conditions. At this stage, women's material welfare and their enjoyment of welfare programs, compared to men (nutrition, death rate and …) were considered. And women's role as producer to supply their own needs isn't very important.

2- access criteria :

Lack of access or limited access for women to sources including (fields, job, capital and training) cause

that their functions at production is less than men (Paknazar 2000). Access to facilities, sources, designed program and projects for women and access to schools and … are in this part. Just whenever most of other legal, cultural and social issues being solved, men and women would equally access to sources and facilities. Concept of enabling at this stage is that women have equal right to access to sources at family and greater society.

3- Concientisation criteria

Women should know that their problems aren't due to their individual inefficiency and shortage but it has emerged by social system in which discriminations has become formal and acceptable issue. (Araghzadeh, 2002). This stage is more critical and important than other stages. Because women can participate at development activities not just be passive users. Women have real equality at development, just when be aware. Concientisation will help to increase women's ability to equality at participation at society. At this stage, women face with critical analysis with society and will find that what has been considered natural and unchangeable reality, is changeable. (Bakhshoodeh, 2005).

4- Participation criteria

One the most important items that this criteria has considered , is men and women's equal participation at decision making process of affairs of family at society (Paknazar 2000) . Men and women both should participate at process of assessment needs, designing, performing and evaluation of projects and development programs (UNICEF, 1998). In summary, this criterion means women's participation at all stages of surveying needs, detecting problems, planning, management, performing and valuation.

5- Control criteria

This criterion emphasize on this point that in addition to equal access of men and women to development sources , they must have adequate control on these sources that this issue is balance criterion , between men and women so that no one exceed other one (Paknazar 2000) . Women should have opportunities for decision making at workplace and home. If woman is producer, should be shared with part of her interest and wage. Women like men, should be able to choose her individual and social field and able to make decision and also development activities should be facilitator of these processes.

FAO (food and agricultural organization) addresses these three purposes as strategic goals while enabling women:

1- equality between men and women to access production sources
2- women's participation at policy and decision making
3- decreasing rural women's workload and increasing job opportunity and income for them (Paknazar 2000)

within theoretical framework of enabling women , having control on sources is presented as highest stage at women's participation process on development , but existing data at most developing countries , indicates that not only rural women haven't any control on financial resources of family but even they were deprived to access to sources and credits , specially through formal credits system (Shaditalab, 2002) .

The question that arises here is that what relation is there between enabling women and micro-credits programs? Nowadays, micro-credits are considered as effective mechanism to eradicate poverty for women. Interests of micro-credits further increasing women's income, include:

- improving women's role in family
- Increasing women's confidence, not only through obtain financial success through business activity, but through increasing women's access to social services and communication with other women.
- Changing at social level (social class) at perspective of women's role.

Discussion and conclusion:

Supplying credits and analyzing credits approaches cause opportunity to activate poor men's working

In researches that conducted by Nanda (2004) became clear that women participation in credits programs had positive affects on their demand about health care.

Fiona Steele and etal (2008) in researches that conducted as called " influences of credits programs on empowering women at Bangladesh , found that women who joined to credits programs , have participated in more educational programs and have married with more educated men and also they have saved more and they had more cash .

Ellen and her colleagues (2009) used approach called it "credits and education at Bolivia, Ghana, Honduras, Mali and Thailand". This approach looks for empowering women through financial services with education. In this approach, women get familiar with importance of credits through education and extension and also familiar with ways to access it through establishing different groups.

Shahnaj and chaudhury(2009) in research as "credits and its role on empowering women " concluded that there is meaningful relation between attending in credits programs and empowering women , at economical dimensions .

Ruhal amin and others (2010) found that those who joined credit funds had more ability rather than those who didn't.

Jameela (2010) presented that credit programs has shown lot of affects on empowering women so that has increased their social, politic and economic ability.

Thus it is obvious that credits programs and its educational and empowering programs can be affective on social, humane and economic development or rural society, if it be associated with proper and gradual practices and base on reciprocal communications principles and apply opinion of local society.

Maybe the main challenges that threaten credits associations , is lack of necessary emphasizes on social dimensions and on reinforcing their basics , that practically cause that this social foundations lose its efficiency soon and practically changed to unsuccessful institution .

In order to overcoming dominant consideration, experts believe that we should consider following in protection process of these social institutions.

- Establishing and reinforcing through supporting without ant direct government involvement
- Evaluating and constant modifying of financial management mechanisms
- Improving organization effectiveness
- Establishing constant relation and interaction with similar and equal systems.
- Establishing local , regional and national networks
- Establishing support and cover systems in order to decrease risk
- Establishing balance and interaction with financial systems greater decision making include: capital market (local, regional, national) and governmental.

Also following suggestions have been offered:

- Helping to marketing and establishing many exhibitions for member's productions, credit programs, guiding and training them in line with group and workshop activity, can assist them on economic empowerment.
- Since women have pointed to education deficiency as major barrier for empowering them , thus educating rural women at the field of exploiting different credits and channels of receiving credits , and also various educations , is so that lead to enabling them , that contain considerable importance.
- Providing extension educations for men in order to believe economic role of their women , and give them chance of corporation on all economic , credits fields
- Since that base of credit association, forms base on people corporation, so it's good chance to use these communities to expand extension-education activities. So it is better to consider special programs on different extensional filed such as agriculture , ranching , family health , housekeeping economy and other fields accordance to condition of region and rural women's needs .

- It is suggested that vast and exact programming happens at following fields:

A- extending insurance, facilities for amenities
B- educating women about awareness of their own individual and social rights
C- persuading rural women about importance of participating at cooperatives and other educational institutes
D- educating women about job management and income management

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存在量子三旋的磁性状态自旋液体
---非线性希格斯粒子数学讨论（10）

平角

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摘要：三旋中的线旋，本身就是一种缠结现象，能为多主体系统内的量子缠结打开一扇窗。目前这种新物质研究成果更有助于改变电脑的数据存储方式，或改进用之于“远距离缠结”的怪异量子通讯现象。由于三旋研究成果早已用于高温超导体研发，接着这一新进展，三旋自手术理论也能够描述“herbertsmithite”观测到的现象。

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关键词：第三次超弦革命，液态自旋量子，自手术。

介绍：

我们讲“第三次超弦革命的标志是自手术理论”，主要是针对“自旋”来说的。当然这里说的“自旋”，是指真正内禀的自旋。如球面的自旋，不能理解为它环绕某一本征轴的旋转运动，只能说自旋的球面表现与陀螺相似；但这正恰是荷兰科学家古德斯米特和于伦贝克，在 1925 年首创电子“旋转”特征具有“二值性”的基础。

因为在经典物理学中，角动量和日常旋转可以指向任何方向。但如果假设球面的自旋是环绕沿垂线方向的某一本征轴的旋转运动，于伦贝克指出，那么量子旋转一定存在“二值”旋转：即本征轴沿垂线“向上”的方向旋转，和本征轴沿垂线“向下”的方向旋转。他将这两种可能的自旋态，描述为电子绕原子核做圆周运动时，沿一条垂直轴顺时针或逆时针旋转。于伦贝克和古德斯米特证明，电子自旋为＋1/2 或－1/2。而他们的这种自组织自旋到今天已经统治了我们现代物理学 88 年。

球面式的量子自旋存在的“二值性”，是天经地义、不可更改的吗？

不！如果球面能像地球的地磁场北极出南极进的磁力线通道那样去旋转，即球面也能“变脸”为环面，那么自旋物体环绕的本征轴坐标，也就不是三角坐标或极坐标能描述的。而且如果球面“变脸”为环面旋转，能出现反映在微观世界，那么这还是量子在湮灭或塌缩现象之外存在的另一类“自手术（Self-surgery）”现象。

“自手术”来源于把数学概念的“炸开”等价于类似“手术（surgery）”的数学概念的扩容。这是早在 20 世纪 60 年代末期出现自组织（Self-organization）理论之前，即 1958 年至 1962 年期间，从四川大学的数学家到盐亭县的中学生中的一些人，一直在琢磨把“不撕破和不跳跃粘贴，能把空心圆球内表面翻转成外表面”与环面自旋整合这类难题，才明朗起来的。众所周知，如果把拓扑学上的“组织”概念与“手术”概念并立，其意思明显是对立的。因为拓扑性质，是可以想象成在橡皮薄膜的塑性形变下，仍然保持不变的性质。比如有一个洞的一块橡皮薄膜，可以任意改变它的形状，只要不把它剪开或者把它的两点

粘在一起，这块橡皮薄膜有一个洞的性质不会改变。因此“洞”是一种典型的拓扑性质的区别。

即被称为橡皮薄膜几何学的拓扑学，是不主张“手术”的；它认为在橡皮薄膜的塑性形变下，通常熟悉的距离、朝向、大小等性质可以改变，但它们都不是拓扑性质的整体改变，而只是局部性质的改变。然而拓扑学后来还是发展出“轨形拓扑”。这类似把两个喇叭小的一端的对接，再翻转到两个喇叭大的一端的对接的内部，成为一个环面一样。这种几何操作，称为轨形拓扑。反之拓扑学“组织”，是指系统内不撕破和不跳跃粘贴的有序结构或这种有序结构的形成过程。这里的“组织”可分为两类：他组织和自组织。类此，把“手术”也分为两类：他手术和自手术。这是与拓扑学组织不同的有序形成过程；轨形拓扑是在拓扑学中包含了手术和自手术的学问，说白了就是在拓扑学的自组织理论之外，还需要“自手术理论”。

之所以需要，因为像西医、中医分内科和外科一样，拓扑学、耗散结构理论、协同学、突变论、超循环理论、混沌理论和分形理论等自组织理论，只能等价对应于类似西医、中医的内科。可以说基础自然科学从轻元素到重元素、从分子到生物大分子和生命现象等在各个层次过程的不同侧面的研究，直到第一、第二次超弦革命的自组织思维，都还处在类似西医、中医的内科的手法层次。半个多世纪以来发生在我国的第三次超弦革命，是从“自手术”理论来解读卡拉比-丘流形微分拓扑的尖端收缩“炸开”的理论。总结这类研究，21 世纪初我国已正式出版了《三旋理论初探》和《求衡论》等专著，详述存在量子三旋类似磁性束旋状态自旋液体的物质，完整、全面地解答了从经典物理到量子物理的第三种自旋相。

因为日本著名理论物理学家汤川秀树早说过：宏观世界的物体，例如陀螺或汽车，不具有自旋的性质。虽然这些物体也可以环绕本征轴旋转，但是这种旋转不是它们的必不可少的性质；特别是，我们能够加强它们的旋转运动，也能停止它们的旋转运动。而量子水平的自旋，既不能加强，也不可以减弱。如果宏观物体也有自旋，岂不也有其他量子效应，这是不可能的。所以如果存在像地球的地磁场北极出南极进的磁力线通道那样去旋转的物质，这是一种协变效应，那么就只能类似液体和气体。

