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PREFACE

It is a great honor for us to hold the third National Conference in Applied Sciences & Humanities (NCASH) under MULTICON – W 2018 scheduled during February 23 – 24, 2018. Multicon –W 2018 is the Ninth Event in the series of International Conferences organized by TCET. The present National Conference NCASH 2018 is organized in view of strengthening and achieving Vision & Mission of the institute and technological need of hour.

Keeping in view the importance of research and development of interdisciplinary areas, TCET department of Humanities and Sciences took an initiative of organizing NCASH 2018 to provide a platform for deliberation and exchange of novel ideas amongst academicians, researchers & professional in the relevant discipline and domains, the multidisciplinary theme of conference has attached the attention of some of the best minds in the field and representative for leading institutions to use the platform for showcasing their research and ideas. This conference will be an immensely enriching experience for research scholars, faculty members and industry delegates.

The department faculty members and students are highly indebted for providing unconditional support and motivation from the management of Thakur Educational Group.

The organizing committee expresses heartfelt thanks to the research scholars, faculty members and students who presented their papers during the two days of conference. All possible efforts are made by the editorial committee to keep up the standard and quality of the conference proceeding without changing the main views, thoughts and ideas of the authors.

We hope that these two days of discussions and deliberations and exchange of ideas in NCASH 2018 will instrumental in providing new knowledge to all the delegates. Our best wishes and good luck to all.

Dr. B.K. Mishra,

Program Chair-NCASH 2018

NCASH- 2018

TiO_2 Doped Polyaniline Nano-Composites

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***Abstract*- Polyaniline (PANI)/TiO_2 nano-composite samples with different percentages of TiO_2 doping with a chemical oxidative method were used for synthesizing at room temperature. TEM was used for characterizing the composition, morphology and structure of the polymer and the nano-composites. It is known that in comparison to the pure TiO_2 and PANI based sensors, the TiO_2 PANI exhibits the faster response in gas detection, and higher sensitivity. Furthermore, the sensitivity of TiO_2 /PANI nano-composite thin film based sensors toward hydrogen gas is increased with increasing the TiO2 concentration in PANI matrix.**

Keywords: Polyaniline, Nano-Composites, PANI .

I. INTRODUCTION

Various intrinsic polymers especially subcategory of conducting polymers have drawn considerable interest from last few years [1-4] due to its proven applications in the field of energy storage [3], optoelectronic devices [5], molecular recognition and gas sensing [6]. An array of alternate double and single bond in the chemical structure of these polymers make them a soft target for ease oxidation and reduction reaction. These tuned characteristics frame them as a good sensing material. Among various derivatives like poly-pyrole, polyacetylene, polythiophene, polyaniline has attained more interest due to simple synthesis, environmental stability, and distinctive conduction mechanism [4-6].

Numerous chemical and electrochemical processes are well documented for Polyaniline synthesis [4-6]. Still there is a plenty of space available in the improvement of chemical synthetic procedure of it. Therefore, in the present report we came across the effect of acid and hybridization of metal oxide (nano range) with polyaniline. Preliminary study of theses composites towards gas sensing has given remarkable outcomes. It was found that microstructure, surface morphology and roughness were showing vast persuade on sensing properties. Our sensing study is still at beginning stage so we mainly documented the synthesis of plain polyaniline and TiO2-polyaniline thin film

II. EXPERIMENTAL METHOD

A) Material

Aniline, hydrochloric acid, oxidizing agent potassium like dichromate, tartrate was procured commercially sources (Aldrich/Merck). Titanium ethoxide was directly purchased from local resources. The sample was characterized by transmission electron microscopy (Vega Digital microscope imaging systems) with a voltage of 50kV. All the synthesis has been carried out in the Argon atmosphere.

B) Preparation of Aniline hydrochloride

To a 0.01M distilled aniline solution (20 mL) a solution of 1 M HCl (30 mL) was added and contents were stirred for 10hrs at room temperature. Reaction was cooled at freezing temperature using an ice bath; solid form of our desired product was isolated. Product was partially dried under vacuum, filtered by using Buchner funnel. Polymer was later thoroughly washed with diethyl ether and hexane to remove excess aniline, resulted white crystalline powder.

C) Synthesis of Polyaniline

An aqueous solution of oxidant potassium dichromate was added to aniline hydrochloride solution in same solvent. As the process of oxidation polymerization started the temperature raises with progress of reaction. Reaction was continued for 4 hrs at room temperature after that solution was left undisturbed for rest overnight. The pasty mass was quenched with 1M oxalic acid followed by subsequent washing through deionized water and diethyl ether. Resulting polyaniline derived emeralidine salt was treated with NH4OH to convert it in basic form to achieve better solubility in aprotic solvent. This precipitate was washed with acetone and dried under reduced pressure.

D) Synthesis of TiO_2 doped Polyaniline

TiO_2 solution was prepared by standard sol gel method. The precursor solution was prepared by the mixing of aqueous solution of KCl in to an ethanolic solution of acetyl acetone and stirred the reaction mixture for 2 hrs. In the resulting solution titanium ethoxide was added in to drop by drop fashion. The hybridization of resulting precursor solution and polyaniline base was done by direct addition with 1:1 volume ratio. Composite TiO_2-polyaniline solution were coated on to SiO_2 deposited silicon based substrate by using spin coating technique to form different thickness of composite films. TEM was used for characterizing the thin film surface morphology .TEM micrograph shows that TiO2 nanorods are uniformly distributed in PANI-TiO_2 nano-composite. Resulting morphology TiO_2 doped Polyaniline belong to nanofibre with uniform diameter of 30-50 nm. The nanofibres length was found to be varying from 500 nm to several micrometers forming good interconnected networks. In PANI–TiO_2 nano-composites, the strong interaction at the interface of TiO_2 and PANI reduces the decomposition, which is supported that the presence of TiO_2 nanorods can improve properties of the conductive polymer.

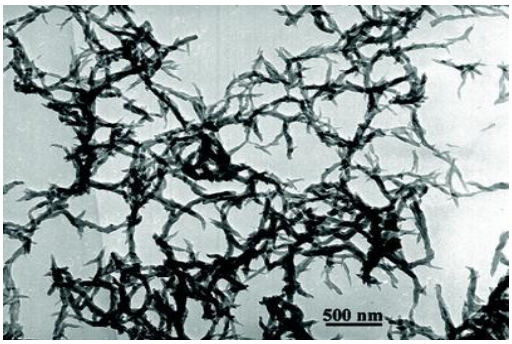

Fig. 1: TEM image of TiO_2 doped Polyaniline

Development of gas detection system is still under the process which is based on variation in conductivity of resulting sensing material towards various gases. The electrical response via current during the sensing was measured with multimeter. A response was observed by increasing and decreasing the current flow.

III. Conclusion

Polyaniline and TiO2 doped PANI was synthesized, and characterized to produce standing film with variation in parameters like reaction condition, doping time and level of doping . These variation effect the overall conductivity. The formation of rough morphology improves the interaction with analyte (sensing gases). It is found that the morphology, size, crystallinity, electrical properties, and gas sensing behavior of the TiO_2 /PANI composite thin films are affected by the concentration of TiO_2 in PANI. It is experimented further to continue that during the polymerization, most of TiO2 nano-particles are coated with PANI and forms a honey-comb like open porous structure having large surface area, which is suitable for H_2 gas sensing applications. The electrical conductivity of TiO_2 / PANI composite films slightly increased with increase inTiO_2. The gas sensing properties are to be experimented further.

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Finite Element Method for Machining of Composite Materials: A Review

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Abstract- **Composite materials are as a rule broadly utilized as a part of aviation and car industry. The interest for composite materials is expanding because of their better properties, for example, high quality than weight proportion, great consumption protection and high firmness. Operations such as boring, orthogonal cutting, turning are significant for composite materials to meet the dimensional and utilitarian prerequisites. Penetrating is a noteworthy procedure in assembling of gaps, required for gathering the segments in modern applications. Boring of openings in composites prompts a penetrating instigated harm called delamination. The analysts have attempted to decrease the boring instigated harm by limiting the working factors and device outline. Be that as it may, the examination on delamination investigation utilizing Finite Element Method (FEM) is constrained. This paper gives an exhaustive writing audit on machining of composites which for the most part concentrates on regular strategies like turning, processing, trimming and boring and furthermore on reenactment techniques including discrete component strategy and limited component technique. A brief and inside and out audit for boring of composites utilizing limited component technique is conveyed, which gives an information on harm of the composites caused amid penetrating and orthogonal cutting. Examination of trial and reproduction comes about demonstrates a general vision on machining of CFRP utilizing FEM instruments.**

Keywords: Finite element method, Drilling, Orthogonal cutting, Delamination, Discrete element method, Composite laminates.

I. INTRODUCTION

During the previous years the concern for composite overlays, for example, carbon fibre reinforced polymer (CFRP), glass fibre reinforced polymer (GFRP), fibre metal composite laminates (FMLs), metal matrix composites (MMCs) and ceramic matrix composites (CMCs) [1] is expanding because of their unrivaled mechanical properties, for example, high quality to weight proportion, high firmness to weight proportions, high damping limit, great dimensional steadiness and great erosion and weakness protections [2-6]. Composite materials are framed by the blend of at least two materials to accomplish properties that are better than those of its constituents. They are copiously utilized as a part of different assembling divisions, for example, flying machine, shuttle, car, marine, synthetic preparing gear and wearing merchandise.

Because of their high favorable circumstances the metallic materials are getting supplanted by composite materials. As a centrality of expanding scope of uses of fiber composites, the machining of these materials has turned into an essential territory for explore. Composite materials are manufactured to their close net shape by hand lay-up, autoclave forming, pressure embellishment, pultrusion and fiber winding procedures [7-12]. Turning, processing and boring are the essential post machining operations which are done to meet the surface quality and dimensional resiliences [13]. 40% of metal evacuation is finished by penetrating operation in airplane business [14]. As composite materials are heterogeneous and anisotropic in nature, amid machining material harm happens, for example, delamination, opening shrinkage and fiber haul out [15,16].

Delamination is the most basic harm happening amid machining which brings about overwhelming misfortunes in ventures [17]. Delamination diminishes the basic trustworthiness of the material which causes long haul execution disintegration of the composite structures [18]. Laser cutting, water-stream cutting, ultrasonic cutting, electro release machining are a portion of the diverse non-customary machining process which are performed in creatingcavities in composite materials [19]. A considerable measure of research has been done to explore and create ideal apparatus point geometry for boring openings in composite materials, yet the work done utilizing limited component display for breaking down penetrating instigated delamination is restricted [20]. This paper gives a total audit on the diverse reenactment strategies performed on processing, boring and orthogonal cutting. Brief depiction on limited component technique and discrete component is likewise given. A couple of articles clarify the correlation of limited component and trial strategies. Process parameters which impact the surface harshness and delamination amid penetrating and orthogonal cutting utilizing limited component technique and discrete component strategy have likewise been talked about.

II. MACHINING OF COMPOSITES

The machining of composite materials not just relies upon the properties of fiber and network creation, it additionally relies upon the fiber introduction and volume division. Carbon fibre reinforced polymer (CFRP), fibre reinforced plastics (FRPs), glass fibre reinforced polymer (GFRP), metal matrix composites (MMCs), fibre metal composite laminates (FMLs), ceramic matrix composites (CMCs) and characteristic filaments demonstrate comparable material properties. They draw examine interests from the machining perspective. More number of research work has been done in machining perspective, which incorporates ordinary procedures like turning, processing, boring [27,29,38,40,126-128] and furthermore the unusual procedures, for example, laser removal, water-stream cutting [42,48,50,52,132,133]. This segment gives a short portrayal on various traditional procedures and furthermore how the procedure parameters impacts the cutting execution and the surface quality on machined territory is examined.

Conventional process:

Composite materials are created to their close net shapes amid assembling, however these materials require machining to accomplish dimensional precision and to deliver openings required to achieve congregations. Machining might be performed earlier or after the curing of material. Machining of composites is done by both customary and non-regular techniques.

Conventional procedures which are oftentimes utilized are turning, processing, penetrating, granulating, trimming, countersinking and sawing. Conventional process is done by choosing legitimate instrument geometry, cutting pace and bolster rate. Table 1, gives distinctive machining operations performed on composite covers by number of scientists. In this area a short portrayal of turning, processing, trimming and boring are clarified beneath.

Table I: Machining operations performed on different types composite materials.

Machining operation	Material	References
Orthogonal cutting	FRP	Wang & Zhang [2]
	MMC	Ciftci et al. [109]; Li &Seah et al. [111]; Weinert [112]; ElGallab et al. [114-116]; Muthukrishnan et al. [117]
Drilling	FRP	Singh et al. [5]; Abrao et al. [77]; Amrinder et al. [82]
	CRPF	Karnik et al. [4]; Gaitonde et al. [6]; Hocheng&Tsao [10]; Faraz et al. [15]; Durao et al. [16]; Piquet et al. [55]; Murphy & Gilchrist [57]; Fernandes& Cook [58,59]; Tsao et al. [60,63,64,67,69,70,84]; Shyha et al. [61]; Marques et al. [66]; Won &Dharan [85]; Hamzeh et al. [88]; Cundall&Strack [89]
	GFRP	Palanikumar et al. [11]; Caprino et al. [18]; Tagliaferri et al. [19]; Abrao et al. [41]; Khashaba et al.[17,74]; Sonbaty et al. [86]
Milling	FRP	Kalla et al. [37]
	CRPF	Hocheng et al. [30]; Davim et al. [31,36]; Khairushshima et al. [39]
	MMC	Denkena et al. [38]; Suresh et al. [40]
Turning	CRPF	Rajasekaran et al. [25]; Santhanakrishnan et al. [27]
	GFRP	Palanikumar et al. [28]; Lee [29]

A) Turning

In tube shaped segments turning operation is completed to accomplish dimensional resistances. Unmistakable gadget materials which are used as a piece of turning of composite materials are cemented carbides, cubic boron nitride (CBN) and polycrystalline diamond (PCD) [22-24]. A large portion of the examination work stresses the test to limit the surface unpleasantness as surface quality relies upon the nourish rate, profundity of cut, cutting pace and furthermore on device properties, for example, geometry, material [25, 26].
Santhanakrishnan et al. performed operation such as face turning operation on CFRP[27]. Cutting wonders and devices execution was examined tentatively utilizing sintered carbide device. Instrument execution was assessed on following parameters, for example, apparatus wear, surface harshness and chip development. The outcomes demonstrated that uniform surface quality can be acquired utilizing sintered carbide apparatus amid machining. Investigation was done by utilizing fluffy rationale calculations to examine the surface harshness in CFRP material by Rajasekaran et al. [25]. Surface unpleasantness was examined in view of parameters like sustain rate, cutting rate and profundity of cut. Instrument material utilized for the investigation was made of cubic boron nitride (CBN). Conclusion was made that, most importantly of the parameters said above encourage rate had more effect on surface harshness of the material. Surface harshness was controlled by Palanikumar et al. [28] utilizing Taguchi and reaction surface approachs. The outcomes demonstrated that, high cutting paces, high profundity of cut and low nourish rates are the variables that can give a decent surface complete the process of amid machining of the material. Increment in nourish rate builds surface harshness, while cutting pace and profundity of cut does not impact the surface unpleasantness was proposed by Lee [29].

B)Milling and Trimming

Processing and trimming operation, as appeared in Fig .1(a, c) [21] are utilized as a material evacuation process in machining of composites. Trimming operation is completed in composite materials, to accomplish form shape precision. Machining of complex shapes and a high surface complete can be gotten amid processing operation [30-32]. Excellent surface of composite material relies upon the variables, for example, sustain rate, cutting rate, device nose sweep and apparatus wear [33-36]. Surface harshness of the material increments with increment in encourage rate and as the cutting rate builds surface complete reductions. Delamination and burr arrangement are framed amid processing. The primary driver behind the material harm is because of the mind boggling communication which happens between the closures of the factory and the composite overlay amid machining. Precise expectation of push drive and hub cutting power are the key variables which can lessen the previously mentioned material harm amid processing [37]. Denkena et al. [38] suggested helical processing to lessen the delamination and burr progress while machining the metal network composites. In the event that surface completing is to be viewed as, various process parameters, for example, pivotal and extraneous bolster rate, slicing speed are detected to be viable [38,39]. Amid the examination of end processing operation on silicon carbide molecule strengthened with aluminum amalgam composites by Suresh kumar et al.[40], they found that the surface prompted harm acquired for aluminum composite was less when contrasted with that of the processing operation of aluminum metal. Cutting velocity, profundity of cut and bolster rate were well-thought-out as the cutting parameters for end processing operation. Impact of nourish rate was more contrasted with that of cutting pace on surface unpleasantness of the composite material amid machining operation.

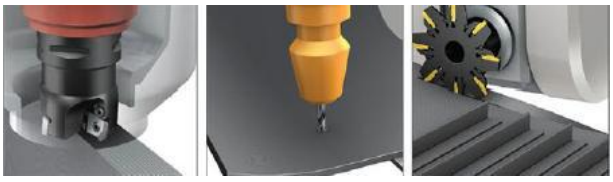

Fig. 1: Pictorial representation of composite laminates (a) Milling (b) Drilling (c) Trimming

C) Drilling

Drilling as appeared in Fig. 1(b) plays a critical machining operation for making bolted or shot congregations in CFRP

segments in businesses [41]. Various non-customary machining operations, for example, laser machining [42-46,132,133], grating water fly machining [47-49] and electrical release machining [50-54] have been polished for creating gaps in composite covers. A few scientists have led different scientific and additionally exploratory examinations to think about the conduct of delamination amid penetrating of composite overlays. Various regular boring procedures utilizing extraordinary boring apparatus, for example, straight woodwind bore [55-59], advance bore [10,60-66], center penetrate [65,67,68], step center bore [10,60,69], saw bore [10,70], candle bore [10], multi confronted bore [71], split bore [72], pounding boring, vibration helped contort boring and fast boring have been performed by numerous analysts [73-76] with a specific end goal to think about the impact of various process parameters causing the delamination in composite materials. The issues which happen amid boring of composite overlays are surface delamination, for example, peel-up delamination Fig. 2(a) [82], push-out delamination Fig. 2(b) [82] and inordinate surface harshness of the opening [15, 77-82]. Fig. 3 [77] indicates distinctive parameters that must be streamlined amid boring of composite materials.

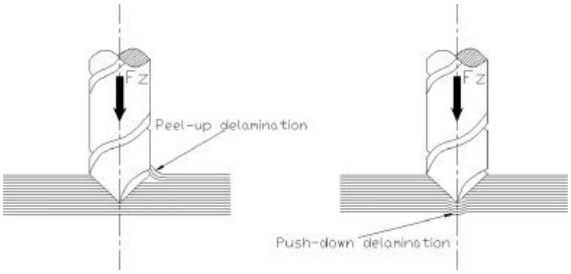

Fig. 2: (a) Peel-up delamination Process (b) Push-down delamination process

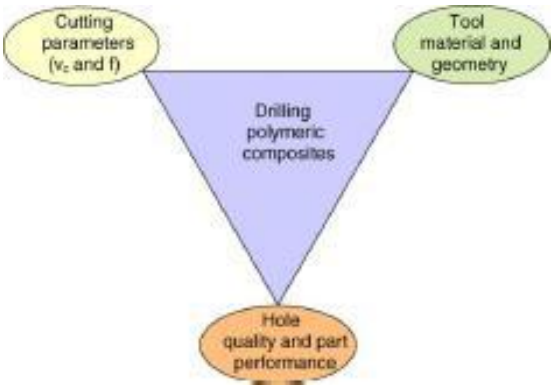

Fig. 3: Major considerations that needs to be well-thought-out during drilling of composites.

Bhattacharya et al. [83] analyzed that the nature of bored surface relies upon the apparatus geometry, penetrating parameters and instrument material. An exceptional non etch edge and straight woodwinds bore was produced by Piquet [55] with a zero freedom chamfer to enhance the penetrate quality in composites. Tsao and Chiu [60] directed an analysis to limit the push drive amid penetrating of CFRP overlays by utilizing compound center exceptional drills. Compound center exceptional drills are the penetrate made out of the external bore which is center bore and internal bore is the curve bore, saw bore and candle bore as appeared in Fig. 4 [60]. Their decision was that, the push drive in boring of CFRP can be lessened by choosing the correct apparatuses and boring parameters. Cutting velocity proportion, bolster rate and inward bore write are the most critical factors which impact the push constrain. Compound center extraordinary drills were worthwhile as lower push drive, bring down delamination, bring down chip stopping up and higher chip evacuation was acquired amid the examination. Hocheng and Tsao [10] explored delamination by utilizing distinctive kinds of drills, that is wind penetrate, saw bore, candle bore and step bore. The examination were directed for the shaft speed of 900 and 1000 rpm and the encourage rate connected were 0.003 to 0.0133 mm/rev.

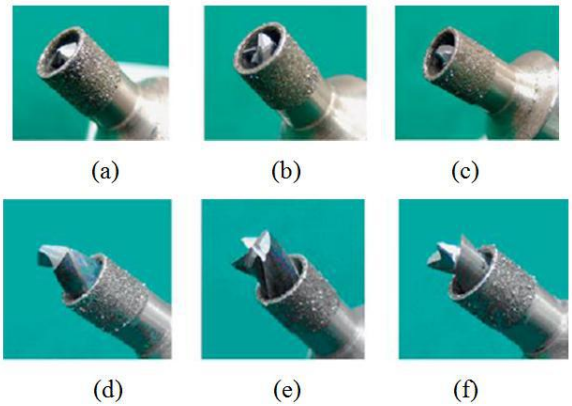

Fig. 4: Distinctive type of core drills (a) Core-twist drill, (b) Core-saw drill, (c) Core-candlestick drill, (d) Step-core-twist drill, (e) Step-core-saw drill and (f) Step-core-candlestick drill

Ultrasonic C-scan procedure was utilized to decide the penetrating instigated delamination, created by different drills. A connection between's boring pushed power and delamination was produced. Mistake was dictated by contrasting the hypothetical and trial comes about, by computing basic push constrain. The conclusion was made that, center penetrate, candle bore, saw bore and step bore can be worked at bigger bolster rate without making any delamination as looked at turn bore, which has most elevated impact on delamination at higher sustain rates.

Palanikumar et al. [11] examined delamination in penetrating of GFRP composites. The investigation was completed by utilizing fast steel and 4 woodwind shaper. Exact models were created to think about the impact of delamination amid penetrating. Analysis of variance (ANOVA) and regressioninspection was employed for breaking down the test. By Taguchi's investigation, flag to commotion proportion of delamination factor (Fd) was figured utilizing Eq. (1) which is characterized by the proportion of most extreme breadth (Dmax) of harmed area to the ostensible gap distance across (Dnom) and it was discovered that delamination expanded as the nourish rate increments for both cutting apparatuses.

$$Fd = \frac{Dmax}{Dnom}$$

Facilitate examination was finished utilizing ANOVA for same flag to clamor proportion of delamination factor and the resultsrevealed that delamination factor was prejudiced by encourage rate as it were. Four woodwind end process shaper indicated better outcomes contrasted with contort penetrate amid their examination.

Tsao [70] examined the impact on push power and delamination by utilizing center saw bore amid boring of CFRP overlays. Taguchi's strategy which incorporates the mix of examination plan hypothesis and quality misfortune work idea was connected for the investigation. In the wake of dissecting, the trial comes about showed center saw bore being powerful than the typical center penetrate. Shaft speed and bolster rate affected more for the push power and delamination of composite material.

Push constrain assumes a fundamental part amid penetrating causing delamination, higher the push compel higher will be the delamination, bring down the push drive lesser will be the delamination [129-131]. Hence to determine this issue Tsao et al. [84] completed a test inquire about on penetrating of composite materials by applying dynamic go down power to decrease delamination. They connected a flexible dynamic reinforcement drive instead of inactive support plate to offset the push out delamination caused by the penetrating push compel. They expressed that by applying dynamic reinforcement constrain, delamination lessened by 60-80% at higher sustain rates. And furthermore when the reinforcement constrain was connected all the more near the boring apparatus, there was more minimization of delamination.

Won and Dharan [85] in their work showed how the push drive was influenced by the etch edge amid boring of composite overlays. The examination was led with and without pre penetrating of pilot gap in the overlays. The outcomes demonstrated that the push constrain was lessened when penetrated utilizing pilot opening and the etch edge contributed more to the aggregate push amid boring of composite overlay.

Sonbaty et al. [86] examined the different components which impact amid the machining of GFRP composites. They inferred that by expanding the cutting pace, torque and power diminished which thusly upgraded the surface harshness of the material. And furthermore by expanding the sustain rate, push drive expanded which prompted the slight change in surface harshness of the composite material. Enemouh et al. [87] built up a strategy in which Taguchi's technique and multi target enhancement measure were joined in ideal boring condition to acquire a sans delamination boring.

Hamzeh et al. [88] researched on how the machining parameters and device geometry, impacts the machinability of penetrating in carbon fiber strengthened thermoset overlays. Cutting pace, bolster rate and instrument point edge were the procedure parameters which were considered through the trial. The conclusion acquired was, by expanding cutting rate and at bring down bolster rate better surface complete was created and furthermore bring down push compel were gotten.

Delamination factor expanded with expanding encourage rate and with increment in shaft speed and apparatus point edge, delamination factor was diminished.

III. SIMULATION OF COMPOSITES

Amid machining of composite covers there is a persistent contact between the apparatus and the work-piece because of which quick instrument wear and poor surface complete is acquired [134,135]. This prompts high expenses and difficulties in machining of composite materials. To keep these downsides an elective arrangement that is numerical reenactments have been produced. Finite element method (FEM) and discrete element method (DEM) are the two exceptional varieties of numerical solution approaches. In spite of the fact that there has been heaps of research on boring prompted delamination by exploratory strategies, FEM strategy connected and investigated to the same has been constrained. Table 2 gives learning on number of analysts, who took a shot at various machining operations with the use of limited component technique. In this area, work done by different analysts on orthogonal cutting and boring actuated delamination by utilizing limited component technique and discrete component stratagem has been swiftly offered.

Table II: Machining processes modeled using finite element method

Machining Process	Material	References
Milling	CFRP	Rentscha et al. [103]
Drilling	FRP	Rakesh et al. [105]
	CFRP Woven	Singh et al. [20]; Ozden&Elaheh [106,107]
	GFRP	Nilanjan Das et al. [101]
Orthogonal cutting	FRP	Arola&Ramulu [119]
	CRPF	Carlos et al. [102]; Shuji et al. [120]
	GFRP	Carlos et al. [102]; Takeyama &Iijima [121]
	MMC	Pramanik et al. [122]; Zhu &Kishawy [123]; Zhou et al. [124]; Kannan et al.[125]

A) Discrete element method (DEM)

Cundall and Strack [89] were the first to present the discrete component technique in the investigation of conduct of shake. Discrete component strategy is a recreation procedure which is generally utilized as a part of the investigation of material conduct. It sets up a relationship and approval for particulate materials, for example, soil, shake and earthenware production with the molecule properties, size and shape [90-92]. This technique is extremely valuable with a specific end goal to comprehend the granular materials. Different calculations are produced in this technique for various dynamic procedures. Numerous analysts [93-95] have been applying this strategy as it conveys an unmistakable picture of material conduct amid various process and it can likewise be consolidated and utilized with other numerical techniques to take care of complex issues. Yasir et al. [96] researched on, how the transverse pressure happens in uni-directional fiber fortified polymer utilizing discrete component strategy.

Orthogonal cutting was performed by utilizing DEM procedure on fiber introductions of 0˚, 90, 45˚, - 45˚ by Iliscu et al [97]. Uni-directional CFRP was utilized as work material and carbide instrument was utilized for the experimentation. A calculation was created to get the molecule speed and molecule position. Two time scales were utilized, (a) period for venture of cut, (b) time connected for swaying. Amid the analysis it was discovered that, for 0˚ fiber introduction high pressure, bowing and fiber pulling was seen as appeared in Fig. 5(a). Crack of mode I and mode II write was seen toward the device because of clasping amid chip arrangement. For 90˚orientation mode I compose break was noted and multi splitting was seen in the material as appeared in Fig. 5(b). Fiber extending and shearing was seen amid chip development in 45˚ fiber introduction as appeared in Fig. 5(c). Most astounding device wear happened in this introduction and the purpose behind the apparatus wear was because of the little chips got amid machining. In - 45˚ fiber introduction fiber haul out was seen because of shearing of the material which prompted the burst of the network as appeared in Fig. 5(d). Be that as it may, the device wear watched was low and surface complete got was nearly poor to other fiber introductions. Recreated consequences of cutting power for fiber introduction 0˚ and 45˚ were observed to be correspondingly coordinating with the test comes about while for - 45˚ and 90˚ cutting power of reenactment comes about was higher contrasted with the exploratory ones. Thus encourage constrain gave an opposite outcome when contrasted with that of the cutting power. Amid correlation in exploratory and DEM valuation, it was

discovered that the subsequent cutting power and sustain compel acquired were observed to be in a decent assention.

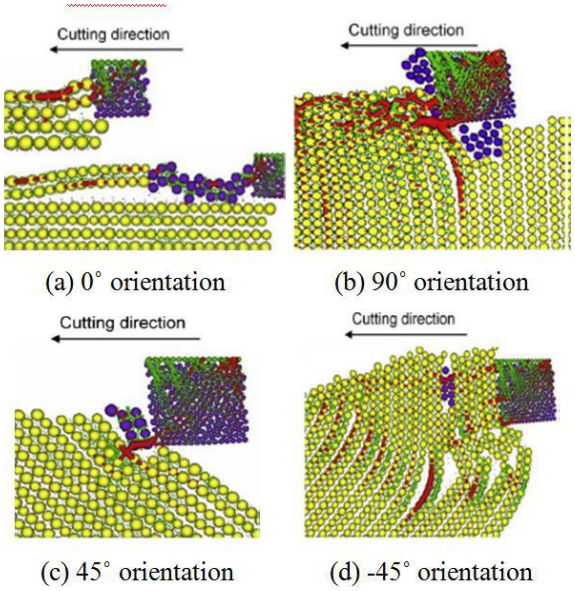

Fig. 5: Development of chip during orthogonal cutting by discrete element simulation for fibre orientation

B) Finite element method (FEM)

The distinctive kinds of FEM demonstrating approaches incorporate (a) large scale mechanical approach [12,98,101-103,119], (b) small scale mechanical approach [99,100,103] and (c) full scale miniaturized scale joined approach [12,104]. The composite material is thought to be comparable homogeneous material if there should be an occurrence of full scale mechanical approach, this is done to decrease the trouble in machining recreation yet the outcomes got will be less exact. A test on limited component displaying of uni-directional CFRP was finished by Rao et al. [98]. 3D full scale mechanical approach was considered. Diverse scope of fiber introductions, profundity of cuts and distinctive rake points were utilized for the investigation. The outcomes demonstrated that the push power and chip arrangement anticipated by limited component reproductions coordinated well with the test comes about. The fortified filaments and network materials of FRP was demonstrated independently in miniaturized scale mechanical approach, because of which exact expectations can be done and it additionally researches and investigate the neighborhood impact, which is a disadvantage in macromechanical approach. Smaller scale mechanical approach is mind boggling and the computational cost is high when contrasted with that of large scale mechanical approach. Full scale miniaturized scale approach is the blend of large scale mechanical approach and small scale mechanical approach. Cutting of carbon fiber fortified plastic by engaging FEM tactic was studied by Rentscha et al. [103]. Processing operation was completed both tentatively and by recreation way to deal with think about the outcomes. Naturally visible approach was utilized for anisotropic material properties with persistent fiber introduction and tiny approach was produced for unequivocal lattice portrayal. 0˚ and 90˚ fiber introductions were utilized for the examination. The acquired outcomes as appeared in Fig. 6, by reproduction demonstrated great concurrence with test discoveries; however amid material evacuation instrument they figured cutting power and push drive differed in a little proportion when contrasted and the exploratory ones.

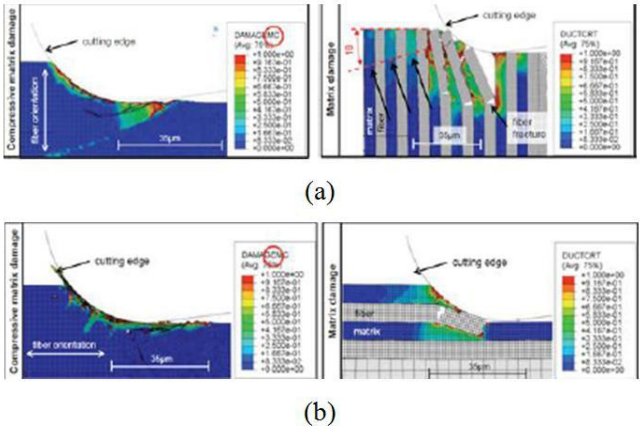

Fig. 6: (a) Damage distribution for 90˚ fibre orientation at Macroscopic and Microscopic level and (b) Damage distribution for 0˚ fibre orientation at Macroscopic and Microscopic level

Drilling operation by Finite Element Method:

Rakesh et al. [105] examined delamination on fiber strengthened plastics utilizing FEM approach. The test was completed utilizing three unique apparatuses, bend penetrate, jodrill and trepanning device. Boring parameters which were considered amid explore are appeared in Table 3. The geometric demonstrating of various drills was finished utilizing Pro-E programming and for the reenactment reason ABAQUS programming was utilized. For approving, the consequences of reproduction and trial were thought about for axle speed of 2250 rpm. They watched that, contort bore caused all the more boring prompted delamination contrasted with other penetrate instruments, as appeared in Table 4.

Table III: Drilling circumstancesused during examination of drilling-induced delamination by finite element method

Material	Geometry of drill bit	Diameter	Feed Rate	Spindle Speed	Reference
UDGFRP	Twist drill	6 (mm)	0.075,0.188,0.300 (mm/rev)	375,938,1500 (rpm)	Singh et al. [20]
Woven GFRP	Twist drill	5 (mm)	0.25,0.5, 0.75,1 (mm/rev)	45,65 (m/min)	Nilanjan Das et al. [101]
UDGFRP	Jodrill Twist drill Trepanning tool	8 (mm)	20 (mm/min)	2250 (rpm)	Rakesh et al. [105]
UDCFRP	Twist drill Step drill	8 (mm)	457 (mm/min)	4500 (rpm)	Ozden &Elaheh [106]
UDCFRP	Twist drill	8 (mm)	355,457, 584,685 (mm/min)	3000,4500,6000,9000 (rpm)	Ozden &Elaheh [107]

Table IV: Comparison of experimental results with simulation results in drilling

Experiment results	Simulation results	Remarks	Reference
ANOVA	Outcome sperceivedbes towing to Tsai Wu Failure criteria	The outcomes perceived from the experimental and simulation stoodworthy agreement with each other	Singh et al.[20]
Thrust Force 230 N	Deviations were within the limit 225 N	Deviation of 10-21% for lower cutting speeds. Deviance of 6-27% for greater cutting speeds. Thrust force is directly connected to delamination	Nilanjan Das et al.[101] Ozden& Elaheh[106]
Torque 0.29 N-m	0.3 N-m	Test and recreation comes about were observed to be reasonably coordinate each other	Ozden& Elaheh[107]
Delamination Factor Twist drill- 2.86 Jodrill- 2.53 Trepanning tool- 2.03	4.43 3.79 3.08	Trepanning apparatus is the best device contrast with Twist and Jodrill for least delamination	Rakesh et al.[105]

Singh et al. [20] completed an examination on uni-directional GFRP to discover the components affecting delamination by limited component display (FEM). Trial approach was done to contrast the outcomes and reproduction as appeared in Table 4. 27 test trials were done and the variety of push power and torque versus point edge, nourish rate and shaft speed were noted. Bore point edge, bolster rate and shaft speed are the procedure parameters which were considered amid the examination. Amid the assessment of examination it was discovered that, point edge and the bolster rate impacted the push compel and likewise torque was affected by the connection of the point edge and the encourage rate. For reproduction reason, demonstrating of contort bore for 90˚, 104˚ and 118˚ was done in Pro-E programming. Amid investigation Tsai Wu disappointment plots were attracted as indicated Fig. 7. It was watched that Tsai Wu disappointment expanded as the point edge expanded. Approval was finished by deciding delamination factor by test and reproduction strategy. They detailed that, as the bore point edge expanded delamination figure expanded which turn expanded the boring instigated harm.

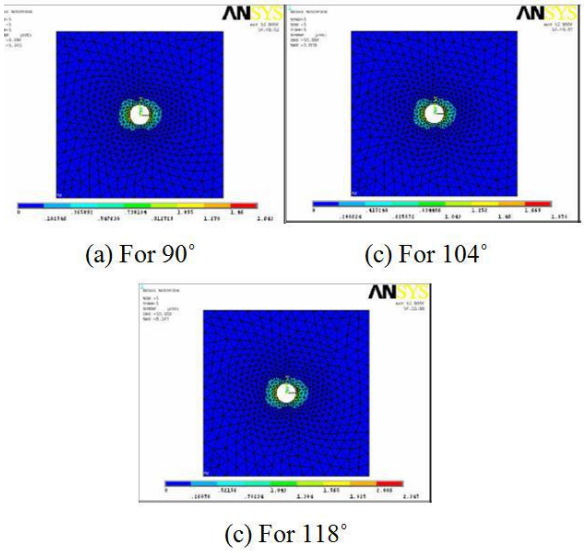

Fig. 7: Plots for different point angles as per Tsai Wu failure criteria.

Nilanjan Das et al. [101] completed an exploratory and limited component consider on woven glass fiber fortified plastic. To think about the boring reactions, full scale mechanical approach was utilized. The trial was completed by utilizing two diverse penetrate writes that is (a) rapid steel (HSS) and (b) carbide bore. A few numerical conditions were built up and ascertained for woodwind geometry of penetrate and cross section of the workpiece. Exploratory run was completed for various speed encourage blends and a MATLAB program was composed for it. The normal penetrating push drive was controlled by utilizing the program for unfaltering cutting period. For reproduction, bend penetrate was demonstrated utilizing Pro-E programming and limited component examination was done utilizing ANSYS AUTODYN programming. Push out and peel up delamination was resolved cautiously. To validate, the correlation of test and limited component comes about were plotted in chart and it was discovered that there was a 10-21% deviation for bring down cutting rate (Vc) of 45 m/min as appeared in Fig. 8(a) for HSS instrument, Fig. 8(b) for carbide apparatus, 6-27% deviation for higher cutting pace (Vc) 65 m/min for both the bores as appeared in Fig. 8(c) for HSS instrument, Fig. 8(d) for carbide device. Ozden and Elaheh [106, 138] explored delamination amid boring of CFRP utilizing FEM. Strong works and ABAQUS were utilized for demonstrating and investigation of boring of CFRP. The outcomes demonstrated that progression bore was more proficient in diminishing push power and torque contrasted with that of the turn penetrate.