例如，人吃烟吐烟圈或烟囱偶尔冒烟圈等现象，是一些类似磁性束旋状态的多极自旋现象，但它们是不规整也不理想的束旋状态的多极自旋现象。第三次超弦革命的标志的自手术理论，是把类似圈洞态的拓扑客体，定义为类圈体。在自手术的黎曼切口轨形拓扑或真空撕裂类似船闸模型的操作下，为什么类圈体既能将半整数自旋的粒子和整数自旋的粒子分开？其原因是它作了自旋的三旋坐标的解构或建构。

这就必然要涉及三旋的手征判定。这里如果设旋转围绕的轴线或圆心，分别称转轴或转点，现定义：（1）自旋：在转轴或转点两边存在同时对称的动点，且轨迹是重叠的圆圈并能同时组织起旋转面的旋转。（2）自转：在转轴或转点的两边可以有或没有同时对称的动点，但其轨迹都不是重叠的圆圈也不能同时组织起旋转面的旋转。（3）转动：可以有或没有转轴或转点，也没有同时存在对称的动点，不能同时组织起旋转面，但动点轨迹是封闭的曲线的旋转。

根据上述自旋的定义，那么类圈体应存在三种自旋，现定义：（A）面旋：指类圈体绕垂直于圈面中心的轴线作旋转。如车轮绕轴的旋转。（B）体旋：指类圈体绕圈面内的轴线作旋转。如拨浪鼓绕手

柄的旋转。（C）线旋：指类圈体绕圈体内中心圈线作旋转。如地球磁场北极出南极进的磁力线转动。线旋还要分平凡线旋和不平凡线旋。平凡线旋是常见的圈翻转。不平凡线旋是指绕线旋轴圈至少存在一个环绕数的涡线旋转，如麦比乌斯体或麦比乌斯带形状。同时不平凡线旋还要分左斜、右斜。因此不平凡线旋和平凡线旋又统称不分明自旋。反之，面旋和体旋称为分明自旋。这样看来，涡旋仅是自旋中的线旋，或线旋与面旋的组合；而物理学上一般说的自旋是面旋或体旋。三旋规范标准动力学，是符号编码标记的。单动态共 10 个；双动态共 28 个；多动态共 24 个。用三旋性质处理量子色动力学，夸克的颜色可以看成是由圈态的三种自旋的不同排列组合引起的，从而能建立一套夸克立方周期表。

三旋束旋态是种怪异的状态，很难进行测量或者说很难证实它的存在。三旋理论之所以要与量子自旋液体物质状态高度关联，是因为按汤川秀树的说法，内禀自旋不能靠外部力量支撑，三旋对流束旋状态不能人工制造，也就类似不能拿在手中，又不能像空气气流那样看不见，因此选择液体这种既能支撑又能看得见的物质，就很容易联想。所以当高温超导体一经发现，1987 年著名理论学家菲利普-安德森首次提出存在第三种磁态。而三旋束旋态也很快能用上来研究，如《高温物理超导和生物超导机制的思维》的论文，就是在 1987 年《潜科学》杂志第 6 期上发表的。

但高温超导体并不是液体，然因自旋液体物质状态与三旋“自手术”现象高度关联的具有引人注目的集体行为，有助于理解高温超导性，并能解答所产生的具有分数量子数的奇异激发。从此，我们也开始关注有关它们存在的结论性证据。2011 年麻省理工学院的科学学家，在实验室历时 10 个月首次合成了长 7 毫米，重 0.2 克的一种二维阻挫反铁磁体（herbertsmithite）的大型单晶纯晶体。随后，他们一直对这种晶体的性质进行细致研究。通过所作的中子散射测量，他们观察到了在低温下出现的分数自旋激发，这正是量子自旋液体的一个标志性特征。herbertsmithite 的矿物晶体，是以矿物学家赫伯特-史密斯(Herbert Smith)名字的命名。1972 年，史密斯在智利发现了这种矿物。

液态自旋量子是一种固态晶体，但它的磁态却呈液态。与其他两种磁性不同，这种物质内部没有静态磁性取向，即液态自旋量子的单个粒子磁性取向，类似三旋始终处于变化之中，与真正液体中的分子运动类似。但粒子之间存在强烈的相互作用，它们不会固定在某个地方。但绝大多数的其它物质，都拥有不连续的量子态，量子态的改变用整数表达。与此相比，液态自旋量子表现出碎片式的量子态。这种被称之为“自旋振子”的液态自旋量子的晶体，能够形成一个连续体，是拥有称为第三种基本磁态的一种新物质态；这也是迄今为止，得出的最具有说服力的实验数据，证明存在这种现象。

三旋中的线旋，本身就是一种缠结现象，能为多主体系统内的量子缠结打开一扇窗。目前这种新物质研究成果更有助于改变电脑的数据存储方式，或改进用之于“远距离缠结”的怪异量子通讯现象。而远距离缠结，是指两个相隔很远的粒子能够同时影响彼此的状态。由于三旋研究成果早已用于高温超导体研发，接着这一新进展，三旋自手术理论也能够描述“herbertsmithite”观测到的现象。

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Application of *Pleurotus ostreatus* SMC as soil conditioner for the growth of soybean (*Glycine max*)

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Abstract: Spent mushroom compost (SMC) of *Pleurotus ostreatus* (an edible fungus) was used as soil conditioner for the improvement of growth of a leguminous agricultural crop (Soya bean (*Glycine max*). The experiment was conducted in a screen house, located behind the Department of Botany and Microbiology, University of Ibadan. The experiment was laid out in a Complete Randomized Design and Replicated with six(6) treatments; 0%,10%,20%,30%,50% and 100% Results from this investigation shows that this dicot, soybean performed well at 10% (0.6kgSMS/6kg soil) treated level on most of its agronomic characters and yield (pod no, FW and DW) parameter. It was observed that, there were seed production on the control experiment plants, but were significantly lesser with the SMC treated seeds/plants($p \leq 0.05$),. However the control (soil) and Ref. Control (SMS only) produced less fruit (Pod) . It was also found that the substrate pH for growing these crops at all treatment level was increased from acidity to neutrality. The results from these findings were discussed in relation to the usage of SMC as a possible organic fertilizer for the improvement of this leguminous crop.

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Keywords: Agricultural crops, mushroom compost, Nigeria, *Pleurotus ostreatus* , Soil conditioner.

1. Introduction

Soybean is a plant of the family Fabaceae, order Fabales . The height of the plant varies from below 20cm (7.9in) up to 2 metres (6.6 ft). It consists of approximately 8% seed coat 90% cotyledons and 2% hypocotyledons. The pods, stems and leaves are covered with fine brown or gray hairs. The leaves are trifoliate , having three to four leaflets per leaf, which are 6-15cm or 2.4-5.9in long and 2-7cm (0.79-2.8in) broad.Soya bean is among the new 40 varieties of five crops across targeted countries released by scientist working with the tropical legume II(TLII) project , funded by Bill and Melinda Gates Foundation in kwara state, Nigeria (Bulletin of Tropical Legume,2011)

SSA Soil fertility has been reported as one of the major constraints of tropical agriculture. This is due to the fact that Sub-saharan Africa's potential to grow food crops has been declining every year because of degradation in soil fertility (Yaker 1993; Brader 1995 as cited In (Oyetunji *et al* 2002).These SSA soils are very susceptible to nutrient depletion due to farming intensification, which is associated with low buffering capacity (kang and Wilson 1987; Tian *et al* .1994), and Coupled with the inability of farmers to procure the necessary imput to support the infertile soils

Edible mushrooms are a group of fungi species (Basidiomycetes) that grow naturally on tree trunks, leaves, root of trees as well as decaying woody materials (Stamets 2000; Lindequist *et al.*, 2005).They are achlorophylous organisms and thus can be grown in jars, bottles devoid of sunlight. From these mushrooms are deposits of lots of nutrients, very vital for the use as crop enhancer. Nutrients such as vitamins, minerals and micro and macro nutrient have been detected in most oyster mushrooms (Jonathan,*et al.,*2012a). Oyster mushrooms such as *Pleurotus ostreatus* is a fungus, that belongs to the class basidiomycetes. They are generally understood to be called white rot fungi, because of their ability to degrade lignocellulosic materials. *Pleurotus* species as primary rot fungi are able to colonize different agricultural wastes as substrates. *P. ostreatus* is among the edible mushrooms reported to be cultivated in Nigeria (Jonathan and Esho, 2010).*Spent Mushroom Compost* (SMC) is the remnant of substrates (sawdust any other agricultural substrates) used to cultivate a mushrooms (Jonathan *et al.,*2012b). It is a by-product of the mushroom industry after different flushes of mushroom fruitbodies have been harvested (Chang 1981; Fasidi *et al*., 2008).It is believed that the importance of industrial fertilizers in developing modern farming practices and provision of food for the world wide population has been acknowledged. However, some of these inorganic fertilizers could pose adverse effects on crops. Hoffman and Smith (1993), for instance reported that the application of potassium to citrus fruits could affect the shape of their fruit abnormally,

and also increases their acidity. The susceptibility of pome fruit to physiological disorders, and the decrease in fruit color , when nitrogen fertilizer was applied (Shear and Faust,1980). Moreso, the flavor of apple fruit have also been affected when , high rate of nitrogen fertilizer , were applied to apple tree (Link 1980). In addition, the post harvest physiology of cucumber fruits, by affecting membrane lipid chemistry, membrane integrity and respiratory metabolism have been reported (Knowles *et al* ., 2001), when phosphorus nutrition was applied. These are all the negative effects of the excessive use of inorganic fertilizers. In any case these effect could be avoided when an alternative such as spent mushroom compost which is organic in nature can be employed. However SMS when allowed as waste in the environment can serve as environmental pollution source thereby causes nuisance to the environment which is harzadious. But this harzardous effect can be turned around for fortune when used as a substrate for growing agricultural crops. The use of spent mushroom compost in growing agricultural crops has been recognized in recent times as a possible means of enhancing sustainable agriculture or production of food crops(Olfati et al 2011).

Environmental pollution with excessive fertilizers with heavy metal contents is a global concern being everywhere and has also been reported. Plants that are termed phytoaccumulative are those that have the ability to absorb and utilize heavy metals from the soil, displaying attributes of phytoremediation (Memon and Schroeder 2009). There have been records of harzadious effect of fertilizers on the environment and on plant at large which do not have the ability to utilize heavy metals present in fertilisers. For instance inorganic fertilizer is known to play a significant role in environmental pollution.Among which, nitrogen fertilizer increases denitrification , resulting in elevated emission of nitrous oxide (N_2O) to the atmosphere, and thus , contributing to global warming (Smith *et al* .,2008).The application of nitrogen fertilizer, has also been reported to possess the potential of depleting soil organic carbon with time (khan *et al.,* 2007).