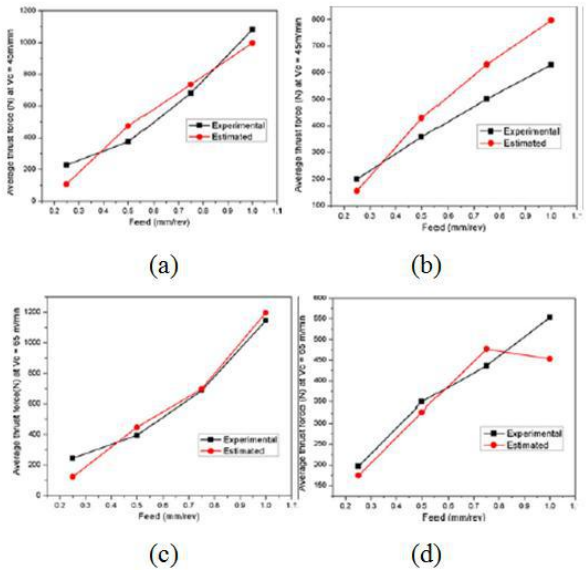

Fig. 8: Thrust force evaluation of experimental outcomes and projected finite element outcomes for Vc= 45 m/min (a) for HSS drill bit, (b) for Carbide drill bit and for Vc= 65 m/min (c) for HSS drill bit, (d) for Carbide drill

Orthogonal machining by finite element method

Orthogonal machining is ordinarily completed for metal matrix composites (MMCs) and the elements which impact for the intense machining are grid properties and volume part of fortification stage. Because of increment in volume portion and normal size of the support stage the expansion in apparatus wear happens [108-113]. Amid machining, as the cutting velocity, bolster rate builds a superior surface complete was gotten yet with increment top to bottom of cut poor surface complete is accomplished [136,137]. Writing review [114-118] gives, that the device materials utilized for cutting of these composite materials, for example, polycrystalline diamond (PCD) gives an enhanced surface complete contrasted with that of high speed steel (HSS) and tungsten carbide (WC) and the device wear and surface complete likewise depend onthe grain size of the device.

Orthogonal cutting was performed by Arola and Ramulu [119] on unidirectional FRP composites, in view of greatest pressure and Tsai-Hill criteria. The recreation comes about were contrasted and the test results and it was discovered that cutting power of reenactment coordinated well with the test comes about in any case, push compel were observed to be off base with the trial ones.

Shuji Usui et al. [120] detailed an examination on the Lagrangian limited component machining model utilizing an express time joining plan for orthogonal machining and penetrating. Orthogonal machining was concluded for four tasters of uni-directional CFRP, that is 0˚, 45˚, - 45˚ and 90˚. For 0˚ taster the peel break occurred along the fiber interface as appeared in Fig. 9(a). For 45˚ introduction as appeared in Fig. 9(b), the recreation result demonstrated that the chips were isolated by mode II crack at fiber/grid interface. For 90˚ introduction little chips were shaped and naturally visible breaking was seen as appeared in Fig. 9(c). For - 45˚ introduction amid orthogonal cutting the workpiece was part into half as appeared in Fig. 9(d). The reproduction comes about demonstrated that the 90˚ introduction caused more harmed to the workpiece contrasted with 0˚ introduction which were observed to be comparable for exploratory moreover. The FEM comes about acquired were relatively like that of the trial comes about.

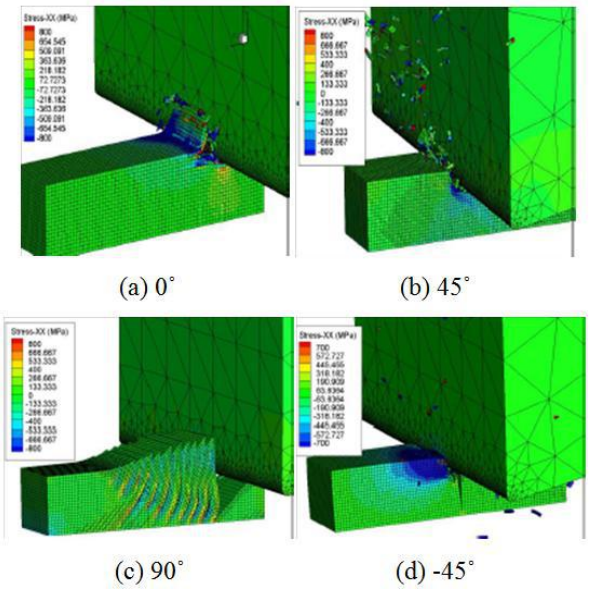

Fig. 9: Orthogonal cutting performed for four different orientations

A full scale mechanical model was created via Carlos Santiuste et al. [102] for numerical examination of orthogonal cutting of CFRP and GFRP composites. Authorsestablish that subsurface harm experienced by GFRP was additionaldifferentiated with that of CFRP. Dynamic disappointment happened amid machining of GFRP though calamitous harm was noted in CFRP as appeared in Fig. 10. Chip orientationin the middle of machining of GFRP composite was considered by Takeyama and Iijima [121]. They announced that metal like chip development was noted amid machining the composite and the arrangement of chip relied upon the fiber introduction.

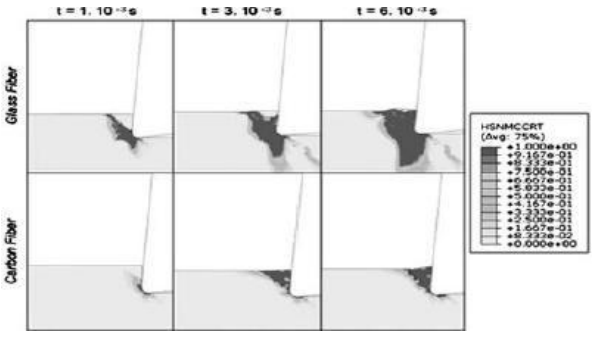

Fig. 10: Comparison of matrix damage occurring in CFRP and GFRP composite

Stress strain connection, instrument wear and molecule debonding were considered by Pramanik et al. [122] amid orthogonal cutting of metal grid composite (MMC) by limited component technique. Debonding at the interface and disappointment of the molecule was seen along the cutting way amid experimentation while amid reenactment just debonding of the material was noted as disappointment criteria were not characterized in the material definition. Coupled temperature deductioninvestigation was done by Zhu and Kishawy [123] during orthogonal cutting of Al6061 MMC. The examination was improved the situation nourish rate of 0.1, 0.2 and 0.3 mm/rev at a cutting rate of 85 m/min. It was discovered that

plastic disfigurement happened along the chip device interface because of the contact between the instruments rake face and material.

The impact of cutting velocity and profundity of cut while orthogonal cutting of SiC/Al composite was contemplated by Zhou et al. [124] employing polycrystalline precious stone apparatus. Amid the analysis, at the underlying stage it was noticed that the as the instrument progresses because of less contact territory between the chip and device, high pressure focus was seen as appeared in Fig. 11(a) and as the profundity of cut expanded between the apparatus and the material, plastic misshapening of the material expanded this twisting happened along the rake face of the device as appeared in Fig. 11(b). The outcomes were contrasted and the exploratory outcomes acquired by Kannan et al. [125] who had additionally directed the machining on MMC's. The test and recreated comes about demonstrated a slight deviation of under 20%.

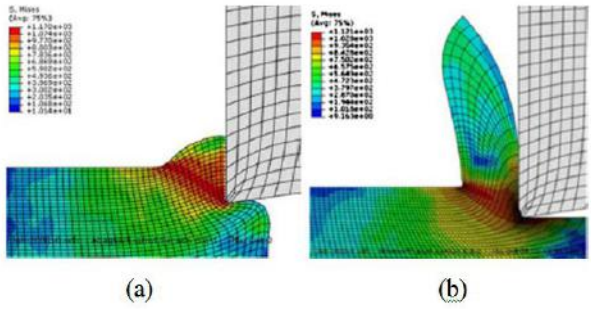

Fig. 11: Formation of chip (a) initial stage (b) when depth of cut is increased.

IV. Conclusions

This paper has given a far reaching writing survey on machining of composites, covering accomplishments of recent year as far as traditional and numerical reproduction techniques. A portion of the conclusions are condensed as takes after: Composite materials are picking up their engaging quality because of their high mechanical properties. High quality to weight proportion and their protection from offer for various sorts of natural conditions, make them generally utilized as a part of number of mechanical applications. Selection of appropriate cutting instruments for their impact on surface complete and machining precision, which impact the proficiency of machining execution are evaluated. The parameters which were found to generally impact the delamination were observed to be encourage rate and shaft speed. For decreasing delamination impact amid penetrating, diverse methodologies, for example, applying dynamic move down power, presenting pilot gap and utilizing exceptional center drills are assessed and their impact on diminishment in delamination have been observed to be extremely encouraging. Numerical reproduction techniques (FEM and DEM) offer an elective method for understanding the apparatus association with the composites. They give another approach of machining process which furnishes promising outcomes when contrasted and trial comes about.

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XPS and UV-Vis Absorption Study of Pt, Pdwireguaze Supported Hydrogen Mitigation Catalysts

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***Abstract*- In NPP tremendous volume of hydrogen generated under LOCA conditions. This can peril to containment integrity once it cross it limit of 4%.Passive autocatalytic recombiner emerged as an impeccable solution to pact with this situation. By using single electroless deposition bath, mixed noble metal (platinum palladium) catalysts were effectively prepared using formaldehyde as a reducing agent. Rate of coating was found slower at earlier and later stage of deposition in case of both single Pt based and mixed noble metal (SM-2) catalysts. Noble metal areobserved in metallic state from XPS study.**

Keywords: NPP, LOCA, Platinum, Palladium, Hydrogen

I. INTRODUCTION

World's nuclear power program is mainly based on Pressurized Water Reactors (PWRs), Boiling Water Reactors (BWRs) and Pressurized Heavy Water Reactors (PHWRs) [1]. All these nuclear reactors are designed with paramount care to achieve premier level of industrial as well as nuclear safety by adopting defense-in-depth approach in their design [2]. They have been given with various operational safety features as well as reactor regulation and reactor protection systems. Along with above features, several engineered safety characteristics has been also provided to ensure minimum risk to the environment and to the population at large [3-6].

In the event of certain hypothesized severe accidents, although of extremely low probability of their occurrence, there is likelihood of complete/partial loss of reactor heat sink followed by significant fuel overheating leading to complete/partial core melting. Thus, this results in release of huge amount of hydrogen in the containment primarily by the clad oxidation reaction (due to metal water reaction at high clad temperature) as well as by waterradiolysis [7-12].

Hydrogen so released in the containment building, on account of its very low density, has a propensity to rise up by buoyancy and accrue in the uppermost regions of the closed containment space. These phenomena may lead to progressively growing hydrogen concentration in the gas mixture of the containment atmosphere in some localized regions and attain levels that might lead to its combustion and/or even detonation inside the containment. This in turn could pose a threat to the integrity of the containment, the last physical barrier to prevent the release of radioactivity into the environment [13, 14].

To avoid this entire scenario, methods like inerting, dilute venting, passive autocatalytic recombiner etc. reported so far in a literature [15]. Passive autocatalytic recombiner is one of the best conceivable solution to pact with this situation. Earlier we reported catalysts like Pt, Pd on SS wireguaze, Pt-Pd Simultaneous and Sequential deposition on SS wireguaze [16], Pt/Cordierite [17] etc.

Earlier reported Pt-Pdwiregauze catalysts (Pt-2, SM-2 and SQ-2) have been characterized by XRD for phase purity analysis, FE-SEM for surface morphology, EDS for average elemental distribution over metal surface. These catalysts have shown very good catalytic activity and good resistance to CO poisoning [16]. But still there is a scope to elucidate rate of metal deposition on wireguaze from electroless deposition bath by UV-Vis spectrophotometer. Further, investigation for study of metal-metal or metal-support interaction is carried out by XPS. In this article, we report the coating kinetics study by UV- VIS absorption spectrophotometry and XPS study of our earlier reportedPt-2, SM-2, and SQ-2 catalysts [16].

II. EXPERIMENTAL

The catalysts of the interest have been prepared by electroless deposition method using, Chloroplatinic acid and Palladium chloride as a noble metal precursors and formaldehyde as a reducing agent. Complete details of catalysts preparation and activity measurement areal ready reported [16].

III. RESULTS AND DISCUSSION

3.1 Coating kinetics

The deposition of precursors is carried out by electroless deposition method using formaldehyde as a reducing agent. Both

precursor solutions (chloroplatinic acid and palladium chloride) have particular absorbance spectrum therefore it is possible to interpret their rate of deposition by UV-VIS spectrophotometry. Fig.1 shows the absorbance spectra of electroless deposition bath of SM2 catalyst with time of deposition. Absorbance spectrum corresponds to the hexachloroplatinic acid and palladium chloride precursors. It is observed from spectrum that concentration of deposition bath is found to falling with increasing deposition time. Fig.2 shows the decay plot of absorbance with time for SM-2 and Pt-2 catalysts electroless deposition bath. From Fig.2 it is clearly apparent that the rate of deposition is quicker for bi-metallic (SM-2) precursors bath as likened to single metal (Pt-2) precursor bath. Here it also depicts that, for both the catalysts initial rate of coating is slow up to the 1 hour and after 1 hour it becomes quicker and again become slower after 3 hour. This may possibly be due to the following reasons: initially even distribution of smaller nuclei's are taking place on the substrate. This smaller nuclei act as catalytic agent for further processes and hence the method come to be autocatalytic. After the duration of 3 hour, the quantity of reactants start diminishing in the electroless deposition bath and the rate of coating again further falls. X-ray photoelectron spectroscopy (XPS) analysis was performed for Pt-2, SQ-2 and SM-2 samples. All three samples Pt-2, SQ-2 and SM-2 were analysed for Pt, whereas SM-2 and SQ-2 were analysed for only Pd. The peak corresponding to Pt for Pt-2 and SM-2 samples were deconvoluted in to two peaks, i.e. 4f5/2 and 4f7/2 with the respective binding energy of ~ 74 and 71 eV. (Fig. 3c and 3e). The observed binding energy for Pt (4f7/2) in SM-2 and Pt-2 sample is 71.2 and 71.4 eV.These values are in well agreement with the values of Pt0 reported in literature [17, 18]. Hence, here study shows that noble metals are in metallic state. No characteristic peak (Fig. 3d) is observed for Pt in SQ-2 sample this could be because of external coating of Pd on existing layer of Pt.

For the analysis of Pd with respect to SM-2 and SQ-2 samples, the spectrum is deconvoluted in to two peaks, 3d5/2 and 3d3/2 with respective binding energy of~ 335 eV and ~ 340 eV, respectively (Fig. 3a and 3b). The 3d5/2 binding energy contribution of Pd (SM-2 sample) is at 335.8 eV whereas for SQ-2 sample is at 334.8 eV. Both values resembles the presence of Pd is in metallic state (Pd0) [19] though there is slight shift (+1 eV) is observed in binding energy for Pd in case of SM-2 sample [20]. The shift in binding energy can be explained on the basis of procedure of coating. The coating in SM-2 is carried out simultaneously so there is possibility of homogenous solid solution formation and earlier deposition of platinum. Whereas, the coating of SQ-2 sample is carried out sequentially therefore there is only deposition of Pd on existing Pt results in no resultant shift in binding energy value. Therefore, in SM-2 sample electron can transfer more easily from Pt to Pd or vice versa. The inference withdrawn from XPS data supports the earlier investigation of initial coating of platinum and later followed by palladium in case of SM-2 sample.

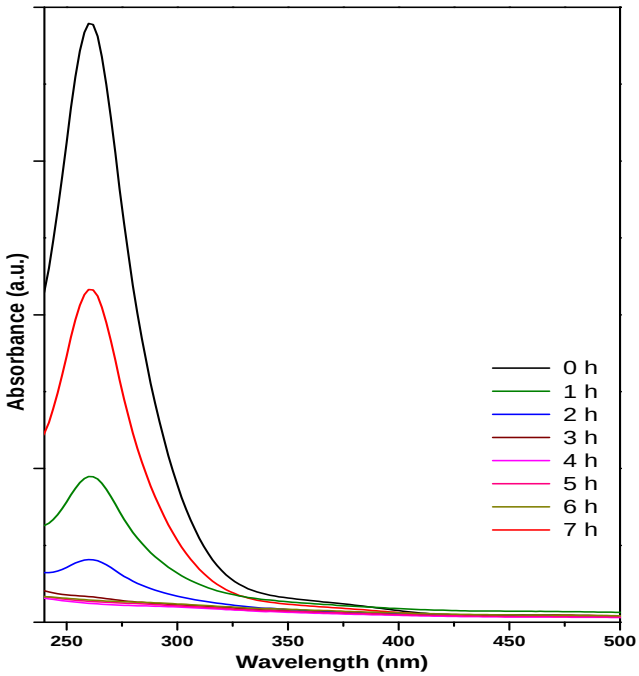

Fig.1: Plot of absorbance of SM-2 catalyst

3.2 X-ray photoelectron spectroscopy

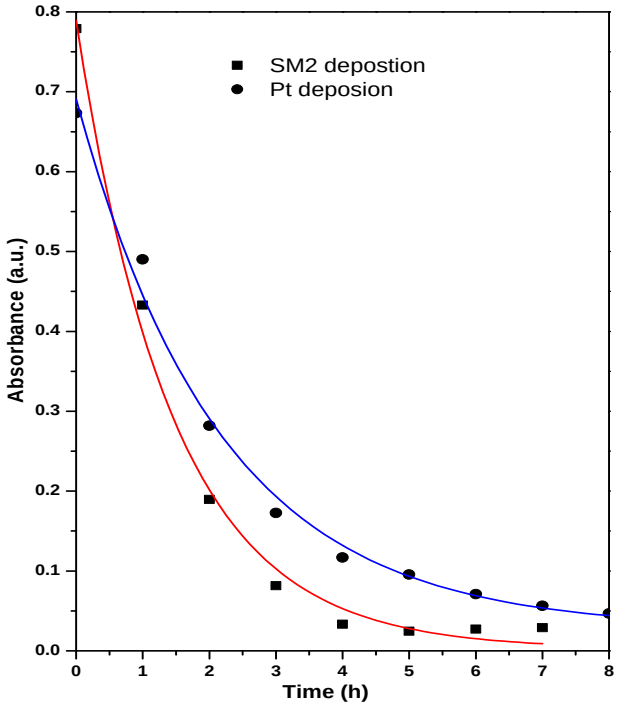

Fig.2: Plot of absorbance for SM2Deposition bath solution with respect to time. And Pt catalysts bath solution at λ_{max}=260 with time.

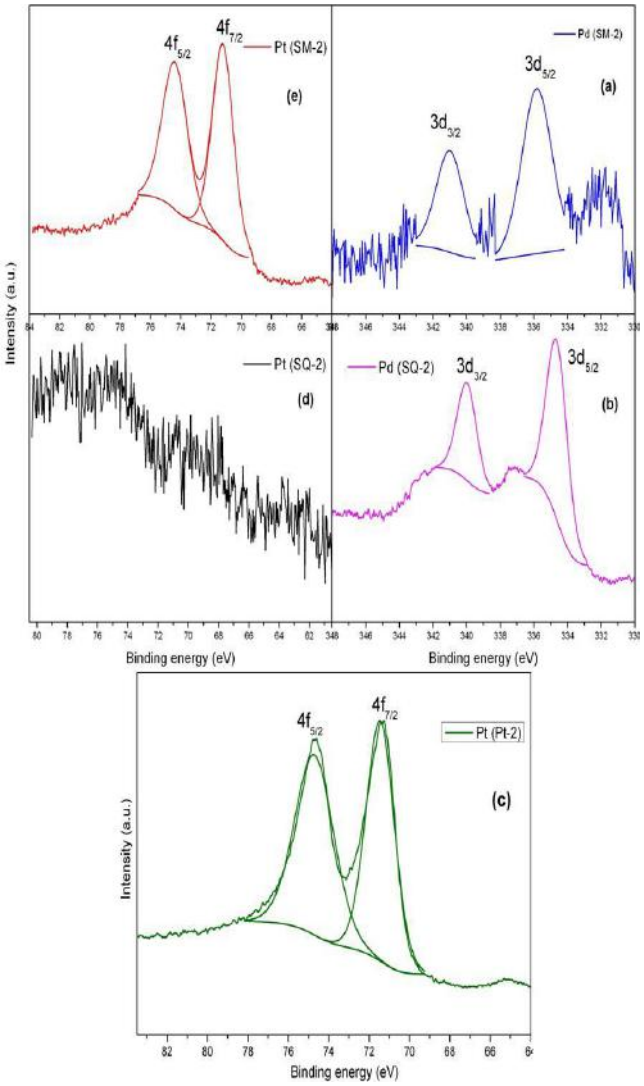

Fig. 3: XPS spectra of (a) Pd for SM-2 samples, (b) XPS spectra of Pd for SQ-2 samples, (c) XPS spectra of Pt for Pt-2 samples, (d) XPS spectra of Pt for SQ-2 samples, (e) XPS spectra of Pt for SM-2 samples.

IV.CONCLUSION

By using single electroless deposition bath, mixed noble metal (platinum palladium) catalysts were effectively prepared using formaldehyde as a reducing agent. Rate of coating was found slower at earlier and later stage of deposition in case of both single Pt based and mixed noble metal (SM-2) catalysts. Metallic nature of noble metal is observed from XPS study.

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Raman Spectroscopic Studies on Zr Substituted $BaCe_{0.8}Y_{0.2}O_{3-\delta}$ Electrolyte for SOFCs

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***Abstract*- In this work we have synthesized Zr (20%, 40%, 60%, 80% and 100%) substituted BCY (BCZY) by sol-gel route and studied using Raman spectroscopy. In Raman scattering spectra recorded for BCZY compositions, Raman bands around 300-375 cm-1 correspond to stretching vibration modes of CeO2. Broadening of these bands was observed as Zr concentration increases from 20% to 60% while completely disappeared for compositions with highest Zr content i.e. 80% to 100%. This illustrates a gradual change in structure of BCZY solid solutions as Zr concentration increases. Hence it can be concluded that, with rise in Zr concentration, the number of Raman-active vibrational bands decreases, indicating a transition of the structure to a more highly symmetric phase.**

Keywords: Solid Oxide Fuel Cells, Proton Conducting, Barium Cerate, Raman Spectroscopy

I. INTRODUCTION

Solid Oxide Fuel Cells (SOFCs) are very efficient energy conversion devices having very low adverse environmental impact [1,2]. Recent studies show that use of proton conducting electrolyte materials instead of oxide conducting electrolytes significantly lowers the operating temperature of SOFCs [3]. ABO3 type perovskite materials when doped with rare earth element exhibit excellent proton conductivity at lower temperatures [3]. Y substituted BaCeO3 (BCY) is well known and studied electrolyte materials for proton conducting Solid Oxide Fuel Cells (SOFCs). However due to low stability of BCY in CO_2 and in humid atmosphere, substitution of Zr at place of cerium have been suggested which increases the stability of BCY. In the present studies, how this change in structure of parent BCY on substitution of Zr leads to increase in stability of compound is explain using Raman Spectroscopic analysis.

II. EXPERIMENTAL

In this work Zr (0%, 20%, 40%, 60% and 80%) substituted BaCe0.8Y0.2Yo3-δ (BCY) electrolyte materials (BCZY) viz. BCY, BCZ2Y, BCZ4Y, BCZ6Y and BZ8Y were synthesized by sol-gel route which is explain in our previous work [4]. Raman spectra of BCZY electrolyte materials were recorded using ISA make micro/macro Raman spectrometer i.e. LABRAM–1, (Horiba Jobin Yvon, Bensheim, Germany). Excitation of samples under study was done using 488-nm line of an Ar1 laser. The scattered Raman signals were analyzed in a back-scattering geometry using a single monochromator spectrometer which is equipped with a Peltier-cooled CCD detector for multichannel detection purpose. Raman spectroscopy provides short range order structural information (20-100 Å). This technique is very sensitive to structural distortions in which changes of symmetry take place.

III. RESULTS AND DISCUSSION

Raman spectroscopy technique was used for structural characterization of BCZY solid solution system. This characterization technique provides short range order structural information (20-100 Å).

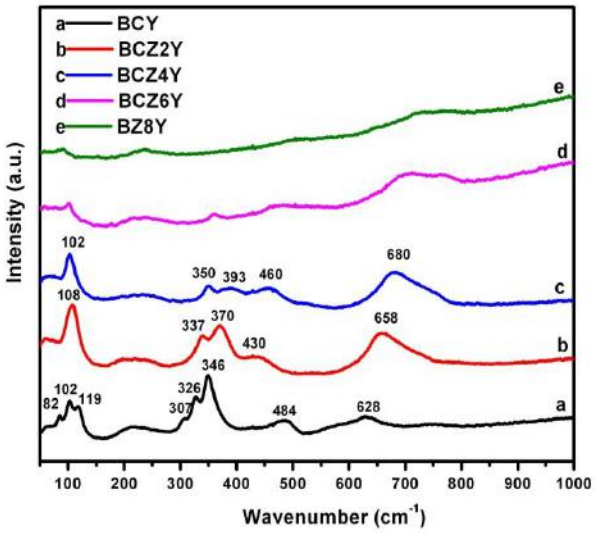

Fig. 1: Raman spectra for BCZY compositions sintered at 1723 K, 8 h

Raman scattering spectra recorded for BCZY compositions are shown in Fig.1. The Raman bands around 300-375 cm^{-1} correspond to the CeO2 stretching vibration modes [5, 6]. It should be noted that since the Ce^{4+} ions occupies a centrosymmetric site in the lattice, the Ce-O stretching and bending Raman active modes involve motion of oxygen ion only. In BCY, Ce-O stretching bands appeared at 307, 326, and 346 cm^{-1}. These vibrations are triply degenerate in the perovskite structure; because of these vibrations constitute a vibration of OII ions around the oxygen octahedron axis which has three unique C3 axes [7]. Broadening of these bands was observed in BCZ2Y and BCZ4Y while completely disappeared in BCZ6Y and BZ8Y compositions. This shows a gradual change in structure of solid solutions with increasing Zr concentration.

Higher frequency region of spectra i.e. > 600 cm^{-1} differ from that of undoped $BaCeO_3$ spectra recorded at RT [8] corresponds to doping effect of Y^{3+} ion. Introduction of Y^{3+} ion at place of Ce^{4+} or Zr^{4+} will create oxygen ion vacancies; change the local

symmetry which induces the Y-O symmetric stretching presence of oxygen ion vacancies will influence the electrical properties of materials. Thus, introduction of Y^{3+} ion accounts for the rise in the protonic conduction.

Bands below 150 cm^{-1} are mostly due to Ba-O stretching and O-Ba-O bending force constants. As reported by I. Charrier-Cougoulic et al., in spectra recorded at room temperature, low frequency range bands (80-150 cm^{-1}) give idea about the structure of the compounds [9]. Presence of triplet (three bands) in this range corresponds to orthorhombic Pnma space group while a doublet (two bands) corresponds to orthorhombic Imma, single band is a characteristic of R3C and no band is for ideal cubic structure. As observed in Figure 1, BCY shows three characteristic bands at 82, 102 and 119 cm-1 of orthorhombic Pnma space group. With substitution of Zr at place of Ce, only one band appeared in Raman spectra at 108 cm^{-1} for 0.2 Zr and 102 cm^{-1} for 0.4 Zr illustrate R3C structure. This attributed to the structural changes as function of Zr substitution from orthorhombic to rhombohedral i.e. towards more symmetric structure. Compounds with high concentration of Zr i.e. 0.6 and 0.8 show almost negligible band in lower frequency region give idea about highly symmetric ideal cubic structure. The small band present at 484 cm^{-1} is due to un-reacted CeO_2 which is only observed in Raman spectra of BCY.

Hence it can be concluded that, as the Zr concentration increases, the number of Raman-active vibration bands decreases, indicating a transition of the structure to a more highly symmetric phase.

vibrations at higher frequency region. It is well known that the

IV. CONCLUSION

Raman spectroscopy is being powerful tool for structural analysis of different materials. In this work, Raman spectra recorded for BCZY solid solutions leads to the following conclusions: BCZY solid solutions were successfully synthesized by sol-gel route. Zr substitution gives structural stability of parent BCY perovskite material by converting it to more symmetric form.

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A Study of Instructional Methods for Teaching English Language Learners in Technical Programmes

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***Abstract*—Instructional methods are various for different professions but engineering profession requires dynamic and innovative methods for teaching and learning English language because effective communication is an essential aspect of the engineering profession. Engineering profession requires use of effective business communication skills to undertake a number works. This includes balancing and relating their work with an ever-changing business environment. Engineers of all types must communicate the innovations, utility of their work either orally or in writing to the society. Therefore, it is an essential that the methods and strategies in teaching and learning should also be made dynamic to meet the needs of engineering profession. In this consideration that this paper attempts to study instructional strategies like interactive instructional methods, interactive demonstration methods and English language learning methods for learning based on work in technical programmes.**

Keywords—Interactive, Demonstration, Work-based Learning

I. INTRODUCTION

Engineers use business communication skills to explain an idea, process, or technical design. Although many executives are pleased with basic technical skills their engineers bring to the organization. There is a need that engineers should possess critical business skills necessary in today's workplace. Today's engineering profession requires engineering professionals who can communicate clearly, concisely and comprehensively.

Knowledge of business communication skills is quite different from the knowledge of communication theory itself. Because the knowledge of communication theory does not necessarily reflect skills required for practical purposes and therefore, it is important to expose engineering profession in similar work environments where communication skills are emphasized. To achieve the goals required for the present engineering profession, it is necessary to find out new techniques to teach and learn. It is therefore, this paper analyses learning methods like interactive instructional methods, interactive demonstration methods and methods for work-based learning.

II. INTERACTIVE INSTRUCTIONAL METHODS

In traditional classroom instruction method of teaching, a teacher introduces a new topic by a lecture-type presentation. In this method new ideas are introduced in a narrative form, many times written on the board, and further explained with the use of audio-visuals aids like overhead projectors, PowerPoint presentations, or other visuals suitable to the nature of the topic. So, the traditional classroom instruction method is just the linearity approach and teacher-centered focus whereby students are the passive recipients of information.

Therefore, nowadays emphasis is laid down on effective interactive instruction methods which require teachers to open up opportunities for student participation and allow students to think and comprehend the complex ideas or concepts. Interactive classroom instruction method usually creates opportunities for students to participate individually as well as in pair, or small-group instructional activities depending upon the nature of the target content and objectives and outcomes of learning. Moreover, this method of instructional helps students to participate in activities where maximum exposure is given to students where in the teacher is in a position to monitor the whole class whether students are on their way to achieve performance criteria and to clarify students' understandings as needed. Interactive instructional activities also keep students to be engaged in reflective thinking as opposed to mere recalling of information. This method makes students active participants in learning and teaching activities. This method has a number of advantages which can be generally stated as follows. This method of learning facilitates students by making them to think about new ideas, background information, procedures ,and facts in a context. It also creates students' opportunities to think about occupational relevance, connections to the prior knowledge and connections to other contributing concepts learnt by them through various sources. Interactive method is helpful in creating structures for the development of communication skills required for the particular profession.

It is therefore that this method of classroom instruction is gaining much importance in teaching and learning in all educational institutions.

III. INTERACTIVE DEMONSTRATION METHODS

Interactive demonstration is also a method quite in vogue in education and useful for teaching concepts with proper applications. In this method students practically learn the operations of specialized equipment, reading architectural blueprints, welding, troubleshooting electrical systems, producing video programs etc. The interactive demonstration method of instruction can be effectively conducted emphasizing

complementary components, including getting students' attention to the application of the concepts, conducting the demonstrations, facilitating student practice in the classrooms and workshops, and monitoring and evaluating performance through assessments. To plan demonstrations for teaching and learning, some considerations require instructional decisions which can be stated as follows:

It is important that the target content should be appropriate for teaching through demonstration methods. Moreover, the demonstrations must be about procedures, skills, concept applications. It is necessary to select essential content and determine the appropriate learning setting to facilitate effective demonstration strategies in the classrooms and workshops.

There is a need to adjust the sequence and duration of the demonstration components. In some instances, the demonstrations can be made possible to conduct a class period, whereas in other instances longer activities requiring preliminary and follow-up tasks can be needed to make the demonstration strategies successful.

It is equally important to consider English language proficiency exhibited by English language learners in the class. The questions prepared should be appropriate to facilitate interactive activities and guide English language learners through the demonstration strategies. Basic knowledge of English language should also be considered an essential factor to prepare demonstration strategies for the students.

It is crucial to select appropriate interactive strategies that are useful for English language learners to build upon their prior knowledge and level of language proficiency. Demonstrations should be made in such a way that students would be able to learn operational procedures and related skills involving student practice, scaffolding strategies and independent learning which will particularly be useful tool for English language learners to enhance their performance. It is therefore, interactive demonstration method of classroom instruction is also helpful to gain the practical knowledge and enough exposure to English language.

IV. METHODS FOR WORK-BASED LEARNING

This method includes various activities which help students to get knowledge beyond traditional cooperative education like job shadowing, in service learning, various internships, and apprenticeships undertaken by students. Hence, this sort of exposure to practical knowledge helps students to get valuable experience in the world of work. Work-based learning can be in the form of simply shadowing employees for a few hours or several days to spend an entire semester or more in increasingly demanding jobs across multiple worksites to gain practical knowledge. WBL can be effective in businesses, health care facilities, government offices, or almost any other real-world locations in the community. It is best method to keep students engaged in working with the public, working alongside regular employees, or in work simulations or operating some school-based businesses. The important factor about WBL is its authenticity that keeps students engaged in real work alongside real expert workers and is often serving real customers, clients, or patients. In this instructional strategy, the English language learners would be speaking, listening, reading, and writing English for real life purposes. Activities conducted in WBL will help students to understand the nature of expertise in a career area and also help them to understand how they can pursue their own career interests.

WBL is a method that places students in intellectually demanding workplace settings before students complete their graduation programs so that they can get a first-hand knowledge of what goes on in their career field. Students can interact authentically with working adults, engage in intellectually demanding work, see how academic, technical content and skills are used in modern workplaces. This is an ideal place for those learning English spoken by positive adult role models and to listen and read the specialized terminology of an occupation used routinely.

Following are the advantages of WBL:

Advantages for Students: This instructional method when used effectively will improve academic achievement of students. In this method students will understand the relevance of their education and the application of knowledge in a meaningful way. It can help to open the doors of many opportunities for career options. This will help to increase self-confidence amongst student community. Modern education needs to acquire a real workplace experience and work-readiness skills. Advantages for Parents and Guardians:. This method can help parents and guardians to give practical education to their child..It can develop collaboration with others, assisting their child to make career. Advantages for Institutions: This method of instruction can increase academic achievement by participating students in learning. It also helps institutions to motivate students for better attendance and graduation rates. This is an effective method to improve relationships with the community. Advantages for Employers:. It is best method to prepare employees who understand workplace expectations. It can reduce recruitment and training costs. This method will be helpful to decide value of learning from student's work. It is an ideal model to improve morale and management skills among existing workers.

V. CONCLUSION

Thus, this paper emphasizes the need of interactive instructional methods, interactive demonstration methods and methods for work-based learning which are more prominently integrated with academics, the contextual, hands-on nature of different curriculum and instruction methods and offers a wealth of opportunities for authentic learning aligned with practices that work with English language learners.

These instructional methods highlight the knowledge of English language learning and contextual instructional practices which can be integrated to help English language learners to succeed in technical education programs. The effective use of these methods can increase application-based curriculum to get authentic learning tasks. These methods will help to get variety of interactive activities to develop students' engagement, cognitive and language efficiency.

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Sea Water Air Conditioning: Review

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Abstract- **We have to reduce power consumption of Air conditioning & avoid the uses of substances which causing global warming and depletion of ozone layer like chlorofluorocarbon. So we are making use of alternate energy resource for air conditioning which also prevents use of harmful refrigerant. So it is economical and environment friendly system.**

Keywords: Air Conditioning, Sea water, chiller, Conventional energy, Environmental Aspect

I. INTRODUCTION

Conventional Air conditioning uses electrical power and also produces emissions which will cause global warming, so there is need to reduce consume power and avoid emissions which causing global warming. Renewable energy is always best source of energy. We have to take most of from it in future to avoid depletion of conventional resources [1, 3]. The use of air conditioning is maintaining the Temperature, Humidity & Quality of Air. The most of power for air conditioning is required for reducing temperature of the air. Humidity of air can be varied by controlling the moisture of air where as air quality can be controlled by using filter. So, to reduce the temperature of air we are using cold water of sea, lake or river which is available at high depth [4, 3].

II. THEORY

The conventional central air conditioning chilled water passes circulated through a required space & it absorbs required heat due to which temperature of water increases through 4-6 degree. Then this water carried to the chiller unit where 0.8 -1.2 Kw/ton power required to remove the heat. This consumption of electrical energy may vary depending on location. [5]

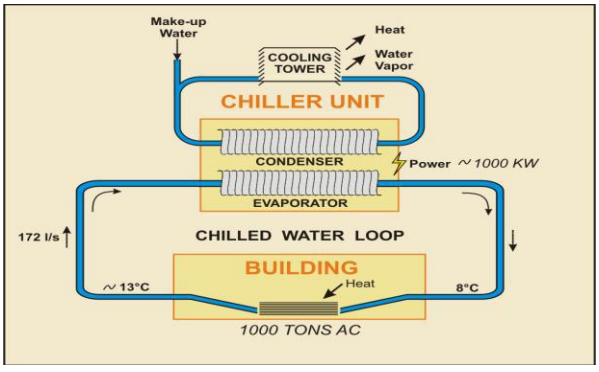

Fig.1: Conventional A.C.