In consideration, a need arises as a necessity to consider the use of biofertilizer, devoid of toxic metals, which has the ability to prevent the depletion of the soil organic matter, according to Jeyabal and Kuppuswamy(2001).And also which can be easily obtained, from mushroom farms at no cost or cheap rates. As the world drifts into practicing "Organic farming" in agriculture, the need to embrace the use of Biofertlizer, such as SMS should be encouraged. This study, is therefore aimed at, (i) Studying the responses of the aforementioned crop to the presence of Spent Mushroom Compost as a biofertilizer . (ii) To determine the quantity and quality of nutrients in SMS appropriate for growing agricultural crops such as cowpea, and how it affect its pH .Hence it was the objectives of the present investigation, to apply spent mushroom compost on Soya bean ,to find out its effect on growth and yield attributes of the crop. The Nutrient status of soil and Compost were evaluated , percentage of pods produced per six kilogramme soil were enumerated at harvest. Nutrient contents and uptake of whole crops were determined. Number of leaves, plant height and leaf length were the growth parameter sampled as data collected, together with the total yield produced**.**

2. Materials and Methods

2.1. Collection of and source of SMC and planting materials: The spent mushroom composts utilized were obtained from a Mushroom cultivating farm at odo-ona kekere Ibadan city, Nigeria. The compost/substrate was a remnant of the material (sawdust) used to cultivate *P.ostreatus* The seeds of *Glycine max*; TGX1740 were all collected from the Institute of Agriculture and Research Training (I.A.R& T) Moore Plantation ,Ibadan, Nigeria.

2.2. Preparation of the growth media. The spent mushroom composts substrates were weighed in different quantities (0.6kg, 1.2kg 1.8kg, 2.4kg and 3.0kg representing 10%, 20%, 30% 50% /6kg soil). Each of these quantities was properly mixed with 6kg of depleted garden soil, which was collected from a cultivated land behind the Department of botany at the screen house, at the University of Ibadan . Each mixture was packed into a 6kg bucket of soil and adequately watered (Iwase *et al* 2000). The treatment for each was replicated three times (Jonathan *et al*., 2012a).

2.3 Soil treatment: To obtain fine sand, the soil was sieved (with a 2mm wire gauzed) metallic tray, in order to remove stones , plant debris and generally unwanted materials that could hinder plant growth. After this, the soils present in every bowl were treated (supplemented) with SMS except control bowls(0%) at the following varied concentrations; 10%, 20%, 30% and 50%. 10% SMS of 6kg soil require 0.6kg of SMS, while 20% ,30%,and 50% SMS all required 1.2kg,1.8kg and 3.0kg respectively. The thoroughly mixed substrates were allowed to decompose after wetting for about seven to ten days for biological and derivative activities of microbes to occur, which was expected to improve soil structure , composition, and more so its nutrient.

2.4. Experimental design and experimental set-up:

The experiment was designed in a Complete Randomized Design (CRD) which was set up in 3 Replicate, while the Treatment was done at six levels (0,10, 20, 30, 50 and 100) . Two controls, viz; SMS (100%) and SOIL (0%) were utilized.The CRD method of placing pots at the start of the experiment in the screen house;

Treatment In Percent, (0- 100%), Replicate Scattered.

Cowpea

A	B	C
0%	10%	20%
100%	30%	50%
10%	20%	0%
50%	100%	30%
0%	10%	50%
20%	30%	100%

2.5. Pre-Planting Analyses: The soil and SMC were tested for their physicochemical properties, prior to utilization for the study. 54 bowls were used for this experiment, and all were punctured underneath for drainage and proper aeration circulation. Soils were measured with a top weighing balance (Hana) in Kg. 6kg of soil were required and measured. 54 buckets were filled with soils of these masses. SMS were also measured and applied to the soil according to the treatment levels *viz*; 10%(0.6kg) through 50%(3kg).i.e

$SMS_{0\%/6kg\ soil}$; 0.0kg/6kg soil(No SMS)
$SMS_{10\%/6kg\ soil}$; 0.6kgSMS /6kg soil
$SMS_{20\%/6kg\ soil}$,; 1.2kg SMS/6kg soil
$SMS_{30\%/6kg\ soil}$; 1.8kg SMS/6kg soil
$SMS_{50\%/6kg\ soil}$; 3.0kgSMS/6kg soil
$SMS_{100\%/0kg\ soil}$; 6.0kg.SMS (No Soil)

2.6. Planting method: Direct planting method was employed; seeds were placed in the soil and treated soil at 2-3cm for all seeded crops(Jonathan *et al*.,2011). This experiment was carried out in the screen house, Department of Botany in the University of Ibadan. The was prepared according to the method described by Fasidi *et al*.(,2008).

2.7 Seed viability testing: All seeds of TGX1740 (Soya bean), were tested for viability, by planting in soil to study their germination. Result showed 100% viability, meaning the seed were all viable. The method employed was obtained from (www.Pulse-point-20seed viability testing pdf-Adobe Reader) Germinated seedlings/Total seedling X 100/1.

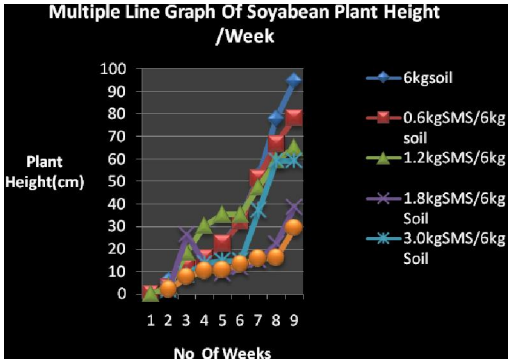

Figure 1. The plant height of soyabean

2.8. Chemical analyses The mineral element compositions of the SMC were determined before their application to the soil. This was done in order to know the various elements that were present in the spent mushroom substrate before usage. After the completion of the experiment the various substrate were also analyzed to know their utilization level. The mineral element analyses were carried out using the procedures of Association of Official Analytical Chemist (1990).

2.9. Planting method: Direct planting method was employed; seeds were placed in the soil and treated soil at 2-3cm.

2.10.Growth parameters and measurement: The growth parameters (Plant height, leaf length, leaf width, number of Leaves, girth size, and plant yield, fresh and dry weight and(total plant biomass) were monitored. Plant heights, leaf length, leaf width were determined using a meter rule (in cm). Girth sizes were read with a micrometer screw gauge with (x0.001mm) calibration, which were later multiplied by the circumference formula (π=3.142) while fresh and dry weight were measured with a sensitive weighing balance. Number of leaves were counted and recorded , on weekly basis, while the stem girths were taken once every two weeks, four times. The calculation of the individual plant species leaf area were effected with the formula A= (L x W x CF) proposed by Montgomery (1911), where L is the leaf length, W is the leaf width, and CF is the coefficient factor. The following coefficient factors were used for the calculations of leaf area for the different crops; 0.75 for maize (Montgomery 1911), as cited in McKee (1964), 2.7x LA for Cowpea (Jolaoso, 1988) and 0.65 for Soybean; (Wiersma and Bailey (1975), as cited in (Zur *et al* 1988).

2.11. Determination of exchange acidity in soil: 5g of air-dry soil was weighed into 50ml, centrifuge tube. 30ml of MKCl was added and the Centrifuge was tightly covered with a rubber stopper. it was

shaken for 1 hour. The content was centrifuged at 2000rpm for 15 minutes and then decanted carefully the supernatant into a 100ml volumetric flask. Again, 30ml of MKCl was added to the soil sample, and shaken for 30 min.This was repeated, until the supernatant is clear. The clear supernatant was transferred into the same volumetric flask .The step was repeated again, until it was made up to 1 MKCl mark (AOAC, 1995).

2.12. Determination of soil micronutrient extraction: 5g of soil was weighed into a 100ml plastic bottle .50ml of HCl, was added, and Shaken for 30mins. The mixture was filtered through No. 42 filter paper. Then the presence of Cu, Zn, Fe, and Mn on atomic absorption spectrophotometer were then determined.(Baker and Amacher,1982).

3.Results and Discussion

3.1 Effect of SMC on soybean plant height

Soyabean plant had better plant height at 0% (untreated soil) , with values of 57.17cm; 27.3% and 44.9cm; 23.3% germination respectively, as compared to others. These values are larger than that on 100% treated sample. (SMS alone) (15.04cm) . These values suggested that, dicotyledonous plant tend to slow in increase in height , when they are supplied with nutrients as unfertilized soil, possess the highest , height , when compared with others.

3.2. Effect of SMS on soybean leaf numbers

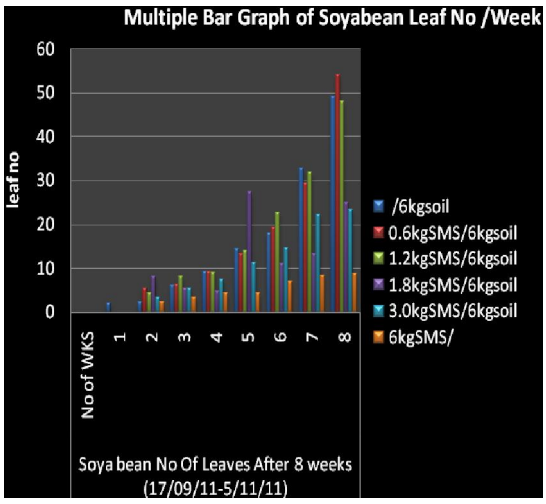

Fig. 2. Effects of SMC on Soybean leaf numbers.

3.3. SMC Effect on soybean stem girth. There were no significant difference between the stem girths of all the treated level of the soyabean plant(NS).

Table 1. Effect of SMC on Soyabean stem girths(cm) 8 wks of planting

SMS TRT	Glycine.max (Mean±SEM*)
0%	1.02± 0.88
10%	1.02± 0.74
20%	1.23± 0.62
30%	1.00± 0.91
50%	0.74± 1.01
100%	0.36± 0.27
LSD@5%	NS

*SEM = Standard Error of Mean, NS = Statistically Non significant.

Soyabean Leaf number is represented by a multiple bar graph (Figure 2), and it reveals that untreated soil had the first leaves to unfold, during the first week, followed by others. However the growth of the other varied treated soil aside control, remained almost constant till week 5, where 30% had a leaf number approximately 30(Figure2).This leaf dropped to a total number of 11, as a result of defoliation while that of 20%, 10% and 0% sprouted well. But finally 10% treated soil had the highest leaf numbers (Figure 2).

For the reference control SMS(100%) , the total leaf number was 3, at week 1& 2 , which later defoliated to a total of 2, at week three , remaining the same through week 8. This clearly signifies that excessive nutrient is dangerous to a plant's health and should be discouraged hence, plant should not be planted directly in SMS, a claim supported and suggested in SMS brochure(2006) and Manahan (2010).

For the plant height of soyabean , the multiple line graph is used for representation and it shows that 0% (untreated soil) for soya bean plant had the best height, approximately 97cm (Figure 1). This is followed by 10%, while 20% treated soil increased slightly above that of 30% treated soil having values of 66.5cm. The present obvious SMS effect on the plants strongly denotes that nutrients should be applied to plant at moderate levels as excessive or abnormal applications could cause growth damages as observed by (Fry 1987).This plant had a poor growth and leaf discoloration, when planted in SMS directly (Plate not shown) but SMS supplemented soil had soyabean plants showing considerably plants with healthy nature(pictures not shown) . The discoloration and stunted growth on Soyabean plant clearly shows that planting directly into SMC/SMS could be highly toxic (Fry 1987; Wallace 1961) and this is why the use of direct planting into SMS has been discouraged (SMS Brochure, 2006)., shows Soyabean, growing on soil/ substrate treated with 0.6kgSMS (10%treated level) had the best growth based on fresh weight of pods (14.93 ±7.52).

3.4 Effect on Soyabean number of pods

Result from table 2, shows the number of pods produced on Soyabean plant were higher on treated soil/ substrate , when compared to untreated(0%), and highest level of treated substrate (100% SMS; reference control). Soyabean plant did best at 10% with a total number of pods of 45.33±4.096, with a biological efficiency of 24.9% ,while 50% and 20 % Supplemented soil had the same value (41.33);and the same B.E(Biological efficiency) of 22.7% respectively.

Table 2 : SMC effects on no of pods of *Glycine max*

SMS level	*Glycine max* Pod no (Mean±SEM*)	%Germination
0%	4.33c ± 4.333	2.4
10%	45.33a ±4.096	24.9
20%	41.33ab ± 4.096	22.7
30%	20.16 b ± 4.619	13.3
50%	41.33ab ± 8.951	22.7
100%	0.000c ± 0.000	0.0
LSD@ 5%	0.67	

*SEM=Standard error of Mean

Means having the same superscript letter(s) are not significantly different at the probability level (P<0.05), by LSD.

3.6. Effect of SMS on Soyabean fresh weight.

10% treated soil , produced the highest weight value (54.50± 7.77 g), having percent germination of 24.8% . Comparing these value of soyabean to that of control (0%)and the excess reference fertilizer(SMS alone) it will be noted that 10% treated soybean plant had a higher value.0%, and 100% had values of 41.86g, and 0.000g respectively.

Table 3:SMC Effect on fresh weight(kg) of *Glycine max* 8 weeks after planting.

SMC Level	*Glycine max* (Mean ±SEM*)	%Germination
0%	41.87 ± 9.07^{bc}	19.1
10%	54.50 ± 7.77^{a}	24.8
20%	38.56 ± 5.23^{cd}	17.6
30%	37.93 ± 5.62^{de}	17.3
50%	46.50 ± 6.50^{ab}	21.2
100%	0.00 ± 0.00^{e}	0.0
LSD @ 5%	0.94	

Means having the same superscript letter(s) are not significantly different at the probability level (P<0.05), by LSD,

*SEM =Standard error of Mean

3.7. *Effect on yield: Pod Fresh Weight*

Soya bean plant on 10% treated soil had the best pod fresh weight of 14.93g, which is slightly different from 30% treated soil, having 14.23g, and also from 20% having 13.87g. A remarkable difference is observed, when compared with both control levels (0% and 100%) with pod fresh weight of 1.667g, and 0.00g respectively, while 50% had a fresh weight of 1.33g

Table 4: SMC effect on fresh weight(kg) of *Glycine max* pods per plant 8 weeks after planting

SMS Level	*Glycine max* (Mean SEM)	Pod(g) %Germination
0%	1.67 ±1.67bc	3.6
10%	14.93±2.52ab	32.4
20%	13.87±2.14cd	30.1
30%	14.23± 1.76ab	30.9
50%	1.33± 0.67de	2.9
100%	0.00± 0.00e	0
LSD@ 5%	0.37	

*SEM =Standard error of Mean.

Means having the same superscript letter(s) are not significantly different at the probability level (P<0.05), by LSD.

3.8. Effect of SMS on the growth parameters:

Plant height(cm), Number of leaves, stem girth(cm) and leaf Area(cm^2) are represented on Fig1, 2 and tables 1 and 8. The highest plant height grew on untreated soil (0%). But both the stem girth and number of leaves had better values at 20% treated soil /substrate, with the following values; 1.23cm, and 24.5cm respectively .while the leaf area, was best at 10% (19.51cm^2).Table , also shows that soyabean plant grew tallest in height on the 0%soil(44.87±10.15) compared to others.

Table 5: SMC Effect on Soyabean Leaf Area(cm^2) after 8 weeks

SMS TRT	Glycine.max
0%	17.81ab± 2.80
10%	19.51a± 2.96
20%	16.24bc± 1.78
30%	11.39de± 1.04
50%	15.79cd± 3.02
100%	4.78e± 0.87
LSD@5%	0.98

3.9 SMC Effect on substrate pH

Table shows the range of increase in pH values. There is a considerable constant increase in the pH of the substrate from the fourth week, which is slightly acidic to the end of the experiment, near neutrality It is known that most crops grow best within a soil pH of 6-7, in which crop nutrient exist in an available form that can be taken up by plant roots(Anonymous authors, 2002), unlike that observed in the substrates of this work (Table 1) . In this study, the pH of the growing medium , containing the various(treated) crops ,were taken after the fourth week , and generally it was observed that the minimum mean pH value was . However , on the Glycine max(soyabean) soil/ substrate, the

range of pH falls between5.42 on 50% treated soil to 5.95 and 5.99 on both 20% and 30% soil. It is known that pH influences plant growth indirectly by affecting nutrients availability.

Table.6 Effect of SMS on Soil pH

Sample/Week	0	1	2	3	4	5	6	Mean
Soil(in KCl)	6	0	0	0	(inH2O)		6.7	
SMS		7.5						
0%(G.max)		0	0	0	5.55	5.61	5.66	5.61
10%(G.max)		0	0	0	5.13	5.17	5.22	5.2
20%(G.max)		0	0	0	5.97	5.99	6	5.99
30%(G.max)		0	0	0	5.77	5.95	6	5.91
50%(G.max)		0	0	0	5.42	5.52	5.63	5.5

The increase in soyabean yield is in line with that of Steward(1995) and Steward et al(1997) who jointly observed in their work that SMS application increases yield of potato. Similarly Maynards (1994) and Wang *et al* (1994) reported that vegetable production could be sustained with the application of SMS. Additionally, Chang and Yau (1981) and Iwase *et al* 2000 reported its use in increasing production of tomatoes sevenfolds. The Dry weigh and Fresh weight matter of Soybean plant were significantly increased and this is also in line with that of Mullen and Mcmahon (2001). Again this work reveals the fresh weight, dry weight, fruit fresh weight of, soybean pod no , plant height, leaf number and leaf area, have also been significantly influenced by SMS at ($P< 0.05$).

The loss of organic matter is believed to be as a result of conventional agricultural practices ,therefore it is advisable to employ organic agriculture which employs closed cycles of energy and materials, by maximixing reuse, and exercising the use of nutrients of organic origin. This work clearly reveals that organic fertilizer type such as SMS can significantly affect at the probability level ($P<0.05$), plant total yield, number of pods per plant, pod dry weight, pod fresh weight, number of leaves, leaf area, and fruit (Pod) fresh weight , it is therefore advisable to use SMS as a substitute for cow manure as a soil conditioner(J.A Olfati *et al* 2011), at moderate levels.

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Microbiological analysis of ready to eat food (cooked rice and beans) sold among different restaurant in University of Port Harcourt, Port Harcourt, Nigeria

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Abstract: This study reports on the microbiological analysis of ready to eat food (cooked rice and beans) sold in University of Port Harcourt, Port Harcourt, Nigeria. The total colony count of ready to eat (cooked rice) ranged from $2.45x10^5$cfu/g to $17.8x10^5$cfu/g and $3.5x10^4$cfu/g to $17.1x10^4$cfu/g for ready to eat beans samples, for bacterial. The data's revealed that bacteria isolated from both food samples collected from the restaurants in University of Port Harcourt are *Bacillus cereus, Staphylococcus aureus, Escherichia coli*, and *Klebsiella pneumoniae* which is mainly associated with food poisoning because of its ability to produce toxins. From the result gotten, it was indicated that these ready to eat food samples that were analyzed, did not meet the bacteriological quality standard. The presence of pathogenic bacteria in ready-to-eat foods should receive particular attention, because their presence indicates public health hazard and give warning signal for the possible occurrence of food borne intoxication. More closely supervision should be made on these restaurants around the university of Port Harcourt community by relevant authorities, and more analysis should be carried out on other food samples sold in the University of Port Harcourt community, to ensure proper food quality standard.
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1. Introduction

Ready-to-eat food is not a nominated food or class of food within Standard. This Product group is defined as: Food that is ordinarily consumed in the same state as that in which it is sold and does not Include nuts in the shell and whole, raw fruits and vegetables that are intended for hulling, peeling or washing by the consumer (NSW, 2009). Although it is extremely difficult to pinpoint the precise beginning of human awareness of the presence and role of microorganisms in foods, the available evidence indicates that this knowledge preceded the establishment of bacteriology or microbiology as a science (Jay *et al.* 2005).

Some ready-to-eat foods also are regarded as 'potentially hazardous'. Such foods can support the growth of pathogenic (food poisoning) bacteria and must be kept at certain temperatures to minimize the growth of any pathogens that may be present in the food or to prevent the formation of toxins in the food (NSW, 2009)

There is a wide variety of ready-to-eat foods. Examples include, but are not limited to, Sandwiches, kebabs, sushi, takeaway foods and bakery products (NSW, 2009). Ready-to-eat foods usually include a number of ingredients which may or may not be cooked. Due to the variety of ready-to-eat foods, the interpretation of microbiological results obtained from testing must account for the method of processing and the individual components of the food (NSW, 2009). To assist with interpreting the microbiological analyses of such foods as part of our monitoring and surveillance program (i.e. surveys), the NSW Food Authority uses criteria that are based on interpretive guides published by the United Kingdom's Health Protection Agency and by Food Standards of Australia, New Zealand (FSANZ, 2001; NSW, 2009)

Because human food sources are of plant and animal origin, it is important to understand the biological principles of the microbial biota associated with plants and animals in their natural habitats and respective roles (Jay *et al*., 2005). Although it sometimes appears that microorganisms are trying to ruin our food sources by infecting and destroying plants and animals, including humans, this is by no means their primary role in nature (Jay *et al*., 2005). In our present view of life on this planet, the primary function of microorganisms in nature is self-perpetuation.

The microbial spoilage of foods may be viewed simply as an attempt by the food biota to carry out what appears to be their primary role in nature (Jay *et al*., 2005). Food borne illness is defined as diseases, usually either infectious or toxic in nature, caused by agents that enter the body though the ingestion of food (WHO, 2007). Governments all over the world are intensifying their efforts to improve food safety in response to an increasing number of food

safety problems and rising consumer concerns (WHO, 2007). "Food borne illnesses account for about one of every 100 U.S. hospitalizations and one of every 500 deaths" (Buzby *et al*., 2001).

Food borne diseases are known to contribute to both human morbidity and mortality as well as to health care costs (Campbell *et al.,* 1998). Most food-related illnesses have historically been attributed to one of five major groups of pathogenic bacteria (Mboto et al., 2012). These five groups are *Salmonella, Shigella, Clostridium botulinum, Clostridium perfringens, Bacillus cereus, and Staphylococcus aureus*. These have been joined by the emerging pathogens such as *Yersinia enterocolitica, Escherichia coli, Listeria monocytogens,* and *Campylobacter jejuni* (Mboto et al., 2012).