In the sea water air conditioning the naturally available cold water used for air conditioning. This water is available in abundant quantity along coastline.[2,5] The temperature of water varies with depth of sea as shown in the graph (Fig No.2)

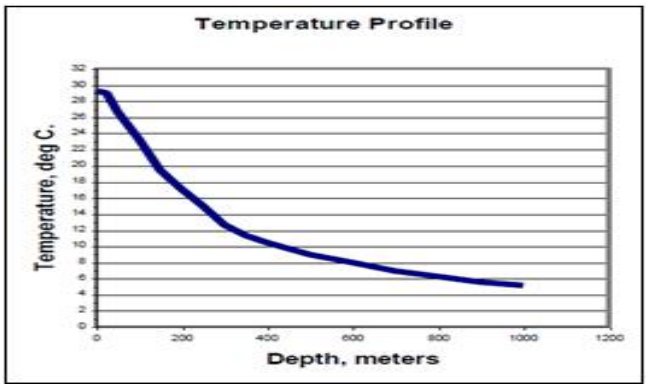

Fig.2: Temperature VS Depth

In this system deep sea water is taken from the sea which has temperature c lose to conventional water going into chiller (5-7 degree C). The water will be pumped from sea and transferred through the heat exchanger where it removes the heat from building. If we are using lake water then after removal of heat same water can be distributed in the city after water treatment. [3,4]

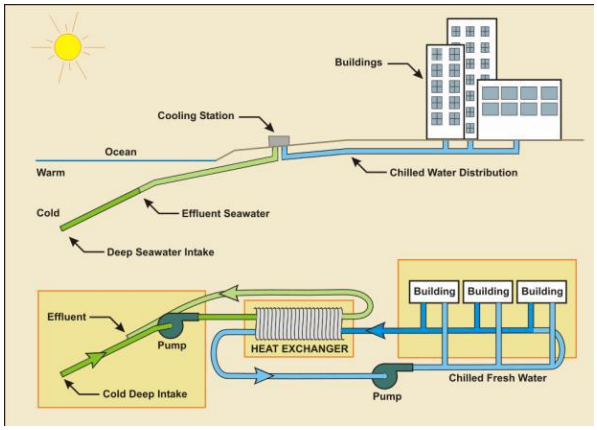

Fig.3: Building Supply

Sometimes there may be restrictions to use this system because there may not be sufficient sea depth to get cold water or the building may be at large distance so not to possible chilled water at same temperature.[1,4] To overcome these difficulties we can add auxiliary chiller to support SWAC as shown in figure 4. Sometimes we can use sea water in heat Exchanger of conventional AC to cool the evaporator instead of air cooled

heat exchanger to support conventional air conditioning as shown in figure. The operation of AC is not on full load throughout the Year, Month & day.[2,4] It Varies according to climate condition & to optimize its use we can install storage Container which will store cold water of sea when load is low & transfer stored water when load is more than rated.[1,3]

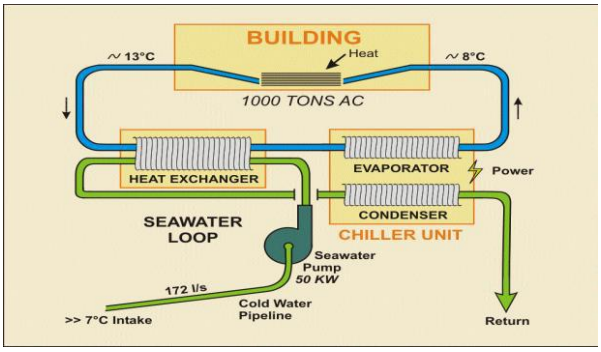

Fig.4: Heat Exchanger

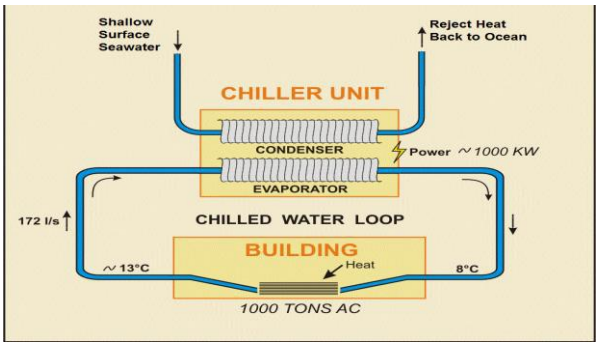

Fig.5: Chiller Unit

III. Environmental Advantages:

SWAC reduces electricity consumption drastically & uses conventional energy. It also helps to reduce Green House Gases and thus global warming by eliminating use of CFCs. It also reduces the carbon dioxide level. Though the Capital cost Of SWAC System is more but the operational cost is low compared to conventional AC as it uses conventional energy. Due to these the system having less than 2100 Tons of load will not justify cost of the SWAC. The following figure(Fig No. 6&7) shows the comparison of the SWAC & Conventional Air conditioning.[4,5]

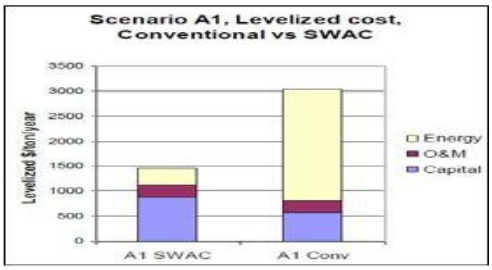

Fig. 6: Conventional vs SWAC

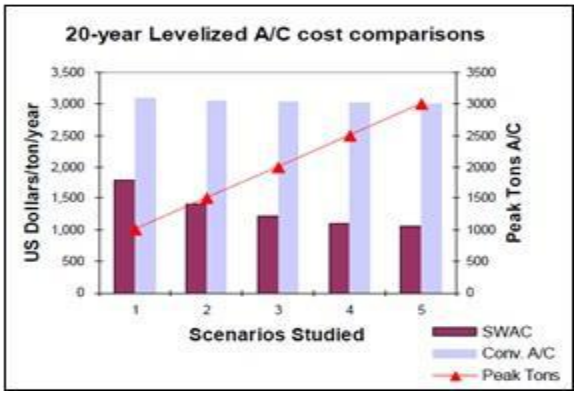

Fig.7: AC Comparisons

Current project: The Following Table (Table No.1) shows the different projects in different part of the world with their capacities [3,4]

Table No.1 Project & Capacity

Sr No.	Name of Project (Location)	Capacity (In Tons)
1	Honolulu, Hawaii	20000
2	Bahamas	3000
3	Curacao Piscadera	3000
4	French Polynesia	450
5	Toronto	75,000
6	Cornell University	20,000
7	National Institute of Ocean Technology (NIOT) in Madras, India,	Ongoing (30000)

IV. Future Scope

The optimization between environmental climate conditions & deep sea water temperature can be made more effective. There need to used material for pipeline which can sustain sea water for long duration.

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Recent Technology for Synthesis of Coumarin Derivative

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***Abstract*- A clean Coumarin derivative were synthesized using recent technology of microwave irradiation, a comparative study was done by using conventional method and microwave irradiation technique, the study includes comparison between yield and time. The present study reveals the synthesis of Coumarin derivative in one step in which 2-oxo-2H-1-benzopyran-4-carbaldehyde is treated with hydrazine hydrate to give desired product conventionally and also by microwave irradiation technique; the target compounds were characterized to deduce the structure.**

Keywords: Coumarin, NMR, Microwave Irradiation, Convetional

I. Introduction

Coumarin belongs to heterocyclic ring system which includes aromatic moiety benzene ring fused to a pyran ring. Coumarin contains the basic backbone of various types of phenols which is present in alkaloids, to copherols, anthocyanins1. Uptill recent advances in the research development coumarin molecule is reported to be having many such activities such as antihelmenthic2, antihepatits3, antidengue4, anti-malarial5, herbicidal, analgesic and anticonvulsant6 activity. Here in this we aim to synthesize new coumarin derivatives and to investigate their antimicrobial and anti inflammatory activities.

II. Methods & Material

Raw materials used in this experiment was obtained from M/S Fluka AG) and M/S Sigma-Aldrich chemicals and Co. Inc. (Milwoukee, WI, USA). are not corrected. IR spectra were established by using IR-Affinity, Shimadzu using DRS system. 1H-NMR spectra was established on a JEOL AL-300 FT-NMR spectrometer (300 MHz, JEOL Ltd., Tokyo, Japan), using TMS as internal standard. Mass data has been recorded on Agilent GC-MS carried on GC7890 MS 200 of Agilent, Microwave oven for synthesis Monowave 300 Anton Parr.

III. Experimental

A) Synthesis of ethyl (pyrazin-2-yloxy) acetate (Compound-2) Conventional Method

Coumarin derivative (0.01 mol) and hydrazinehdrate in acetone stirred for 3 hours. Reflux the reaction mixture leading to formation of title compound. Reaction monitoring was done by TLC as shown in Fig. 1. Product was isolated by drowning into cold water. Aqueous layer was extracted with10 mL Diethyl ether for three times to extract product. Recrystallized, the product with acetone Yield 48%; Colourless solid; mp:234^{0}C, ^{1}H NMR(400 MHz, DMSO-δ6) δ (ppm) 5.9 (s, 1H), 3.1(s, 2H), 7.06-8.08 (m, 4H, Ar-H).IR (KBr) cm^{-1}: 1279(C-N), 3486 (- N=) MS (m/z): 202 [M$^+$] ($C_{11}H_{10}N_2O_2^+$),187 ($C_{11}H_9NO_2$), 146($C_9H_6O_2$).

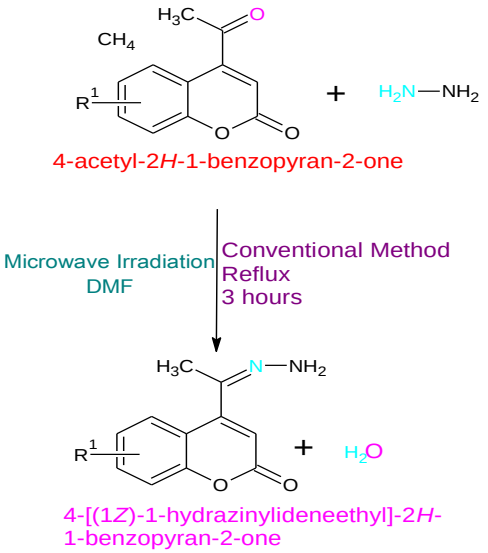

Fig.1: Reaction Diagram

B) Synthesis of ethyl (pyrazin-2-yloxy)acetate (Compound-2) Microwave-Irradiation Method

Coumarin Derivative (0.01mol) was dissolved in DMF. To this solution Hydrazine hydrate solution was added (0.01mol). The reaction mixture was irradiated for 210seconds. The crude product was cooled to room temperature, pour the reaction mixture to ice cold water, product was obtained. Filtered the product; wash with water. Recrystallized the product with Ethyl alcohol, Yield 87%; Colorless solid; mp:232^{0}C, ^{1}H NMR(400 MHz, DMSO-δ6) δ (ppm) 5.6 (s, 1H), 2.3(s, 2H), 7.11-8.28 (m, 4H, Ar-H).IR (KBr) cm^{-1}: 1210(C-N), 3456 (-N=) MS (m/z): 202 [M$^+$] ($C_{11}H_{10}N_2O_2^+$),187 ($C_{11}H_9NO_2$), 146($C_9H_6O_2$).

IV. Observation

Compound	Substituent	Conventional		Microwave		Melting Point (in ^{0}C) M.P/B.P
		Time in (Hours)	Yield in (%)	Time in (Seconds)	Yield in (%)	
2a	H	3	48	210	87	232
2b	0	9	65	209	85	244
2c	-Cl	5	66	216	89	237
2d	NO_2	5.5	52	234	92	349
2e	-COOH	6	67	189	77	277

V. Results & Discussions

Compound 2d has shown yield of 92% when synthesized by using microwave-technique where as conventional method has produced yield of 52%, same in case for 2c yield from conventional method is low as 66% then in microwave technique with 89%.

VI. Conclusion

The microwave method was found to be better than conventional method in terms of reaction time, yield and relatively simple method to perform synthesis.

Acknowledgement

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Reach the Unreached: Street Children Literacy

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***Abstract*-This paper discusses about the outcome of the activities conducted by extension work team volunteers for the literacy of street children. The children staying in the local areas of Central Mumbai and Mumbai suburbs were targeted. The children working with street vendors, selling products at traffic signals and wandering aimlessly in the local slums where approached by extension work team volunteer. The reaction of parents about this activity is also discussed in a broad perspective. The government authorities also were involved in the activity. The outcome of this activity provides a chance for these unprivileged children to stay and get the school education free of cost.**

Keywords – Street Children, NIOS, Vendors, Education

I. INTRODUCTION

Education is a need of hour for an individual, societal, nation wise to help the individual to make his or her stand across the society. The knowledge attained through education helps open doors to a lot of opportunities for better prospects in life. Around, 75 million children are away from basic education, 150 million children enrolled but dropped out before completing primary education in which two third of population is girls. 18 million children in India are street children and Mumbai city itself, has more than 2 lakh children on the streets. "Street Children" term is used for the children having an age below 18 years who lives or wander on the street. The street children communities face widespread discrimination, compounded by illiteracy, malnutrition, health & social problems growing from extreme poverty. Many individuals are unable to get educated or continue their schooling due to various problems viz; lack of awareness, school fees, family background, interest, physical, psychological, unavailability of school, etc. As per the requirement of the nation for development, skill development is an important topic on which individual must focus. Many organization are keen to target the children who are unable to get educated due to different problems as mentioned above. The multiple NGOs are working towards this national issue under which multiple bills are passed in Lok Sabha & Rajya Sabha. The Maharashtra government is having a standard procedure to help the street children which is discussed in this paper. The mobile application is launched by government under which child right violation is reported faster. The noble peace prize recipient Kailash Satyarthi, founder of "Bachpan Bachao Andolan" spent his whole life for sheltering and educating the street children. Due to lack of awareness and education, street children get indulge in activities viz; trafficking, child labour, sexual abuse, exposure to diseases and police violence, which are not healthy for their current and future life. Many activities are conducted by different organization so that people staying on streets can be made aware of their rights under which they can make their subordinates life suitable and happy. The street children nowhere interested in education as their life is full of complication which starts with food for which they start working at their early age. The working of street children at their early age leads to unreached towards their education. Some of the parents residing on streets don't want to send the children to school contemplating the loss of the earning member and it will be difficult to survive. Education is one of the fundamental human right which allows the children to develop some skills that can enhance their potential. The lack of education has dire consequences for the child and negative consequences for the society as a whole. Street children often develop behavioral issues that interfere not only with their own intrapersonal and interpersonal well-being, but also negatively affect later adaptation and contribution to a healthy, productive society. They learn these behaviors on the streets that inflict damage on the self; the likelihood of treating others the same way is increased. These children have many needs and offer special challenges. Some of these can be addressed through education with a values-based educational approach. A widely acclaimed movie of Mira Nair "Salaam Bombay" also explains about the values of respect and support for the rights of street children at its core. Many children are illegally adapted by anti-social elements of the society who doesn't allow them to move anywhere and participate in good activities, though street children are far away from education even in 21st century.

Lewis Aptekar [1] discussed about the needs of street children who are unique in the sense, some of the children did not have any formal schooling while others dropped out of school at different levels. the dynamics of the street child are complex, especially with regard to provision of formal education. to address the specific educational challenges of street children is not based on an easy and quick solution. it will need a well-planned, holistic and inter-sectoral approach to be effective.

Pandey R. [2] explains the study aimed to provide a situation analysis of the nature and extent of the problem of street children in India, to assess the satisfaction of their basic needs, to provide a profile suitable for policy formulation, and to suggest modifications in services. Observation, case study and interviews were part of the methods used in data collection. A sample

ranging from 1250 to around 2300 children was obtained from each of six cities: Greater Bombay, Calcutta, Madras, Hyderabad, and Kanpur. An inventory of facilities for street children was also performed. Subjective evaluation was used to assess the adequacy of food, clothing, shelter, health care, protein intake, vitamin intake, immunization, education, recreation, sports and games, love and affection, security and protection, recognition and praise, adequacy and contentment, creative expression, social interaction, social acceptance, social security, and social maturity. Findings were presented for the community setting, family conditions, the economic situation, basic needs deprivation, and a program of action. 92.9% of street girls lived with their parents, while 85.6% of boys did so. 7.4% of street boys lived alone and not one girl lived alone. Most of the street children were loved by their parents; the bonds were stronger between parents and street children than between street children and siblings. 26.6% of street children reported exploitation by parents in order to supplement the family income, but 55.8% did not consider their earnings exploitation by parents. All children who worked in the informal sector and for more than full-time hours. Children feared and hated employers. Sanitary conditions were poor. There was a strong need for food, clothing, medical treatment, education, and night shelter. The community was indifferent to the street children. UNICEF in 1988 brought the poor conditions of street children to the attention of the government of India. Programs specific to street children do not exist, although social welfare programs are available that could serve the needs of street children.

II. LITERATURE REVIEW

Archana K Roy et. al. [5] explains about seasonal labour migration from rural to urban or from backward to developed region is a household livelihood strategy to cope with poverty. In this process, the children of those migrants are the worst affected whether they accompany their parents or are left behind in the villages. The present paper explores the impact of temporary labour migration of parent(s) on school attendance of the children between 6–14 years and their dropping out from the school through an analysis of the cases from both the ends of migration stream in India. Data was collected from thirteen construction sites of Varanasi Uttar Pradesh and nine villages of Bihar by applying both qualitative and quantitative techniques. It is evident from the study that the migrants through remittances improve school accessibility for the left behind children and bridge gender gap in primary school education. However, among the accompanying migrant children of construction workers, many remain out of school and many are forced to drop out and some of them become vulnerable to work as child labour due to seasonal mobility of their parents. Thus, mainstreaming these children in development process is a big challenge in attaining the goal of universal primary education and inclusive growth in the country like India.

Gloria Luz M. et. Al. [6] discussed a novel log linear analysis to identify the factors that enhance and hamper working children's effort to receive education, stay healthy and engage in recreational activities. The study looked at a sample of working children aged between 5 and 17 years in a nationwide study in 1995 and 2001 by the National Survey on Working Children (NSWC). It was found that the dropout rate from school decreased when the number of working hours and frequency of heavy physical work lessened. Working for a relative, and when the child is an unpaid worker did not affect their schooling as compared to children who engaged in heavy physical work. In 1995, the adverse effect on health among working children in the agricultural sector was due to heavy physical work and exposure to parasites and bacteria. In 2001, it was found that most children working in the industrial sector were affected by exposure to extreme temperatures and harmful chemicals. Long working hours meant less time for recreational activities. The identification of these specific factors are useful for policy makers in the Philippines who aim at reducing the incidence of child labor.

David F. Lancy [7] explains about the communities' anthropologists typically study has undergone rapid change and children are much affected. Enforced schooling undermines children's contribution to the domestic economy. Children's (and parent's) "heads-are-turned" expecting that schooling will put the child on a fast track to secure wage employment. Consequently, children absent themselves from the village curriculum, failing to gain the knowledge and skill essential to making a living in the local ecology. Since the quality of education is usually poor, children cannot use it as a springboard and, so, are left in limbo. Additionally, as the subsistence economy is monetized, children may abandon native crafts or capitalize on tourist demand for new designs. They may be forced to labour to help families disrupted by globalization. At the other extreme to these communities are those where successful schooling followed by prosperity frees children from any and all obligations to contribute to family welfare

III. METHODOLOGY

Extension Work Team (EWT) volunteers, 100 in number from Thakur College of Engineering and Technology (TCET) are working under the project 'National Institute of Open Schooling' (NIOS) followed by department of Lifelong Learning & Extension (Mumbai University - DLLE) conducted a survey on many street children residing in Mumbai Suburban areas from Dahisar to Kurla. Volunteers categorized the street children in three categories- Children selling small fancy items, food, books, etc at the signals.Children begging on the road or at the street signa.Children aimlessly wandering on the streets or in nearby slums.

The groups of volunteers (Four to Six volunteers) visited the localities near their residences and their findings are summarized

as follows:Volunteers visited the area near Malad Railway Station and interacted with four street children picking garbage from the railway tracks. The volunteers contacted the helpline number (1098) provided by government advertisement and waited for three hours and handed over these children to NGOs for their future schooling opportunity. Volunteers visited to Borivali East signal, opposite to Metro Mall and interacted with seven children whom three were going to school were not regular but next four were not going to school but interested to join the school. The volunteers contacted the helpline number (1098) provided by government advertisement and waited for an hour and handed over these children to NGOs for their future schooling opportunity. Volunteers visited to Borivali East National Park signal and near Borivali Railway and interacted with street children in which they found that some children were going to school but were not regular and interacted with one child working at tea stall asking about the willingness of going to school. The child was ready to go therefore volunteers contacted the helpline number (1098) provided by government advertisement and waited for some time and handed over these children to NGOs for their future schooling opportunity. Volunteers visited to Buddha colony, Kurla east in slum area and interacted with children for an age group of six to twelve, picking up garbage from streets, begging and working at tea stalls or hotels who didn't show any interest towards the volunteers and their consent. The volunteers talked to their parents about their ward schooling, convinced them about schooling their ward and then contacted the helpline number (1098). The NGOs people told the volunteers that they will talk to the principal of nearby municipal school and get them admitted there itself. After two days, the TCET volunteers received a call from NGO about the admission process of street children.

Volunteers visited to Borivali West signal, opposite to Mc Donald shop and interacted with four children as well as with their parents about their schooling and then contacted to helpline number (1098), they assured that they will take care about the further procedure, but once volunteer visited that signal children's are still seen at the same place.

Volunteers visited to Kandivali East, Near Mahindra company signal, interacted with four children who were helping their parents to earn the wages, volunteers contacted to helpline number (1098), they assured that they will take care about the further procedure.

Volunteers visited to Navi Basti, Bhiwandi, interacted with three children who were recently migrated to Bhiwandi, they struggling to get settle in the city hence unable to move to school therefore volunteers contacted to helpline number (1098), they assured that they will take care about the further procedure.

Volunteers visited to Matunga station and found children along with their parents were selling flowers and garlands. Volunteers interacted with them and found that not even parents were interested to send their wards to school due to their financial crunch. Volunteers contacted the helpline number (1098) and told about the facts, they assured that they will take care about the further procedure.

IV. Result

Due to the immense effort of the TCET volunteers they proved that "Hard work Pays". Many of the parents with whom volunteers interacted agreed to send their children to school. Due to some technical problems volunteers are not able to give the status of all street children, but few children's are admitted to school and got the benefit of these facilities. The feedback is still going on to understand the needs of street children towards their education. TCET volunteers are trying to resolve the technical issue and get the actual status of children whether they went to school, just by physically reaching to the location. The volunteers had a talk with NGOs and found that there are four teams in the NGOs who look after complete Mumbai region. TCET volunteers interacted mainly in western and central region of Mumbai where teams of NGOs are missing their presence. Due to which work of TCET volunteers made an impact on the life of children who got admitted.

V. Conclusion

TCET volunteers had a healthy interaction with the children residing on street and their parents to make the future bright of street children. Volunteers took the feedback of street children about negligence, casual approach towards education. They made them realize the benefits of education as well as ground reality of illiteracy which encouraged them to go to school by their own. Parents of street children agreed about their mistake to not to allow their ward to go to school and indulge them in early earning. Volunteer's interaction with the NGOs results that they are keen to put their concern towards this issue. This issue is to be raised at a higher level so that no child will be a vagabond.

VI. Acknowledgement

TCET has provided an opportunity under DLLE program to conduct a survey about street children and make them to reach the school. NGOs had also worked with volunteers in this noble cause to take the nation at next level. TCET volunteers worked hard to conduct the survey get the feedback and take an initiative in positive direction for a noble cause

VII. Future Scope

The waiting time of volunteers and action taking time or response time should be decreased so that within the lag time some children or their parents should not change their mind or move somewhere from specified place. A request to all the people in India, if anyone see such children on street don't ignore them contact on helpline number 1098 and do the noble cause. Small vendors on streets should also encourage such children to go to school to make their future bright by keeping a motto in mind as "Padhega India TabhiBadhega India".

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Evaluate the Need of Scientific Study to Validate the Effect of Yoga

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***Abstract*- Our research work is on study effect of yoga to improve the academic performance of adolescence. We identify the main challenge of pursuing a practice based research is to devise a mechanism of evaluation to judge the effect of our yoga therapy and to validate that our yoga therapy is the main contributor for improvement of academic performance. We found that very few research scholars in our country go for experimentally based research in the field of Yoga. The main reason is a huge cost involved in setting up experimental based setup to perform scientific studies of Yoga. Our argument is that, scientific study is required to effect of yoga practices for life saving treatment like treatment of cancer, heart alignment, spinal cord problem or controlling a diabetes of the patient. But we don't need scientific study and its expensive setup to check effect of yoga on non-critical area like improvement of academic performance, or increase in concentration while studyKeywords- Steady, Hydro magnetic, porous medium, constant heat flux, optically thin fluid, Skin-friction, Nusselt number**

Keywords: Yoga, Scientific study.

I. INTRODUCTION

In this paper we will be discussing the main challenge of pursuing a practice based research is to devise a mechanism of evaluation to judge the effect of our yoga therapy and to validate that our yoga therapy is the main contributor for improvement of academic performance.

We found that very few research scholars in our country go for experimentally based research in the field of Yoga. The main reason is a huge cost involved in setting up experimental based setup to perform scientific studies of Yoga. Our argument is that, scientific study is required to effect of yoga practices for life saving treatment like treatment of cancer, heart alignment, spinal cord problem or controlling a diabetes of the patient. But we don't need scientific study and its expensive setup to check effect of yoga on non-critical area like improvement of academic performance, or increase in concentration while study. Normally all Yoga instructor take a verbal feedback from participants after yoga practice and judge its effect. Even when any person visit doctor for some treatment, doctor get verbal feedback about patients' pain and then they start diagnosis scientifically. For e.g when patient tell them about pain in particular tooth, after that only dentist take a x-ray of tooth for further investigation.

II. SCIENTIFIC STUDY OF YOGA

Now we will discuss, how science can contribute to understand of Yoga and what are the problems in adopting scientific study of yoga. Double-blinding a Yoga experiment is not possible [1]. In scientific research, In a blind or blinded experiment, the information about test is kept hidden from the participant. This is required to reduce or eliminate bias. Here bias may be intentional or unintentional and hence no dishonesty is implied by blinding. If the both researcher and subject are blinded, then the trial is called a double – blind experiment. Blinded experiments are impractical and unethical in the field of developmental psychology like Yoga. Opposite of blind trial is open trial. Clinical experiments are performed with standardized protocol. But in real world Yoga is not practiced according to standardized protocols. Scientific research experiments are expensive and sponsors of that are actually responsible for biasing and corrupting the results. Even though Yoga studies tend to involve fixed protocols, but Yoga instructions are based on iterative response to empirical observation. Yoga studies have exclusion criteria, whereas in normal Yoga instructions, every person is welcome to practice, and it is job of the instructor to adapt the practice so that it is suitable for the individual. The evaluations of short-term changes due to yoga are considered as most effective accomplished. And researcher neglect the long term effect of yoga.

All of these issues are not with science , but with randomized , controlled trials used in scientific experiment. From year 1948, Pharmaceutical industry used randomized, controlled trials (also called as clinical trial) to test new drugs. The clinical trial are very much suited for this where experts select the treatment and it is forced on body of subject and role of consciousness plays little or no role in the outcome.

These issues are raised by Dr. McCall [1]. Is scientific investigation is appropriate for complex, self chosen, whole-health wellness practice in fields like Yoga, Psychotherapy, acupuncture, nutrition, homeopathy, nursing and herbalism [3]. Applying Clinical trial to these fields will give unreliable results, particularly false negatives.

III. YOGA RESEARCH – OUTCOME BASED STUDY

In Yoga Research, Quantitative research has given us an Opportunity to study pattern involving group of people. Yoga Research is Outcome based Research [4], where instructor and

participant (subject) know in advanced about desired output. This type of research also called as effectiveness study or observational design. Here participants live and do yoga practice in their natural settings. They are asked to go for survey, where they need to give answer to question related to feelings or behavior after the practice. They answer these questions only in retrospect. Now we need to validate the Yoga research as a outcome based research or based on observational design. Actually observational design never determine cause or effect for e.g. if a researcher didn't randomly assign the participants, then it is difficult to know if yoga practitioners are happier as they practice yoga or happier people attracted to start yoga practice. Or how to claim that it is yoga practice has helped an adolescent to improve academic performance. So there are possibilities of not comparable factors that affect the results. To counter this argument we need to understand that Yoga doesn't cause the wellness but it removes the obstacles to it. As per medical science, the randomized, controlled trial is a good method and it is superior to observation method. But, empirical evidence substantiating this claim is surprisingly absent/. Empirically, results from observational studies within the field of medicine have proved more accurate than those from clinical trials. So fact is Observational designs are statically muddier from the point of view of isolating variables and proving causation. But for longer period and with real world practice of yoga, observational designs will give accurate results. "Using Clinical trial to study the outcomes of a long-term Yoga practice is like putting a square peg into a round hole. And making this statement doesn't give science a black eye." [3]

IV. CONCLUSION

As we have seen, that clinical trial or randomized, controlled trial is good for study yoga experiment for short duration, may be for three to six month and duration above is too expensive. when you want to evaluate effect of yoga practice scientifically, duration may last for few weeks to couple of months. so learning yoga can accomplished in Short duration is worthwhile, but fail to investigate what happens additively and cumulatively with a committed yoga practice, when synergistic outcomes begin to emerge. So as per Dr. Mccall1 small duration is like a drop in the bucket of yoga practice and investigating that underestimating the healing potential of yoga in our research. our aim is not to undermine science, actually yoga will come short when we measured with scientific method. So now we need to come out with different tools and used that tools for studying what we want to study. Our approach for scientific yoga study are study yoga for longer duration, outcome based study.

Outcome based studies offer more advantages when it is carried out for longer duration. the subject in an outcome based study (observational study) represents the target population more closely than do the subject on an experiment. in an observational study of wellbeing, we can measure long-term personality changes that are deeper and more permanent. so outcome based study should be given more place in yoga research when it is done for non critical health issue. and our research is about how yoga will be used to improve the academic performance of adolescence which is a non critical in term of issues of health. we will going to follow observational design to gather good data about a complex. Long-term yoga practice. and we focus only on outcome. Normally in complexity and system research, the complex system is regarded as a black box. black box link to infinite complexity of each adolescent's life and at the end of the day, in spite of many differences among subjects , we will able to ask "do the statistics suggest that yoga may have made a difference in academic performance.?"

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Training and Development Through E-learning: Empirical Issues

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***Abstract*-Training and educative aspects have become crucial part for efficient operative functioning of employees. This paper examines and provides a review of the role of E-learning for employee training and development practice in order to improve organizational effectiveness.**

Keywords: E-learning, training and development, Corporate learning

I. INTRODUCTION

Use of the internet becomes a necessity now days as companies and organizations are adopting technologies to improve the efficiency of day-to-day operations. As multinational companies are expanding globally, the opportunities to connect with people across other countries also increase. E-learning successfully tackles the issue of training all these parties at once [1]. In times of competition and technological advancements, all organizations try to ensure that their technology is developed enough to enable anytime, anywhere learning of their workforce. The challenges of changing pace and employees leaving organizations due to extended periods of training have created an urgent need to reduce the time taken for learning and executing of knowledge, leading to the rise of E-learning [2].

The ever changing nature of technology and required skills to completely utilize it has resulted in increasing demand for enterprise wide E-learning solutions. A large number of E-learning solutions are currently available to meet the demands and challenges of training needs.

E –learning means Electronic learning According to Derek Stockley 2003 "The delivery of a learning, training or education program by electronic means. E-learning delivers content via a computer or electronic device (e.g. a mobile phone) in some way to provide training, educational or learning material. "

Problems of learning using traditional ways

The problems and issues include the following: Not all employees can be spared for training at the same time. (e.g. Imagine an organization where everybody has to be trained, can organizations afford to send people, even in batches for a traditional classroom course. Increased costs of travel and stay, if learners are coming from different locations. Individually employees may differ in their levels of understanding and grasping the course content. Instructors try their best to cover the entire course in least amount of time. Learners get limited scope to revise concepts or re-attempt, unless the company decides to regulate their trainings. Ideally, learning should be continuous but instructor led training makes it a onetime event.

II. CASE OF E-LEARNING

Globally, all businesses, big or small, local or global is adopting e-learning as a means of imparting effective learning. E-learning can be termed as a type of training delivered on a computer to meet individual and organizational goals. The purpose of an organization in using E-learning is to assist the individual improve job performance and satisfaction, perceive on the job skills and facilitate the company produce a competitive work force. It is not alarming that the approach of E-learning is growing expeditiously. The advantages of E-learning are:

There is no compulsion to send all employees at a similar time. The employees can opt for their time and place of learning. Do not follow a set schedule and if need be employee can go over again and again till confidently acquainted with the subject. No time compulsion. Learning can be in segments or all at once as per the learner's need-rather than the trainer's ease. LMS system and small number of trainers can be deployed to manage a large number of courses. The LMS platform with assessment toolkit can track records of courses opted, test scores, time taken, etc for each learner which can provide rational data for nurturing employee's skills. It results in measurable learning. Measuring employee engagement gives better control and leads towards improving it. With the help of score tracking, progress tracking and time tracking matrix, the performance of each employee undergoing the training becomes measurable. Resulting in a more satisfied and retainable manpower. Flexible course distribution accessible through digital technologies, standalone CD ROMs, Internet or a companywide Intranet. Hence less business expenses, which can be a significant cost today. E-learning has become a central scholastic and teaching instrument in the current business climate for the simple reason that corporations have adopted it as part of their business operations.

III. E-LEARNING IN INDIA

Learning has evolved over the years as people wish to move away from the conventional way of leaning. Learning has become all about self-development, online training and education on the go. Internet has contributed heavily to the growth of E-learning. E-learning has been adopted by the corporate sector in

employee training and growth. According to the report, "India E-Learning Market Outlook to FY'2018 – Increasing Technology Adoption to Drive Future Growth", the market is expected to grow at a CAGR of 17.4% over the period FY'2013-FY'2018 basically driven by many factors such as growing acquisition of technology, scarcity of quality education, Ease and cost factors and others. With the usage of E-learning in talent management in corporations, the demand of custom E-learning content and technology is likely to surge thus driving the E-learning growth in India [8]. The report, Learning & Development (L&D) at Workplace: Changing Paradigms, Emerging Trends - prepared jointly by 24x7 Learning and Grant Thornton, in alliance with IIM-Kozhikode concluded that many companies spend on training of their critical workforces to enable them to keep up with the global work environment. The study is based on the report of top 150 companies and focuses primarily on analysis of Learning and Development industry in India with prominence on the corporate training market and the practices of learning and development. The report projects India to become the 3rd largest economy globally by 2028. It also highlights some of the key challenges such as accelerating T&D in a rapidly competitive business environment. It says that only 27% of companies use E-learning as a Learning & Development tool. The size of the Indian E-learning market which has been estimated to be $276 million in 2008 grew at a Compound Annual Growth Rate (CAGR) of 15.9% to reach US$ 578 million between 2008 and 2013.

Naresh B, Dr. BhanuSreeReddy (June 2015), in paper titled "Challenges and Opportunity of E-Learning in Developed and Developing Countries-A Review" compares E-learning environment and its difference between the developing countries. the developing country faces challenges like, lack of adequate infrastructure, trainers, lack of financial support, Government policies, less student willingness. The developed countries on the other hand have more support from the government, proper training regarding technology and awareness of E-learning and user's readiness to learn new technology. The report highlights that high population and higher student-faculty ratio can drive e-learning in the developing world coupled with some of the features of the developed world. The developed world is however paralyzed by minimal student engagement, student motivation, and high student drop out ratio. Indigenous effort such as the establishment of NPTEL by IIT is taking E-learning to the masses. Indian E-learning technology market had increased from USD 88 million in FY'2008 to USD 173 million in FY'2013 at a CAGR of 14.4%. Indian e-learning content market is also advancing to grow at a CAGR of 18.4% from FY'2014-FY'2018. The total Indian E-learning market is anticipated to reach USD 1.3 billion by FY'2018. The size of India's online education market is expected to grow from the current $20 billion to $40 billion by 20179.

Training & Development Programs by GE capital India: GE Capital is an expert providing a diversity of training programs ranging from leadership and general business expertise including E-Training, soft-skills training and competency-based training to programs includingManagerial courses in leadership, innovation, and project planning and executive development.

IV. E-LEARNING ABROAD

Prince F. Ellis and Kevin D. Kuznia(2014) conducted a research on "Corporate Elearning Impact on Employees" the research explored how employees' productivity, job performance, and job satisfaction were impacted by using E-Learning. Corporations use various forms of E-learning processes and applications, such as computer based training (CBT), web-based training (WBT), and many others [7]. The results showed that the use of technology alone will not yield desired results; corporations need to determine a balance between E-learning strategies and managerial support.

Josephine Nyokabi Mwangi (2014) conducted a study titled "An Investigation towards E-Learning at the Workplace: A Case Study of Unep Staff at Gigir". The purpose of the study was to investigate the adoption and use of E-learning at the workplace with a focus on UNEP staff members working in Gigiri. The finding acknowledges the importance of using E-learning in the workplace and recommends the following to the organization on the perceptions of E-learning initiatives; future development of E-learning programs should focus on technical and organizational issues,the E-learning research should be based on the context of use and application at workplace. Resistance from the employees, technological incompatibility and lack of incentives for adopting new work practices by management are identified as major obstacles in the application of E-learning practices.

V. E-LEARNING ISSUES AND CHALLENGES

E-learning is considered by organizations as a new training possibility and as a prospect to economize time and money. Nevertheless, quite often, poor quality learning experiences and a high percentage of losses are observed. Lack of learners' motivation. It is one of the most common E-learning challenges that E-learning professionals must overcome. Learners often have the set belief that conventional training programs are more effective because they believe they can be more fruitful in a familiar environment. Busy learner schedule. Many employees resist taking an E-learning course because they suppose that they won't be able to go at their own pace or that it will require a great deal of their time. Also, trying to keep track of learners' progress can be the most difficult challenge to address. The belief that E-learning environment offers no support. It is a general misconception and drawback that E-learning courses are isolated and offer no support for their learners. Also, virtual environment is not enough to sustain learner interest.

VI. FINDINGS

The author gathered some insights based on analysis of secondary data available reveals following outcomes for

Corporate India and Abroad experiences: Almost 50% of the companies gives preference to E-learning Training Method over traditional classroom-based instructions.85% of the companies think E-learning as most effective training technique to help employees learn and train in new skills.79% of the companies are ready to take leap to improve their work force performance and investing more to update their LMS Systems. 86% of the corporate employees are opting E-learning for corporate training requirements by creating their own content. As fastest growing Indian companies are rapidly increasing their footprint internationally, around 80% of businesses in India are expected to increase the time and effort spends on L&D preference given to E-learning. In the coming ten years, India is likely to become the third largest economy globally, one of the key challenges in sustaining the development force of the economy is how to keep the pace with L&D practices in an increasingly competing business world. There is a shortage of skilled professionals especially in the frontline positions. Due to a growing demand for competent professionals, this challenge rises as an open door for Indian L&D industry which is presumed to triple by 2020.

Amongst the various sectors which are making extensive use e-learning for L&D and also spending considerable amount on it are IT, BPO, technology, banking and the financial sector. Despite the fact that Indian businesses are as yet subject to the conventional training methods, there is an opportunity to upsurge the role of E-learning by delivering more significant and detailed modules to the organizations to train their employees. With organizations willing to take up-learning courses to promote right people with the right skills into the right position, the need for customized E-learning content and technology is anticipated to advance. Across the world most of the organizations are looking for E-learning to train their globally dispersed workforce. In UK, Spain and Benelux nearly 40% of companies train more than 50% of their employees using E-learning. France uses E-learning only for 17% of its employees. In the services sector E-Learning is most widely used as 43% of the companies train more than 50 % of their employees via e-learning.

The practice of E-learning appears to grow immediately after 2012.Given the economic backdrop, numerous organizations are in quest to maintain or reduce their overall training expenses, further they are looking to curtail training cost per employee in order to be able to train a greater number of staff without expanding their budget on learning and development practices. The findings of the E-learning survey affirm that E-learning has turned into a rational delivery mode for all sizes of business. Whether the establishment has less than thousand employees or between 1,000 and 10,000, the number of users in the learning zone is expanding. Quite a few firms like Franklin Covey, Toshiba, Michigan, Xerox, ABB Ltd, Pidilite are using E-learning to increase proficiency and potency of their employee. E-learning advances performance of employee and it diminishes the cost of training. Organizations are able to safeguard nearly fifty percent when adopting E-learning in place of classroom training. Training with E-learning implies that courses can be rendered into shorter sessions and extend over number of days so that the business would not let slip an employee for entire days at a time. Moreover, it improves productiveness as employees save commuting time. Not strikingly, the more enhanced forms of E-learning are highly prevalent among larger firms and companies that are technology-savvy. At Fortune 500 firms, 73.6 percent of training is delivered through Intranet, online methods.

VII. FUTURE IMPLICATIONS

E-learning has been gaining wide acceptance in today's organizations and will continue to rise. Because of the value added with E-learning companies are willing to spend the money to implement or provide it to their employees. The Millennial employees are touted to be more flexible and adept to E-learning at work places and expect this to be an integral part of their employee development process. The rationale behind this is that the millennium generation is a digital generation who are already used to learning in this way (Ettinger et al., 2006B). The challenge that companies will face is to engage these new employees in the delivery of E-learning they are used to such as video games and digital media that they use in their everyday lives. The challenge is to transform what can be a simple mechanical process into an exciting online classroom with powerful interactive features, such as streaming media, personalized skill assessment, application and simulation exercises, case studies, video-clips etc.

VIII. CONCLUSION

Corporate Training is the medium for businesses to expand knowledge base of their clients. Employees can be trained to become more dynamic and increase the success level to get an extra edge over competitors in their field. Corporate training programs are designed for an organization that may wish to train their employees on specific aspects of their job processes or responsibilities. Sometimes, face-to-face training becomes cumbersome due to travelling issues and schedules. This can lead to waste of manpower and resources and reduce the work speed. The conventional training involves a lot of manpower, resources and most importantly time. Over the period of time, E-learning has revolutionized the way corporate trainings are being delivered across the world. E-learning has enabled businesses to conduct successful business operations and achieve greater results. Small sized business and corporate are also conducting such training sessions through online learning management systems. The concept of E-learning is gaining momentum and companies are reaping its benefits to achieve better performance. Now, in a span of time, tens of thousands of corporate trainings can be given to employees over a wide range of time and space thus resulting in having a competitive work force.

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Enhancement of 4Cs through Collaborative Learning Method

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***Abstract*- Collaboration, communication, critical thinking & creativity are the "4Cs" identified as 21st century learning and innovative skills. Collaborative learning method provides conducive environment for the nourishment of these skills. A group of students work in search of meaning, understanding, or solutions or to create a product of their learning. It makes the students interactive in their quest of knowledge. An appealing learning also engages an interaction among all learners and teacher with the help of the study materials and its context. It is said that the learning can be taken place in a better way when it helps the learners to be more active participant in its process. Students feel competent to the new learning challenges and experience. It is necessary to look how this group activity and new roles of students impact the entire processes and activities which students perform before learning, during learning and after learning. At the beginning or before learning, students decide aim and plan learning tasks and work together to accomplish tasks next, they examine their progress and after learning they evaluate their performance and plan for forthcoming learning. This paper highlights the Collaborative Learning Method is valuable and useful to develop "4Cs"- Collaboration, communication, critical thinking & creativity among the students.**

Keywords- Collaboration, communication, critical thinking

I. INTRODUCTION

Learning is a natural as well as an active process wherein students come together to share their knowledge and information and relate the new knowledge with their previous knowledge. Collaborative learning is an educational approach that engages group of students working together for better learning, to complete a task, to solve a problem, or create a product. Collaborative learning is based on the concept that learning is a natural and social act in which the participants share their views about the concept. The learning takes place only through the discussion among the learners. The learners, in the collaborative learning environment, are challenged socially as well as emotionally since they listen to different points of views and are expected to speak out and protect their ideas. In doing so, the learners initiate to create their own unique understanding and not depend solely on a teacher or a text. Thus, in the collaborative learning method, learners will be given the equal opportunity to interact with peers, present and support ideas, exchange various beliefs, question others and be actively involved.

II. IMPORTANCE OF COLLABORATIVE LEARNING METHOD

The team members find value in working in a group for the common goal as a meaningful reason, along with receiving mutual benefits for the company and the team as well. Collaboration provides equal opportunities to every team members to participate and communicate their ideas. Since, at the work place every individual must show the collaboration for the accomplishment of any task otherwise it is hardly possible to complete the task at the individual level. Means, it is the result of team work. When the collaboration is being practiced at the work place, then it should be developed into the students from the beginning of their education itself. Let students gain the knowledge by the natural ways. It will make them habitual to tackle any problem or any allotted task. Collaborative learning method presents the positive environment for the cultivation of most modern skills which are known as 21st Century's learning and innovative skills: Collaboration, communication, critical thinking and creativity.

III. COLLABORATION

It is an important method for teaching-learning process as it is based on the natural way of learning. It is based on the manners by which work is performed and accomplished in our society as well as at workplace. Collaboration is a skill which is essential to achieve meaningful and positive results with effectiveness. Due to globalization and the rise of technology, collaboration became not only important but necessary for students and employees too. It is said that no individual is as smart as all of them, means an individual cannot perform as better as all the members of the group. There is limitation at the end of the individual while performing any project or gaining knowledge whereas a group can share their knowledge and experiences for the completion of task and making understand their team members. A task, an understanding or a better learning is possible with proper cooperation and coordination in the views and opinions of all members. Then, it will be more perfect than the individual's work. Groups are remarkably smarter than the smartest people in the group. Diversity brings all the team members and their cultural perspectives and experience into the collaboration. Thus, collaborative effort creates more effective results than the efforts of an individual.

IV. COMMUNICATION

A person cannot survive without communication. Every individual need to express views and opinions and understands others' too. The exchanging of our thoughts, ideas, feeling and opinion in an effective way is essential in our lives and at work place. An individual with the mastery over the communication skills will be noted and honored by higher authority and society in large. It is a channel through which one can distribute the

work, manage the task, solve the problem, gives the suggestions, persuade colleagues and can make receiver to understand in an effective way. One can make it more interactive and lively by using collaborative learning method in the classroom. In this collaborative learning method, a group of students will be allotted the task and informed them to solve the work by discussing with your team members. The restriction regarding the target language will be told to students. They need to speak in that language and complete the activity given by subject teacher. Here the real situation is created, and students also find interest in such activities. They like to communicate with their peers or friends without any stress of learning to solve the problems. Indirectly we are trying to develop the communication skills of the students by creating natural environment. Here students try to convince their team members and develop the skills of simplifying the concept to make all understand it. Thus, communication skill which is required at every stratum of life will be improved at the institute level by using the collaborative learning method under the supervision of the well-trained subject teacher.

V. CRITICAL THINKING

A person's smartness can be highlighted through the action or decision taken in a critical situation. Critical thinking has been considered as valued skill in society from long time. Nowadays, students need it not merely for the academic advancement but for making their career better for long life. Employees utilize critical thinking to improve the service to customers, do changes in the products as per expectations and constantly improve themselves. Logical and rational thinking is the foundation of critical thinking. It is a way of thinking in which one will not blindly accept all arguments or conclusions rather the questions will be raised against the exposed conclusions. The analysis of the evidence will be done to verify the validity of the proofs which are used to support opinions. The attitude which is based on Curiosity, Skepticism and Humility will help to develop the critical thinking. Understanding the importance of the critical thinking in the career of the individual the subject teacher must imbibe it among the students through the teaching-learning process. A well-trained teacher with the vision of developing the critical thinking can create the situations in the class room where all students get involved in that activity and provide proper solutions with the coordination of their peers. Critical thinking is considered wrongly as the domain of the gifted students, but it can be generated and polished by practice. Learning critical thinking show the way to enhance numerous skills like improving concentration, high reasoned abilities and better thought processing. Active critical thinkers will compare evidences, appraise challenging claims and take sensible judgment or decisions.

VI. CREATIVITY

In this age of global competition, creativity and innovative skills are required for individual and professional success. Generating new ideas and producing something new into reality means creativity. An individual can show that innovation by utilizing passion and commitment in the work. Innovation is possible only if there is creativity. Employers want to recruit, hire and promote the employees who believe in the creativity. Collaborative learning provides positive environment to showcase and inculcate the creativity into students. Here a group of students work on various projects under the guidance of the trained teacher who cultivate the creativity into students. Students use their experience or previous knowledge and co-operate their team members to solve a problem or to create a new project or products. The knowledge of group members and their vision can be used in collaboration for innovative things or ideas. An individual, at initial stage, finds difficult to present any research paper and hesitate to do project or make presentation on any academic subject. Their confidence can be boosted in the collaborative learning where they can support each other, and work can be shared. In such situation students find interest in their task and it is the real beginning of the creativity and innovation.

VII. CONCLUSION

If 21st century education is ever going to make a difference in the lives of students, teachers should support the collaboration learning method to do the class work more interesting and challenging. These four Cs - critical thinking, communication, collaboration and creativity are not new concepts for educators. In fact, these skills are mostly required into the students. Educationalist understood the importance of it but the method of teaching these skills must be implementing in the positive and easy manners which will create interest for learning into the students. Collaborative learning method is based on the interest of the students to learn new things and most teachers desire to teach in a way to integrate skills and knowledge. The students need to come out for the job at corporate world with effective critical thinking, communication, collaboration, and creativity skills. Now, we understood that every child needs these skills to become an effective citizen and succeed at personal and professional level. Teachers and all educationalists should play a positive role to support such system or method which will enhance four Cs. They must ensure that every student is adequately prepared and empowered to face the competition with the aid of these skills.

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Role of English Language Teacher for Engineering Students

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Abstract-Professional courses such as Engineering and Management Studies have been very popular in India today. Getting employment is a prime aim for opting such courses. But surveys conclude that students pursuing engineering education even in tier-1 institutes are facing huge skill gap to meet industry requirements. One such major skill gap commonly found among them is English language and communication in it. Though English language has been taught by English teachers in school, students still find it difficult to use it effectively for communication. Therefore, the role of English Language Teacher is very important in finding out the problems and providing solutions to overcome this challenge, thereby make students effective communicator in their professional life. The present paper focuses on the role of language teacher to enhance communication skills of engineering students in English language.

Keywords: professional courses, language teacher, effective communicator

I. ENGLISH LANGUAGE AT SCHOOL

Being multilingual country, India has many languages which are taught in school and English is one of them. As a compulsory language and a second language in India, it is not yet given priority to communicate and master in it. English is hardly used and a neglected language in vernacular medium schools, which result in creating fear in the mind of the students. Moreover, this fear grows as they do not use it in day to day interaction because of their family background. It is also found that they do not have reasonable exposure to communicate their thoughts in English language. In addition, even English teachers at school level do not use the target language for explanation. The condition is not different in English medium schools, as English is not made mandatory to communicate. The teachers too do not have an adequate proficiency, which make their students avoid using English language. Though English is an internationally acclaimed language and plays a key role in success of the students, it is not yet internalized with competency. Students understand the language but they hardly touch upon spoken aspect of it. Spoken English can suffice them with confidence and express themselves with accuracy. Acquiring fluency in English language is a key asset for India as it is the biggest service provider of the world. Though India is a non-native speaker of English language, it can open up new avenues for the growth of the nation. But proficiency and communicative competency in English is not given prime importance in schools which may hinder the progress of the students at individual level and nation at large. Thus, there is huge need to put a greater emphasis on spoken element of English in schools as on the written one. This may improve their understandability and use of English with proper fluency, pronunciation and sentence construction.

II. ROLE OF ENGLISH LANGUAGE TEACHER

Even today, English language is considered as the language of high learners. With different background and schools, engineers during their graduation are not very confident about their caliber. They opt for engineering because of the multiple opportunities available after this course. But these opportunities can be utilized and fruitful to them only if they acquire English skills to communicate effectively. Though, English is a common medium of communication, it is still neglected in institutes. Even the library resources are available mostly in English language such as books, research papers, journals, thesis, dissertation and information on internet. Additionally, English language competency is one of the key requirements for anything that we need to do. Hence, it is essential to know that English language skill and communicative competency will help in gaining, sharing and applying their knowledge, if they are really interested to bring forth their names in intellectual market of technology.

Teaching English language and communicative competency to engineering students, the teacher has to initiate and innovate on workable solutions for enhancing the English skills. To learn with ease, the teacher has to keep innovating the best practices which may be implemented to enhance their scope of gaining employment. The English language teacher should constantly sensitize them about existing scenario and encourage to come out if fear. Multiple opportunities can be provided in the form of paper presentation, project presentation, and seminar which would provide them a platform to showcase their talent and ability. Such innovative practices would provide them confidence, motivation, and high inner strength to develop their mindset and compete in open market of technology.

Engineering education has a little focus on English language competencies, whereas the communicative competency is quite a focus for enhancing their listening and speaking skills. The four basic skills of language learning: listening, speaking, reading and writing are required to gain and enhance language. Therefore, it becomes essential for English language teacher to recognize communication skills and develop their confidence by disapproving the fear among students. The teacher can mark out innovative techniques and activities like Chinese whispers, role play activities on barriers and non-verbal aspects, to gain their confidence by taking their active participation in activities. Teacher can roll out the student groups or batches by finding out the gaps of learning and the areas of improvement in English

language by considering their schooling medium. This categorization should be done prior to the actual conduct of any activity or lecture. Beyond the curriculum, teacher can think of rolling out special training sessions for some needy and demanding students and map out a common timetable to train and develop their skills in the required weaker areas. An integrated bridge courses, syllabus and exercises need to be designed with authentic materials drawn from everyday use catering to the students' requirements. Along with that, teachers should ensure that the students use English language for communication purpose. This will bring them uniformity in using the language and regular usage of it may help them overcome fear of speaking English language.

Language Laboratory training is one of the best and easiest ways of developing students' skills by giving them live assignments to evaluate themselves with the actual. Language Laboratory software can give students hands-on experience to practice every day conversations and to match their conversations with available audio and visual aids. Verbal aptitude, reading newspaper, magazines and fiction books, watching news channels, movies with subtitles, pronunciation practices, activities on grammar, syntax, vocabulary, pronunciation, fluency and accuracy, etc. are the different activities to be conducted to develop linguistic skills smoothly. The teachers can also provide them guidance by teaching them about filling forms online, tracking information on internet and so on. Group and individual activities, role plays, case studies and mini projects can also make them self-sufficient to boost their confidence. The teachers should guide and assist them to carry out the tasks and activities. This will enhance their skills day after day and provide learning environment. Such practices can work as a strong foundation which would ease them to step forward with confidence in grabbing the opportunity knocking at door.

III. English Language for Employment

Globalization has equipped all companies to spread and widen their business all over the country. To enhance business of an organization requires skilled and convincing workforce, and India can fulfill this global demand. But English language communicative competency can hinder their growth. Budding engineers should set their mind in gaining communicative competency in English language with focused, attentive and proactive mindset. They should be habitual of using the language and simultaneously they need to share their technical expertise through proper interaction among the peer group and by participating actively in seminars and conferences for keeping in tune with emerging technologies. Institutes should also take an active part in providing platforms through different events and activities such as training sessions, practices on general awareness, logic building, aptitude, reasoning, personal mock interviews, debate, extempore, group discussion and quiz competition. This will produce creative minds and innovative leaders in the technical market.

Language plays a key role for success in all path of professional and personal standing. English language helps them to build strong relationship and better understanding among fellow peers, teachers and future colleagues. It is now a bridge language of all international business, technology, research and aviation. Therefore, engineering students must keep in mind that in order to get their dream job, grow and sustain one's position with the present global competition, they should develop their skills of English language along with communicative competency. In today's world, employers seek graduates with sound communication skills along with technical knowledge as it is a valuable asset to keep the healthy relation with internal and external organizations. Expressing knowledge compared to possessing it, will always hold at higher level of standards in the organization. In addition, to get a good score in aptitude, competitive examinations and convey messages effectively with their international counterparts during higher studies, effective and efficient English language and communicative competency is required. All in all, communicative competency in English language is a significant aspect of an engineering student's academic life and future career.

IV. Conclusion

The English language teacher has a key role to play in developing confidence among budding engineers by providing them a positive energy of speaking up their mind in a convincing manner. This will help in sharing the knowledge they possess in the best possible way and can boost their chances of employment. The regular practice and good will on the required English language competency of engineering graduates will fetch them multiple opportunities in their job as well as in their chosen career. Different activities implemented by teacher can encourage them in participating in activities and learn by doing. Their confidence and use of grammatical correct sentences; and the knowledge and perspectives they gain from newspaper and magazines they can frame it the way it is understood. Therefore it becomes easy for the students to practically implement the ideas they learnt. Such communicative competency may also help them in group discussions or interviews. Lack of English proficiency and communication can become the biggest hindrance to gain, sustain and grow in the organization. This may also hamper in qualifying the competitive or aptitude tests. Therefore, English language teachers should opt for unique and entertaining option to train students since beginning as per the industry requirements and take necessary step to bridge the gap between industry and academia. This will unquestionably bring forth the productive results by bringing increase in the number of employment of rural engineering graduates.

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Developing Result Prediction Model for Improving Academic Performance of Students

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Abstract: **In this world of modern education system, the basic objective of all the educational institutions is to have quality academic performance of their students which ultimately fulfills their various goals like better placements. In order to ensure the improvement of student's academic performance, it is necessary for the institutes to keep a track on it by developing a system through which it can also be predicted. The development of this model involves the identification of various factors that play a major role in obtaining accurate prediction. These factors may or may not be controlled by the students or the institute. This selection of important and controllable factors plays a major role. In this study, prediction model for first year engineering students is developed which takes the input from the factors like previous exam result, internal assessment, term work, involvement and attendance of current semester. After selecting the factors, levels and weight is defined. Using formulas in Microsoft Excel, the final result prediction can be achieved in 3 levels; i.e. I-Class, Pass Class or Fail. It was found that the Prediction of Semester – I result was matching with the actual result by only 44.44%, whereas for semester – II, it was nearly 70%. The strongest factor was the result of the previous semester playing a major role in the prediction of results.**

Keywords: Prediction Model, Mathematical Modeling, Academic Performance, Engineering, MS Excel

I. INTRODUCTION

Education is the foundation for any development of a country and the main objective of any higher education is to provide the strong and quality input which will act as a flawless parameter in the development. One way to reach to the higher level of quality is by prediction the academic performance of the students and thereby avoiding any failure that may have been possible in a later stage. Student academic performance prediction can be carried out by creating a model in a systematic order which begins with the understanding of previous performance of the student followed by the analysis of performance in the current duration and then predicting the overall result of that duration for the end semester exam with the help of a mathematical tool. . The development of this model involves the identification of various factors that play a major role in obtaining accurate prediction. These factors may or may not be controlled by the students or the institute. This paper presents the idea of predicting the results of students by taking into account various parameters like the students record in previous exams, their current semester records; i.e. Internal exam marks, Attendance, Participation in the Lecture and Term-Work. This process starts with categorization of students into 3 groups; viz. Average Students, Good Students and Excellent Students.

II. LITERATURE REVIEW

Bresfelean researched on the data collected by using various forms of data like surveys from senior undergraduate students at the faculty of economics & Business administration in Cluj-Napoca [1]. Decision tree algorithms in the WEKA tool, ID3 and J48 were applied and the result was shown which predicts that number of student may opt for higher studies. The model shows application on two groups of specialization students' data and an accuracy of 88.68 % and 71.74 % was shown by this model with C4.5. P. Cortez and A. Silva [2] researched on data of 'secondary students' which shows their grade in contact education system. A wide range of data including past performance as well as socio-economic information was collected and output was gained using different classification techniques. The findings was put forward that the tree based algorithms was up to the mark, results were shown and methods like Neural Networks and SVM. Z. J. Kovacic has shown a case study after collecting the data [3] to analyse the data to predict student's success in various field. The algorithms CHAID and CART were applied on student data for analyzing successful and unsuccessful students chosen for Polytechnic of New Zealand. The quality of output of 59.4 and 60.5 was obtained with CHAID and CART respectively. M. Ramaswami and R. Bhaskaran [4] used the CHAID prediction model to examine the relationship between different factorsthat can be used to determine the output of prediction at higher secondary school education in India. The factors that was included in the prediction model was Medium in which instruction was given and also the score which student got in their higher secondary, this were some important factors This CHAID prediction model of student performance was constructed with seven class

predictor variables with accuracy 44.69%.Recommender system technique was used by Thai-Nghe, Drumond, Krohn-Grimberghe, Schmidt-Thieme [5] in educational data mining to analyse student performance and predict its result. Comparison of the model for accuracy was done by Nghe, Janecek, and Haddawy [6] which used Bayesian network algorithms for analyzing and predicting the performance of undergraduate and postgraduate students at two very different academic institutes the results was found 12% more accurate. V. P. Bresfelean, M. Bresfelean and N. Ghisoiu [7] proved that success of students depends on his/her choice in maintaining and continuing their education .Merceron and K. Yacef [8] presented to predict the future aspects of success rates of students of particular university. Decision trees were made functional by collecting the data from the student in order to generate the prediction of students' success rates. Baradwaj and Pal [9] received the data of students from university like attendance, Class test, assignment marks & seminar from previous database, to examine and analyze the performance at the semester end.

III. METHODOLOGY

The data used in this study is collected from Department of Humanities & Sciences (First Year Engineering), Thakur College of Engineering & Technology (TCET) for the Academic Year 2016-17. In this various data collection and formulation requires to be done. Prediction Model consists of stage-wise analysis which is carried out in 6 stages:

IV. DATA GATHERING & ANALYSIS

In Stage-I, the data for the previous semester/exam results is collected. This is done with the help of Google forms in which the following data is asked from the students. To check the authenticity of the data collected, random small sample, 10% of the population, is checked with the mark-sheets of the students. If errors are not found, the data is formulated as per the excel sheet format, where the students are sorted as per class and roll number. In Stage-II, the data collected for HSC is analyzed and the students are segregated as Average, Good and Excellent. This is done by creating the levels of the marks obtained by a student. The criterion for grading is as shown in Table 1.

Table I: **Criteria for Grading**

Criteria for Grading			
PCM	>80	65-80	<65
CET	>120	80-120	<80
Grade	5	4	3
Score = PCM Grade + CET Grade			
Score	9,10	7,8	6
Rating	Excellent	Good	Average

The grades are calculated with the help of formulas in MS Excel with the help of the string, *"=LOOKUP(PCM_Marks,{0,65,80},{"3","4","5"})"* for PCM (Physics, Chemistry &Maths) Marks and for CET (Common Entrance Test) Score, it is*"=LOOKUP(CET_Score,{0,80,120},{"3","4","5"})"*. The total score is calculated by addition of CET Score and PCM Score. The Total Score is then analyzed and Rating after HSC is given using the formula, *"=LOOKUP(Total_Score,{0,7,9},{"Average","Good","Excellent"})"*.

Table II: **Stage II Data Collection for HSC (Preview)**

Roll No.	1	2	3
Name of the Student	Student 1	Student 2	Student 3
PCM Marks Obtained	155	129	244
PCM Marks Out of	300	300	300
PCM %	51.67	43	81.33
CET Score	77	56	131
PCM Grade	3	3	5
CET Grade	3	3	5
Total Score	6	6	10
Rating	Average	Average	Excellent

In this way, the students are rated and segregated. This helps to understand what basic level of understanding is a student having and how much of input is required. This Stage Data also helps in identifying and focusing on the Average students who, may be predicted for a poor result on a later stage. A population analysis is done as shown in Table 3.

Table III: **Population Validation after HSC**

Branch	Excellent	Good	Average
Computer Engineering (CMPN)	62	48	19
Electronics Engineering (ELEX)	4	33	25
Electronics & Telecommunication Engineering (EXTC)	13	71	42
Information Technology (IT)	34	81	17
Mechanical Engineering (MECH)	29	82	15
Civil Engineering (CIVIL)	16	42	68
Total	**158**	**357**	**186**

Population validation helps in understanding the overall distribution of students in the three categories. It also helps in planning for Teaching-Learning process for a particular division. One of the general conclusions can be made that more the number of Average students in a class, more will be the focus required on them.

In Stage-III, the current semester academic performance of the students is recorded in the form of 4 important components; Internal Assessment (Term-Test), Term-Work, Attendance& Participation in the Teaching-Learning in Lecture room. Term-Test marks of all the subjects (Applied Mathematics – I, Applied Physics – I, Applied Chemistry – I, Engineering Mechanics, Basic Electrical Engineering & Environmental Studies) are converted in Average% for Term-Test I & II respectively. In the same way, Term-Work Average of all Subjects is calculated out of 25. Final Attendance % is consolidated considering the attendance of all Subjects. Participation of a student is obtained from the respective teacher; marks are given out of 5 with 5 being for the actively participating students and 1 for simply attending. The data is consolidated as shown in the Table 4. Similar data for Semester – II is consolidated.

Table IV: **Consolidation of data of other Components through Semester – I**

Roll No.	Name of the Student	Term Test Average (I&II) %	Rating (After TT-Average)	Term-Work Average (All Subjects)	Final Attendance Average	Participation (From Teacher)
1	Student 1	62	Good	21	82	3
2	Student 2	68	Good	22	90	3
3	Student 3	89	Excellent	24	96	5

Stage-IV deals with the proper formulation of data for all the components with proper weight assigned. Keeping in mind the importance of previous Exam/Semester Result, maximum weight is given to this component with 40. Equal Weight is given to the Score of PCM and CET, i.e. 20. It is then added and total out of 40 is considered as per the following formula:

$$\text{HSC (40)} = \frac{PCM\ Obtained}{PCM\ Out\ of} \text{ x } 20 + \frac{CET\ Score}{10}$$

Term-Test Performance % is scaled down to 20 Marks with Term-Work scaling to 25 Marks. Overall Attendance is given Marks out of 10, so % Attendance is scaled down to 10. The Teacher's feedback about the Participation of Students in Class is given out of 5. The Total score is 100. In Semester – II, the 40 Marks of Previous Semester Exams are given as 00 for Fail, and the rest are given marks directly multiplied with 4 with their CGPI (the maximum being 10 CGPI, maximum possible score is 40). The Prediction of Individual Student is given as Fail: 0-50, Pass Class: 51-70 & I-Class: 71-100

Table V: **Formulation of Data and Prediction of Individual Students (Semester – I)**

Roll No.		1	2	3
Name of the Student		Student 1	Student 2	Student 3
HSC	(40)	18	14	29
TT	(20)	11	12	16
TW	(25)	21	22	24
A	(10)	8	9	10
P	(5)	3	3	4
Total	(100)	61	60	83
Prediction		Pass Class	Pass Class	I-Class

Table VI: **Formulation of Data and Prediction of Individual Students (Semester – II)**

Roll No.		1	2	3
Name of the Student		Student 1	Student 2	Student 3
SEM-I	(40)	0	0	28
TT	(20)	11	13	18
TW	(25)	16	25	23
A	(10)	6	9	9
P	(5)	3	3	4
Total	(100)	36	50	81
Prediction		FAIL	FAIL	I-Class

In Stage-V, the Prediction of all the students is analyzed and the result of population is calculated. For this, a consolidated table is prepared by which information regarding class-wise result prediction is calculated as per Table 6. Finally, a compound formula is applied to get the prediction value of Overall Pass % from the total strength. Based on the approximation, the final predicted value is calculated using the following formula:

Population Prediction = 90% of I-Class + 50% of Pass Class + 20% of Fail

The overall F.E. Result can be predicted using the same formula. For Semester – I, the prediction is shown as follows:

Table VII: **Consolidated Prediction with Population Prediction (Semester – I)**

Class	I-Class	Pass Class	Fail	Predicted Result (%)
CIVIL A	26	13	24	55.08
CIVIL B	18	20	25	49.52
CMPN A	43	18	4	74.62
CMPN B	43	18	3	75.47
EXTC A	28	24	11	62.54
EXTC B	28	23	12	62.06
ETRX	29	19	14	61.94
IT A	43	15	9	71.64
IT B	52	9	5	79.24
MECH A	48	8	7	77.14
MECH B	44	16	3	76.51
Total	402	183	117	Prediction = 0.9*I-Class + 0.5*Pass Class + 0.2*Fail
	477			
	67.90%			

In the similar way, prediction for Semester – II is done based on a similar formula but with a change that instead of 50% of Pass-Class, 80% of Pass Class is considered. The reason being, in Semester – I, the base is taken as HSC performance which does not give a clear idea about what the student is capable of. But in Semester – II, the base is taken as Semester – I result which gives a clear indication of the student's performance.

Table VIII: **Consolidated Prediction with Population Prediction (Semester – II)**

Class	I- Class	Pass Class	Fail	Predicted Result (%)
CIVIL A	5	20	33	36.38
CIVILB	7	14	40	35.5
CMPN A	26	21	18	57.69
CMPN B	26	18	20	56.88
EXTC A	2	23	38	33.17
EXTC B	7	21	35	37.78
ETRX	9	24	29	41.77
IT A	13	25	29	44.78
IT B	16	23	27	47.42
MECH A	12	29	22	47.14
MECH B	23	20	20	55.08
Total	146	238	311	Prediction = 0.9*I-Class + 0.8*Pass Class + 0.2*Fail
	384			
	55.30%			

In Stage-VI, Comparison of the Actual & Predicted Result is done. The individual results are analyzed with the predicted results. Actual Performance of students when compared with their Predicted performance is divided into 3 groups as shown in the following matrix:

Table IX: **Performance Comparison Matrix**

Predicted / Actual	I-Class	Pass-Class	Fail
I-Class	**Matching**	Upgraded	Upgraded
Pass-Class	Degraded	**Matching**	Upgraded
Fail	Degraded	Degraded	**Matching**

Prediction model would be more accurate if the %Matching Result is more. For Semester – I, the Comparison of Actual & Predicted Values can be consolidated as in Table 10 and in Table 11 for Semester – II. The Actual Result of Semester – I (F.E.) was 58.6% against the Predicted Result of 67.9%.

Table X: **Comparison of Predicted & Actual Result (Semester – I)**

Class	Upgraded	Matching	Degraded	% Result Matching
CIVIL A	8	24	31	38.1
CIVIL B	2	36	25	57.14
CMPN A	4	32	29	49.23
CMPN B	2	41	21	64.06
EXTC A	1	22	40	34.92
EXTC B	3	24	36	38.1
ETRX	2	34	26	54.84
IT A	3	25	39	37.31
IT B	0	23	43	34.85
MECH A	3	20	40	31.75
MECH B	2	31	30	49.21
Total	**30**	**312**	**360**	**44.44**

Table XI: **Comparison of Predicted & Actual Result (Semester - II)**

Class	Upgraded	Matching	Degraded	% Result Matching
CIVIL A	11	44	3	75.86
CIVIL B	9	44	7	74.58
CMPN A	10	40	15	63.49
CMPN B	10	48	6	76.19
EXTC A	17	39	6	62.9
EXTC B	11	38	13	61.29
ETRX	7	47	8	77.05
IT A	11	49	6	79.03
IT B	13	44	9	69.84
MECH A	12	40	11	63.49
MECH B	5	46	11	74.19
Total	**116**	**479**	**95**	**69.42**

The Actual Result for Semester – II (F.E.), was 58.4% against the Predicted Result of 55.5%.

V. RESULTS & DISCUSSION

From the Analysis of Semester – I & II Actual & Predicted Results, it is clear that the Prediction of Semester – II was better than that of Semester – I. This was mainly because of the Previous Exam Result. In Semester – II, the base was that of the result of Semester – I which gave a clear picture of the performance of students in Engineering Education whereas in Semester – I, the base was of HSC which was not an Engineering Exam. Thus to get a better prediction, more factors are to be considered. Also, the %-Matching of results of individual students is better in Semester – II (69.42%) again with the same reason of performance of Semester – I. here the students who were unsuccessful in Semester – I, were having the disadvantage of scoring a Zero for Previous Semester/Exam Result. It was also evident from the Results that the students who were unsuccessful in Semester – I, many of them carry forwarded similar result in Semester – II.

VI. CONCLUSION

Prediction model gives an idea about the possible results of the students. But this data needs to be accurate and reliable so that the outcome could be changed by providing extra efforts to those students whose predicted result comes out to "FAIL". To make the prediction model more reliable and efficient, many factors needs to be added. These factors could be in the form of Teacher's Judgment before Exam, Student's Judgment after Exam and others.

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Transforming Passive Vocabulary to Active Vocabulary- Innovative Techniques to Enrich Vocabulary

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Abstract-The vocabulary is basically related to the number of words that a person knows, one either has a large or a small vocabulary. The study of words has shown that words have many beautiful shades of meaning and is nicely representative multi-hued nature of so much of the English lexicon. Vocabulary is extensively used to signify the body of specialized terms in a field of study or activity. Therefore, this paper attempts to study types of word collections which fall in two groups which help to enrich communication. It also tries to define the two groups' passive and active one and details the importance of vocabulary enrichment. Further it throws the light on different ways to convert passive group of lexicon into active group of lexicon. This paper is based on experimental activities conducted in college during practical hours

Keywords-vocabulary, English lexicon, communication, Passive and active vocabulary.

I. INTRODUCTION

A student's vocabulary is the set of words within a particular language that are known to that student. Proper knowledge of vocabulary and grammar always gets an upper hand in language usage as far as correctness and effectiveness of communication is concerned correctly. One can say vocabulary/words are bricks and grammar is cement which builds one's home i.e. Person's vocabulary. Uses of appropriate words are more important to get one's message across. An average graduate knows 5000 to 10000 words i.e. collections of words are divided into active vocabulary and passive vocabulary. Active one involves words actually used in speech and writing. Passive group is the group of words which one can understand and recognize but hardly use that words while speaking or writing. An Engineer's active vocabulary will be different than an actor.

One's collection of non usable words is always more than active collection. This passive word collection of person can be transformed into active usage, due to exposure and deliberate efforts taken by the learner. As human being is a lifelong learner, number of words in passive vocabulary as well as in Active vocabulary is always in flux.

II. IMPORTANCE OF COMMUNICATION AND VOCABULARY IN TODAY'S CORPORATE WORLD

Communication process involves transferring of thoughts or ideas from one person or group of person to another person so that it can be understood and acted upon. In today's scenario when students of professional colleges will enter into world of industry, rich vocabulary will always get an upper hand in getting one's message across. If person doesn't have adequate conversational techniques people will let his words in one ear and out the other, and his information will not be understood properly. It is required for management to nurture good relations with employees. Relationship is based on a way we introduce ourselves to others. If a supervisor has a good knowledge of vocabulary and communication process he can make his subordinates act well upon his words. Thus, it serves a tool of supervision and it is important to motivate employees. Keeping good relation is the key to retain employees in industry. Further vocabulary helps in acquiring information this helps in planning and coordination. It serves a good aid for an understanding. Free exchange of ideas and information becomes a regular habit in an organization. This helps a lot in releasing tension amongst professionals in corporate world.

III. DEFINITIONS AND TYPES OF VOCABULARY

Productive language knowledge (Active vocabulary) - Productive language knowledge or active vocabulary which involves words involves words actually used in communication.

Receptive language knowledge (Passive vocabulary)- Receptive language knowledge or passive vocabulary which involves words understood if someone else uses it. Receptive knowledge can be acquired through practice in reading sessions as well as through listening activities. Native speakers of a language can understand many more words than they actively use. Some people have a passive collection (i.e. Words they understand) of up to 1 lakh words but an active collection (i.e. words they use) of between 10000 and 20000 words. Any new language learner acquire at the upper intermediate level active collection of about 3000 to 5000 words and a passive collection of about 5000 to 10000 words.

Teaching vocabulary in a foreign language and its passive to active conversion

Teaching vocabulary in new language and its active conversion is, one of the greatest challenges in learning a new language, especially its transition from passive to active knowledge. The new vocabulary is reachable in passive form. Having passive vocabulary clarifies communication process but faculties have to help students to develop their active vocabulary right from institutions of learning so that they will be at ease in foreign

language in future professions also. Here teacher can use various techniques to teach new vocabulary.

A. Encourage students to form a habit of word collection-Let students decide what choice of words they collect from the text. Students can enter them in journal or underline them in a text itself. At home, they can make different cards for different words which also comprise its part of speech, meaning, sentence of own. They can start with just five words a day and exchange and share their word cards with other students.

B. Categorization of words-Teachers can form group of students and tell them to write collection of words those belong to the same category. For example, one group will write a set of nouns say things in laboratory, another group could be allotted the task of writing collection of words those starts with C, third group, can write words those rhyme with buy and slowly and gradually increasing difficulty level up to group of words with actions or another set with emotions and so on.

C. Effective reading helps acquiring new lexicons and It's retention-According to Min, H. (2008), Reading in target language is also a good way to introduce students to new vocabulary, and the use of reading plus vocabulary enhancement activities has been shown to be effective in helping students to acquire and retain new language. For example: students can write a story with new words they learnt from reading and in this is the way students personalize new lexicons.

D. Putting words in context-At the time of transferring passive lexicons into active one must be certain to observe the context, connotation and denotation of every word you transfer. Paraphrase one sentence in the context itself. For example, 'He is disapproved of my actions'. One can paraphrase this sentence in context itself by adding one more sentence to it like 'He thought that I had behaved badly'. This is known as paraphrasing the sentence in context itself.

E. Training students in identifying morphemes and their Meanings-Teacher can keep an activity for students to identify morphemes with meanings. For example, in the word 'Preview' the morpheme pre-means before. So, meaning of preview is seeing something before. Teacher can tell and encourage students to identify new words which has pre-morpheme like prefabricated, present etc.

F. Dictionary: When to ditch and when to use-From dictionary one can know the usage frequency of certain words in spoken and written form. But every time don't stop to search in a dictionary, instead find some smart ways of conversation and focus should be on the flow of conversation. One can describe a missing word or use a synonym.

G. To expose students to language activities-Teacher can give handouts of letters with idioms used in it and students will write all idioms starting from each letter so that they can recall whenever they want to use easily and quickly. Apart from this student could be provided with words and some irrelevant sentences to write a story. Further students could be told to read articles from newspaper and write synonyms of difficult words from thesaurus.

H. Need to smooth path for new lexicons

Use less often your favorite words; smooth the path in brain to start deliver words from your passive lexicons. And practice this often to personalize new vocabulary.

I Patience, curiosity and action is the key-Understand that turning your passive collection to active knowledge is a complicated process that takes time. There is end number of ways of vocabulary enhancement to boost students' new acquisition. Unless and until students have not spoken enough of their passive lexicons there are chances that they will remain under exposed of their own capacity. Thus using much more than they usually do will shift their passive language part to active part. It can't be done overnight. It will take years of practice and an all curious open minds.

IV. CONCLUSION

To conclude we can say that some changes in teaching and learning pattern can make a big difference. Self-learning among students can form their mind self-reliant. On teachers part too they should reserve some time out from their curriculum and syllabus to indulge some new habits among students. Students should be encouraged time to time to share their knowledge in foreign language. Apart from IQ need of the society is good EQ i. e Emotional quotient which will take its care through nurturing and sharing comfortably in everywhere around the world.