The aim of this study is to determine the microbiological quality of ready to eat food (cooked rice and beans) sold in University of Port Harcourt, Port Harcourt, Nigeria.

2. Materials and methods

Samples of ready to eat foods (cooked rice and beans with stew) were randomly obtained from High class fast food centers within University of Port Harcourt, Port Harcourt, Nigeria. Samples were collected with sterile containers, and were taken under aseptic condition to the laboratory for microbiological analysis.

2.1. Isolation and Identification of Isolates

Ten grams of each ready-to-eat food samples were weighed using a weighing balance and placed into a sterile blender, 90ml of distilled water was also added and the mixture homogenized to obtain a thoroughly blended meat. The homogenized food was aseptically transferred into a sterile beaker. One ml of the homogenized food sample was aseptically transferred using a sterile one ml sterile pipette into a test tube containing nine ml sterile distilled water and tenfold serial dilution was carried out. All media used were prepared according to the manufacturer's instruction. After preparation it was sterilized byautoclaving at $121^{O}C$ for 15 minutes after which it was allowed to cool and 15mls aliquots was poured on sterile Petri dishes. About 0.1ml of suspensions (a mixture of sample and normal saline) was deposited into the surface of the solid media and incubated at $30^{o}C$ for 24 hours. After incubation, they were stored in a refrigerator at $10^{o}C$ (Fouzia and Amir, 2011).

3. Result analysis

A total of ten samples of ready to eat food (cooked Rice and Beans with stew) were analyzed microbiologically for bacteria and fungi count.

3.1. Enumeration of isolates

The total heterotrophic bacteria count of ready to eat rice ranged from $2.45x10^5$cfu/g to $17.8x10^5$cfu/g (Table 1). The total heterotrophic bacteria count of ready to eat beans ranged from $3.5x10^4$cfu/g to $17.1x10^3$cfu/g (Table 1). It was observed that ready to eat rice has the highest bacteria count. The total staphylococcus count ranges from $1.3x10^3$cfu/g to $2.2x10^3$cfu/g (Table 1) for ready to eat rice, and ranges from $2.2x10^3$cfu/g to $3.4x10^3$cfu/g (Table 1) for ready to eat beans (all from the restaurant sample). No Salmonella and Shigella count from any of the food samples.

Table 1: Total heterotrophic bacteria count of ready to eat foods

Samples	Total Heterotrophic bacteria count		Total Staphylococcus count	
	Cfu/g	Log cfu/g	cfu/g	Log cfu/g
Rice ($R_{1)}$	$3.1x10^5$	5.49	$1.6x10^3$	3.20
Rice ($R_{2)}$	$17.8x10^5$	6.25	$1.5x10^3$	3.19
Rice ($R_{3)}$	$3.2x10^5$	5.50	$1.7x10^3$	3.24
Rice ($R_{4)}$	$2.45x10^5$	5.38	$1.3x10^3$	3.11
Rice ($R_{5)}$	$4.15x10^5$	5.61	$2.2x10^3$	3.34
Beans ($B_{1)}$	$7.2x10^5$	5.85	$1.55x10^3$	3.19
Beans ($B_{2)}$	$17.1x10^3$	4.23	$1.6x10^3$	3.20
Beans ($B_{3)}$	$4.2x10^4$	5.38	$1.7x10^3$	3.24
Beans ($B_{4)}$	$3.5x10^4$	4.54	$1.6x10^3$	3.20
Beans ($B_{5)}$	$5.15x10^5$	5.71	$3.4x10^3$	3.58

3.2. Identification of isolates

The isolates obtained from the sampled ready-to-eat foods sold in restaurants in University of Port Harcourt were identified as *Bacillus cereus*, *Escherichia coli*, *Klebsiella pneumoniae,* and *Staphylococcus aureus*.

3.3. Frequency of occurrence of Isolates

Table 2 shows the frequency of occurrence of isolates obtained from the sampled ready-to-eat foods. It showed that *Staphylococcus aureus* [8(42.1%)] is the most predominant organism obtained from the sampled ready-to-eat foods. This was followed by *Escherichia coli* [5(26.3%)] and *Bacillus cereus* [4(21.1%)]. *Klebsiella pneumoniae* [2(10.5%)] was the least predominant as shown in Table 2.

Table 2: Frequency of occurrence of isolates obtained from the sampled ready-to-eat foods in University of Port Harcourt, Nigeria

Isolates	No. (%)
Bacillus cereus	4(21.1)
Staphylococcus aureus	8(42.1)
Klebsiella pneumoniae	2(10.5)
Escherichia coli	5(26.3)
Total	19(100.0)

3.3. Distribution of isolates

Table 3 shows the distribution of isolates obtained from the sampled ready-to-eat foods in University of Port Harcourt, Nigeria. From the result, *Staphylococcus aureus* was obtained from four rice samples (R_1 R_2 R_3 and R_5) and in four beans samples (B_1 B_2 B_3 and B_5). *Klebsiella pneumoniae* was obtained from two rice samples (R_1 and R_4). *Bacillus cereus* was obtained from two samples of rice (R_1 and R_3) and also from two beans samples (B_2 and B_5). Finally, *Escherichia coli* were obtained from two samples of rice (R_1 and R_5) and three samples of beans (B_1 B_3 and B_4) as shown in Table 3.

Table 3: Distribution of isolates obtained from the sampled ready-to-eat foods in University of Port Harcourt, Nigeria

Samples	Isolates
Rice (R_1)	*Bacillus cereus*, *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumoniae*
Rice (R_2)	*Staphylococcus aureus*
Rice (R_3)	*Bacillus cereus*, *Staphylococcus aureus*
Rice (R_4)	*Klebsiella pneumonia*
Rice (R_5)	*Escherichia coli, Staphylococcus aureus*
Beans (B_1)	*Escherichia coli, Staphylococcus aureus*
Beans (B_2)	*Bacillus cereus*, *Staphylococcus aureus*
Beans (B_3)	*Escherichia coli, Staphylococcus aureus*
Beans (B_4)	*Escherichia coli*
Beans (B_5)	*Bacillus cereus*, *Staphylococcus aureus*

4. Discussion

Ready to eat food do not need to be reheated before consumption. The data revealed that bacteria isolated from all food samples collected from the restaurants in University of Port Harcourt were *Bacillus cereus, Staphylococcus aureus*, *Escherichia coli* and *Klebsiella pneumonia* by comparing their morphological and biochemical characteristics with standard reference organisms (Buchanan and Gribbons, 1974; Cheeshrough, 2003; Mboto et al., 2012).

The total heterotrophic count of bacteria ranged from $2.45x10^5$ cfu/g to $17.8x10^5$cfu/g for ready to eat rice and $3.5x10^4$cfu/g to $17.1x10^3$cfu/g for ready to eat beans samples. This is an indication of recontamination in food handling and hygiene techniques (Clarence et al., 2009; Mboto et al., 2012).

In this study, there was presence of *Staphylococcus aureus* in 4 rice samples (R_1 R_2 R_3 R_5) and as well as in 4 beans samples (B_1 B_2 B_3 B_5), collected from four different restaurants among the five that was analyzed. There was also the presence of *Klebsiella pneumoniae* in 2 Rice samples (R_1 and R_4) which is believed that it is a result of storage under a very cold temperature. Also there was presence of *Bacillus cereus* in 2 samples of Rice (R_1 and R_3) and also in 2 Beans samples (B_2 and B_5) of which produce toxins in the food. Also in 2 samples of Rice (R_1 and R_5) and in 3 samples of Beans (B_1 B_3 and B_4), the presence of *Escherichia coli* was found. Amongst all the samples analyzed, there were no fungi found in any of these samples. Microorganism isolated from ready-to-eat food samples in this study have been earlier found in foods, environment and other places and their pattern is similar to previous reports by Clarence et al. (2009) and Mboto et al. (2012). The presence of these organisms in ready-to-eat foods depicts a deplorable state of poor hygienic and sanitary practices employed in the food catering, food handling, processing and packaging of foods. Faecal coliforms such as *Escherichia coli* are generally considered as indisputable indicator of faecal contamination from warm blooded animals (Mboto et al., 2012).

The presence of *E. coli* (26.3%) in this ready-to-eat food samples is an indication of faecal contamination of the foods. This might be due to possible unhygienic handling of the foods during cooking and processing or due to possible contamination from the skin, mouth or nose of the handlers which might be introduced directly into the meat (Schroeder et al., 2005; Mboto et al., 2012). The isolation of *E. coli*, may be as a result of poor environmental conditions due to dust and contamination of the water used during cooking and processing (Talaro and Talaro, 2006; Mboto et al., 2012). *Klebsiella pneumoniae* (10.5%) another organism found in the meats is also a pathogenic organism of public health significance and concerns (Okonko et al., 2009).

E. coli is a normal flora of the human and animal intestine and has been identified as a leading cause of food borne illness all over the world (Hussein, 2007; Mboto et al., 2012). *E. coil* 0157.H7 strain was not detected in any of the ready-to-eat food samples examined. However, diarrhea caused by enterotoxigenic *E. coli* (ETEC) is highly prevalent in young children in developing countries as well as travelers (Duffy, 2006; Mboto et al., 2012). Ready-to-eat foods sold to the public in a restaurant are grossly contaminated with coliform bacteria as well as other bacterial forms.

In this study, the isolation of *Escherichia coli* was 26.3%, *Staphylococcus aureus* 42.1%, *Bacillus cereus* 21.1% and Klebsiella 10.5%. In a study by Gandham (2012), the isolation of *Escherichia coli* was 82.0% and Klebsiella 8.0%. In another study by Joshi et al. (1980), 73.0% isolation of *Escherichia coli* and 4.6% Klebsiella was reported which correlates well with the present study. Another study by Khanna et al. (1977) showed an isolation of *Escherichia coli* 21.1% and Klebsiella (2.8 %). *Echerichia coli* isolation rate in the present study was 26.3%. This is in contrast to the isolation rate seen in the study by Kanduja et al. (1969), Gowal et al. (1984) and Gandham (2012).

The presence of *Staphylococcus auerus*, a

pathogenic organism of public health concern and significance in these ready-to-eat food products might have contaminated the processed food products from source as a result of handling by processors. Improper handling and improper hygiene might lead to the contamination of food and this might eventually affects the health of the consumers (Dunn *et al*., 1995; Adebolu and Ifesan, 2001; Li-Cohen, 2002; Omemu and Bankole, 2005; Lando, 2006; Okonko *et al*., 2008 a,b,c).