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Innovative Utilization of Technology in Teaching Learning and Evaluation

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***Abstract*—This paper discusses innovative utilization of technology in Teaching Learning and Evaluation methods available worldwide. Utilization of technology includes E-learning, Web based learning in addition to the face to face teaching. Utilization of technology and multimedia in teaching learning and evaluation is described. Smart gadgets such as smart phones, laptops, desktops etc. can be used for different tasks involved in addition to face to face teaching such as designing question papers, assessment of student & result analysis, feedback, etc. are discussed.**

Keywords—Technology; Hybrid Learningg; smart gadgets.

I. INTRODUCTION

The aim of this paper is to emphasize the importance of utilization of technology in conventional teaching learning and evaluation methods to create a productive learning experience for students and fulfilling teaching experience for teachers. The two educational methods followed worldwide are conventional learning and technology-based hybrid learning. The conventional method of teaching and learning involves the direct interaction of teachers and students preferably in classroom, laboratories and seminar halls. Hybrid learning is technology based learning where teachers and students interact indirectly with various smart gadgets such as smart phones, computers, audio and video conferencing, chat rooms, webcasts, and CD-ROM, etc. Hybrid teaching is more advantageous over conventional method of teaching learning, some of the advantages are: It encourages the students by making learning process more interesting, It offers flexibility of time., Faculty can modify the lecture content and provide an online test, quiz to maximize student learning ,Faculty can achieve course objective better and can evaluate course work online quickly, Participating in online test, quizzes improve the soft skills, problem analyzing attitude of the students, In addition to face to face learning, in-class activities such as, group presentation, online survey increases the effectiveness of teaching learning and encourages out-of- class learning. Thus, Hybrid learning blends technology with the face to face learning and makes teaching learning and evaluation process more motivating and stimulating. The strategy of blending online learning with traditional education is utilized to accommodate students' diverse learning styles and to enable them to work beyond college hours which is not possible with full-time conventional classroom education. With online learning we can attain more educational efficiency by enhancing the rate of learning, and better consumption of teacher's time. These strategies can be remarkably useful in rural areas as well as urban areas where blended or online learning can help teachers and students to stay connected and interact. Technology based learning includes tutorials, web conferences, online forums and gaming, along with other methods.

II. LITERATURE SURVEY

According to S.B. King (2014), utilization of technology enriches teaching and learning performance. Different innovative and creative teaching methods are now in use worldwide. According to J.R Darda (2014) Hybrid teaching includes e-learning in addition to the face to face learning. He has described utilization of technology and multimedia in detail. Also he has described about utilization of smart gadgets for different purpose like, teaching, framing question papers, evaluation of student, feedback of student and research methodology. All these techniques are discussed in his paper. According to E. Gunn (2014), a specific case study of Incorporation of clicker technology in chemistry class is described as a method for collecting and automatically tabulating student feedback which is used in faculty development. Students are polled in real-time on issues of classroom management and the success of various teaching methods. Tabulated data can be displayed on the classroom screen and used to facilitate classroom discussion. This method was introduced in a first-year general chemistry class for and resulted in unusually high student evaluation marks in categories related to interaction with the instructor. The success of this method was evaluated from few observations. Some of these observations are, taking evaluation twice such as term tests and end semester exam, surprise tests, peer observation, and continuous assessment. Most of the technical courses are expected to provide opportunities that encourage and nurture creativity in engineering students. If education becomes enjoyable and adventures, then it can generate curiosity in the students and motivate them to work hard. In this paper some of the main issues for introducing Innovation in engineering and management will be explored. This paper reviews the purpose of teaching, creative techniques, and role of innovator that enhances knowledge in engineering and management students.

III. UTILIZATION OF TECHNOLOGY

Utilization of technology in Teaching enhances interest of students with different

Kinds of activities, which makes the concept easy to understand.

It makes teachers and students more proactive and resourceful.

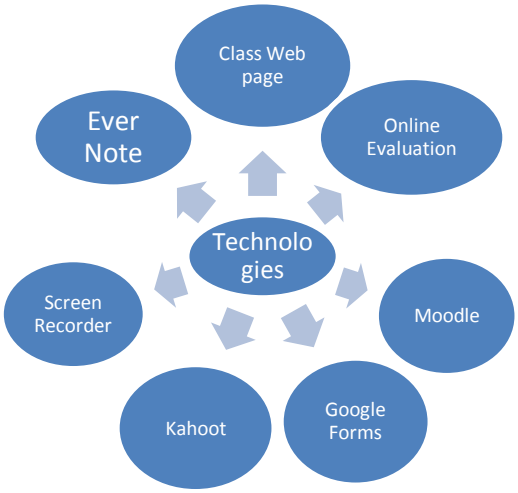

Fig.1: Technologies used in teaching learning

CLASS WEBPAGE

A class webpage can be created on college website where announcements, photos, notices, assignments, etc. can be posted. All the students can access it from any smart gadgets.

ONLINE EVALUATION SYSTEM

Student validation data such as attendance record and student progress report can be published on college website so that student can track their progress any time. We can also send email to students and parents to update them about the progress.

MOODLE-

It is Open source system to help design your session. Moodle provides Virtual Learning Environment for both students and teachers. Teachers can upload lecture materials, question banks, videos, assignments and quizzes. Which student can access and utilize any time. On Moodle activities such as discussion forums, group assignments, can also be conducted.

GOOGLE FORMS

We can use Google forms in teaching learning and evaluation methods effectively. We can Plan any trip, tour, site visits, manage registrations of event, collect student's data, create quiz, and much more using Google forms. We can do online survey with different styles, we can create own unique forms by choosing option according to our requirements. With Goggle forms we can create multiple sets of question papers consisting of any type from multiple choice to one line answer and long answers, we can also add images and YouTube videos in question papers if required. With Goggle forms we can even assess the question paper in any form such as multiple choice, short answer or long answer. Evaluation process for MCQ can be set as an automatic process; by making this process automatic, students don't have to wait for their result or marks. As soon as they submit paper they will able to see full checked answer sheet and can see which questions they have attempted, which are left out and also they are able to point out their mistakes. Utilization of this process reduces evaluation time drastically and teachers will get detailed result of each student in excel form, furnished with readymade result analysis of the entire class as shown in figure 2. The result analysis will comprise the number of first class, distinction, pass or fail in that class. This system allows us to have detail analysis of question paper simultaneously. From this analysis we can realize which questions were tough for the students and which were easy to attempt. Thus we can determine the difficulty level of question paper as shown in figure 3 & 4.

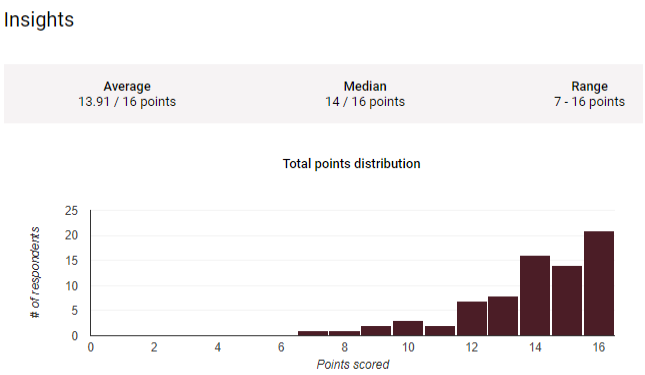

Fig.2: Sample Marks analysis

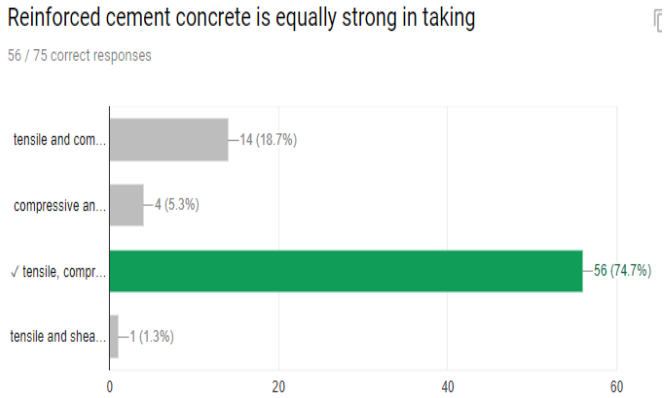

Fig.3: Sample Question analysis 1

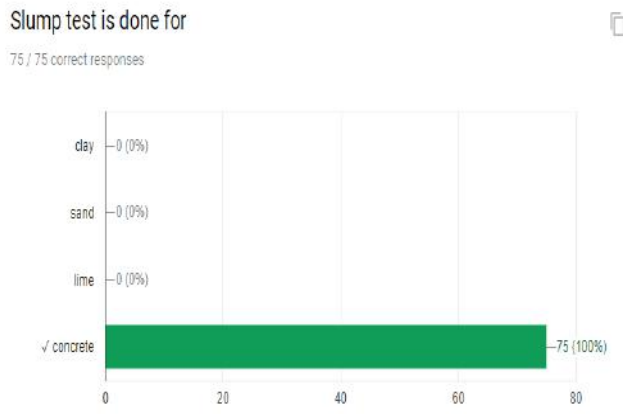

Fig.4: Sample Question analysis 2

KAHOOT- Kahoot is free learning online game website with which we can create multiple choice questions. We can modify the format and number of questions as per our choice. We can even add images, videos, diagrams in the questions as per our requirements. After completion of each chapter we can gauge the understanding of the students about the chapter by using Kahoot.

Kahoot can be played in a group also. In a classroom, multiple students simultaneously can participate with their own smart gadgets, here the questions can be displayed on projector screen and students have to answer from their device. Accordingly they can get score or points or marks. It creates funs and healthy competitive environment in the class. Kahoot can be used as mobile App also. Here students can be assigned homework. In home work challenges we can create question papers which will be seen on students mobile and by sharing PIN or link with student, student can play and complete challenges after class hours from anywhere, which will enhance student confidence along with fun. They can play game for revision and better understanding. All kahoot players can be encouraged to share their knowledge among other peer kahoot players to intensify the understanding of the topic.

SCREEN RECORDER -With screen recorder we can record and capture area of screen. The option to add narration from microphone and video from webcam is also available. We can record lectures, demos of experiment, webinars, etc. and share all these free on, YouTube, College website or save directly to a video file. Later we can show it in a class room. Screen recording is an efficient way to share ideas and convey complicated content to students in easy way. It can be used for explaining complicated derivations, Numerical, etc. with step-by-step process, describing a specific concept, or presenting a PowerPoint presentation with narration and multimedia elements. Screen recorder App is available free online. Teacher can create video lecture on his own without the help of any other person. Teachers can use screen recording videos to deliver their lectures along with some homework problem as assignments. Then during the class, students can ask queries regarding unsolved problems. As we prepare semester teaching plan at the beginning of each semester, on the similar lines we can systematically prepare screen recording videos for difficult topics. This can help students along with teachers for better understanding of topic in short span of time. Screen Recording is a powerful, very effective, and inexpensive learning tool that can enable smooth learning across any curriculum area.

EVERNOTE-Evernote is an App that can be used as digital notebook. In this notebook, one can capture experiences, notes, website links and students can store images, PDFs, and even hand-written notes. Evernote is an ultimate tool for teachers and students to organize their content. Anyone can download the application and organize their notes and handouts in an Evernote notebook.

It is portable, imperishable and can be searched easily for stored content. The data is stored on cloud hence even if the phone is lost data is intact. This app can also be a great tool to be used for research activities

IV. RESULT AND DISCUSSION

In the current era of educational field, the role of teacher is changing to innovator. The concepts of imparting information and knowledge in electronic form instead of using pen - paper and blackboard in classroom are evolving learning methods for many professional courses including engineering education. This changing role of education is to be anticipated with the inventive techniques in teaching learning and evaluation to generate technologically-savvy engineers and managers. Hence, teaching learning process depends upon successful way of communication with utilization of technology, along with face to face learning and innovations. The teacher as innovator always should try to incorporate creative techniques that can improve the teaching standards.

V. CONCLUSION

Utilization of innovative methods of teaching and learning can make the process interesting and more interactive. The objective of teaching learning is to impart the knowledge as well as to develop the analytical and logical aspect in the students. This objective can be achieved by using hybrid teaching learning tools more effectively. The tools and techniques discussed in the paper can make teaching learning experience more fulfilling and enriching.

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Nation Development & Crisis Management through National Service Scheme

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***Abstract*- In developing country like India with such a great diversity in caste, culture and religion it has such a great difficulty in enacting common rules, laws and regulation to satisfy everyone and enhance on the path of development. India has been facing lots of issues and problems in various fields like child education, women empowerment, high mortality rate, enormous increase of slums, malnutrition, corruption, and so on and on. Every five to ten years Government changes, policies changes, rules & regulation changes but hardly there had been any changes in scenario. Amidst this darkness there is a ray of light in the form of NSS which can at least play a small to big part to reform the situation. So, this paper deals how NSS can be crucial in overcoming this plight and managing the situation.**

Keywords: Blood Donation, Cleanliness drive, literacy programme, traffic control.

I. INTRODUCTION

NSS-this scheme has been sponsored by Government of India and was launched during the Fourth Five-Year Plan by sanctioning a budget of 5 crores. It was started on 24th day of September 1969 by Union Education Minister V.K.R.V. Rao in few universities of our country. Now it has spread an almost all states and universities. The motto of NSS is "Not Me But You". This motto itself describes the dedication and objectives of NSS.

II. HOW NSS WORKS

NSS performs two types of activities (i) NSS camp (ii) regular activities. NSS one-week camp is held once in a year. Usually camps are organized in close vicinity to adopted village where they carry social activities for the development of that village. The regular activities are usually carried out at the weekends or after college hours so that their academics is not hurted. 120 hours of regular activities are carried out in a year.

OBJECTIVES OF NSS-Students should be able to (i) Understand the community in which they work. (ii)Identify the needs and problems of the community and involve them in problem-solving. (iii) Develop proficiency required for group-living and sharing of responsibilities. (iv)Acquire leadership qualities and democratic attitudes.(v)Develop ability & capacity to meet emergencies and natural disasters and crisis and practice national unity, integration and social harmony.

The various activities that are carried out by NSS students are: (i)Commendable community service (ii) Blood Donation Camp (iii) Medical Camp (iv) Educate children (v) Thalassaemia Minor Screening Camp (vi) Shramdan (vii) Traffic Management Program (viii)Spread Happiness among under privileged children

HEALTH-Objective: To deliver knowledge and information regarding the viral spread of disease in the region. Activities conducted under HEALTH Domain (i) Blood Donation Camp.(ii) Malaria Awareness Seminar. (iii) Leptospirosis Seminar & Awareness (iv) Medical Camp (v) Medical Camp and Eye checkup (vi) Organ Donation Seminar, registrations and Rally. (vii) International Yoga Day etc.

EDUCATION-Objective: To spread knowledge by interacting with the BMC school children and help in their overall development. Activities conducted under EDUCATION Domain (i) BMC School Teaching: Spreading literacy by interacting with the BMC school children and help in their overall development (ii) Poster Making for School Teaching Aids. (iii) Computer Training. (iv) Technical paper presentation (e-waste management) competition: Improving the technical skills and soft skills of the volunteers (v) Sports Activities (vi) Cultural Activities (vii)Constitution café-World café

SOCIETY-Objective: To create awareness regarding social issues & to remove the social stigma, Traffic Management. Activities conducted under SOCIETY Domain (i) Ganpati Visarjan (day-1,5,11): Volunteers learn about traffic and crowd control. (ii) Traffic Control and management: Awareness about Road Safety by poster making. (iii) International Peace rally (iv) NSS week celebrations- Street play and flashmob(v) Joy of giving (vi) Swami Vivekananda 153rd Birth Anniversary celebrations(vii) Orphanage (viii)Disaster management: Spread peace and harmony

ENVIRONMENT & CLEANLINESS-Objective: To spread knowledge and information regarding the importance of Environment and cleanliness so as to prevent the viral spread of diseases in the region. Activities conducted under ENVIRONMENT & CLEANLINESS Domain (i) Tree Plantation: Environment protection and digging (ii) Cleanliness

Drive/Swacchata Abhiyan: To promote garbage disposal and to work towards a clean environment. (iii)World wetlands day celebration

UNIVERSITY RALLY & WORKSHOP -The university organizes a rally. The rallies are usually based on the topic of Anti-Addiction etc. The volunteer carries posters related to the topic and try to spread awareness about the ill effects of addiction. The volunteers also attend University workshop where they are taught about the ill effects of addiction, how to eradicate it from the society and what we could do on our part to support the anti-addiction drive.

The various other activities conducuted are rakhi selling, flag selling ,independence day, malaria seminar, traffic control, organ donation, ganesh visarjan, anti-addiction rally, swachtta abhyan, marathon, constitution café, poster making, ncfw seminar, aadhar oldage home visit, save electricity, blood donation camp, bmc school computer. Volunteers sell rakhis in and around the college campus and amongst friends and family made by blind children bought from the Nation Association for the Blind or so. The rakhis ranged from Rs. 10 to Rs. 30 and the money collected are used as funds for the blind children. The volunteers sell sticker flags among people before the Independence day at a low cost and also ask them to dispose the used flags properly and pick up the thrown flags if they see any. The volunteers participation in the NSS march in their college which is followed by the flag hoisting by the Chairperson of the college. A seminar is organized in colleges for the volunteers where they were told everything about Malaria, how it is caused and how to prevent it. The volunteers are a part of the helping team at the Artificial Pond set up by the local. The volunteers help the devotees to perform their rituals and guide them through the system of Visarjan. They also manage the traffic on the roads during Visarjan and ensure the safety of the people. To celebrate the traffic control week, the unit make posters and campaign on the roads and signal and spread awareness about safety during driving and other road safety and traffic rules to minimize the ill effects of inattentive driving and violation of road safety rules. The unit are a part of the organ donation campaign wherein they spread awareness amongst people about the increase in need of organ donors and unavailability of them. The myths surrounding organ donation are cleared and people are asked to sign up for it and given donor registration cards. The unit organized Anti-Addiction rally. The volunteers carry posters related to the topic and try to spread awareness about the ill effects of addiction. Swachatta abhiyaanas started by PM of our country in collaboration with the NSS Unit. College campus and other areas around the college are covered by the students. A flash mob is performed by the volunteers at the Marathon in association with some Foundation NGO, that works for the women rights and their betterment. A group discussion is organised wherein, each group is given a copy of the Preamble of the Indian Constitution and is asked to discuss about how relevant is the Preamble in today's time and what changes would they suggest making it applicable for the current scenario of our country. Posters are made by the volunteers on the topic 1916, the city saviour to spread awareness of this system amongst the people through posters. It is based on the misconceptions in our society and in bringing light to how we discriminate between boys and girls in our day to day life without even acknowledging them and how we could change it. The volunteers visit the Aadhar oldage home where they interact with the residents, play games with them like housie and others, sang and dance with them. As a token of remembrance, a handmade tree with leaves made of paper to write the names of each resident is given to the residents on behalf of the entire unit and also, a chart with the drawings and sayings of our national leaders like Gandhiji, Sardar Vallabhbhai Patel and many more. The Blood donation wherein nearby hospitals participate is organized in association with say Lion's club and collects a good total no of units of blood. Also, each donor is given a red ribbon to promote AIDS Awareness amongst people. A selected batch of volunteers visits the BMC School on weekends to teach the students basics of computer. Volunteers are given 3 sheets of paper at the beginning of the year. They are asked to maintain the record of the electricity units used of minimum 5 families and give suggestions on how to reduce the use of electricity and prevent its wastage. They were asked to calculate the total units saved by each family at the end of the year.

Fig.1: NSS activities

III. NSS OUTCOMES

Students shall be able to (i) Understand the socio-economic conditions of community in which they work. (ii) Identify the needs and problems of the community and involve them in day to day problem-solving. (iii) Develop competence required for group-living and sharing of responsibilities. (iv) Acquire leadership qualities and democratic attitudes. (v) Develop ability and capacity to meet emergencies and natural crisis and practice national unity & integration and social harmony.

IV. CONSTRAINTS OF NSS

(i) The budget sponsored by government in not enough for performing so many activities successfully.(ii)Mostly Professors who are teaching in colleges are given the profile of Programme Officers who finds very difficult to carry out so many activities along with their academic work. (iii) Students have to carry NSS along with their academic work, so even they face shortage of time. (iv) Sometime PO/ students don't have experience/knowledge to carry some specific work successfully. (v)Sometime PO keeps on changing frequently in some institute due to which the success of NSS is hampered.

V. SUGGESTIONS

There should be reformation in sponsored budget so to perform the NSS activities successfully.(ii)Full time PO should be should be appointed who are free from academics or has minimum academic work, so to carry NSS work successfully.(iii)The PO should be well trained to perform some important difficult activities.(iv)Even the NSS students should be trained through seminars/ workshops etc. to carry some of the important activities successfully.

VI. CONCLUSION

By looking at the various activities and roles played by NSS volunteers it can be stated that they work for social cause selflessly by self-motivation. They do all these things along with their academics and personal & household work. So, their work is really appreciable. Even the government and universities and colleges should motivate, facilitate and empower these students more so that they can carry even more appreciable work.

VII. FUTURE SCOPE

Organ Donation: Every year 1.5lakh peoples need kidney transplant, but just 5000 are able to receive donor. Nearly 10 lakh people need corneal transplant, 50 thousand people needs heart transplant, 20thousand people need lung transplant but only very very of them are able to get the donor and survive. Out of nearly 125 crores of Indian population, person as organ donor per million population is just 0.08 which is far less compared to other countries. NSS can play a special major role here in motivating the people door to door and explaining the pros of donation so that our country can excel in this field as well. Also the Government can think of sponsoring the budget to NSS unit for development of a certain regions like they do it to corporators & gram panchayats, MP's MLA's and compare the outcomes.

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Qualitative and Microbial Analysis of Raw and Soil Biotechnology Treated Domestic Sewage Water from Palghar, Maharashtra, India

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***Abstract* - The study was carried out to determine the quality of sewage water before and after treating water by soil biotechnology method. Various parameters on which quality was determined were pH, chemical oxygen demand, Biological oxygen demand, TSS, TDS and Total Kjeldhal Nitrogen. Both the samples were also analyzed using Atomic Absorption Spectroscopy (AAS) to detect the concentration of Sodium, Potassium and heavy metals like Nickel, Copper and Aluminum. Microbial analysis was carried out to find out the presence of bacteria, fungi, yeast etc. The results obtained from this study reveals that SBT treated sewage water is harmless for human handling and is beneficial for agricultural purpose.**

Keywords: Sewage water, SBT treated water, Bacteria, Agriculture, BOD, COD, Psychrophiles, Mesophiles, thermophiles, Azotobacter, Irrigation, MPN, Coliforms, Standard plate count.

I. INTRODUCTION

One of the major wastes disposed everyday is domestic sewage. It is 99.9% pure water by weight, rest of the 0.1% contains variety of suspended and dissolved impurities which causes significant problems and also contains disease causing microbes [1]. Most of the communicable diseases are due to unsafe water; most of which is contaminated either by sewage or agricultural run-off. At Govardhan Eco Village (GEV), the domestic sewage waste is treated by Soil Biotechnology Method.

SBT consists of resistant control and includes soil, formulated coarse filter media and a select culture of organisms such as plants and earthworms. It involves a combination of both biological and physical processes for processing of waste water or used water and it derives its fundamental principle from the operation of a terrestrial ecosystem. It is a natural bio-geochemical cycle of nature and hence proves to be most effective eco-friendly technology for waste water treatment. The SBT plant at Govardhan Eco Village recycles 30,000 liters of sewage water every day [2].

Chemical and Microbial analysis of domestic sewage water is done before and after treatment to prove the benefits of this eco-friendly technology.

II. PARAMETERS ANALYZED

Following water quality parameters were analyzed to find out the water pollution status: (1) pH (2) Total dissolved solid (TDS) (3) Total Suspended Solids (TSS) (4) Dissolved oxygen (DO) (5) Chemical oxygen demand (COD) (6) Biochemical oxygen demand (BOD) (7) Total Kjeldhal Nitrogen (8) Oil and Grease (9) Detection of sodium, potassium, Nickel, Copper and Aluminum by AAS (10) Enumeration of total viable bacteria, coliforms, psychrophiles and thermophiles (11) Detection of actinomycetes and fungi.

III. WATER QUALITY PARAMETERS AND THEIR EFFECTS ON AGRICULTURE

The water was collected from GEV, Palghar district in order to study physico-chemical and microbial characteristic of domestic sewage water pre- and post treatment. Various samples were collected following the standard methods described for sampling. The procedures and standard methods were used for qualitative and quantitative assessment of water quality parameters.

pH: pH is the measure of the acidity or alkalinity of a solution. Water pH between 6.5 and 8.5 is considered to be advantageous for irrigation. pH values above and below the normal range, indicates that action needs to be taken to get better crop performance[3].

COD: Chemical oxygen demand is a measure of the necessary oxygen for the chemical oxidation of the organic matter. It can be high without any negative effects for the plants and the soil. In some cases high organic matter content is considered positive as it improves the water holding capacity of the soil on the long term.

BOD: Biological oxygen requirement is a measure of the quantity of oxygen required for the biological oxidation of organic waste. It can be used as a measure to find out the efficiency of waste water treatment plants.

TSS: Total suspended solids are the dry-weight of particles blocked by a filter [4]. TSS, measured in mg/l, can be calculated as

$$\mathrm{TSS\,(mg/l)} = \frac{(\text{final wt} - \text{initial wt}) \times 1000}{\text{Amount of sample taken}}$$

TDS: "Total dissolved solids" refer to any minerals, salts, metals, cations or anions dissolved in water. It comprises of inorganic salts and some minute amounts of organic matter that are dissolved in water [5], [6].

Total kjeldhal nitrogen: The nitrogen cycle is the measure by which atmospheric nitrogen is made obtainable in different forms to living organisms. Starting from the basic molecules of ammonia, nitrate and nitrite up to the more complex proteins and amino acids. nitrogen is very essential for living organisms to function. This is a very important function in the smooth operation of many wastewater treatment plants in India. [7], [8].

OIL AND GREASE: Oil and grease is organic toxic waste which causes ecology damages for aquatic organisms, plant, animal, and is mutagenic and carcinogenic for human being. They form a layer on water surface that decreases dissolved oxygen [9].

Aluminum: Can cause non-productivity in acid soils (pH < 5.5), but more alkaline soils at pH > 7.0 will precipitate the ion and eliminate any form of toxicity [10],[11].

Nickel: Toxic to most of the plants ranging 0.5 mg/l - 1.0 mg/l. Toxicity can be reduced at alkaline pH or neutral [10].

Copper: Toxic to most of the plants ranging 0.1 to 1.0 mg/l in nutrient solutions. Availability of high pH (alkaline soil) or Copper can cause leaf chlorosis as well as the suppression of root growth [10],[11].

Sodium: Sodium exists in almost all water used for irrigation and is not essentially a cause for concern unless high concentrations are present. High concentrations (> 70 mg/L) can be dangerous to both plants and soils. Sodium in water used for irrigation can be absorbed by roots and flora, and foliar burning can occur if excess amounts accumulate in leaf tissue [12].

Potassium: The potassium (K+) cation performs similar to sodium in the soil and is very commonly found in natural waters in small amounts.

Microbiological analysis: Since the composition of wastewater varies, the types and numbers of organisms will fluctuate. Fungi, protozoa, algae, bacteria and viruses are present. Raw sewage water may contain millions of bacteria per milliliter including the coliforms, streptococci, anaerobic spore-forming bacilli, the proteus group and other types originating in the intestinal tract of humans. The causative agents of poliomyelitis, hepatitis, typhoid, dysentery and cholera may occur in sewage. Certain bacteriophages are easily isolated from sewage water.

The potential methane producers such as Methanococcus, Methanobacterium, Methano-sarcina contribute to the production of anaerobic and temperature elevated conditions in sewage[13]. Bacterial growth is very receptive to temperature because high temperature can give rise to the fluidity of the phospholipid bilayer which leads to cell lysis. However, bacteria are known to have increased enzymatic activity at higher temperature because of increased thermal energy. For example, when thermophilic sludge treatment is compared to mesophilic treatment, the sludge biodegradability is higher with thermophilic degradation [14].

Total viable count:In routine analysis the total number of bacteria present in 1 ml of sewage is determined by standard plate count method. One set of plates is incubated at 370 C for 48 h (mesophilic bacteria). Another set of plates is incubated at 220 C for 72 h (psychrophilic bacteria) and yet another set of plate is incubated at 550C for 72 h (thermophilic bacteria). After incubation the colonies are counted and the amount of cfu/ml (colony forming units) can be calculated [15].

Plate count technique is useful in finding out the efficiency of operation for destroying or removing the organisms. A microbial count can be made before and after a specific treatment and results obtained indicate the degree to which the bacterial population has been reduced. A sample of water containing less than 100 bacteria per ml is considered to be safe [5].

The total number of psychrophilic bacteria: Non pathogenic bacteria have the ability to grow mainly at lower temperatures. It is important that Gram-negative bacteria in water produce lipopolysaccharides in their cell wall which can be toxic – like endotoxins of pathogenic bacteria. Because of this, the growth of their numbers in water should be constantly monitored. A large increase in their numbers is an evidence of the presence of easily available organic compounds in the water. Theoretically, the presence of 0.1 mg organic carbon in water can show the result in an increase of bacteria up to 108 cfu in 1 ml. Phosphorus is also a factor which stimulates the growth of psychrophilic microorganisms. Adding even small amounts of this element (i.e.,50mg/l) causes 10 times the acceleration of bacterial growth in a water treatment plant [15].

The total number of mesophilic bacteria: High numbers of bacteria growing at 370C are more dangerous because among this high population of bacteria, pathogenic forms may be found which can be dangerous for human health. High number of bacteria available in samples of water can prove a point that water treatment process has proceeded badly or that polluted water is siphoned [15].

The total number of thermophilic bacteria: It is an index of production of gases such as methane that elevate the temperature of sewage and allow the proliferation of thermophilic bacteria[14].

Total coliform and fecal coliform (MPN - Most probable number) It is statistical method based on the probability theory. In this technique, the sample is diluted serially till the numbers of organisms reach the point of expansion. From each and every dilution several multiple tubes of a specific medium are immunized. Presence of organism is indicated by acid and gas in the medium. Pattern of positive and negative test results are then used to calculate the number of coliforms in the original sample. Since the test gives the most likely number of organisms present in the sample. it is also known as MPN test[16].

Study of biological nitrogen fixers: Azotobacter is a free living, non symbiotic nitrogen fixing bacterium that brings about biological nitrogen fixation [17]. Since the sewage is SBT treated it is possible that these valuable microorganisms may enter the treated sewage by diffusion from the soil. Enrichment technique is used to create an increase the number of this organism as its number is very few in soil samples and hence in the treated sewage.

IV. MATERIALS AND METHODS

pH: pH was determined by pH metry using a pH meter[18].

COD: [5]0.1N Pottasium dichromate, 0.1M sodium thiosulphate, 2M sulphuric acid, 1% starch solution. COD was determined by titrimetry by using procedure using Aneja.

BOD: [5]0.5% Allyl thiourea, 1N sulphuric acid, sodium hydroxide. BOD was determined by titrimetry by using procedure using Aneja.

TSS: APHA 2540 D Total Suspended Solids Dried at 103–105°C [19].

Oil and grease: American Public Health Association (APHA) 5520 B. Partition-Gravimetric Method [20].

Microbiological analysis: Raw and treated sewage waste matter samples were incubated overnight at 370C, before analysis.

The samples were sampled to enumerate total possible counts and total coliform counts. Also, the fungi and actinomycetes present in the collected samples were studied. The sample was also checked for the availability of nitrogen fixing bacteria, Azotobacter spp.

The samples were 10-fold serially diluted and the total viable count was carried out using appropriate dilutions, sterile molten nutrient agar medium and incubation conditions by pour plate method[15]. Determination of total coliform count was carried out by MPN (three tube method) using single and double strength Lauryl tryptose broth[16].

For the study of fungi and actinomycetes, a loopful of each of the samples were streak isolated on sterile Sabouraud's dextrose agar and sterile Kenkunight and munnair's agar plates respectively[5]. Azotobacter spp was isolated by enrichment in Sterile Ashby's mannitol broth medium and subsequent streaking on sterile Ashby's mannitol agar plates[5].

V. RESULTS

Results of chemical analysis:

Parameters	Desirable limit for irrigation	Untreated sewage water	SBT treated sewage water
pH	6.5-8.5	6.97	7.58
COD (mg/l)	-	474	119
BOD (mg/l)	100	169	39
TSS (mg/l)	200	134	38
TDS (mg/l)	< 500 - No potential problem ; 500-2000 slight to moderate; >2000 severe	716	650
Total Kjeldhal Nitrogen (mg/l)	-	7.48	4.02
Oil and Grease (mg/l)	10	3	0.1
Parameters	Desirable limit for irrigation	Untreated sewage water	SBT treated sewage water
Aluminium (as Al) mg/l	5	0	0
Nickel mg/l	0.2	0	0
Copper mg/l	0.2	0	0
Sodium mg/l	0-50	5.1	5.05
Potassium mg/l	5-10	7.13	7.01

Results of microbiological analysis:

Parameters	Untreated sewage water	SBT treated sewage water
Total Viable count		
Mesophilic count	6*106 cells/ml	93 cells/ml
Psychrophilic count	5.3*104 cells/ml	32 cells/ml
Thermophilic count	69 cells/ml	27 cells/ml
Coliform count	2.1*104 cells/ml	Absent
Yeast	Candida Species	-
Fungi	-	Aspergillus Species
		Penicillium Species
		Slime moulds
Actinomycetes	Nocardia Species	-
Biological nitrogen fixers	-	Azotobacter species

VI. DISSCUSSIONS:

This study completely focused on the effect of SBT treatment on domestic sewage and determination of the possibility of treated sewage for human handling and irrigation.

In the result sections we noticed considerable decreases in almost all parameters from "untreated sewage water" to "SBT treated sewage water".

In chemical analysis, pH of treated water is within the desirable limit for irrigation. COD and BOD reduce considerably after treatment making itself suitable for human handling. With respect to total dissolved solids (TDS) the potential risk is reduced after treatment, though not completely risk free. The reduction in the total kjeldhal nitrogen content can be due to the fact that organic matters are eliminated after treatment. Elements like Aluminum, Copper and Nickel are absent. Sodium and potassium are within the limits.

A considerable reduction in the total number of viable organisms is observed in treated sewage suggesting that the potential risk to the health of humans can be almost eliminated by SBT treatment of sewage. Moreover, coliforms are completely eliminated reducing the risk of dissemination of these organisms in the environment which pose a serious threat of gastro-intestinal tract infections in humans. Penicilium species and Aspergillus species are potential antibiotic producing fungi that increase the competition for nutrients thus reducing the load of bacterial pathogens. Azotobacter species able to fix up atmospheric nitrogen into soil by biological nitrogen fixation, making it available to the plants.

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Utilization of Social Media as a Tool in Enhancing English Language for Employability – A Pragmatic Approach

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***Abstract*- The role played by social media is very vital and is of great prominence in the present scenario. No one can ignore the growing importance and utilization of social media. At the same time, it is a fact that sound knowledge in English will help students to fetch a respectable job and a decent package. English is acknowledged as an international language and almost used in every walk of life. The paper highlights various ways of improving English language through social media which could help budding engineers and other professionals to improve their English communication which includes all the four skills- reading, writing, listening and speaking. Proficiency in the English language will aid the young engineers to move ahead andclimb the ladder of success. Over a few decades social media has rapidly fused into various domains of our everyday life. It is also been observed that social media is gaining impetus as an official communication in most of the fields. In social media, the language mostly used is English. English is the only link language through which people can communicate to one another, though belonging to various dialects nationally and internationally. English language can be learnt with poise through technology which will facilitate to become self empowered and as well as to empower others.**

Keywords: Acknowledged, Empower, Facilitate, Impetus, Prominence, Utilization

I. INTRODUCTION

Communication is an elementary factor of our life. Communication has turned to be the means of achievement in every field. A person cannot be successful and attain his goals if he does not hold unparalleled communication skills. The central idea of communication is to transmit clearly and explicitly. Communication becomes effective and blooming only when the recipient gets the similar message as favored by the sender. Communication includes all the four skills – reading, writing, listening and speaking. English being a worldwide language, communicating effortlessly in English has become mandatory for those who seek to excel well in the professional and intellectual field. [1]Engineering is one of the principal fields of learning in the world and technocrats the pride of the humankind. But it is observed, even though students are technically good they need effectual communication skills, lack of which hampers their job opportunities in MNCs. Candidates with outstanding communication skills are only selected by multinational companies. [2]

Osterman says, (1997) "Engineering is a very broad profession that envelops many other sciences and specialties. Engineers cannot spend a lot of time behind the closed office door. They have to communicate and share ideas and thoughts with other collaborators and authorities." [3]

Originally, the engineers were expected to do technological things at the back stage. The necessity for expertise in English was not felt. The engineering program never stressed on communication skills in English. As time rolled on, India became an ingredient of the global market and English being the lingua franca of the global business, the Indian companies are focusing and absorbing individuals who hold good language skills of English. [4] Moreover, English is the means of interpersonal communication in the business world and to have good authority on English language became all the more a requirement.

Engineers have to toil in team and this teamwork requires mutual collaboration and understanding inside and outside the organization. In order to comprehend and synchronize with co-workers and implement their projects they should possess and be experts in all the four skills- listening, speaking, writing and reading. Thus it would be erroneous to depend only on technical familiarity and skills, which are inadequate to advancement in one's professional career. Exceptional communication skills and good knowledge in English is requisite to excel in the globalised job market. [5]

Professionals and engineers are experiencing a lot of remarkable challenges every day. They have to communicate with many - with the populace of unlike caste, unlike background and unlike nationality. They are anticipated to read both technical and business documents like reports, periodicals, manuals, minutes of the meetings, office records, statements, emails and the list is infinite. In short, they have to go through an array of texts ranging from a short e-mail to a complete book or a wide report every day.

In reality, one cannot visualize any academic professional or business work where effectual reading skills are not essential. Reading helps to have enhanced understanding on a topic. It aids a person for self - development and to generate a constructional pathway towards a larger understanding and complicated plans to follow in future. Reading helps to develop better communication skills and forms the base for academic brilliance.

Engineers are anticipated to write both technological and business documents like periodicals, reports, emails, statements office records, manuals and the list is endless. In other words, they have to inscribe various texts ranging from a small e-mail to an extensive report each day. In reality, one cannot visualize any academic, professional or company work where effectual writing skills are not essential. The means of communication is English in all these fields.

Engineers have to listen to many people in their professional career like their own colleagues, their juniors, their seniors and of course their clients. They should listen carefully, so that no misinterpretation or misapprehension takes place. Listening skill is a gift which should be nurtured, inculcated and enhanced.

As a member of staff, an engineer has to toil in group or as a team. He has to contract with a range of people from different parts of the globe. He has to synchronize with various people in order to attain his targets and goals. Therefore, listening skill plays a fundamental role in the life of any professional. This listening takes place in English in the business world.

"Good English Communication Skills are a vital element of an engineer's profession and the lack of such skills only undermines the image of an engineer."[6]

A professional should be well versed with English language and diction. Expression is the basic doctrine of human communication. The communication procedure is a primary part of productive living. Every individual needs to be well prepared with the tool called communiqué in order to accomplish his goals in life and profession. Professionals have to converse with people of unlike cultures, diverse backgrounds and dissimilar nationalities because of globalization. Thus, proficiency in English is the need of the hour.

II. IMPORTANCE OF ENGLISH LANGUAGE

India is perhaps the most intricate country in the globe because of its unbelievable cultural mosaic, diversity and empathy at every stage. The Indian society constitutes of various races, religions, cultures, backgrounds, languages and dialects. The arrival of British to India in 1600 was the commencement of English education in our country. For business affairs and even organization, the East India Company required huge number of employees. The Company realized that to import staff to India was very expensive. This was an imperative reason of introducing English teaching in India. The Company expected, by introducing English teaching, it will become inexpensive to produce ample and skilled staff to employ for various secretarial jobs. Thus, English education was introduced. [7]

When India became self-governing in 1947, the only functional lingua franca in the nation was English. The Indian Constitution adopted in 1950 visualized that Hindi would be consecutively phased in to substitute English over a phase of fifteen years. It was also assured that Hindi would be the primary official language. Unfortunately, the non-Hindi speaking states protested. Thus, English language continued for official purposes till 1965. On the other hand, no strict judgment has been taken yet. Consequently, the amendment bill of English language affirmed English to be an associate language, till some firm and rigid resolution is taken. India being a land of diversity with various cultures and languages English is the only language which plays an indispensable role in integrating people underneath one flag and constitution. [8]

Today India stands at a threshold where it has to not only integrate further with the world economy, but also and more importantly, achieve an all inclusive growth for its entire population. With the objective of meeting these aspirations and transforming India into a knowledge society, was set up the National Knowledge Commission, a high level advisory body to the Prime Minister of India, chaired by Mr. Sam Pitroda, telecom visionary and a social thinker. [9]

The Commission has once again reiterated the significance of linguistic capabilities and English language proficiency in the 21stcentury market place and observed that "Command over the English language is perhaps the most important determinant of access to higher education, employment possibilities and social opportunities."It is ironical that though India has one of the largest pools of English, a speaking person in the world, the language is still not accessible to the common people of the country." The commission further recommends "…that the time has come for us to teach our people, ordinary people, English as a language in schools. And we are convinced that action in this sphere, starting now, would help us build an inclusive society and transforming India into a knowledge society."[10]

One of the imperative deficiencies found by the recruiters of companies in candidates for various jobs is their poor communication skills both oral as well as written.

"Many engineering graduates in India are found to be unemployable due to their poor communication skills and lack of confidence. There have been a lot of research papers that have recapped the importance of improving engineering graduates' employability skills; however, the problem of poor communication skills grows unabated in India." [11]

The Growing Importance Of Social Media: Social Media is an expression which is being used a lot in the present circumstances. Social media is a way of communication like a radio or a newspaper. Students are connected with people throughout the world. [12] The materialization of social networking sites simplified the entire process as they are easier to employ and navigate. It is more than just a mode of seeking information. With the globe, in the middle of a social media uprising, it is apparent that social media like facebook, Whatsapp, e-mail, twitter, are used comprehensively with the intention of communication. [13] Communication can be with a single individual or a group of people. Present day, people, particularly the youth are captivated on to the various social media for being in touch with their peers. Social media is medium for societal interaction. People exhibit their social lives, share information, pictures and videos. They interact in order to share their hobbies, interests, likes and dislikes. [14]

After the completion of their studies, engineering students have to possess proficient communication skills in English in order to get employed. For getting a job, they have to read various notices, go through advertisements and have to submit their resume written in proper English to the company. During personal interview they have to exhibit their fluency in English language. Thus English is required throughout and their success and failure in securing a job depends on their proficiency of the English language. Thus, if technology and English language are integrated then, it will surely help students to enhance their language skills. [15]

III. METHODOLOGY

Research Objectives: To find out how social media can be utilized as a tool to improve English language. To analyze how social media can enhance English language and help students for employability. To determine how English and social media are connected and related.

Research Design: Selection of research method: Survey method. Design of sampling plan: A sampling plan is a method which helps to choose the sampling units of a research from the sampling structure of population. The researcher chose the five

engineering colleges of Palghar district, Maharashtra, to collect sample.
Population: First year engineering students
Sampling: Simple Random Sampling
Sample size: 100
Tool for data collection: A questionnaire was prepared to find out the percentage of students using social media and various social networks and time spent on social media.

IV. Result and Discussion

Result: From the table above it is very clear that all the student's use Whatsapp. 95% of the students use e-mail. Some of them do not possess their e-mail account yet, which they are likely to open soon.94% of the student's use You tube. They use and are aware of the benefits of You tube. 90% of the students have facebook account. They update their status regularly and post pictures, photos and share videos.85% are active on Twitter, while other social media like Skype, Hike and LinkedIn etc. are used by 80% of the students.

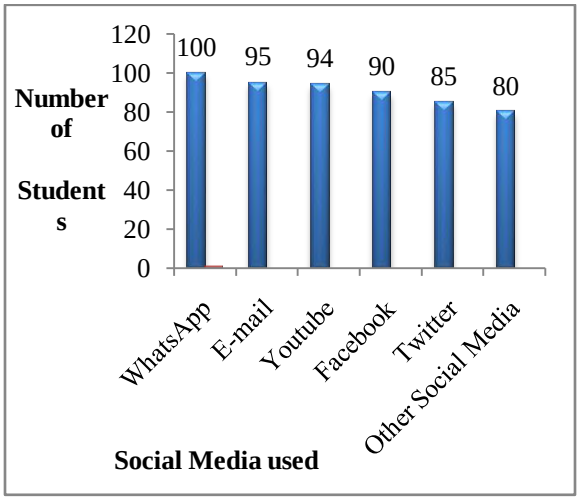

Fig 1: Use of Social Media by Students

Discussion: From the above findings it is crystal clear that students use Whatsapp, E-mail, You tube and Facebook to the maximum compared to other social media. Thus language teacher can form a group on these social media and can help students improve their English. While chatting, the teacher can specify the students to write in full sentences, take care of punctuations and spellings. Students should confirm their spelling before sending the messages. If the students are not sure about the spelling, they can check the same in the dictionary. Further, the language teacher can ask the students to write an e-mail and send it to her regularly. Writing e-mails will undeniably boost up their writing skills. The language teacher can recommend educational videos and ask the students to listen. Later on speak for three minutes related to the video. This will help the students to develop listening as well as speaking skills. The language teacher can advocate beautiful articles to be read by the students to develop their reading skills. Later on, to brief out what the students read in the form of writing. Thus, both reading and writing skills are improved.

Result: The findings obtained from the above, it is apparent that students spend most of the time on Whatsapp which is 10 hours a day. They chat and share anytime and anywhere as they are always online. The students spend 3hours on mails. The time spent for You tube and Facebook is 2.5 and 2 hours respectively. 0.5 hours is spent on the social media like Twitter. 0.5 hours is spent on other social media, if required.

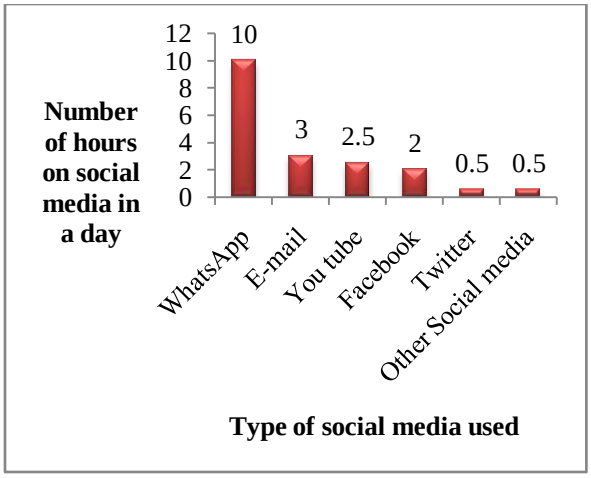

Fig 2: Time Spent on Social Media by Students

Discussion: It can be gathered that most of the time the students are on line. The students should be motivated to use correct English while chatting on social media to improve writing skills. They should be encouraged to read good articles and news updates online to augment reading skills. They should be guided to listen to inspirational speeches, to develop the art of listening. Further, the students should be made conscious and enthused to speak only in English while attending any call, particularly with their peers that will enhance speaking skills.These kind of initiative will not only help the students to pick up English but also to have better opportunities for placements.

V. CONCLUSION

It can be concluded that due to technological boom, the present generation youth are definitely exposed to various social media. The most used social media is Whatsapp followed by e-mail, you tube and facebook. These social media can be utilized for the enhancement of English language and ultimately for employability. Students love to be connected on social media. Thus their energy and time can be channelized to a purposeful motive. Then they will learn the language naturally. All the teachers and predominantly the language teachers should persuade and motivate the students to learn English language through social media.

Suggestions: The language teacher can form a group on Whatsapp. The students should message only in English. No other language should be encouraged. They should use full forms, full sentences and punctuation wherever needed. The teacher can give topics and students after writing on these topics can mail to the teacher for review/comments. The teacher can ask the students to speak on a topic for a minute and send the video to the teacher. Further, the same video can be circulated among the group. The group members can watch their friend's video, which not only helps to develop the art of listening but also they can offer feedback. This will help the students to boost their confidence. The teacher can send a small passage and a few

questions to be answered. The students read and answer the questions in group chatting. This will enable them to improve their reading and speaking skills. The teacher can conduct mock interviews of the students and take a video. By watching the video the students can identify their mistakes and follow the suggestions made by the teacher for improvement. The students can send mails to teacher and students group which will help them to improve netiquettes. The teacher can form group and help the students to improve vocabulary. They can play and learn at the same time. Games like word buildingfind the error; fill in the blanks with appropriate words and many such educational games.

Limitations: The present study was restricted to the engineering colleges of Palghar district, Mumbai, Maharashtra due to time constraint. The study was confined to one aspect – utilization of social media as a tool in enhancing English language for employability particularly the engineering students. The sample taken was limited. The tool of study was restricted to survey method.

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Effects of Hall Current on Steady Hydro Magnetic Rotating Flow of a Viscous Incompressible Fluid through a Porous Medium in a Parallel Plate with Constant Heat Flux

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Abstract - In the present paper, we have considered the impacts of Hall current on enduring hydro attractive pivoting stream of a thick incompressible liquid through a permeable medium in a parallel plate channel with steady warmth motion. The Exact diagnostic answers for temperature and speed profiles are gotten from non-straight Partial differential conditions when upper plate is warmed by consistent warmth transition. The numerical estimation of skin grating and Nueselt numbers are computed at lower and upper plate. The impacts of Hartmann number,Grashof number and Rotation parameter parameters are examined into the present model through charts and tables.

Keywords- Steady, Hydro magnetic, porous medium, constant heat flux, optically thin fluid, Skin-friction, Nusselt number

I. INTRODUCTION

The impact of relentless Laminar thick incompressible stream of electrically leading liquid turning in permeable media has numerous applications, for example, in geophysics, metallurgy and designing orders, for example, filtration of raw petroleum, material industry and, compound industry. MHD assume a critical part in oil ventures, horticulture and astronomy. . The liquid course through permeable medium are experienced in an extensive variety of building and modern applications, for example, in recuperation or extraction of unrefined petroleum, geothermal framework, warm protection, warm exchangers , capacity of atomic squanders , air and maritime disseminations. Cogleyet al. [1] has first researched the significance of Comprehensive writing on lightness initiated attractive field issue on laminar gooey incompressible free convective stream in a vertical warmed channel inside the optically thin with low thickness . Makinde and Mhane [2] talked about the impact of warm radiation on magneto hydro elements oscillatory stream in a parallel plate channel loaded with soaked permeable medium and non-uniform divider temperatures The annular geometry is generally utilized in the investigation and plan in the field of warmth exchangers. A run of the mill utilization of it is in gas cooled atomic reactors in which cooling gas is streaming along the channel. Kumar et al. [3] have contemplated the completely created flimsy magneto hydro elements occasional stream of a thick incompressible liquid through a planar divert in which permeable medium by utilizing annoyance methods. Narahari [4] examined the impacts of warm radiation and free convection streams on flimsy tease stream between two vertical parallel plates with constants warm motion at one limit. Israel Cookey .C, et al. [5] explored the joined impacts of warm radiation and transverse attractive field on relentless fow of viscus incomperissible electrically leading liquid through an even channel loaded with immersed permeable medium and non uniform divider temperatures. The impacts of lobby current and revolution on MHD free convection stream in a vertical turning channel loaded with permeable medium exhibited by K.D. Singh and Reena Pathak [6]. Recentally Dr. G. Prabhakara et al [7] have invesigated the consolidated impacts of radiative warmth exchange and a transverse attractive field on enduring turning stream of a viscus incompressible electrically directing optically thin liquid through a permeable medium in a parallel plate channel and consistent temperatures at the dividers. Numerous papers were distributed on relentless free convective stream past between parallel plates in which the plate temperature was under consistent warmth transition conditions. In the present paper, we have thought about the impacts of Hall current and consant warm motion at upper plate on enduring hydro attractive turning stream of a thick incompressible liquid through a permeable medium in a parallel plate channel.

II. MATHEMATICAL FORMULATION

Consider the lightness prompted enduring laminar stream of a viscus incompressible electrically directing optically thin liquid limited by two parallel plates loaded with immersed permeable medium affected by a transverse uniform attractive field of quality H0 considering Hall current, The lower plate which is on z' is kept up at temperature T=T0 and the upper plate at z'=h is provided warm at steady rate q' per unit zone. A Cartesian co-ordinate framework with x' - hub arranged on a level plane along the focal of channel is presented. The z' - pivot is taken opposite

to the planes of plates is the hub of turn and the whole framework pivots about this hub with uniform rakish speed. Hence, with normal Boussinesq estimate, the stream is represented by the accompanying conditions.

$$-2\Omega v' = -\frac{1}{p}\frac{\partial p}{\partial x'} + \nu\frac{\partial^2 u'}{\partial z'^2} + \frac{\mu_e J_y H_0}{\rho} - \frac{\nu'}{k}u' + g\beta_T(T - T) \quad (1)$$

$$-2\Omega u' = -\frac{1}{p}\frac{\partial p}{\partial y'} + \nu\frac{\partial^2 v'}{\partial z'^2} + \frac{\mu_e J_x H_0}{\rho} - \frac{\nu'}{k}v \quad (2)$$

$$\frac{K_T}{\rho c_p}\left(\frac{\partial^2 T}{\partial z'^2} - \frac{1}{K_T}\frac{\partial q}{\partial z'}\right) = 0 \quad (3)$$

subject to the following boundary conditions

$$u' = 0, \quad v' = 0 \quad T = T_0 \quad at \quad z' = 0$$

$$u' = 0 \quad , v' = 0 \qquad , \frac{\partial T'}{dz'} = -\frac{q'}{k} \qquad z' = h \quad , \quad (4)$$

Here u' and v' are the speed parts along x' and y' headings, p the weight, T the temperature , g the gravitational increasing speed ,q the radiative warmth transition, βT the coefficient of warm development, ν the coefficient of kinematic thickness, σ the electric conductivity, μe the attractive porousness , H0 is the connected attractive field , ρ thickness of the liquid , Cp the particular warmth limit at steady weight , KT the warm conductivity and k the penetrability of the permeable medium.

Since the plates stretches out to interminability along x' and y' headings, all the physical amounts aside from the weight rely upon alone, and subsequently the separate conditions of progression are inconsequentially fulfilled. At the point when the quality of the attractive field is substantial, the summed up ohm's law is altered to incorporate the corridor current so that

$$J + \frac{\omega_e \tau_e}{B_0}(J \times B) = \sigma\left[E + V \times B + \frac{1}{e\eta_e}\nabla P_e\right] \quad (5)$$

Where ωe the cyclotron recurrence of the electrons, τe is the electron crash time, σ is electrical conductivity, e is the electron charge and pe is the electron weight. The particle slips and canteen electric impacts are excluded in the condition (5). Assist it is accepted that ωeτe - 0 and ωeτe<<1, where ωi and τi are the cyclotron recurrence and crash time for particles separately. In condition (5) the electron weight inclination, the particle slip, and bottle electric impacts are dismissed. We likewise expect that the elecrtic field E=0 under suspicions decreases to

$$J_x + mJ_y = \sigma\mu_e H_0 v \quad (6)$$

$$J_y - mJ_x = -\sigma\mu_e H_0 u \quad (7)$$

Where m=ωeτe is the hall parameter. On solving equations (6) and (7) we obtained

$$J_x = \frac{\sigma\mu_e H_0}{1+m^2}(v + mu) \quad (8)$$

$$J_y = \frac{\sigma\mu_e H_0}{1+m^2}(mv - u) \quad (9)$$

Using the equations (8) and (9), the equations of the motion with reference to rotating frame are given by

$$-2\Omega v' = -\frac{1}{p}\frac{\partial p}{\partial x'} + \nu\frac{\partial^2 u'}{\partial z'^2} + \frac{\sigma\mu_e^2 H_0}{\rho(1+m^2)}(v' + mu') - \frac{\nu'}{k}u' + g\beta_T(T - T_0) \quad (10)$$

$$-2\Omega u' = -\frac{1}{p}\frac{\partial p}{\partial y'} + \nu\frac{\partial^2 v'}{\partial z'^2} - \frac{\sigma\mu_e^2 H_0}{\rho(1+m^2)}(mv' - u') - \frac{\nu'}{k}v \quad (11)$$

Let F' =u' +iv' and $\xi = x' - iy'$

Now combing equations (10) & (11) , we obtained

$$2\Omega F' = -\frac{1}{p}\frac{\partial p}{\partial \xi'} + \nu\frac{\partial^2 F'}{\partial z'^2} - \frac{\sigma\mu_e^2 H_0}{\rho(1+m^2)}F' - \frac{\nu}{k}F' + g\beta_T(T - T_0) \quad (12)$$

Corresponding boundary conditions are

$$F = 0 \qquad , \quad T = T_0 \qquad at \quad z' = 0$$

$$F = 0 \qquad , \frac{\partial T'}{dz'} = -\frac{q'}{k} \quad at \quad z' = h \quad (13)$$

We assume that the temperatures T0 and q of the walls are high enough to induce radiative heat transfer. Following Cogley et al. (1968) and assuming that the fluid is optically thin with relatively low density, then

$$\frac{\partial q}{\partial z'} = 4\alpha^2(T - T_0) \quad (14)$$

Where α is the mean radiation absorption coefficient.

The above equations are non-dimensionalised by use of the following non- dimensional variables:

$$u = \frac{u'}{U}, \; v = \frac{v'}{U}, \; z' = \frac{z}{h}, \; F = \frac{F'}{U}, \; \xi = \frac{\xi'}{h}, \; p' = \frac{ph^2}{av^2} \quad (15)$$

$$\theta = \frac{T - T_0}{\nabla T}, \; \Delta T = \frac{hq'}{k}$$ where U is the mean velocity.

and the physical parameters

$$M^2 = \frac{\sigma\mu_e^2 H_0^2 h^2}{\rho\nu}, \quad D^2 = \frac{k}{h^2}, \quad E = \frac{\Omega h^2}{\nu} \quad R^2 = \frac{4\alpha^2 h^2}{K_T}$$

:

$$P = -\frac{\partial p}{\partial \xi}, \; G_r = \frac{g\beta_T h^2(T_0 - T_1)}{U\nu} \quad R^2 = \frac{4\alpha^2 h^2}{K_T}$$

,

The governing equations in the non-dimensional form are obtained as

$$\frac{\partial^2 \mathrm{F}}{\partial z^2} - (M^2 + D^2 + 2iE)F = -P - G_r\theta$$

(16)

$$\frac{\partial^2 \theta}{\partial z^2} - R^2\theta = 0$$

(17)

Subject to the following boundary conditions

$$F = 0 \quad , \quad \theta = 0 \quad at \quad z=0$$

$$F = 0 \quad , \frac{\partial \theta}{\partial z} = -1 \quad at \quad z = 1$$

(18)

In the above conditions, we have utilized some extra non dimensional parameters, for example, the Hartmann number(M), Porosity parameter (D), Rotation parameter (E), Grashof number (Gr), Radiation parameter (R) and Pressure slope (P) are characterized as takes after:

III. ANALYTICAL SOLUTION

Solutions of the equations (16) – (17) under the boundary conditions (18) are obtained as

$$F(z) = \frac{P}{\lambda^2}[(e^{-\lambda} - 1)\frac{\sinh \lambda z}{\sinh \lambda} + 1 - e^{-\lambda z}] + \frac{G_r}{R(R^2 - \lambda^2)}[\frac{\sinh Rz}{\cosh R} - \frac{\tanh \sinh \lambda z}{\sinh \lambda}]$$

(19)

$$\theta(z) = \frac{-1}{R}\frac{\sinh Rz}{\cosh R}$$

(20)

Where $\lambda^2 = M^2 + D^2 + 2iE$

Using the velocity expression given in equation (19) the skin frictions can now be calculated in non- dimensional form at upper and lower plates are obtained as follows

$$\tau = -(\frac{\partial F}{\partial z})_{z=1} = \frac{P}{\lambda}[(1 - e^{-\lambda})\coth \lambda - \lambda e^{-\lambda}] + \frac{G_r}{R(R^2 - \lambda^2)}[\frac{\lambda \tanh R}{\tanh \lambda} - R]$$

(21)

$$\tau = -(\frac{\partial F}{\partial z})_{z=0} = \frac{P}{\lambda}[(1 - e^{-\lambda})\cos ec\,\mathrm{h}\,\lambda + \lambda + \frac{G_r}{R(R^2 - \lambda^2)}[\frac{\lambda \tanh R}{\tanh \lambda} - \frac{R}{\cosh R}]$$

(22)

The rate of heat transfer in dimensionless form at lower and upper plates in terms of Nusselet number is obtained from equation (20) as

$$N_u = -(\frac{\partial F}{\partial z})_{z=0} = -SechR$$

(23)

$$N_u = -(\frac{\partial F}{\partial z})_{z=1} = -1$$

(24)

IV. CONCLUSIONS

In the present examination, the impacts of radiation parameter, Grashofnumber, Hall parameter number and Hartmann Number, on the free convective stream of an electrically leading liquid produced by steady warmth motion on upper surface of parallel plate within the sight of an attractive field with instigated field considered. It is discovered that Hartmann number and Grashof number and radiation parameter assume imperative parts in controlling the conduct of liquid stream.

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Boundary Value Problems in Elastic Column with Clamped End and Free End

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Abstract- **The present article deals with the application of boundary value problems in calculating the buckling load of an elastic column. The boundary conditions are estimated by the column lenthand its end support (i.e. clamped end, free end, hinged end, etc.). The following article will discuss the fundamentals of the boundary value problems, fewparticular cases of the problems and their solutions and how to interpret these results in the context of our problem.**

Keywords- Initial Value Problem (IVP), Boundary Value Problem (BVP), Wronskian, Clamped End, Free End.

I. INTRODUCTION

The differential equations has a very broad scope in the various fields viz. Stock market, Agricultute, Medical Science etc. Differential Equations are very important tool for measuring, modeling and to studynaturally occurring problems such as to determine, when exactly beams will break and to predict future outcomes such as the spread of disease or the changes in populations of different species over the period of time. Whenever such unknown phenomena is changing with respect to time or space, there is an involvement of a differential equation in it. In general, a differential equation is simply an equation which involves dependnt variable as an unknown function, independent variable and its derivatives with respect to the independent variable. To be more technical, a differential equation means a mathematical equation for some unknown function of one or more than one variable which relates the values of that unknown function itself and its derivatives of various orders to a particular phenomena. Differential equations are generally categorised into two parts: Ordinary Differential Equations (ODE) or Partial Differential Equations (PDE), where ODEs involve dependent variable as an unknown functions of one independent variable while PDEs involve dependent variable as an unknown functions of more than one independent variable. In this article we will be focusing on ordinary differential equations (ODEs). Some important characteristics of a differential equation are its order, degree and its linearity. The order of the differential equation means the highest order derivative present in it and the degree of the differential equation means the index of highest order derivative. A differential equation is said to be linear, if it is linear in its dependent variable and its derivatives, i.e. in case of an ODE, if it is expressed in the form

$P_n(x)y^n + P_{n-1}(x)y^{n-1} + \cdots + P_1(x)y' + P_0(x)y = Q(x)$ is known as n^{th} order linear differential equation.

Furher such differential equations are called homogeneous linear differential equations when the right hand side $Q(x) = 0$. One can note that one of the important property of homogeneous linear ordinary differential equations says, for n^{th} order linear differential equation there are 'n' linearly independent solutions,where each of the solutions can be expressed as a linear combination of these 'n' linearly independent solutions. In the differential equation when the condition of some unknown function y and its derivatives are evaluated at a single point then it is known as an initial condition. Generally an n^{th} order ODE will have $y(x_0)$, $y'(x_0)$, $y''(x_0)$,...,$y^{(n-1)}(x_0)$ given as an initial conditions. A differential equation in assosciation with such initial conditions is referred as an initial value problem (IVP).

If some unknown function y (and) or its derivatives are calculated at two different points then it is known as boundary conditions. A differential equation in assosciation with these boundary conditions is referred as Boundary Value Problem (BVP). An example of a BVP is the equation $y'' + f(x)y' + g(x)y = Q(x)$ where the boundary condition are $y(\alpha) = a$, $y(\beta) = b$. When $Q(x) = 0$ and $a = b = 0$, then BVP is said to be homogeneous.

II. INITIAL VALUE PROBLEMS

In the present paper we introduce some fundamentals of IVPs and BVPs which are applicable to this article. Particularly, we are considering first and second order differential equations. In particular linear differential equation problems and initial value problems are separated from boundary value problems. The following results shows the existence of solutions to IVPs.

Result I : Consider the IVP $y'' + f(t)y' + g(t)y = Q(t)$, where $y(t_0) = a$, $y'(t_0) = b$, where f, g, and Q are continuous on an open interval containing the point t_0. Then there exist a unique solution $y = \varphi(t)$ of this problem

and the solution exists throughout the interval [a,b]. Generally the existence of a solution for nonlinear ODEs will be given in the interval containing the initial value. The Result I, not only tells us about a solution existing but also tells us the interval in which it does exist. The next result highlights other difference between nonlinear and linear problems.

Result II : Fortwo linearly independent solutions y_1 and y_2 of the differential equation $y'' + f(t)y' + g(t)y = 0$, the linear combination $c_1y_1 + c_2y_2$ is also a solution for any arbitrary values of the constants c_1 and c_2. The Result II does not hold for nonlinear problems and that highlights one of the main differences between nonlinear and linear problems. This has been illustrated by various examples in the textbooks and reference books of ODEs. While dealing with solutions to linear functions we come across the following important definition.

Definition: If y_1 and y_2 are two linearly independant solutions of a differential equation, then we define the Wronskian W, as $W=\begin{vmatrix} y_1 & y_2 \\ y_1' & y_2' \end{vmatrix} = y_1y_2' - y_1'y_2$

This definition along with Result II gives us the following result.

Result III: If y_1 and y_2 are two linearly independant solutions of the differential equation $y'' + f(t)y' + g(t)\, y = 0$, and that the Wronskian $W = y_1y_2' - y_1'y_2$ is not zero at the point t_0 where the initial conditions $y(t_0) = a$ and $y'(t_0) = b$ are assigned. Then for arbitrary choice of the constants c_1, c_2 the linear combination $y = c_1y_1(t) + c_2y_2(t)$ satisfies the differential equation and its initial conditions. Due to this choice of constants it will simplifly the process of solving the problems of this article.

Result IV: If y_1 and y_2 are two linearly independant solutions of the differential equation $y'' + f(t)y' + g(t)y = 0$, and if there exist a point t_0 where the Wronskian of y_1 and y_2 is nonzero, then the linear combnation of solutions $y = c_1y_1(t) + c_2y_2(t)$ includes every solution of the differential equation, for some arbitrary constants c_1 and c_2. It can be observed that the Result IV deals only with a linear ODE and does not involve an IVP. This shows an important fact that every second order ODE has two linearly independant solutions. Also one can note that these are the only solutions to the ODE and all other solutions can be expressed as a linear combination of these two solutions.

III. BOUNDARY VALUE PROBLEMS

For the differential equation $y'' + f(x)y' + g(x)y = 0$ along with the boundary conditions $y(\alpha) = a$, $y(\beta) = b$

To solve this BVP, we have to find a function $y = \phi$ such that ϕ satisfies the given differential equation on the interval $\alpha<x<\beta$ and takes on the values of a and b at the end points of this interval. To find ϕ, we have to first check the general solution to the ODE and then using the boundary conditions we need to find, if there are constants to solve the problem.

Results are completely different, although the logic of finding solutions to linear IVPs and BVPs is very straight forward. As discussed earlier, linear Initial Value Problems possess a unique solution in well defined interval, where as Boundary value problems may possess a finite (unique) solution, no solution or infinitely many solutions depending on the conditions of the problem. For example if we consider the problem $y'' + y = 0$ subject to the boundary conditions $y(0) = a$, $y(\pi/2) = b$. Here, unique solution exists. If we change the boundary conditions to $y(0) = a$, $y(2\pi) = b$ then we have no solution if $a \neq b$. However, if $a = b$ we have an infinite number of solutions.In this case we shall relate BVPs to systems of linear algebraic equations.

Consider the linear system $Ax = b$ where A is an $n \times n$ coefficient matrix, x is an $n \times 1$ vector to be determined (solution vector), and b is a given $n \times 1$ constant vector. The solution to the system is dependent on the matrix A. If A is non-singular, the system possesses a unique solution. If A is singular then the system may possess no solution or an infinite number of solutions. For the homogeneous linear system $Ax = 0$,the zero (trivial) solution $x= 0$ always exists. If A is non-singular then the trivial solution is the only solution. Whereas if A is singular then there are infinitely many non-trivial solutions. The corresponding homogeneous linear system is similar to the differential equation $y'' + f(x)y' + g(x)y = 0$ where the boundary conditions are $y(\alpha) = 0$ and $y(\beta) = 0$, where α and β are the endpoints of our interval. Thus we need to solve

$$\begin{pmatrix} y_1(\alpha) & y_2(\alpha) \\ y_1(\beta) & y_2(\beta) \end{pmatrix}\begin{pmatrix} c_1 \\ c_2 \end{pmatrix}=\begin{pmatrix} 0 \\ 0 \end{pmatrix}$$ where y_1 and y_2 are solutions to the ODE. This is showing the same algebraic problem which is mentioned above. Fom the previous section we know that there are exactly two linearly independent solutions to the ODE. We can further find the relation between BVPs and linear algebraic systems by considering the linear system $Ax = \lambda x$. This sytem has the solution $x = 0$ for all values of λ, but for certain values of λ, the solution has non-trivial solutions. We call these values of λ eigenvalues and their respective solutions, x, the corresponding Eigen functions or Eigen vectors. The problem as a whole is called an eigenvalue problem. An example of an eigenvalue problem in ODE's would be $y'' + \lambda y = 0$ with boundary conditions $y(0) = 0$ and $y(\beta) = 0$. The relation between systems of linear equations and boundary value problems provides a very important tool in determining the type of solution for a BVP. Also it provides an important factor in solving equations for the constant values of the general homogeneous solution to a

linear ODE. The concept is the same as it is for an algebraic system. We want to determine all values of λ for which the nontrivial solution y exists. We will use this relationship between BVPs and systems of linear equations to solve the eigenvalue problems in the next section.

IV. APPLICATION OF BOUNDARY VALUE PROBLEMS

A CASE OF SIMPLY SUPPORTED COLUMN

Consider the differential equation $y^{(4)} + \lambda y'' = 0$, where the solution $y = \varphi$ is the eigenfunction corresponding to λ. The problem is to find each of the following boundary conditions and the smallest eigenvalue, which determines the buckling load, as well as the corresponding eigenfunction, which determines the shape of the buckled column.

It can be noted that the given ODE is linear and from the previous section we can extend our results from second order ODE to fourth order ODE. Thus, for the given fourth order ODE has four linearly independent solutions which are independent of the boundary conditions. All these solutions to the ODE can be written as a linear combination of these four solutions. First we will solve this 4th order linear ODE. Notice that thecharacter of the solution changes for $\lambda < 0$, $\lambda = 0$, and $\lambda > 0$. To applythe boundary conditions, we need to consider each case separately and it requires that the solution be non-zero in order tofind the buckling load and the shape of the buckled column.

Case 1:When $\lambda < 0$. Let $\lambda = -\mu^2$ for $\mu \neq 0$. Then the auxillary equation for the ODE is $m^4 - \mu^2 m^2 = 0$.

Hence the roots are $r = 0, 0, \mu, -\mu$ and the homogeneous solution is $y = c_1 + c_2x + c_3e^{\mu x} + c_4e^{-\mu x}$.

Case 2:When $\lambda = 0$. Then the auxillary equation is $m^4 = 0$ and the homogeneous solution is

$y = c_1 + c_2x + c_3x^2 + c_4x^3$.

Case 3:When $\lambda > 0$. Let $\lambda = \mu^2$ for $\mu \neq 0$. Then the auxillary equation is $m^4 + \mu^2 m^2 = 0$ and the homogeneous solution is $y = c_1 + c_2x + c_3\cos(\mu x) + c_4 \sin(\mu x)$. Hence we get three possible forms for the solution to the ODE. Now let us apply the different boundary conditions to find non zero solutions to the different situations. It can be noted that for λ to be an eigenvalue, we need to find non-zero eigenfunctions. For every case which was mentioned above, this amounts to find at least one non-zero c_i. This is equivalent to determining for which values of λ a matrix will be singular.

CLAMPED END, FREE END

For the above boundary value problem boundary conditions vary according to how a column is supported, few particular cases arrives. If one end of a columnis fixed and the other end is free, then the eigenvalue parameter also appears in the boundary conditions. To find the buckling load and buckling shape for this type of column, we need to solve $y^{(4)} + \lambda y'' = 0$ subject to the boundary conditionsy (0) = y' (0) = 0, y'' (L) = 0, and y''' (L) + λ y' (L) = 0.We begin by looking at the following cases.

Case 1: When $\lambda < 0$, $\lambda = -\mu^2$, and $\mu \neq 0$.

Then our general solution is $y = c_1 + c_2x + c_3e^{\mu x} + c_4e^{-\mu x}$.

Applying our boundary conditions,

we have $y(0) = c_1 + c_3 + c_4 = 0$

$y'(0) = c_2 + c_3\mu - c_4\mu = 0$

$y''(L) = c_3\mu^2e^{\mu L} + c_4\mu^2e^{-\mu L} = 0$

$y'''(L) + \lambda y'(L) = \mu^3c_3e^{\mu L} - \mu^3c_4e^{-\mu L} - \mu^2[c_2 + c_3\mu e^{\mu L} - c_4\mu e^{-\mu L}] = 0$.

The matrix relating to these boundary conditions is

$$K = \begin{pmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & \mu & -\mu \\ 0 & 0 & \mu^2 e^{\mu L} & \mu^2 e^{-\mu L} \\ 0 & -\mu^2 & 0 & 0 \end{pmatrix}$$

with determinant $\det(K) = -2\mu^5 \cosh(\mu L)$.

Since $\mu \neq 0$ and $L > 0$, $\det(K) \neq 0$. Therefore, the trivial solution is the only solution which satisfy the system of equations for the boundary conditions and hence the BVP.

Case 2: When $\lambda = 0$.

Then the solution obtained is $y = c_1 + c_2x + c_3x^2 + c_4x^3$ is homogeneous solution.Using boundary conditions gives

$y(0) = c_1 = 0$

$y'(0) = c_2 = 0$

$y''(L) = 2c_3 + 6c_4L = 0$

$y'''(L) + \lambda y'(L) = 6c_4 = 0$.

Then we have the matrix

$$K = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 2 & 6L \\ 0 & 0 & 0 & 6 \end{pmatrix}$$

which has determinant $\det(L) = 12$.

Since $\det(L) \neq 0$, we have a nonsingular matrix and once again only the trivialsolution exists.

Case 3: Let $\lambda > 0$ with $\lambda = \mu^2$ for $\mu \neq 0$.

Then the general homogeneous solution is

$y = c_1 + c_2x + c_3\cos(\mu x) + c_4 \sin(\mu x)$

Applying the boundary conditions yields

$y(0) = c_1 + c_3 = 0$

$y'(0) = c_2 + c_4\mu = 0$

$y''(L) = -c_3\mu^2\cos(\mu L) - c_4\mu^2 \sin(\mu L) = 0$

$y'''(L) + \lambda y'(L) = \mu^3 c_3 \sin(\mu L) - \mu^3 c_4 \cos(\mu L) + \mu^2 [c_2 - c_3\mu \sin(\mu L) + c_4\mu \cos(\mu L)] = 0.$

After simplifying the right hand side of the last boundary condition the corresponding matrixfor the boundary conditions is

$$M = \begin{pmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & \mu \\ 0 & 0 & -\mu^2 \cos(\mu L) & -\mu^2 \sin(\mu L) \\ 0 & \mu^2 & 0 & 0 \end{pmatrix} \text{ and}$$

has determinant $\det(M) = \mu^5 \cos(\mu L)$. For a non-zero solution we need $\det(M) = 0$ happens for $\cos(\mu L) = 0$. Thus, $\mu L = (2n-1)\pi/2$. Hence, $\mu 1 = \pi/2L$ and so $\lambda_1 = \pi^2/4L^2$. To determine φ_1, we can substitute for μ_1 in the boundary conditions and solve the system accordingly. Hence, these boundary conditions forms the system

$c_1 + c_3 = 0$; $c_2 + c_4\pi/2L = 0$;

$-c_3(\pi/2L)^2\cos(\pi/2) - c_4(\pi/2L)^2 \sin(\pi/2) = 0$ which gives

$-c_4(\pi/2L)^2 = 0$ and so $c_4 = 0$; and $-c_2(\pi/2L)^2 = 0$ which gives $c_2 = 0$. Therefore we get $c_1 + c_3 = 0$ i.e. $c_1 = -c_3$ gives general solution $y = -c_3 + c_3\cos(\pi x/2L)$

Thus we get $\varphi_1 = 1 - \cos(\pi x/2L)$by taking$c_3 = -1$

V. Conclusion

The above result shows that both the buckling load $\lambda_1$and bucklingshape φ_1 are dependent only on the column length. To be more specific, thebuckling load is not depending upon the strength of the material; rather it depends onlyon the column's dimensions and the material's stiffness, which is also referred toas the material's modulus of elasticity. The buckling load is also the maximumweight a column may support. If any amount of weight over the buckling loadis applied, then buckling, as determined by φ_1, will occur. As for the shape of thebuckled column, we must consider the buckling load or critical load, in more appliedterms.