Most researchers have looked at the consumer handling practices of individuals of different geographical area to potentially explain differences in foodborne illness rates in different populations. Research findings showed that individuals with higher levels of education, which have a strong positive correlation with high income (Younus et al., 2007), are more likely to eat raw clams, raw oysters, raw fish, raw sprouts and pink hamburger, besides of having unsafe hand and cutting board washing practices (Lando, 2006). Patil *et al.* (2005) combined findings from 20 studies using meta-analysis methods to estimate percentages of consumers engaging in risky behaviors, such as consumption of raw food, poor hygiene, and cross-contamination. They found that high income individuals reported greater consumption of raw food, less knowledge of hygiene, and poorer cross-contamination practices. Redmond and Griffith (2003) reviewed several studies regarding domestic food handling practices, with the majority of the studies placed in the United Kingdom, Northern Ireland and in the United States. They reported that compared with women, men are less knowledgeable about food safety and have riskier hygiene and cooking practices. Li-Cohen and Bruhn (2002) found that women, lower-income households, people 65 years and older, and non-college graduates practice safer food handling methods than men, higher-income households, people younger than 65 years and post-16 college graduates.

It is therefore suggested that ready-to-eat food processors and consumers should be educated on the adverse effect of using untreated or polluted water for processing as these could serve as sources of faecal contamination. However, food processors and consumers should observe strict hygienic measures so that they will not serve as source of chance inoculation of microorganisms and contamination of these processed ready-to-eat foods.

The presence of indicator and other organisms examined in this study is of special concern and perhaps the greatest danger associated with water used for food processing, drinking purposes and for human consumption is contamination by human excrement (Edema *et al*., 2001; Okonko *et al*., 2008a,b,c). The need for microbial assessment of water for production of food and food drinks should also be emphasized to reduce possible contamination (Fagade *et al*., 2005).

5. Conclusion

The findings of this study revealed that ready-to-eat foods sold at University of Port Harcourt, Port Harcourt, Nigeria are contaminated with pathogenic gram negative and gram positive bacteria. The possible sources of these contaminants are due to the unhygienic manner of handling food in the restaurant. This implies that these ready-to-eat foods are viable source of various diseases. Some of these diseases could spread and acquire epidemic status which poses serious health hazards. Irrespective of the presence of these gram negative and gram positive bacteria in ready-to-eat foods analyzed, it is believed that cooking processes and hygiene could greatly reduce the microbial load to harmless level (Agnes, 1995; Mboto et al., 2012).

Conclusively, the presence of these microorganisms in food courses food spoilage and food poisoning. Food should not only be nutritionally balanced, but should be microbiologically safe as well. From the result gotten, it was indicated that these ready to eat food samples did not meet the bacteriological quality standard (WHO, 2007). More closely, supervision should be made on these restaurants around the University of Port Harcourt community by relevant authorities, and further studies should be carried out on other food samples sold in the community, to ensure proper food quality standard.

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Assessment of Asymptomatic Bacteriuria in Pregnant Women in Port Harcourt, South Southern Nigeria

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Abstract: This study investigated the prevalence and the causative organisms of asymptomatic bacteriuria among pregnant women attending their first prenatal visit at University of Port Harcourt Teaching Hospital (UPTH) and Braithwaite Memorial Hospital (BMH), both in Port Harcourt, South Southern Nigeria. A retrospective analysis was performed on the routine prenatal screening (urine culture tests) of 9,698 women attending their first prenatal clinic visit between 1 January 2011 to 31 July 2012. They were reviewed, analyzed, and correlated with data on patients' age, nationality, gravidity, and number of previous abortions. Of 9,698 women, only 166 (1.7%) showed significant bacterial growth, and 1,918 patients (19.8%) were reported as heavy mixed growth. The most common bacterium isolated was *Escherichia coli* on 88 patients (53%). In this study, low prevalence of bacteriuria among pregnant women was compared to published studies conducted in other countries. In view of the paucity of information regarding asymptomatic bacteriuria in pregnancy, and the findings of this study, there is need to conduct a nation-wide survey to guide the revision of medical practice on a national scale in Nigeria.
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Keywords: Prevalence, Asymptomatic bacteriuria, Prenatal screening, Port Harcourt, Nigeria.

1. Introduction

Urinary tract infections (UTIs) are the most common bacterial infections during pregnancy (Cunningham and Lucas, 1994; Lee et al., 2004). The incidence of UTI varies depending on the local prevalence of asymptomatic bacteriuria and whether it is treatable. Asymptomatic bacteriuria (ASB) is a major risk factor for the development of urinary tract infections (UTIs) during pregnancy. Thus, accounting for 70% of all cases of symptomatic UTI among unscreened pregnant women (Jones et al., 2009). It is generally defined as true bacteriuria in the absence of specific symptoms of an acute UTI (Smaill and Vazquez, 2007). Although, the original criterion for diagnosing it was the presence of more than 100,000 bacteria/ml on two consecutive clean catch urine samples, a more practical alternative is the detection of more than 100,000 bacterial/ml in a single voided midstream urine sample (Smaill and Vazquez, 2007; Kass, 1960). Furthermore, ASB occurs in 2% to 10% of all pregnancies (Whalley, 1967). It does not occur more frequently with pregnancy. However, it is more likely to result in a symptomatic UTI in pregnant women (Jones et al., 2009) because of stasis of urine, and the bacteria in the urinary tract from relative obstruction, that is caused by the physiological changes during pregnancy that predispose women to bacteriuria. These physiological changes include the dilatation of the ureters secondary to progesterone, and to the mechanical obstruction from the gravid uterus later in pregnancy. Glycosuria, proteinuria, and aminoaciduria were found in pregnancy and also facilitate bacterial growth (Jones et al., 2009).

As many as 20-40% of pregnant patients with ASB, if left untreated, will eventually develop pyelonephritis later in their pregnancy compared with < 1% of pregnant women without ASB (Lee et al., 2004). Pyelonephritis is the most common severe bacterial infection that can lead to prenatal and maternal complications, including premature delivery, infants with low birth weight, fetal mortality, preeclampsia, pregnancy-induced hypertension, anemia, thrombocytopenia, and transient renal insufficiency (Cunningham and Lucas, 1994; Foxman, 2002). Proper antibiotic treatment of ASB is effective in reducing the incidence of pyelonephritis and low birth weight, but there was no evidence of a reduction in preterm delivery (Smaill and Vazquez, 2007).

Screening for ASB in pregnant women has been shown to be cost effective when compared with treating UTI and pyelonephritis without screening (Rouse et al., 1995; Wedland and Plante, 1989). The various screening techniques used to detect bacteriuria include urinalysis, leukocyte esterase activity, a nitrite test, and urine cultures. A midstream urine culture is still considered the best diagnostic test (Tolosa, 2008). Because ASB is clinically significant in pregnancy, it should be aggressively sought, diagnosed, and treated in all stages. Screening is an essential component of prenatal care (Tolosa, 2008). The American College of Obstetrics and Gynecology advocates routine screening for

bacteriuria with a urine culture at the first prenatal visit and during the third trimester (ACOG, 1998). The US Preventive Services Task Force recommends screening for bacteriuria with urine culture for pregnant women at 12-16 weeks of gestation, hoping to identify 80% of women, who will eventually develop ASB (USPSTF, 2007).

Using a decision analysis, screening for and treating of ASB to prevent pyelonephritis have been shown to be cost effective over a wide range of estimates. Although, the cost benefit diminish if the rate of ASB is less than 2% (Rouse et al., 1995; Wedland and Plante, 1989). Estimates from mathematical modeling to evaluate the cost–effectiveness or cost–benefit of different diagnostic strategies vary significantly, with an approximate incidence rate of 9%, when pyelonephritis is considered as an outcome (Tolosa, 2008). The low prevalence of infection in certain populations, the cost of different screening tests, and the uncertainty about the benefits of treatment in decreasing adverse outcomes of pregnancy have, however, been used to argue against universal screening and treatment (Smaill and Vazquez, 2007).

In Nigeria, there is insufficient old data and scanty recent data about the prevalence of bacteriuria (asymptomatic or symptomatic) during pregnancy. While there are no new data to indicate that women should not be screened for ASB, it is difficult to estimate accurately cost-effectiveness of screening it without up-to-date information on the prevalence.

The primary purpose of this study was to determine the prevalence and the causative organisms of ASB among pregnant women attending their first prenatal visit at two hospitals in Port Harcourt, South Southern, Nigeria; and, Secondly, to evaluate the value of the current policy of universal screening of pregnant women among our local population.

2. Materials and methods

2.1 Study Design and Setting

This is a retrospective descriptive cross-sectional hospital-based study (prevalence study) where the results of the routine prenatal screening urine culture tests of 9,698 women attending first prenatal clinic from 1 January 2011 to 31 November 2012. They were reviewed based on their age, nationality, gravidity, and history of abortions. The data was obtained from two hospitals; University of Port Harcourt Teaching Hospital (UPTH), and Braithwaite Memorial Hospital (BMH). Both hospitals provide tertiary medical care for the regional population of Southern Nigeria.

The screened women were divided into groups according to their nationality: Nigerian and Non Nigerian, age: < 20 years, 20-34 years, > 35-44 years and > 45 years), gravidity: nulliparous/primigravida (G1), multiparous (G2-G5), and grandmultiparous (> G5). In addition to history of previous abortion: Women with and without history of abortion.

A quantitative urine culture was obtained with blood and MacConkey agar plates. Significant growth means; the presence of > 100,000 organisms/ml urine of a single bacterium, while heavy mixed growth means; presence of > 100,000 organisms/ml urine of more than one type of bacteria.

2.2 Ethical Consideraation

Ethical approval was obtained from the Departments of Pathology and Community Medicine, University of Port Harcourt Teaching Hospital Institutional Review Board, Port Harcourt, Nigeria. All information about persons screened was kept confidential. This study did not interfere with the normal management of the patients.

2.3 Data Analyses

Statistical analyses were performed using the Statistical Package for the Social Science (SPSS), Version 16 for Windows. Continuous variables were summarized using descriptive statistics in terms of means±standard deviations; 95% confidence intervals (95% CI), minimums and maximums, while a Chi-square test was used to compare categorical variables. A p-value less than 0.05 were considered significant.

3. RESULTS

3.1 Demographics of Study Population

Of a total of 9,698 pregnant women 6,082 (62.7%) were Nigerian, aged between 15 and 48 years; mean, 27.6 (95% CI = 27.52 - 27.76). Their gravidity range was between 1 - 17; mean 3.53 (95% CI = 3.48 - 3.58). Their parity was between 0 - 14; mean 2.07 (95% CI = 2.03 - 2.12). Their history of abortions range was from 0-11; mean 0.48 (95% CI = 0.46 - 0.5) and were screened for bacteriuria by mid stream urine culture.

3.2 Prevalence of Urine Culture Results and Demographic

Of the 9,698 culture results, 7,614 (78.5%, 95% CI = 77.7 - 79%) yielded no growth; 1,918 (19.8%, 95% CI = 19 - 20.6%) yielded heavy mixed/mixed growth, and only 166 (1.7%, 95% CI = 1.45 - 1.97%) showed significant growth. Figure 1 shows that the most common bacterium isolated was *Escherichia coli*, 88 (53%). Other bacteria included *Candida albicans*, 33 (19.9%); Group B *Streptococcus* (GBS), 18 (10.8%), *Staphylococcus*, 8 (4.8%); *Actinobacter*, 8 (4.8%); *Diphtheroids*, 5 (3%), *Proteus*, 1 (0.6%); and *Klebsiella* 1 (0.6%) species,

Table 1 shows that nationality had significant relationship with the significant growth urine result (χ^2; 32.19; df, 2, p = 0.0005). Most of the significant growth was among Nigerian nationality group, 139 (2.3%). Age groups had considerable relationship with the significant growth urine culture result (χ^2;

48.8; df, 6, p = 0.0005). Most of the significant growth occurred in the 35-45 age group; 43 (2.8%), followed by age group 20-34 years; 123 (1.7%). There was no significant growth among age group < 20 years and > 45 years.