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Yoga for Youth

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***Abstract*- This article intends to suggest remedies for common stressors faced by students in their day to day lives in modern societies, through yoga. Practicing yoga can help them in boosting their self-confidence, stress management, self-regulation, and lead to healthy all round development. We intend to motivate teachers to promote and foster healthy habits like yoga among their students so as to maintain physical and mental harmony. Young generation is the future of every society and possesses the evolving capacity to develop the self and society, and yoga is a favourable means to attain holistic well-being for both, to channelize their energy in right direction.**

Keywords: Yoga, youth, stress, selfregulation

I. INTRODUCTION

Worldwide integration and globalization has exposed the modern-day youth to a plethora of opportunities and has helped broaden their visions to horizons that are way beyond the imagination of their guardians from the yesteryears. But with the influx of so many new resources in their lives, the youth is also faced with insurmountable heaps of expectations to perform well in order to thrive in this competitive environment. Different institutions in adolescents' lives, such as their family, school, college and the media, constantly provide stimulation as well as increase expectations. This exposure to new expectations and demands has the potential to create stress in young people's lives, especially related to evaluation and comparison of their performances with their peer group.

Youth, nowadays, actively engage in their own development process. Apart from the values and moral system that they imbibe from their kin, a major chunk of the development and character molding happens from the interactions that youngsters have with the outside world. They encounter multiple situations with perspectives that could be different from those inculcated by their guardians and patrons, which leads to conflicts and indecisiveness. Another strife that youngsters go through these days is to get them and their choices accepted in a highly judgmental and stereotypical society. They desire to please the society by their "appropriate" and "socially right" behaviors. Their self-imposed expectations to meet the standards set by their care-givers, academia, and society may cause them anxiety and depression.

Hence, it becomes extremely necessary to make the concerned parties aware about the rising stress levels in modern day youth and propose indigenous methods to mitigate the effects of the same. This would help them lead a healthy and happy life, thereby fostering growth and prosperity in the society.

II. STRESSORS FOR STUDENTS

Results from a recent research suggest that the current millennial generation undergoes the highest levels of stress amongst all the other age groups [1]. A survey conducted by ICICI Lombard and published in Hindustan Times [2] asserts that around 65% of youngsters between the age of 22-25 show early signs of anxiety and depression. It was an on-line survey, wherein 1,100 Indian males and females between the age group of 20-50 years responded to the queries. The survey also indicated that, 64% of the total respondents were sleep deprived, which is one of the most chronic symptoms of depression. It also revealed that the overall mental wellness levels among women are higher (66%) than that of their male counterparts (55%), the survey revealed. The survey further reported that as far as academics is concerned, lower income than peer group (55%), cut-throat competition at work (24%) and lower performance (21%) are the main reasons that cause anxiety in youngsters.

The attributes listed below can cause depression and stress in students,

Competition: In almost all major institutions, when students observe that their capabilities are judged only on the basis of how they fare in their exams, it demoralizes them. Their academic performance becomes the sole yardstick of their worth, which inhibits their curiosity and tendency to think out of the box.

Trauma: Any untoward incident in one's early life, if not handled and counseled properly, may lead to lifelong scars and traumatizing memories. These incidents might range from simple events like ignorance shown by the parents at the time of need or as grave as any other form of physical or emotional abuse. This mars their dignity and their self confidence to achieve anything in life. This might lead to detrimental circumstances where in staying in isolation, portrayal of aggression and violence can become frequent.

Anxiety: Anxiety disorders can be caused due to pressure to perform, competition, trauma, sleep deprivation, over scheduling of tasks, excessive workload, fear and anticipation of failure, issues in inter-personal relationships, exams, and conflicts within the family.

Attention Deficit Disorder (ADD) / Attention Deficit Hyperactivity Disorder) (ADHD): This is a mental disorder which is characterized by the inability of the victim to stay focused, be comfortable in their surroundings, conduct their social interactions with ease etc. Affected people are unable to control their impulses and may have problems in paying attention. Some of the skills that a student with ADD/ADHD often struggles with, are good working memory, flexible thinking, managing one's emotions, self-regulation, task organization and future planning.

Inability to express emotions: When an adolescent does not receive sufficient guidance and support for their social-emotional development, it can lead to the advent to many mental illnesses. This may, in turn, usher socially unacceptable demeanor including violence and aggression. This leaves teenagers uninspired, demotivated, direction-less, restless and they may encounter poor health in bones, joints and vital organs.

Obesity: It has long been theorized and proven that a strong association exists between long-term persisting stress and obesity. Chronic stress, in most cases, results in "comfort eating", where in youngsters pamper themselves by overeating junk foods that are high in fat, sugar and calories. They indulge in unhealthy eating habits like skipping meals or eating late night which lead to weight gain.

Excessive media exposure: Modern society offers unnecessary distractions and undesired attractions, especially linked to media and communication technologies, on which we have become so dependent in our everyday lives. The massive presence of media and the time spent on social networking technologies by youth are clear indicators of the paradigm shift in lifestyles and priorities of the so called "Generation X". Students spend over seven and a half hours daily using media devices such as mobile phones, tablets or computers [3], making media a focal point of their lives. Although, there is no ambiguity that media is an ocean of immense knowledge resources for students, its excessive use leads to increase of health issues such as obesity and other severe physical and mental problems. Media addiction is the term coined by health-care professionals, identifying media as a fundamental factor leading to mental illness, obsessive–compulsive behaviors, concentration problems, and other attention disorders. Apart from the aforementioned health issues, there have been constant concerns raised regarding the security of students from cyber-bullying and exposure to violence and sexually explicit content.

It is a well known fact that stress, generate din all the above ways, can have a profound impact on an individual's mental and physical health. If persistently ignored, high levels of stress could potentially transform into chronic depression and could lead to a wide range of health issues, including anxiety, insomnia, muscle pain, high blood pressure, and weak immune system. Stress can even contribute to major illnesses such as heart disease, depression, and obesity or aggravate existing health problems [1].

These days, there has been a roaring wave of awareness in India about the benefits of yoga as a medium to lead a well balanced life. The government has played a central role in promoting yoga as an essential daily habit among the masses. One of the major steps taken towards acknowledging the importance of yoga at a worldwide level and bringing it back into people's lives was to convene an International Yoga Day on June 21st annually, since 2015 [4]. The campaign was taken further, by the government, when a special ministry dedicated to Yoga and traditional medicine was set up. Nationwide, Madhya Pradesh became the first state to constitute a "Happiness Department" to infuse positivity in the lives of people and improve the happiness index of the state on the whole [5].

III. Yoga: A Gift of Indian Tradition

Yoga is an indigenous spiritual science which brings harmony between one's body, mind and consciousness. It is the art of healthy living. 'Yoga' is a word that is derived from the Sanskrit root 'Yog', which means to 'unite'. Originated in ancient India, yoga is considered one of the most successful and longest surviving philosophical systems in the world. Most popular schools of yoga in India are the Sivananda, Iyengar, Ashtanga and Bikram Yoga. The eight pillars of yoga, that make it one of the strongest contenders for healing and recovery therapy, are, Yama : moral values and disciplines, Niyama : rules for self-regulation, Asana: physical postures, Pranayama : practicing efficient breathing , Dharana : focused concentration, Dhyana : science of meditation, Samadhi : enlightenment or blissfulness

Given the widely accepted benefits of yoga, it naturally becomes a potential tool for students to cultivate a healthy lifestyle and deal with stressful situations in an effective manner. Yoga aligns our mind with our body and incorporates emotional equilibrium and harmony. To be able to flourish in today's fast changing world, it becomes mandatory for students to start practicing yoga which can help them become more conscious and listen inwards to their bodies, ideas, and feelings. Thus, yoga contributes to healthy physical development and good mental health; To be successful individuals and constitute a responsible future society, youth needs to inculcate qualities like undeterred focus, self-confidence and discipline from early stages of their lives. We strongly believe that youth need to nurture their personalities based on their unique capabilities and interests to strike a favorable balance between their strengths and societal expectations. By starting to practice yoga early in life, they can be more responsible and matured when they grow older and will add much more value to the society, than otherwise.

Today's students expect a creative, interactive syllabus and participatory method in the teaching–learning process. This approach is applicable for learning yoga too. Thus, if it could be communicated with young people effectively, they can adopt yoga as a powerful tool for themselves to minimize stress, as well as develop resilience to deal with it. We need to focus on research to understand the ways young people can enjoy learning yoga, sustain it in practice, and use it in daily life. From a social perspective, we anticipate that yoga can also transform people to be socially sensitive; hence, it may increase the likelihood of youngsters engaging in civic activities and shaping a better society. As stated, practicing yoga has the potential to improve the mental health of practitioner. The table given below compares yoga to conventional exercise routine [6].

In what follows, we enlist the benefits of yoga for young generation [7][8].

Mitigate the Pressures: Students face a lot of pressure may it be that of their demanding academic workload or that of the expectations of their teachers and guardians. This may induce some early symptoms of depression which often go unnoticed and re-occur later in aggravated forms. Thus, teachers and parents should encourage students to practice yoga on a regular basis right from their childhood. Yoga is said to release a feel-good hormone called endorphin in the body and thereby helps in alleviating any kind of pressure felt because of psychological burdens.

Table I: Comparison between yoga and conventional exercise

Yoga	Exercise
Parasympathetic nervous system is affected	Sympathetic nervous system is affected
Slow dynamic and static movements	Rapid forceful movements
Normalizes muscle tone	Increases muscle tension
Low risk of injuring muscles and ligaments	High risk of injury
Energizing (breathing is natural or controlled)	Fatiguing (breathing is taxed)
Relaxed movements	Effort is maximized
Noncompetitive and process-oriented	Competitive and goal-oriented
Internal Awareness	External Awareness

Keep Mind in Peace: Sometimes, meritorious students who are accustomed to getting good results and appreciation from their guardians may fail to perform in an exam. Since they do not have the experience of handling such adverse circumstances, it becomes difficult for them to overcome the feeling of failure, which leads to frustration and demotivation. They face problems like emotional instability and stress of not being able to meet their relatively high self expectations. Many health experts suggest that, yoga can play an instrumental role to calm down the fluctuations in their mind and to cope up with the stress. It will help them to move forward and improve their performance.

Stimulates Open-Minded Thinking: Practicing yoga on a regular basis stimulates teenager's mind to think out of the box and encourages them to think about a problem from different perspective. This fosters the spirit of innovation and invention amongst the youngsters. Many students who have tried it have affirmed that yoga opened up their minds and broadens the horizons of their imagination. Also, with an unbiased frame of mind, such students were also able to respect other people's opinion better which helped them establish meaningful collaborations with other members of the society. Also, the patience that they learned because of yoga help them take rational and logical decisions to overcome any problem.

Self-Regulation: Yoga helps in practicing self control and regulates one's emotions and reactions. In yoga, one learns to control their sentiments which include calming down anger and developing patience.

Boosts Immunity: Yoga improves blood circulation to all the vital organs of the body and helps build a better immune system by increasing the count of the antibodies. By pursuing yoga on a regular basis, students can improve their stamina and feel less fatigued through the work hours. Thus, it will help them fight against all the symptoms of depression and anxiety.

Good Sleep Quality: One of the greatest benefits that the students will get from doing yoga is that they will be able to get better quality of sleep. The various asanas of yoga can help our body utilize the time that we sleep, to relax and rejuvenate itself better. Good sleep naturally improves student's productivity and satisfaction of completing their tasks.

Interpersonal Relationships: Yoga would be beneficial to increase the quality and effectiveness of the interpersonal relationships among youngsters and their guardians. This is because a regular yoga practice would help develop essential qualities like compassions and friendliness. Also, yoga can teach them on how to be truthful and treat others with respect. This would foster healthier relationships of youth with the society.

Improves Academic Performance: Yoga has the ability to teach teenagers to have unwavering determination and focus towards their task. It improves their concentration by supplying more blood to the brain and calms their nerves down during stressful situations like exams or interviews. Students also learn breathing techniques maximize their productivity and efficiency while studying.

Improves Physical Health: Regular yoga improves the energy of teenagers such that they participate promptly and enthusiastically for any type of physical and mental activity. This is because yoga improves their flexibility, strength and longevity and prevents them from feeling tired all the time. Long hours of study and hectic schedule of many youngsters may induce back pain or spinal cord ailments. This leads to poor body posture in the later years. Practicing yoga significantly repairs one's body and helps to maintain it in good shape.

Self-Confidence: Every student faces a lot of challenges during the course of their education which can be tackled easily if they don't get bogged down due to anticipation of failure. Thus, yoga is extremely helpful in such cases when where it can increase one's self confidence.

IV. CONCLUSION

Yoga aids one's smooth transition from childhood into adulthood and fosters all round development of teenagers. Practicing yoga during these growing years can help to strike harmony between their mind and body such that former promotes the development of the later and vice versa. Yoga provides students a secure, non-competitive environment and a space of acceptance where diversity is valued and highly encouraged. Yoga conditions the minds of the teens to develop self-love and make positive shifts in their lives. This is the perfect age to reap the incredible benefits of yoga, which happen on a physical, emotional and mental level.

The science of yoga can be leveraged effectively if it is incorporated into the teaching learning process so that students imbibe healthy habits right from their childhood. In today's test times, it has become mandatory that guardians bring up their kids in a way that prepares them to face the challenges and learn from their failures. Patience, perseverance, resilience, social activeness, self control, confidence and discipline are some of the qualities that youngsters need to posses in order to sustain and flourish. It is very easy to inculcate these if yoga is made an integral part of the curriculum and students are made aware of its benefits. We need more context specific ways of introducing yoga to adolescents which can be tailored to cater the requirements of its audiences. Yoga should be taught with a

playful and fun approach, without losing its technicality and seriousness.

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Some Unified Finite Integrals Involving Feynman Integrals and Polylogarithm Function

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***Abstract*- In this paper two unified finite integrals are obtained. The first integral has the certain class of Feynman integral and product of r general class of polynomials** $S_{V_\ell}^{U_\ell}[x_\ell]\,(\ell=1,\ldots,r)$ **a general class of multivariable polynomials,** $\bar{H}$ **function and generalized associated Legendre function of second kind. The second integrals comprises Polylogarithm function F(-z, s) , the associated Legendre polynomial** $Q_k^n(x)$ **and a generalized polynomial set. In these two integrals the argument used is** $(x-a-1)^{-\frac{n}{2}}(x-a)^{\lambda-1}(b-x)^{\mu-1}(cx+d)^{\gamma}(gx+f)^{\delta}$. **Since polynomials and functions used in these integrals are general in nature, the results obtained here generates interesting extensions and unifications of large number of new and known results.**

Key words : Feynman integral , Polylogarithm function , general class of a multivariable polynomials, Associated Legendre function, generalized polynomial set, r general class of polynomials.

I. INTRODUCTION

The integral formulae consisting various types of special functions have been discussed by many authors. Garg et.al [1] defined a unified integral involving Fox H-function. Ali [2] gave interesting unified integrals linking the hyper geometric function 1F2 using the result by Garg et.al [1]

Choi and Agarwal [3] obtained two generalized integral formulae consisting the Bessel function of the first kind by using Ali's work [2].

Agarwal, Bhatt and Gupta [4] study some Unified Finite Integrals involving generalized Associated Legendre Polynomials of second kind. These formulae consists the product of the $\bar{H}$ - function and the general class of multivariable polynomials with arbitrary coefficients. Chouhan et. Al [5] derived unified integral formulae linking the Fox H-function and M-Series and expressed these results in terms of the H function.

II. SOME DEFINITIONS

Feynman Integrals: The function linked with certain class of Feynman integrals

$$g[\gamma,\eta,\tau,s;z]=\frac{K_{d-1}\Gamma(s+1)\Gamma\left(\frac{1}{2}+\frac{\tau}{2}\right)}{2^{s+2}\sqrt{\pi}(-1)^s\Gamma(\gamma)\Gamma\left(\gamma-\frac{\tau}{2}\right)}$$

$$\bar{\mathrm{H}}_{3,3}^{1,3}\left[-z\;\middle|\;\begin{matrix}(1-\gamma,1;1),\left(1-\gamma+\frac{\tau}{2},1;1\right),(1-\eta,1;1+p)\\(0,1),\left(-\frac{\tau}{2},1;1\right),(-\eta,1;p+1)\end{matrix}\right]$$

$$K_d=\frac{2^{1-d}\pi^{-\frac{d}{2}}}{\Gamma\left(\frac{d}{2}\right)}$$

Where

Erdelyi et.al. [6] introduced the polylogarithm function of order s as follows

$$\mathrm{F}[z,s]=\bar{\mathrm{H}}_{2,2}^{1,2}\left[-z\;\middle|\;\begin{matrix}(1,1;1),(1,1;s)\\(1,1),(0,1;s)\end{matrix}\right]$$

Generalized Polynomial Set: Rodrigues type formula [7] define the generalized polynomial set $S_n^{\alpha,\beta;\tau}[x]$ as follows

$$\mathrm{S}_{\mathrm{N}}^{\alpha,\beta,\tau}[x]=(\mathrm{Ax}+\mathrm{B})^{-\alpha}(1-\tau x^r)^{\beta/\tau}\times \mathrm{T}_{k,\ell}^{\mathrm{N}}\left[(\mathrm{Ax}+\mathrm{B})^{\alpha+b\mathrm{N}}(1-\tau x^r)^{\frac{\beta}{\tau}+\alpha\mathrm{N}}\right]$$

where differential operator is defined as

$$\mathrm{T}_{k,\ell}=x^{\ell}(k+x\,\mathrm{D}_x)$$

where $\mathrm{D}_x\equiv \mathrm{d}/\mathrm{d}x$

Raizada [7] define $S_n^{\alpha,\beta;\tau}[x]$ in the following form

$$\mathrm{S}_{n}^{\alpha,\beta,\tau}[x]=\sum_{b_1,b_2,a_1,a_2}\theta(b_1,b_2,a_1,a_2)\,x^{\mathrm{R}}(1-\tau x^t)^{sn-a_1}$$

Generalized Associated Legendre Polynomials: The generalized associated Legendre functions $P_k^{m,n}(z), Q_k^{m,n}(z)$ are introduced by Kuipers and Meulenbeld [8] .

The hypergeometric function form of these functions is as follows

$$Q_k^{m,n}(z) = e^{m\pi i}\, 2^{k-\frac{m-n}{2}} \frac{\Gamma\left(k+\frac{m+n}{2}+1\right)\Gamma\left(k+\frac{m-n}{2}+1\right)}{\Gamma(2k+2)} \times (z-1)^{-k-\frac{n}{2}-1}(z+1)^{\frac{n}{2}} \times {}_2F_1\left(k-\frac{m-n}{2}+1, k+\frac{m+n}{2}+1; 2k+2; \frac{2}{1-z}\right)$$

Where

$$\left|\frac{2}{1-z}\right| < 1,\ k+m\pm\frac{n}{2} \neq -1,-2,\ldots,2k+2 \neq 0,-1,-2,\ldots$$

Taking m=n $Q_k^{m,n}(z)$ converts to associated Legendre polynomial $Q_k^{n}(x)$

$$Q_k^{n}(z) = e^{n\pi i}\, 2^k \frac{\Gamma(k+n+1)\Gamma(k+1)(z-1)^{-k-\frac{n}{2}-1}(z+1)^{\frac{n}{2}}}{\Gamma(2k+2)} \times {}_2F_1\left(k+1, k+n+1; 2k+2; \frac{2}{1-z}\right)$$

III. INTEGRAL FORMULAE

In this part, two new results are obtained by solving the integrals.

A. First Integral:

$$\int_a^b \frac{(x-a)^{\lambda-1}(b-x)^{\mu-1}(cx+d)^{\gamma}(gx+f)^{\delta}}{(x-a-1)^{\frac{n}{2}}} \times \prod_{\ell=1}^{r} S_{V_\ell}^{U_\ell}\left[y_\ell \frac{(x-a)^{\sigma_\ell}(b-x)^{\eta_\ell}}{(cx+d)^{\lambda_\ell}(gx+f)^{\mu_\ell}} \right] \times g\left[\gamma,\eta,\tau,s; z\frac{(x-a)^u(b-x)^v}{(cx+d)^p(gx+f)^q}\right] Q_k^{m,n}\left(1-\frac{2}{x-a}\right)\mathrm{d}x$$

$$= e^{m\pi i}\, 2^{-\left(\frac{m-n}{2}+1\right)}(-1)^{-\left(k+\frac{n}{2}+1\right)}\Gamma\left(k+\frac{m-n}{2}+1\right) \frac{K_{d-1}\Gamma(s+1)\Gamma\left(\frac{1}{2}+\frac{\tau}{2}\right)}{2^{s+2}\sqrt{\pi}(-1)^s\Gamma(\gamma)\Gamma\left(\gamma-\frac{\tau}{2}\right)} \times \sum_{\ell_3=0}^{\infty} \frac{\left(k-\frac{m-n}{2}+1\right)_{\ell_3}\Gamma\left(k+\frac{m+n}{2}+1+\ell_3\right)}{\Gamma(2k+2+\ell_3)\ell_3!} \frac{(b-a)^{\lambda+\mu+l-1}(ac+d)^{\gamma}(bg+f)^{\delta}}{} \times \prod_{l=1}^{r}\sum_{k_l=0}^{[V_l/U_l]} (-V_l)_{U_l k_l} A_{V_l,k_l} \frac{y_l^{k_l}(b-a)^{(\sigma_l+\eta_l)k_l}}{(k_l!)(ac+d)^{\lambda_l k_l}(bg+f)^{\mu_l k_l}} \times \sum_{\ell_1,\ell_2=0}^{\infty} \frac{1}{\ell_1!\ell_2!}\left(\frac{c(a-b)}{ac+d}\right)^{\ell_1}\left(\frac{g(b-a)}{bg+f}\right)^{\ell_2} \bar{H}_{7,6}^{1,7}\left[z\ \frac{(b-a)^{u+v}}{(ac+d)^p(bg+f)^q}\ \middle|\ \begin{matrix} L_1, (1-\gamma,1;1), \left(1-\gamma+\frac{\tau}{2},1;1\right), (1-\eta,1;1+s) \\ (0,1), \left(-\frac{\tau}{2},1;1\right), (-\eta,1;1+s), L_2 \end{matrix} \right] \quad \ldots (4.1)$$

Where,

$$L_1 = (1+\gamma-\ell_1-\Sigma\lambda_l k_l, p;1), (-\lambda-k-\ell_1-\ell_3-\Sigma\sigma_l k_l, u;1), (1+\delta-\ell_2-\Sigma u_l k_l, q;1), (1-\mu-\ell_2-\Sigma\eta_l k_l, v;1)$$

$$L_2 = (1+\gamma-\Sigma\lambda_l k_l, p;1), (1+\delta-\Sigma\mu_l k_l, q;1), (-\lambda-\mu-\ell_3-k-\ell_1-\ell_2-\Sigma(\sigma_l+\eta_l)k_l, u+v;1) \quad \ldots$$

The following conditions should be satisfied

(a) $\mathrm{Re}(\lambda,\mu) > 0$

(b) $\min\{u, v, p, q\} \geq 0$ (all should not zero simultaneously)

(c) If $\min(\sigma_l, \eta_l) \geq 0 \quad (l = 1,\ldots,r)$

$$1+\mathrm{Re}(\lambda+k)+u\min_{1\leq j\leq M}\mathrm{Re}(b_j/\beta_j) > 0 \quad \ldots (I)$$

$$\mathrm{Re}(\mu)+v\min_{1\le j\le \mathrm{M}}\mathrm{Re}\,(b_j/\beta_j)>0$$

… (II)

When $\max(\sigma_l,\eta_l)<0\ (l=1,...,r)$

$$1+\mathrm{Re}(\lambda+k)+\sum_{l=1}^{r}\left[\sigma_l\left(\frac{\mathrm{V}_l}{\mathrm{U}_l}\right)\right]+u\min_{1\le j\le \mathrm{M}}\mathrm{Re}\,(b_j/\beta_j)>0$$

… (III)

$$\mathrm{Re}(\mu)+\sum_{l=1}^{r}\left[\eta_l\left(\frac{\mathrm{V}_l}{\mathrm{U}_l}\right)\right]+v\min_{1\le j\le \mathrm{M}}\mathrm{Re}\,(b_j/\beta_j)>0$$

… (IV)

When $\sigma_l\ge 0,\ \eta_l<0,\ (l=1,...,r),$ (I) and (IV) are satisfied.

When $\eta_l\ge 0,\ \sigma_l<0,\ (l=1,...,r),$ (II) and (III) are satisfied.

(d) $\max\left\{\left|\frac{c(b-a)}{ac+d}\right|,\left|\frac{g(b-a)}{bg+f}\right|\right\}<1,\ b\ne a.$

(e) If $k+\frac{m+n}{2}\ne -1,-2,...;k\pm\frac{m-n}{2}\ne 0,\pm1,\pm2,...;$

$2k+2\ne 0,-1,-2,...$

$|z-1|>2$

B. Second Integral:

$$\int_a^b\frac{(x-a)^{\lambda-1}(b-x)^{\mu-1}(cx+d)^{\gamma}(gx+f)^{\delta}}{(x-a-1)^{\frac{n}{2}}}\times$$

$$S_n^{\alpha,\beta,\tau}\left[y\ \frac{(x-a)^{\sigma}(b-x)^{\eta}}{(cx+d)^{\zeta}(gx+f)^{\upsilon}}\right]\times$$

$$F\left[-z\ \frac{(x-a)^{u}(b-x)^{v}}{(cx+d)^{p}(gx+f)^{q}}\right]Q_k^n\left(1-\frac{2}{x-a}\right)dx$$

$$=\frac{1}{2}(b-a)^{\lambda+k+\mu}(ac+d)^{\gamma}(bg+f)^{\delta}$$

$$e^{m\pi i}(-1)^{-\left(k+\frac{n}{2}+1\right)}\times$$

$$\sum_{b_1,b_2,a_1,a_2}\ \sum_{\ell_1,\ell_2,\ell_3,\ell_4=0}^{\infty}\frac{(k+1+\ell_3)\Gamma(k+n+1+\ell_3)}{\Gamma(2k+2+\ell_3)}\times$$

$$\frac{\tau^{\ell_1}y^{R+\ell_1 t}(a_1-sn)_{\ell_1}}{\ell_1!\ell_2!\ell_3!\ell_4!}$$

$$\times\frac{(b-a)^{\ell_3+(R+t\ell_1)(\sigma+\eta)}\theta(b_1,b_2,a_1,a_2)}{(ac+d)^{(R+t\ell_1)\zeta}(bg+f)^{(R+t\ell_1)\upsilon}}\times$$

$$\left(\frac{c(a-b)}{ac+d}\right)^{\ell_2}\left(\frac{g(b-a)}{bg+f}\right)^{\ell_4}\times$$

$$\bar{H}_{6,5}^{1,6}\left[z\ \frac{(b-a)^{u+v}}{(ac+d)^{p}(bg+f)^{q}}\middle|\begin{matrix}L_3,\ (1,1;1),\ (1,1;s)\\ (1,1),\ (0,1;s),\ L_4\end{matrix}\right]$$

where

$$L_3=(1+\delta-\ell_4-(R+t\ell_1)\upsilon,q;1),$$
$$(1+\gamma-\ell_2-(R+t\ell_1)\zeta,p;1),$$
$$(-\lambda-k-\ell_3-\ell_2-(R+t\ell_1)\sigma,u;1),$$
$$(1-\mu-\ell_4-(R+t\ell_1)\eta,v;1)$$

$$L_4=(1+\delta-(R+t\ell_1)\upsilon,q;1),$$
$$(1+\gamma-(R+t\ell_1)\zeta,p;1)$$
$$(-\lambda-\mu-k-(\ell_2+\ell_3+\ell_4)-(R+t\ell_1)(\sigma+\eta),u+v;1)$$

The following conditions should be satisfied

(a) $\mathrm{Re}\,(\lambda,\mu)>0$

(b) $\min\{\sigma,\eta,\zeta,\upsilon,u,v,p,q\}\ge 0$ (all should not zero Simultaneously)

(c) $1+\mathrm{Re}(\lambda+k)+\mathrm{Re}(\sigma)+u\min_{1\le j\le \mathrm{M}}\mathrm{Re}\,(b_j/\beta_j)>0$

$$\mathrm{Re}(\mu)+\mathrm{Re}(\eta)+v\min_{1\le j\le \mathrm{M}}\mathrm{Re}\,(b_j/\beta_j)>0$$

(d) $\max\left\{\left|\frac{c(b-a)}{ac+d}\right|,\left|\frac{g(b-a)}{bg+\mathrm{f}}\right|\right\}<1,\ b\ne a.$

(e) If $k+\frac{m+n}{2}\ne -1,-2,...;k\pm\frac{m-n}{2}\ne 0,\pm1,\pm2,...;$

$2k+2\ne 0,-1,-2,...$

$|z-1|>2$,

IV. CONCLUSION

In the present paper two unified finite integrals are established. These integrals contains certain class of Feynman integral , $Q_k^n(x)$ product of r general class of polynomials associated and a generalized polynomial set. There is a scope of some new results as special cases of our main integrals. These results can be further extended to obtain appealing unifications and extension of a number of new and known result due their general nature.

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$S_{V_\ell}^{U_\ell}[x_\ell]\ (\ell = 1,...,r)$ Legendre function of second kind, , associated Legendre polynomial, Polylogarithm function F(-z, s) a general class of multivariable polynomials, generalized

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Effect of Participation in Extracurricular Activities on Academics and Holistic Development of Students

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***Abstract*— Extracurricular activities are found in all levels of our instruction framework in numerous distinctive ways. They can be music, sports, clubs, talk about and other social occasions beneath different stages. Creating the potential of people in all encompassing and coordinates way is need of hour. To make students dependable and competent of accomplishing a tall level of individual well-being, as well as being able to contribute to the improvement of the family, the society and the country at expansive. It has been by and large expected that cooperation in extracurricular exercises has a positive effect on students amid their learning stage in schools or college. This paper describes the role of extracurricular activities and the positive effects that they can have on students of all kinds. Also, survey analysis is presented to know their views about impact on personal development.**

Keywords-Extracurricular Activities (ECA), Academic Performance, Holistic Development, Personality building

I. INTRODUCTION

Extracurricular activities or exercises are exceptionally imperative these days for understudies taking different experts courses. They offer assistance them to move forward upon different abilities as side interests. In the handle, it enacts their brains. It has been watched that group of students who had taken part in different extracurricular exercises demonstrate themselves as more intelligent experts. Exercises and association of understudies in different clubs and organizations are imperative in cultivating the qualities of youth. Extracurricular activities (ECA) are exercises that understudies take part in that does not drop into the domain of ordinary educational programs of Colleges. They are found in all levels of our schools. There are numerous shapes of extracurricular exercises such as sports, clubs, administration, understudy daily paper, music, craftsmanship and show. Extracurricular exercises are completely intentional so understudies that do not need to take an interest in them do not have to. Extracurricular exercises have numerous positive impacts on instruction. In the education system of United States, it is mentioned that Extracurricular activities began in the United States in the

19th century. Initially they were just an additional part to the normal academic schedule for the year. Extracurricular activities usually had some practical or vocational interest that was included into the activities. Then to begin with extracurricular exercises that were well known in schools begun at Harvard and Yale College. They were proficiency clubs that comprised of distinctive talk about clubs and Greek frameworks such as crews and sororities. The impact of such activities showed that cooperation in extracurricular exercises influences students' scholastic execution. More specifically, studies have been conducted assessing the effects of specific extracurricular activities on academic performance.

Numerous studies have been conducted concerning the relationship between extracurricular activities and academic performance. Total extracurricular activity participation (TEAP), or participation in extracurricular activities in general, is associated with an improved grade point average, higher educational aspirations, increased college attendance and reduced absenteeism. There are many more important life skills to be learned outside the scope of academic studies. This is where extra-curricular activities play an important role, through which students are allowed to get involved with diverse groups and therefore broadening their view of the world. The life experience gained through doing things outside the curriculum of degree is helpful to student to shape one's life. This is more important than a degree, because the kind of skills people learn outside of the library are to be learnt by them.

Another important aspect is, students interested in pursuing higher studies in foreign universities should know that admissions officers will base their decisions on more than just Good grades and high test scores. They want to know how a student might enhance the university just by being there. A good indicator is an examination of personal interests, often illustrated by extracurricular activities. Generally, it applies to things that students participate in outside of school that show interests, hobbies and future career plans.

II. OBJECTIVES

The objectives for Extra Curricular Activities are listed below: To improve self confidence, communication skills, and leadership skills and manage conflict. To inculcate critical thinking skills, time management academic and intellectual competence, motivate more number of students for participation. In the next section some of the research findings are described in brief.

III. LITERATURE REVIEW

There are many research papers published pertaining to this subject matter. In this section some of the important points presented by researchers are described.

In the study[1] conducted at King Abdulaziz University (KAU), Saudi Arabia, a questionnaire was designed and used as the main tool of this study due to its convenience of use. After the questionnaire was administered, the data was collected and analyzed statistically via statistical package for the social sciences (SPSS). The results showed that the students generally feel satisfied about the available ECA in the campus. This study found that there is an interaction between the students' faculty, and their current level influencing satisfaction about the ECA. Also, the study found that there are significant differences in the GPA of the students who participated in ECA and other non-participants; the median of the GPA of those who participated in ECA is higher than those of the non-participants. The result also showed that student's willingness to participate in ECA is the main and only purpose for satisfaction; and neither affected by the type of faculty nor by the current level. Also, the hours spent in studying are the same for each group (those who participated in ECA and those who did not); participating in ECA does not really affect the students study hours; ECA does not prevent the student from studying.

An important inference about 'low performing students 'is mentioned in this paper. The need for remediation is generally characterized as college-level students lacking the skills necessary to perform college-level work in reading, writing, or mathematics. 68.9% of the selected freshmen had to take at least one remedial course in English, Math, or both. Based upon previous research performed by the OIR, remedial students at Sacramento State tend to have high attrition rates and low graduation rates.

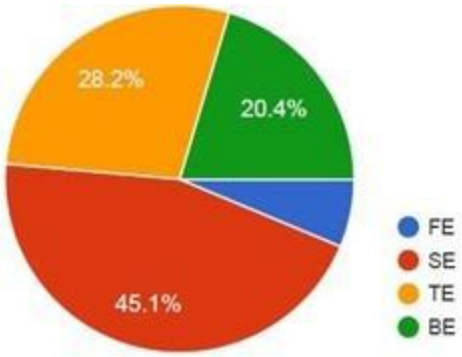
While others suggest that low academic performance does not result from extracurricular activities. However not all types of organizations have a positive impact on academic achievement. Major-related activities have been reported to improve student performance.

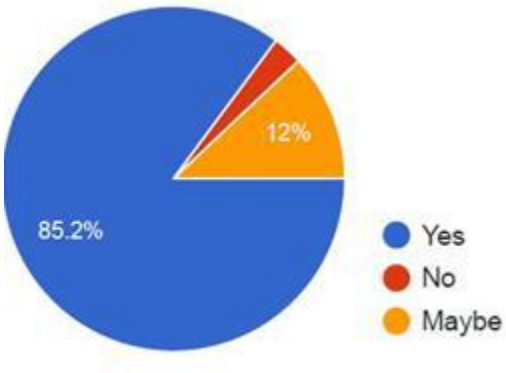
Most of the researchers believe that the first effect that extracurricular activities have on education is behavior [5]. Students that participate in extracurricular activities have reduced behavior problems. In sports, they show discipline in drills, practices, and routines.

IV. SAMPLE SURVEY RESULTS

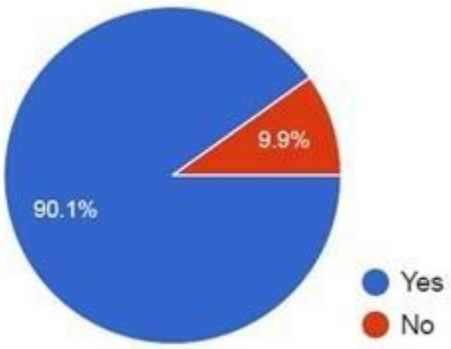
In this regard sample survey (online) was conducted and the important findings of this are described below. Students were given questionnaire and asked to give their inputs. Based on their responses following results are obtained. The class wise analysis of sample survey (total 142 responses) is as shown below.

To know whether taking part in such activities crate impact on individual's personality, in response to this 85% students feel participating in Extracurricular activities create impact on personality in positive manner and 12.5% were not sure.

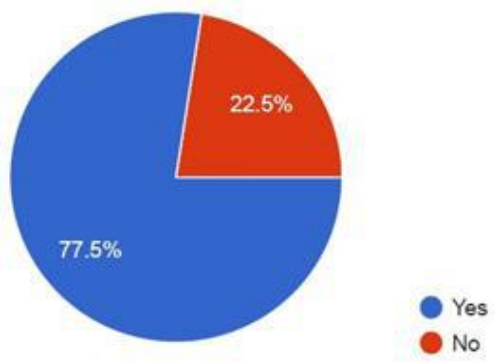




It is found that 90% students have some type of hobby.

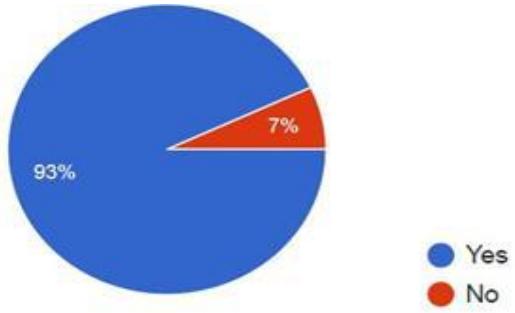


In most of the research papers it was mentioned about improvement in grades after participation in various activities, so in response to this 77.5 % students feel that participation in any type of activity helps in improvement in academics, where as 22.5% do not agree. This shows lack of proper guidance and orientation about benefits of participation in such activities.

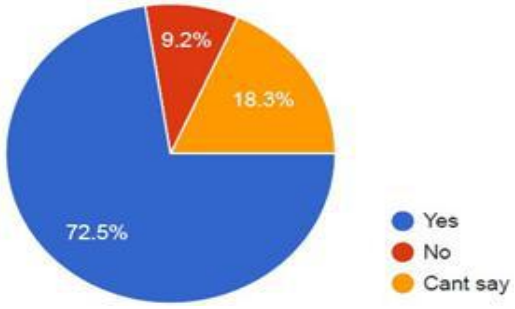


Out of 142 students 78.9% students showed interest to take part in extracurricular activities in institute.

The interpersonal relation among student groups is very important aspect. In the formative years of UG it is necessary to develop healthy interpersonal relationship which further helps in team building in one's professional life. 93% students gave positive response about improving interpersonal relations through activities.