Gravidity/parity groups also had considerable relationship with the significant growth urine result (χ^2; 35.17; df, 6, p = 0.0005). Most of the significant growth was observed in the multiparous (G2-G5) group, 112 (2.2%), followed by grandmultiparous (> G5); 30 (1.5%). The primigravida/nulliparous group showed significant growth only in 24 women (0.9%). History of previous abortion had no relationship with the urine culture result (χ^2; 0.258; df, 2, p = 0.879). The results of this study showed that the most significant growth was found among Nigerian women, in 35-45 years age group and in the multiparous (G2-G5) group.

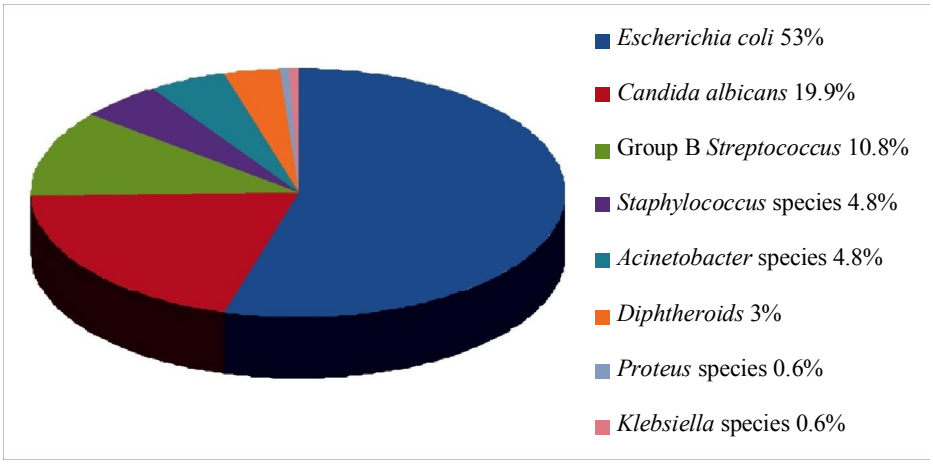

Figure 1: Percentage occurrence of isolated pathogens.

Table 1: Summary of 9,698 Urine Culture Results and Patient Demographic Characteristics.

Characteristics / Urine results	NO Growth N (%)	Mixed Growth N (%)	Significant Growth N (%)	Total N (%)	χ^2 (P-value)
N (%)	7614 (78.5%)	1918 (19.8%)	166 (1.7%)	9698 (100%)	
NATIONALITY					
Nigerian	4737 (77.9)	1206 (19.8%)	139 (2.3%)	6082 (100%)	32.19 [a],
Non Nigerian	2876 (79.6%)	711 (19.7%)	27 (0.7%)	3614 (100%)	(0.0005)
Total	7613 (78.5%)	1917 (19.8%)	166 (1.7%)	9696 (100%)	
AGE (years)					
< 20	531 (76.2%)	166 (23.8%)	0 (0.0%)	697 (100%)	
20 – 34	5809 (78.1%)	1504 (20.2%)	123 (1.7%)	7436 (100%)	48.8 [b],
35 – 45	1227 (81.0%)	245(16.2%)	43 (2.8%)	1515 (100%)	(0.0005)
> 45	47 (94.0%)	3(6.0%)	0 (0.0%)	50 (100%)	
Total	7614 (78.8%)	1918 (19.9%)	166 (1.7%)	9698 (100%)	
GRAVIDITY					
G1	2018 (77.6%)	557 (21.4%)	24 (0.9%)	2599 (100%)	
G2-G5	3970 (77.6%)	1032 (20.2%)	112 (2.2%)	5114 (100%)	35.2 [c],
>G5	1620 (81.9%)	327 (16.5%)	30 (1.5%)	1977 (100%)	(0.0005)
Total	7614 (78.8%)	1918 (19.9%)	166 (1.7%)	9698 (100%)	
History of previous Abortions					
NO	5362(78.4%)	1354(19.8%)	120 (1.8%)	6836 (100%)	
YES	2235(78.7%)	558(19.7%)	46 (1.6%)	2839 (100%)	0.258 [d]
Missed	17	6	0	23	(0.879)
Total	7597 (78.3%)	1918 (19.9%)	166 (1.7%)	9698(100%)	

[a] df,2; [b] df,6 ; [c] df,6; [d] df,2

Abbreviations: $\chi^{2=}$ Chi-square test; G1=primigravida/nulliparous, G2-G5=multiparous, >G5=grandmultiparous.

4. Discussion

ASB occurs in 2-10% of all pregnancies (Whalley, 1967). The majority of the most recent studies, including observational studies from developing countries, found the prevalence range between 4-10% (McNair et al., 2007; Mohammad et al., 2002; McIsaac et al., 2005; Tugrul et al., 2005). This range during pregnancy was reported to be as high as 78.7% in a population from Nigeria that included *Staphylococcus aureus* as an uropathogen (Amadi et al., 2007). This variation in studies can be attributed to several factors such as the geographical variation, socio-economic status, ethnicity of the subjects, setting of the study (primary care, community based, or hospitals), and the variation in the screening tests (urine dipstick, microscopy, and culture).

Race-specific rates show significant variation, as well as there is variation within same race living in different geographical areas or with socio-economic status. Reported prevalence of ASB among Bangladesh pregnant women living in London was 2.0% and 12% in rural areas in Bangladesh (Ullah et al., 2007). Thus, it is important to evaluate the prevalence of ASB in a specific population. This study reported that the prevalence of ASB among pregnant women attending their first prenatal visit in two tertiary health centers in Port Harcourt, South Southern Nigeria was 1.7% (95% CI: 1.45-1.97%). This rate is much lower than that reported in a study from Saudi Arabia; 14.2% bacteriuria in pregnant women from the eastern region of Saudi, where only 25% of the women were symptomatic (i.e., the prevalence of ASB was 10.5%). 15.8% bacteriuria was reported in 1991 from the Western region of Saudi, where the ASB was 7.1% (Al-Sibai et al., 1989). Furthermore, the prevalence rate in this study was much lower than the recent reports from other Middle Eastern countries. For example, the reported prevalence of ASB is 30%, 9.9%, 3.3-6.1% and 4.8% among pregnant women in Yemen (Al-Haddad, 2005), Iran (Hazhir, 2007; Aseel et al., 2009) and United Arab Emirates (UAE) (Abdullah and Al-Moslih, 2005), respectively. However, the prevalence in this study was the same as what has been reported in Malaysian pregnant women (1.9%) (Mohammad et al., 2002) and Bangladesh women (2%) living in London (Versi et al., 1997). The explanation for the low prevalence could have been due to the improved socio-economic status. Particularly, in the study that was reported from the Asian countries where bacteriuria was significantly more common among the low socio-economic group. The higher prevalence was in Qatar, Iran, and UAE; perhaps it's because their patients were recruited from primary heath care centers while patients were from tertiary centers in this study.

E. coli has been identified as the most common pathogen isolated among the pregnant women in this study (Figure 1), which was consistent with the majority of the reported studies in literature (Jones et al., 2009; Smaill and Vazquez, 2007; Wedland and Plante, 1989; Whalley, 1967; Tugrul et al., 2005; Fatima and Ishrat, 2006). However, *E. coli* formed 53% of the isolated organisms, which is lower than what have been reported in countries such as Pakistan, 2006 (78.6%) (Fatimat and Ishrat, 2006); Turkey, 2005 (77%) (Tugrul et al., 2005); Iran, 2009 (70%) (Aseel et al., 2009) and in UAE, 2005 (66.7%) (Abdullah and Al-Moslih, 2005). Moreover, higher than Qatar, 2009 (31%) (USPSTF, 2007); Malaysia, 2002 (40%) (Jones et al., 2009); Yemen 2005 (41.5%) (Foxman, 2002; and Nigeria, 2006 (11.1%) (Akinloye et al., 2006). *E. coli* is the most common microorganism in the vaginal and rectal area. Because of the anatomical and the functional changes that occur during pregnancy, the risk of acquiring UTI from *E. coli* is high (Mohammad et al., 2002).

The prevalence of *Candida albicans* in this present study (19.9%) is higher than other studies (Mohammad et al., 2002; Akinloye et al., 2006) . Western Nigeria, 2006 (7.9%) and Malaysia (2 out of 32 cultures; 6.25%). The physiological alterations during pregnancy that affects immunity and high prevalence of diabetes, including gestational diabetes, among our population may account for this high prevalence of *C. albicans*.

Group B streptococcus (GBS), which is occasionally isolated in urine (10%) (Kennedy, 2005), had a prevalence of 10.8% in this study, less than that reported from Malaysia (15%). GBS bacteriuria may be associated with preterm rupture of membranes, premature delivery, and early onset neonatal sepsis. Thus, all pregnant women with these bacteria during gestation should receive treatment at the time of diagnosis, as well as intrapartum antibiotic prophylaxis (Lee et al., 2009; Smaill, 2010). The 19.9% of mixed bacterial growth reported in this study was similar to that reported from Malaysia (17.2%) (Mohammad et al., 2002) and less than 25.5% previously reported in Nigeria (Amadi et al., 2007) It likely indicates that contamination of urine specimens still happens, despite the strict instructions given to patients about the collection of a midstream urine specimen. Proper collection, appropriate transport, and the early processing of urine specimens remain essential.

During pregnancy, bacteriuria/UTIs are more common in women who are older and of higher parity (Foxman, 2002; Dwyer and Reilly, 2002). However, closer scrutiny of the published literature reveals that the age and parity effects are poorly

characterized. For example, some studies showed that the prevalence of ASB increased with age (Tugrul et al., 2005; Amadi et al., 2007), while others found it more with a younger age group (Hazhir, 2007; Ullah et al., 2007; Al-Sibai et al., 1989). This study showed the age groups had a significant relationship with the urine culture result, and there was no positive growth among age group < 20 years and > 45 years. This observation among these groups was similar to recent data from Iran (Fatima and Ishrat, 2006). Nevertheless, in contrast to previously published data by Al-Sibai *et al.*(1989) bacteriuria was more common (23.2%) among women below the age of 20 years. The reason for this observation was not obvious.

With regard to gravidity/parity, some previous studies found that the prevalence of ASB was highly associated with multiparity (Tugrul et al., 2005; Akinloye et al., 2006). In the present study, gravidity had a significant relationship with urine culture results, and primigravida (nulliparous) women had lower rate of bacteriuria than those who had babies. This rate was consistent with previously published data in Saudi Arabia (Al-Sibai et al., 1989). However, the rate of ASB among primigravida/nulliparous women was 10 times (9.6%) more than our current rate (0.9%) (Al-Sibai et al., 1989). Multiparous groups (G2-G5) in the present study had higher bacteriuria than nulliparous/ primigravida, and grand multiparous women (> G5). Though, no meaningful trends were observed with increasing parity. Versi and colleagues (1997) found that grand multiparous white women had a higher bacteriuria rate than white women of lower parity. This trend with parity was not observed in the Bangladesh women. He hypothesized that the effect of parity was not global, but rather dependent on race and/or geography. This hypothesis was not true as even in the same ethnic group the pattern of the prevalence of bacteriuria with age and parity was not consistent over time. For example, studies on Nigerian women (Olusanya et al., 1993) showed higher bacteriuria rates among nulliparous women in 1993. A 2006 study confirmed it was higher in multiparous women, and that the multiparity was associated with increased bacteriuria in pregnancy (Amadi et al., 2007).

In conclusion, the result of this study updates information on the prevalence of ASB among pregnant women attending their first prenatal visit in two tertiary centers in Port Harcourt, South Southern Nigeria. The prevalence was low (1.7%), and the predominant organism, *E. coli*, was 53%. A large scale national study that includes primary health care centers should be conducted to determine the actual prevalence of ASB in the obstetric population in Nigeria, and to identify the group that is vulnerable for developing a UTI. If low prevalence is confirmed at the national level and vulnerable groups are identified, it is more cost effective to recommend selective rather than universal screening for ASB in pregnancy. Predominantly, because the cost benefit of screening for, and the treatment of ASB, to prevent pyelonephritis, have shown to be diminished if the rate of ASB is less than 2%. However, the uncertainty of the benefits of treatment in decreasing adverse outcomes of pregnancy is not clear.

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Distance learning tools in adult education

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Abstract: While there is still prejudice surrounding some distance learning, it is increasingly being accepted as an alternative to traditional classroom learning. Courses can be offered via the Internet, where students are able to interact with instructors and other students without physically being in the same room. Getting a college education can be difficult for people with inflammatory bowel disease (IBD). Frequent trips to the restroom, exhaustion, doctor visits, and medication side effects are all barriers to the traditional college experience. What if you could get the degree without ever setting foot on a campus? You can do just that through distance or virtual learning. Distance learning has been around for a long time (we've all seen the commercials on TV).
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Keywords: adult education, distance learning.

Introduction:

As in most European countries, adult education has been a tradition for several centuries. The present structure of formal adult education - evening and correspondent institutions on the three levels of education - was developed between 1945 and 1950.

Adult education before the 2nd World War was mainly in the framework of courses, which form was preserved after 1945 as well, but in a radically restructured form.

The folk high school bandwagon that developed intensively between the two World Wars, withered away after 1949 for political reasons. At the same time, the "educational" subsector of adult education in organised forms under state supervision, Only the negative consequences are obvious: getting more education often means leaving one's family and community for jobs and opportunities for advancement somewhere else. The future of Kentucky depends on uplifting the quality of life and economy of all of Kentucky. The social and economic costs of neglect of large parts of the state will drag down the rest of the state and seriously hinder its capacity to compete in the global economy.

Much like strategies to curb epidemic, strategies to reduce illiteracy and raise the educational attainment of Kentucky's population must include both short-term efforts to face the immediate crises as well as long-term strategies to get at the underlying causes. Short-term crises include the imperative to keep helping welfare clients make the transition from welfare to work within the constraints of federal and state mandates and the need to train workers for immediate employer demands. Long-term prevention must address the underlying, persistent problems of the state's economic structure as well as the low awareness--if not appreciation--among segments of the population of the vital connection among education, employment, and improved standards of living.

The everyday approach towards the expression of *adult education* is general and covers everything in connection with formal teaching, educating, training of adults .

In parallel with this concept, there is another interpretation of what is rather an education policy or an education administration nature, namely that adult education covers programmes with well-determined purposes and functions that have results visible in real life, particularly in the labour market.. By this concept adult education and adult training are differentiated, *adult education* means formal learning in institutions where general programmes dominate, and *adult training* covers everything that is oriented to give a mainly specialized and professional knowledge, or is not a systemic part of formal education.

The Adult Education Act (Act 101 /CI/, 2001), which came into force in 2001 uses the general interpretation of the concept as a starting point, which on one hand regulates only a part of it, training outside formal education, and on the other hand it extends it with services that are in connection with adult education. This act defines the training user target group (adults) as persons or individuals who have fulfilled their compulsory school attendance, which means people over 18 according to Hungarian regulations still in force. (At the same time, students in tertiary education with student status are not included).

Adult education in the local agricultural education program is an essential component of the "total" program. Offering adult education programs helps to keep farmers and agribusiness employees better informed of current trends and provides them

with opportunities to learn new skills and improve existing ones. Teaching adults can be very challenging, but also very rewarding. Most teachers would agree that the benefits derived from a successful adult education program in agriculture far outweigh the costs. In addition to the direct benefits to adult participants, the teacher, the school, the community, and the secondary program also benefit from a quality adult education program in agriculture.

The role of the agriculture teacher should be as a facilitator of the learning process. Most adults reject the traditional teacher-student relationship, which is necessary to maintain in secondary programs. Teachers should be encouraged to view themselves as partners with adult participants in the learning process. The democratic philosophy of shared responsibility for planning, conducting, and evaluating adult education programs distinguishes adult education from secondary education.

A local plan for adult education in agriculture should consist of two major components. Namely, a broad statement of philosophy, goals, and objectives of the local adult education program, and an annual calendar of program activities.

Distance Learning Program

Distance learning is one of the fastest-growing components of higher education. Almost 3.5 million students were enrolled in at least one distance learning course in the fall of 2006 and online enrollments are increasing every year. The convenience of taking classes at any time from any location appeals to today's adult learner, especially those who work, have families or live in rural areas. Below are several important factors to consider in choosing a distance learning program.

Accreditation.

Accreditation is a means of ensuring the quality and effectiveness of higher education institutions and programs in the United States. Eight regional accrediting agencies accredit most of the colleges and universities in the United States. A host of national and professional accrediting organizations also exist, including the Distance Education and Training Council (DETC), an organization that identifies and accredits distance learning programs. These twelve questions outlined by the Council for Higher Education Accreditation are helpful in examining a distance learning program's claims of acccreditation. In evaluating distance learning paralegal programs, determine if the school is accredited by one of the regional accrediting bodies and by the American Bar Association (ABA). ABA-approval signifies that the school has met certain standards in terms of academics, facilities and instruction. Graduating from an ABA-approved school may give you an advantage in the legal job market.

Reputation.

The reputation of the distance learning program you attend may hinder or enhance your post-graduate employment prospects. In evaluating the reputation of a distance learning program, you should not solely rely on the school's website or marketing materials. Other ways to investigate the reputation of a distance learning program include:

- Visiting the school.
- Talking to alumni (contact the career services department for alumni names and contact information).
- Researching the distance learning program's record with the Better Business Bureau.
- Talking to paralegals, attorneys and legal employers about the reputation of the school you are considering.
- Researching the school in print publications, news articles and on the Internet.

Academic Offerings.

When evaluating distance learning programs, it is also important to consider the program's academic offerings. A quality distance learning program offers a comprehensive curriculum with a variety of options, electives and advanced coursework. Talk to professors or an academic dean regarding the content and delivery of courses. The American Association for Paralegal Education (AAfPE) recommends that paralegal instructional content include courses in legal research and writing, litigation, ethics, contracts, business organizations and torts. In addition, courses should develop students' critical thinking, communication, computational, computer and organizational skills, and competency to handle ethical issues, according to the AAfPE. Legal programs should also offer an experiential learning component such as an internship, practicum, pro bono work or clinical experience. These are great resume-building opportunities and allow you to learn practical skills and gain real-world experience.

Instructional Technologies.

Distance learning courses can be delivered in a variety of ways through a growing array of technological tools including audio tapes, CD or DVD ROM's, e-mail, telephone conferences and web-based delivery systems. Questions to ask include whether the program employs a mix of instructional technology? Is hands-on training and support provided? Can students preview courses online and try out the technologies before enrolling?

Teaching Staff.

The faculty is the backbone of any distance learning program. Are the courses taught by professors or are the courses pre-taped correspondence instruction? If the courses are taught by instructors, what is the background and qualifications of the teaching staff? Are classes taught by paralegals, attorneys or a mix of both?

Career Services.

Another important consideration in any distance learning program is the extent and quality of its career services program. Research indicates that the greater the resources offered by the career services department, the greater the program's job placement success. You might inquire as to what percentage of graduates find related employment following graduation and whether the career center offers personalized career counseling, job placement assistance, job search seminars, online job boards or resume assistance.

Conclusion:

Additional material for the next stage of learning often means to be expected when developing your learning skills Learners to increase awareness and enjoyment of reading and studying to operate.

To improve the quality of life, learning materials should reinforce the skills they acquired previous. This material should have access to information and provide new technology. should also have to make learning more fun. Additional materials should provide opportunities for literacy skills to read and to strengthen their cognitive awareness.

Track materials (continued) which increased literacy skills and knowledge gained is also effective in enriching learning environment for learners are important. Participatory materials to ensure the participation of learners in the learning process and codification are included out of class activities, dialogue, role playing, etc.

In traditional programs that the principles of psychology and curriculum planning, less attention is the form of content presentation ie codification and providing books, original format and have the dominant form, while for adult content that could have valuable experience in addition to writing, other ways also be provided Affect the selection of pictures and images related to the concepts and content produced by including them.

Learning activities such as activities outside the classroom, dialogue, role playing and ... Another type of content is presented. Duties are placed on the learner, a resource for developing knowledge, skills and insights he considered.

Curriculum content only from the training provided to learners or not, but put together their learning through activities that can inform or does, skills and attitude to achieve. In this case, apart from learning that the assays taught learners directly to sustainable and effective learning occurs in his.

Another way of providing content that is educational activities outside the learning environment possible for learning more and better enables adult learners. For example, hits, field trip experiences for learners or transfer is provided, develop knowledge, insight and skills they will.

To ensure that science curriculum and educational aspects, according to community needs and audiences, application form is provided or not, the content selection criteria should be considered. These criteria is being include knowledge, effectiveness, flexibility, diversity, relevance and practical learning

The geographical distribution indicates that large areas have been left or abandoned without any provision. In a county with several hundred thousand inhabitants and where the rate of people with unfinished basic education is over the national average, there is just one institute. This occurred despite the fact that these schools have a demonstrable function to provide a second chance for underachievers who score below literacy level, to improve their literacy skills.

There are two main reasons which have led to the reduction in number of institutes and their vanishing role, firstly the need for them has dropped (the rate of people with unfinished basic education has decreased within the population), and secondly because the supporting system has changed and the responsibilities (maintaining schools and their specializations) is now the task of local authorities, and the state budget gives significantly less support compared with the refunds for initial education.

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