In the current scenario across globe mental stress is major concern for young generation due to numerous factors. It is always recommended by mental health practitioners to engage oneself in different hobbies like sports, music etc. If such platform is provided to students then it would be helpful for them to relieve stress and perform in final examinations in better manner. So, from survey it is evident that around 72.5% students think that activities help in coping up with stress related to academics. But 18% are not sure about same. It is an indicator and needs to be considered for orienting students for stress relieving techniques through such activities. The overall response to this activity was encouraging and showed positive attributes. Also suggestions from students were sought for improvement in extracurricular activities at institute level. In response to these important suggestions given by students are listed: Students should be given financial support as well as allow them for practice sessions and should be given attendance for the same. Separate sessions for extra-curricular activities to be kept. Students should be encouraged to participate in Inter College, Inter University level. More seminars by experts from relevant field It should be made compulsory for every student to take part in some activity Special sessions on sports by experts in the field Promote adventure clubs in college Extracurricular activities with certification, this can attract more students Spreading awareness among students about the various activities conducted in the college, talent hunt competitions can be organized. Collaboration with Multinational companies may increase the level of participation and better quality



V. CONCLUSION

There are numerous ways for student engagement in Extra Curricular activities. For undergraduate students activities can be planned group wise by providing fixed time slot in weekly timetable and assigning team leader or faculty for smooth conduct. After conduction of each activity feedback should be taken to understand impact of it. The proper planning and implementation of activities have long lasting impact. To enhance participation of student's proper orientation should be done with presentation and case study analysis. The analysis of survey reveals that academic performance improvement and personality development is possible through participation in extracurricular activities .It helps in interpersonal relation building as well as managing moderate level stress. Further, with the help of better tools, statistical analysis may be carried out to study impact in depth.

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Developing Communicative Competence of Engineering Students

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***Abstract*-This research paper is a sincere attempt to ponder over the significance of communicative competence for the engineering students to sustain in the competitive world as well as for further studies. The two important concepts: communication and competence are discussed in the context of syllabus of communication skills in technical institutes. The lacunas of prescribed text are discussed thoroughly. The paper focuses on the teaching-learning method, which lacks students' centric approach. Furthermore, it sheds light on objectives of teaching-learning English as a prescribed text and language. It stresses on how a teacher as a facilitator plays the vital role in enhancing the students' communicative competence with the aid of surveys and research carried out about the communicative competence of engineering students. Students' efforts to gain the communicative competence for their betterment are also illustrated. The paper ends with the note how to impart some innovative strategies to develop the students' communicative competence through the various learner-centric activities**

Keywords: Communicative Competence, Engineering students, Teaching and Learning

I. INTRODUCTION

In linguistics, communicative competence is the term, which refers to language users' smack of phonology, morphology, syntax and semantics as well as socio-cultural knowledge to use apt utterances as per the context. The communicative competence includes linguistic competence, strategic competence, sociocultural competence, and discourse competence. Dell Hymes propounded this term in 1996, against the Noam Chomsky's (1995) distinction between linguistic competence and performance that Hymen considers it perceived inadequacy. His very approach to this notion is now well known as ethnography of communication. It is also considered as one of the theories, which underlies the communicative approach to foreign language teaching.

"Communicative competence is a tool that aids communicator to achieve the intended goals through the effective interaction in the context.

India has been experiencing the era of globalization and it is leading to build the close relationship across the world. English is a global lingua franca that is widely used in communication between the countries and among the people. This language has spread and developed across the countries. Every nation's prosperity lies in its scientific and technological developments. Indian students have been stepping into the world of academic and professional challenges and competitions. The amazing innovations take place in the world of technology. We have to have ample knowledge of the language that is the medium to understand the technology to keep it abreast of the latest developments in science and technology. To acquire the global exposure to the technology and face academic as well as professional challenges in the competitive world, Engineers must have communicative competence in English.

II. LANGUAGE AS COMMUNICATION:

A vital concept to the communicative approach to language teaching is communicative competence: for instance, students' ability to understand and usage of discourse appropriately to interact in academic and social contexts. The propounder the concept communicative competence believed that the ability to communicate properly should be cultivated in language teaching. Engineering students should acquire the soft skills to manipulate their ideas while using the English language as a medium to exchange the information.

III. COMMUNICATIVE COMPETENCE

The word communication entails common, community or sharing which means no community can exist without communication. The term competence is defined as the ability to present your ideas without any hesitation in an effective manner. Competence is not mere fluency in language but the overall presentation of your dynamic personality as per the situation. The technical and scientific development of any country is depending on the versatile engineers who possess the sound knowledge of their respective stream of engineering with excellent communication skills. It will not be hyperbolic if we state that the future of any country belongs engineers. The significance is given to the study of English, imparting necessary equipment in the language lab i.e. updated software to inculcate the communicative competence and even the demand for faculty in English in engineering colleges indicate the realization

of the fact that communicative competence is essential for the budding engineers to come off with flying colours in their future. The language learning is a never-ending process and it should be practiced continuously to get mastery over it. In the engineering colleges, English should be practiced to enhance the life skills and employability and not merely taught to secure the marks in the exam to give adequate importance to the development of skills. Regular practice with zest results in prerogative competence. Rote learning and translation methods are not that effective to acquire the competence because rote learning does not make enable to apply your ideas in a diverse manner. Whereas translation method makes you crippled as always we try to learn via mother tongue and it does not let us inspire to develop the thinking process in the target language.

Moreover, though the grammar is an inevitable part to learn any language, we cannot get competence just having mastery over rules of grammar. Just by mugging rules, one can earn the marks for a particular question but it does not make you enable to apply the ideas with proper syntactic norms. Too much insistence on the definitions of grammatical terms and rules of grammar might curb the interest of the learners.

IV. Communicative Competence through Prescribed Text Material

The prescribed syllabus of English for the engineering courses lacks the functional and students centric approach. It should be framed from competitive exams' i.e. TOEFL, GRE and IELTS orientation, which are conducted by both central and state government to get an opportunity to pursue further education in the foreign universities and colleges. In the classroom during the teaching-learning process, the focus should be on performing target language and while using the language students would make mistakes. The teacher should identify such mistakes immediately and explain to the students with appropriate examples. In this process when the students would understand their incompetence, they will correct themselves and will not commit the same mistakes again. Through this pedagogy, students would understand the definition and actual usage of grammar. The curriculum should include vital elements such as tenses, concord, conditionals, passivity, mechanics of effective writing, letter writing and Email writing, report writing, paragraph writing, statement of purpose, case study reports. As these elements cover the syllabus of most of the competitive exams that will make them enable crack these exams.

Furthermore, while framing the curriculum of English, it must be prepared to keep in mind the academic professional needs and requirements of the budding engineers. There must be room for interaction and students should get a platform to express their views in English in order to gain the competency. Being competent in English, they will be able to tackle situations in their personal as well as professional life. In this process teacher must plays a role of instructor and facilitator. In addition, he should verify through their performance whether the students are acquiring language skills namely listening, speaking, reading and writing. The teacher must inspire them to use language in the context. However, there is 99% perspiration and 1% inspiration to achieve the goal but to happen that 99% perspiration 1% inspiration is most important. After all real learning happens because of inspiration and true the teacher imbibes this approach among the students. The teacher should go beyond the text and should give them the freedom to ponder over real-life situations because we inculcate the concepts through the contextual inferences. Such practice should be conducted often to correlate the prescribed text that would aid the students to be competent in the target language.

V. Communicative Competence for Employability

When engineering students accomplish the degree, they become eligible to apply for a job but few students become successful in getting job those who possess the communicative competence.

Employers want to hire right people means identifying with their competence in respective subject and skills to fulfill the required role and contribute to the growth of an organization.

For employers, getting the right people means identifying people with the right skills and qualities to fulfill the role and contribute to the organization's success. Candidates may have the qualifications and 'hard skills' needed to be able to manage the job role but, without a well-honed set of 'soft skills', employers are less inclined to hire. In these days, communicative competence has immense importance to achieve the required employability skills for engineering graduates to sustain in the competitive world. Every company conducts the formal interviews that focus on testing the subject and general knowledge of each candidate but nowadays it has transformed into informal section methods that include group discussion, technical and personal interviews. In the group discussion, each candidate's presence of mind and tackling the situation is analyzed which is intended to find the right person as a future leader of the company. The software companies, the new employer are expected to undergo some months training on soft skills that focus on communicative competence.

In engineering colleges, English is taught only in first year and third year, that too for a semester in both years. As prescribed syllabus is scanty, this includes communication cycle, grammar, vocabulary, and technical writing. In the theory class, these elements are taught by the teacher where there is one-way communication which not fruitful to inculcate concepts. Hence, the class must be interactive where either teacher should ask the questions to involve students in active learning process.

In conventional teaching method, a teacher is the only speaker where students remain silent and passive. Consequently, students do not get an opportunity to develop their competence

in the target language. It is expected that teacher should give some insight to the students but on the contrary, they just accumulate the information and reproduce in front of students that called for knowledge. Now, what is mean by insight? For instance, while teaching a particular subject one understands every student is different in understanding. Then through the experience, he understands the psychology of students and manipulates the subject through contextual examples. While following this teaching method teacher has to go beyond the text to inculcate the crux of subject explicitly which called insight or deep learning. If the teaching takes place without this exercise then students follow the rote learning method to pass the examination.

Thompson and Wyatt in their book "Teaching of English in India" say, "The power of expression in language is a matter of skills rather than of knowledge. It is a power that grows by exercise, not by knowing merely meanings or rules" (15).

Acquiring communicative competence is a never-ending process because we learn different lexis and grammatical constructions in different circumstances. Competence cannot be achieved overnight, as it requires time and constant exercise. Various students' centric psychological and innovative methods need to be identified and applied to imbibe the essence communicative competence in the engineering students. This whole process of developing a deep sense in English requires both academic and professional relevance, clear objectives, suitable methodology and evaluation procedures. Being a facilitator teacher must emphasize on actual usage of contextual language.

As Palmer says that acquiring, language is a habit-forming when we adopt new habits. Furthermore, he adds that apart from all the problems concerning the word itself, there is the question whether the basic unit of meaning is not the word after all, but the sentence. The traditional definition of the sentence as the expression of a complete thought; first a great deal of meaning in the spoken language is carried by the prosodic and paralinguistic features of language –intonation, stress, rhythm, loudness etc. as well as such features as facial expressions and gestures.

To get mastery over language motivation is an inevitable element to imbibe crux among the engineering students. There must be room for creativity in the teaching language. In this context, creativity connotes creative activity which leads towards activity-based teaching-learning. Introducing the life situation through examples can help students to develop the interest in language learning. The students must reveal the fact that the parole (actual performance) is most important than the langue (system of language). Hence, they must pay more attention towards the apt use of language in the context. In language learning process context is most important because we do learn a language only in the context.

Nowadays, students prefer such engineering college whose training and placement center is reputed in offering the better opportunities. Companies do prefer the job to candidates who are versed in their respective subject as competence in communicative skills. Therefore, throughout the degree course of communication skills is essential in engineering curriculum and content of it must be learner-centric which would make them enable to participate actively in learning a language. For instance, group discussion, debated, storytelling, narration of real-life incidents, meetings, negotiations and presentations on various topics both technical and non-technical must be incorporated in the syllabus specially designed with the intention of developing the communicative competence of engineering students.

VI. CONCLUSIONS

The syllabus engineering should include some literary texts in order to understand the narration, vocabulary apart from engineering and reflection of society. Real life examples should be created to illustrate elements and components communication skills. The activity-based teaching communication skills should implement the different activities and teacher can suggest some out of syllabus topics to discuss, debate, speech, meeting and role play. These activities would make them read out of syllabus and inculcate the different subjects and socio-cultural aspects, consequently, students would different and dynamic words and sentences to elaborate the topics. Students would enhance communicative competence when teaching would be students centric and not just to complete the syllabus. In addition, syllabus containing more communicative approach than theory would be fruitful for the students.

In the practical session students must be introduced with mock interviews, statement of purpose, resume designing, report writing, technical writing etc., which would be both exam and job, oriented. The written assignments assigned to the students would help them to develop critical thinking also will help to gain written competence. These assignments must deal with the use of language in technical or corporate context. Thus, to sustain in the global competition, engineering students must have communicative competence.

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Biology as a Compulsory Course for Engineering Undergraduate: An Insight and Survey

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***Abstract*—This paper deals with the need and importance of learning Biology for engineering undergraduate as per proposed syllabus of AICTE from Academic year 2018-19. It also highlights about few discoveries of previous century taking inspiration from nature. The most daunting task of 21st century is generation of maximum renewable energy and protection of environment, to facilitate it role of biology will be in the epicenter. A survey of first year engineering undergraduates was conducted and its findings are also enumerated in this paper.**

Keywords—Undergraduate Engineering, AICTE, Curriculum, Biology

I. INTRODUCTION

An engineer of 21st century needs to have knowledge of Biology along with other basic sciences such as mathematics, physics and chemistry. One of the reasons behind this is the changing nature of projects on which engineers need to work nowadays. Currently most of the projects are either interdisciplinary or multidisciplinary in nature which requires at least basic knowledge of many subjects or working at the interface of multiple subjects.

Earlier it was considered that knowledge of biology is not essential for engineering graduates and it was confined to the medical education and in science also only for those who opt for it. But in current situation solutions of many problems is being provided taking inspiration from nature and are considered to be sustainable and eco-friendly and is gaining momentum and acceptability among the masses. In last few decades Biotechnology has emerged as separate discipline but the onus of eco-friendly and sustainable process development is not limited to biotechnologist. If we want to have more sustainable process development all engineers need to have basic understanding of biological phenomena [1,2]

II. ENGINEERING AND TECHNOLOGY DEVELOPMENT TAKING INSPIRATION FROM NATURE/BIOLOGY

The most intelligent and advanced machine can be designed by taking inspiration from living world. For example, it is possible to design camera which can see like a human eye [3]. In this technology it is possible to produce much better image with increased field of view. Here the learning from the nature is to have curved surface on which detectors and electronics are placed which acts as a focal plane array of camera to capture the image.Digital photography using plenoptic camera which samples 4D light field on its sensors in single photographic exposure is possible to achieve by setting a microlens array between the sensor and main lens. From the biological viewpoint the optical design of plenoptic camera is exactly like human eye where retina is being replaced by series of microlens. Currently there are several commercial plenoptic camera available which are being used in computational photography.

Researchers, designers and vehicle manufactures at land, water and air are always inspired by biological world to develop idea. The first aircraft design was based on flying pattern of birds and bats. For increased efficiency in aviation engineering NASA is working in collaboration with Flexsys and Airforce research laboratory to develop wing with flapping motion inspired by the wing movement of birds. Flying spies like RoboSwiftis inspired by Swift that can fold it wings back to control its speed and stability in air. Japan high speed train "The Shinkansen" and its 700-series design was inspired by Kingfisher. Due to high speed of train at the time of exit from tunnel compressed air pressure used to make big Boom sound. The problem was addressed by designing of beak shaped front part of train like Kingfisher which can dive at very high speed into water and able to emerge out with no splash.

III. MAJOR CHALLENGES

As perspective to India, currently we are hugely dependent on fossil fuel for energy generation by using our thermal power plants, whereas it has been anticipated that in coming 50 to 60 years fossil fuels are going to be depleted if used at current rate. Also, there is increasing concern of environment related issues with the use of fossil fuel. So, if we start generating energy other than fossil fuel the entire process chain will become more sustainable and robust. The other immediate option is using renewable energy where we have options like hydroelectric power, solar energy, wind energy and energy from biomass. Currently major chunk of renewable energy is being obtained by hydroelectric power and solar energy and wind energy is also progressing well but for generating these kinds of renewable energythe input is erratic, intermittent and non-reliable in nature and does not assure regular and continual supply of energy. The other challenges are in the form of availability of land and suitable technology to have these kinds of installation at macro level.

On the contrary if we seek to generate energy from biomass residues which are available in abundance as we are the country of 70 % villages and our main occupation from ages has been agricultural produce. Other than biomass residue available as waste there could be organised effort to produce additional biomass to address these two major problems of 21st century, we have to take help of biology and biotechnology and engineers of 21st century must be ready for it.

IV. SURVEY

A survey was conducted for first year engineering undergraduate students of A.Y 2017-18 in view of proposed uniform curriculum prescribed by AICTE to be implemented from A.Y 2018-19. The objective of survey is to understand students' viewpoint about this radical change. Also, this will indicate about readiness and willingness of student about the proposed course.

Sampling: Specifically, 1st year 2nd semester students are selected to be the part of this survey as course is proposed to be studied in 2nd year 3rdsemester. The sample size was of exactly 381 students of various branches who have participated in this survey. This variation was brought to understand discipline specific understanding of students need and readiness. Table No. 1 indicates number of students from various discipline who participated in this survey.

Table No. 1: Composition of sample size of various engineering discipline

Discipline	Number of students participated in survey
Computer Engineering/Information Technology	128
Mechanical	75
Civil	88
Electronics/Electronics and Telecommunication	100

Methodology:A questioner in Googledocs consisting of questions in table number 2 were prepared and link for the same was provided to students of first year engineering under graduate. The students were briefed about the AICTE proposal for uniform syllabus across India. Also, students were made aware about the proposed syllabus of biology to be studied as compulsory course. Students were asked to give their response and submit it using link in Google doc.

V. FINDINGS AND DISCUSSION OF SURVEY

Table No. 2: A set of questions asked to students during survey

Question No.	Exact question students were asked to respond upon
1	Should Biology be introduced as compulsory subject in engineering course?
2	Do you believe that studying Biology as part of engineering curriculum will help you in coming out with better Engineering/Technology development needed in 21st century?
3	Are you equipped with the basic knowledge of Biology to take up the course at engineering level?
4	Do you believe development which has happened in past 2 century is inspired by Nature/Biology?
5	Do you believe that study and knowledge of Biology/Nature for engineers are more relevant in case of India as it is country of 70 % Villages?

Should Biology be introduced as compulsory subject in engineering course?

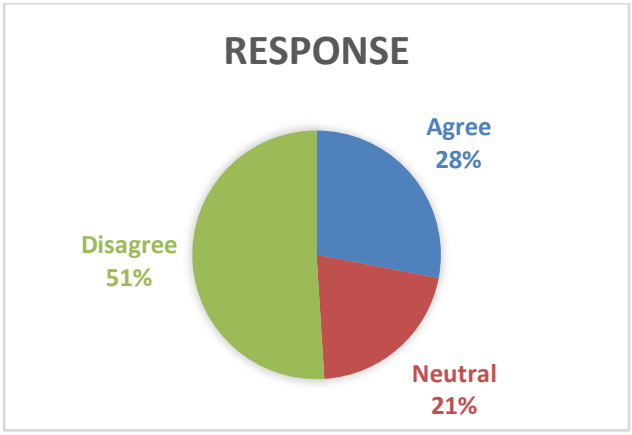

Fig. No. 1: Pi Chart showing response to question No. 1

Do you believe that studying Biology as part of engineering curriculum will help you in coming out with better Engineering/Technology development needed in 21st century?

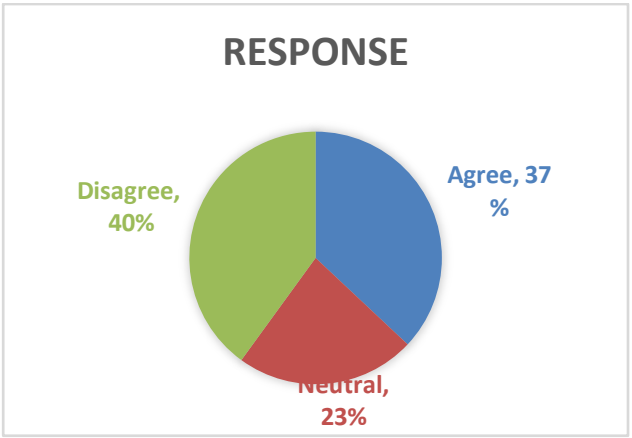

Fig. No. 2: Pi Chart showing response to question No. 2

Are you equipped with the basic knowledge of Biology to take up the course at engineering level?

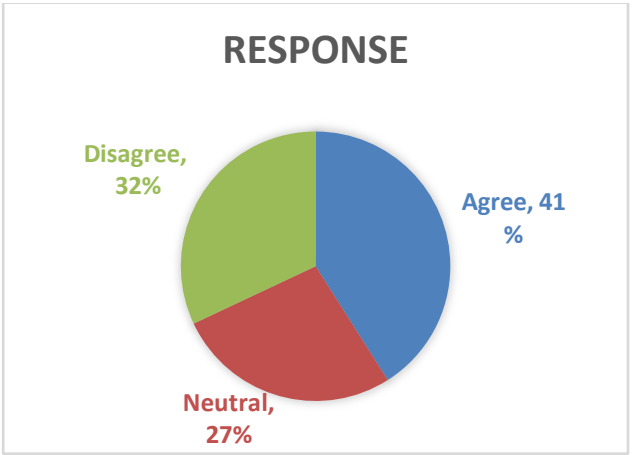

Fig. No. 3: Pi Chart showing response to question No. 3

Do you believe development which has happened in past 2 century is inspired by Nature/Biology?

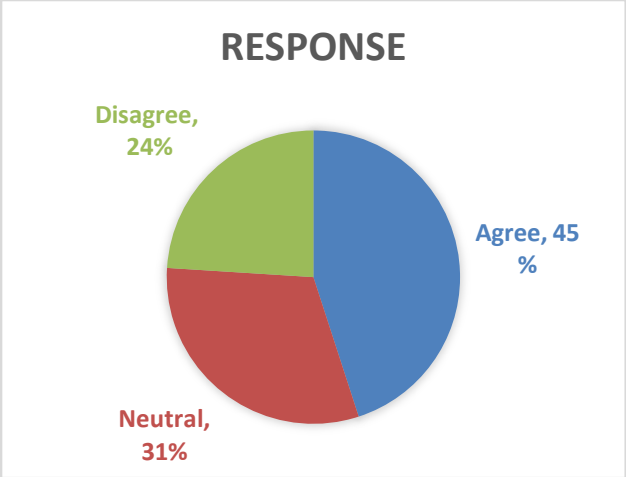

Fig. No. 4: Pi Chart showing response to question No. 4

Do you believe that study and knowledge of Biology/Nature for engineers are more relevant in case of India as it is country of 70% Villages?

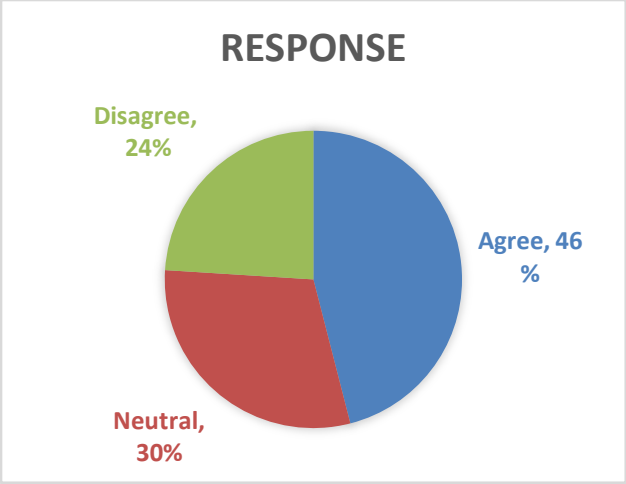

Fig. No. 5: Pi Chart showing response to question No. 5

Should Biology be introduced as compulsory subject in engineering course?

Figure No. 1 indicates only 28% of students participated in survey feels that biology should be introduced as compulsory subjects for engineering undergraduates course. Around 21% students have neutral response whereas the large number of students participated in the survey around51% have view that biology should not be introduced as compulsory subject for undergraduate engineering education.

Do you believe that studying Biology as part of engineering curriculum will help you in coming out with better Engineering/Technology development needed in 21st century?

Figure No. 2 indicates only 37% of students participated in survey feels that study of biology as part of Engineering curriculum will help them to provide solution to address the challenges of 21st century. Around 23 % have neutral response whereas 40 % of participants think that study of biology is not having any correlation with developing better technology and engineering development.

Are you equipped with the basic knowledge of Biology to take up the course at engineering level?

Figure No. 3 is crucial for understanding the readiness of student to have biology as compulsory course in engineering curriculum. 41% of students participated in the survey can handle the course easily and feels that they have pre-requisite to take up the course. 27 % have neutral response and only 32 % of participant feels that they don't have basic knowledge in this domain to handle the subject at engineering level.

Do you believe development which has happened in past 2 century is inspired by Nature/Biology?

Figure No. 4 is helpful for understanding the role of biology in development of engineering and technology in past 2 century. Fairly large number of student around 45% feels that biology/ Nature has inspired the development in a big way. 31% of participants have neutral response for it and fairly less around 24% only feels that biology has not helped in development of technology in past 2 century.

Do you believe that study and knowledge of Biology/Nature for engineers are more relevant in case of India as it is country of 70 % Villages?

This question is asked keeping in view India enjoys the status of country having 70% villages and primary occupation for people here is agriculture. We produce bio mass residues in very huge quantity and organized biomass production can also be done at times if required.

Figure no. 5 indicates around 46% of students agree with this that study of biology for engineers is more relevant in case of India, 30% have neutral response and only 24% disagree with it.

VI. CONCLUSION/RECOMMENDATION

This survey has indicated that large number of student believes that biology has lead from front in technological development in past 2 century and in 21st century also the knowledge of biology will remain crucial for addressing the challenges and development of upcoming technology. A good number of student also feels that they have pre-requisite in term of subject knowledge to take up the course, still very less number of student feels that it should be introduced as part of curriculum. An orientation for importance of biology for engineering graduate should be arranged to all students who opt for science at senior secondary level. Currently there is a trend among engineering aspirants to either drop biology as subject at senior secondary level or pay less attention towards it. It is also being reflected from survey that around 29 % of students are not ready for taking the proposed course as they lack basic knowledge in the domain and hence there is a need for restructuring the courses at lower level and adopt an organized effort in this direction rather than going for sudden change.

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Escherichia Coli: Production of bio-fuels

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***Abstract*- From past many years we have been using fossil fuel as source of energy for various day-to-day needs. Fossil fuel is naturally obtained substances that are formed over the period of many years due to decomposition of organic matter buried under soil. Fossil fuel is of natural origin and is non-renewable source of energy. Fossil fuel is boon to lives and is been used since it has been discovered. With increasing population these fossil fuels are used more and more and now are at the verge of existence, hence there is urgent need to find source energy. Since it is needed to run day-to-day live in almost all fields we require fossil fuels in one or other form right from LPG in cooking to jet fuels. Thus there stand a need to search for renewable, convenient, effective and efficient source. We have various options which fit into this category perfectly. One of them is diesel through e coli bacteria. These are the bacteria which on certain process give out substance exactly similar to diesel which is perfect to be put into existing engines.**

Keywords— terepene, caryophyllene, caryolab-1-ol.

I. INTRODUCTION

As a substituent to exhausting fossil fuels the bio-fuel produced by E. coli bacteria is been researched by scientists throughout the world. E.coli bacteria were only related with the virus in water body until the scientist found out about the capabilities of E.coli for producing bio-fuels. [3] These bacteria are found living guardedly in human intestines but some of them can also cause various deadly diseases right from stomach ache to even death in severe cases. Still they can be synthesized to produce bio-fuels that can be directly used. These bacteria react with organic matter to convert the sugar into fats having similar properties to existing fossil fuels. [11] the engineered e. coli produce terpene enhanced in caryophyllene and caryolan-1-ol. Scientists say that caryophyllene and their stereoisomer posses properties for renewable fuel that can be used as ground transportation fuel and jet fuel.[1] According to Patrik Jones (Department of life sciences at Impererial College London) "Fossil fuels are a finite resource and we are going to have to come up with new ways to meet increasing energy demands. Although we have only produced tiny amounts so far, the fuel we have produced is ready to be used in an engine straight away".

II. PROCCESS INVOLVED

At initial stages of this discovery when unaltered E.coli was been used the quantity of bio-fuels obtained was not adequate. [9] E. coli uses sugar contents present in organic matter to make fuel. It coverts sugar into fats which posses similar properties to that of diesel and this fuel can be directly used without any further modification. According to recent research the bacteria was genetically modified to improve the yield of biofuel. Before modifying E. coli it was a 3 step method in which the plant matter are churned and plant matter are broken down by adding liquid salts. The liquid salts break down the complex plant matter after which enzymes convert the plant matter into sugar .further the bacteria convert sugars into fat or bio-fuels. This is the old traditional method which should be done in 3 steps because the bacteria or even for that matter the unmodified E.coli couldn't tolerate salts.[1] basically the fats gets converted into cell membrane through a biological process. E.coli is used to stop this process and enzymes are introduced in this process to synthesize the product through different biological route after which the bacteria made engine ready fuel. This being the traditional method used earlier which was then improvised by altering E.coli genetically. The new modified and engineered E.coli can not only tolerate salts but also can be in a single step and in a single pot. The modified E.coli could absorb fatty acid and excrete bio-fuel as waste product. Scientists carefully involved genes that would be profitable and which give more preferable results .this not only made the process simpler but also increased the yield to some extent.

III. DIAGRAM

As explained previously, the traditional method was a three step method which is better explained by the diagram below.

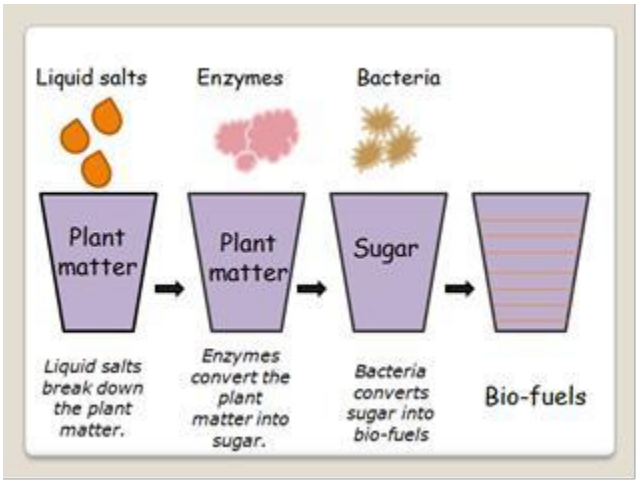

Fig.1. Traditional method for extraction of bio fuels.

IV. CHALLENGES OR DRAWBACKS

The challenge faced by this process is the amount of fuel produced at a time is too low to meet the need of growing

population scientists are working on this process so it could produced adequate amount. Another challenge is the scale on which it is produced; this project should be produced on very large scale. As this type of fuel is very volatile this makes the extraction of fuel tricky. Thus the setup for such extraction can be difficult.

V. ADVANTAGES

[10] This fuel produced by E.coli is fruitful in aspects like economically, socially and environmentally. Now a day ethanol is being used, but due to high corrosive nature of ethanol it cannot be transferred through existing pipelines which makes it hike the maintenance price. Whereas E.coli fuel can be transferred easily through existing pipelines.[9]speaking of ethanol , as compared to E.coli fuel ethanol causes much more emission if carbon dioxide which is harmful to environment. E.coli Fuel is a clean source and produces lowest possible carbon emission. For producing E.coli the source used can be any organic matter which contains sugar traces. The best raw material that can be used is switch grass and miscanthus, they are types of grass which has large sugar content and can be grown very easily. This also makes this process economically acceptable and convenient to establish. E.coli produces fuels such as gasoline, diesel, Essen, jet fuels, diesel, etc. thus E.coli with respect to above mentioned advantages makes it the most covenant fuel to be used as an alternative for fossil fuels. [4] as far as fuels form other organic sources are considered E.coli fuel need not to be mixed with petroleum before using, as said it can be directly put to use. Also, it would be easy to setup as far as other sources as crude oil are considered. Eventually, it won't require high cost, complex machinery, expensive raw materials or not even high maintenance.

VI. FUTURE SCOPE

Due to the increasing population, the demand for fuels is also increasing which is resulting in faster consumption of fuels for various needs. Fuels naturally takes many years to form which threats the progressive human life thus e. coli fuels are pitch perfect alternatives to look for more and advanced research can be done to bring e. coli fuel commercially usable. There can be research conducted on how it be more genetically modified or the process can be altered so that it can give better results. As mentioned earlier, the major problem is the yield. So far, there has been increase in the yield as the research proceeds further. Thus, there seems further scope for more research for more betterment of bio-fuels.

VII. CONCLUSION

As per recent researches the E.coli fuel can be the most efficient fuel when it used commercially. there will be many positive changes such as the fuel becomes cheaper, there will be less pollution and it will also save the extinction or running out of fossil fuel. The bacteria should be more genetically modified so that bio-fuels can be produced on a larger scale. It so may happen that maybe using more modified bacteria we can produce bio-fuel in our own gardens.

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Impact of Procrastination on College Students

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***Abstract*— Procrastination and a student appear to go as one. At the start of another semester, almost every student makes the objective of completing work on time, doing his or her best, and making decent evaluations. In all actuality, most students put off the work until the latest possible time. In spite of this ever-famous pattern of putting off work, most students lament delaying. The question is, why do they procrastinate? Do they not put efforts in themselves? Is the work too hard? Do students not have enough time? Does the faculty put excessive weight on them?**

***Keywords*— Procrastination, students, academics, time management and delaying.**

I. INTRODUCTION

Procrastination is the thing that students are facing in their day to day life. It demonstrates their conduct for postponing the errands which is adversely influencing them. It is a predominating worry for the student's absence of devotion towards their work. Actually, students have their needs that take most of the time. We know that academic weight scales up causing a distraction towards their focusing skills. Actually, numerous students have assignment load and higher-class students also have their part time employments that take up a lot of time. Additionally, as students get nearer to graduation, their classes turn out to be more troublesome, this brings about more work. A few students will take on the work and finish it in a convenient way. But for some students, this measure of work brings about pressure and possible lingering. Our exploration will figure out why students delay and how the related outcomes can be resolved. Keeping in mind the end goal to indicate this thinking we have given a concise portrayal and a brief description on a survey done among the students of our college. Utilizing this data, we have framed table expressing the fundamental reasons, a bar diagram and a last report with an outline for the students understanding over their reasons for delaying. On premise of this investigation we have given the merits and demerits and have come up a few answers to avoid procrastination.

II. REVIEW OF LITERATURE

The writing we are looking into is from different specialists who discovered data on procrastination and the students. These sources are shedding light on regular issues and arrangements others have found. We will contrast them with our own discoveries and check whether we can identify the problem. In our review, we inquired the students if the procrastination was because of dread of achievement. A few students feel that they are never sufficient and don't have any desire to finish their work. At the point when this happens, students will get low evaluations and that will dishearten them further. A few students need to understand that their work will profit them quickly.

Types of Procrastination

Short –Term Procrastination: Short-Term Procrastination occurs when the people are well acquainted with deadlines. The examples of short-term procrastination include project submission before a specified date, preparing a presentation for an interview or having an assignment due. In all these examples, people find out ways to complete their work on time. Most of the students and employees face this kind of procrastination. The quality of work decreases because the task which was appointed to be completed in a month is done in a day. In the end, the desired results are not obtained and it becomes a reason of depression among most of the students.

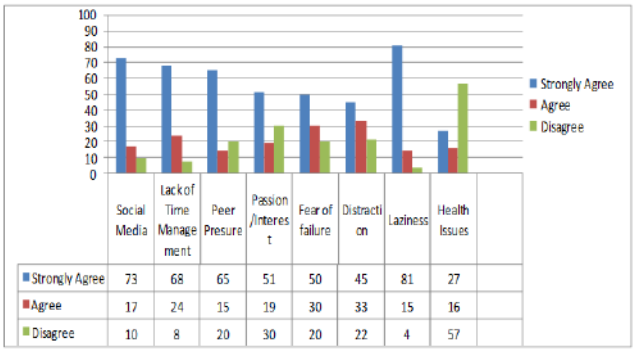
Long-Term Procrastination occurs when there are no deadlines. Tasks like starting a new business or making a documentary don't have any deadline because nothing is going on at first. This is the type of procrastination that affects people in the long term. They fail to reach their goals because they didn't even start chasing them. Losing an opportunity is one thing but not even looking for one can have catastrophic effects on one's professional and personal life. No one is aware of this procrastination until there is a danger of carrier disaster or a big financial loss.

The students are too lazy when it comes to completing their work, its main reason can be academic pressure. The load of assignments is so high in an engineering college that it also affects their time and the study schedule. Time management becomes a challenge, because after so many hours of continuous lectures and practical students are not in a position to study or complete their projects. Also understanding and liking of the subject is important, majority of the students don't pay attention in the lectures due to faculty issues. The transition from junior college to professional college brings changes in the student's life, not only the travelling but also the extra coaching classes takes up their time. Other reasons can be compulsion of the attendance for term grant, choice of course; hobbies and passion of other interests; distraction due to involvement in other activities; age factor; impact of advancement in technologies and electronic gadgets; lack of motivation can also be main reasons of procrastination.

Advantages: It will enhance the student's confidence of doing anything under pressure, which normal person can't do. Benefit of procrastination is to prepare for the real world. At the time of interview or any sort of things, a student is ready to answer on

the spot. This delaying makes you more creative, because you become habitual to work on the spot, which makes them to think more & that creates a lot of ideas in their head, it helps them in doing the work faster because they have lack of time. So being a procrastinator they keep things simple, and they know that beauty exists in doing the simple things well.

Disadvantages: Being a procrastinator, all the time leads to poor decision-making capability. It leads to poor time management; students lose valuable time which is never going to come again. It also affects the health if they adapt to the habit of procrastinating since it leads to anxiety and stress. Academics may create great trouble for career, one might not be getting the job he or she deserves. It will lead to lack of self-confidence and cause low self-esteem; sometimes students might damage their reputation among a group of people.



	Social Media	Lack of Time Management	Peer Presure	Passion /Interest	Fear of failure	Distraction	Laziness	Health Issues
Strongly Agree	73	68	65	51	50	45	81	27
Agree	17	24	15	19	30	33	15	16
Disagree	10	8	20	30	20	22	4	57

Fig.1. Survey Report

III. METHODOLOGY

Survey form was prepared based on various criteria and it was circulated among students of the various departments. The research we conducted uses both qualitative and quantitative methods. After two days forms were collected and database was prepared on acquired information, analysis was done which was presented in the form of a bar chart. Quantitative Data: Formal interaction among students in class room was done for better understanding of the problem faced by the student fraternity and solutions were also suggested by the same. Positive and negative suggestions were accepted by the students & compiled it for future solutions. Designing of survey form was done based on the following criteria's: (1) Social Media (2) Lack of Time Management (3) Peer Pressure (4) Passion / Interests (5) Fear of Failure (6) Distraction (7) Laziness (8) Health Issues. After conducting the survey, we analyzed that Laziness contributes the most for a student to procrastinate which is 81%. This also acknowledges us that social media is also a major factor that stands second as an impact, which leads to lack of time management and also causes health issues.

Qualitative Data: At the point when asked what might enable them to procrastinate less, we got different replies. A large portion of the students required self-inspiration, assurance, and energizing educators. These understudies are suggesting that their homework does not inspire them. Half of the understudies get overpowered and they don't realize what they have to do. The students' decisions expressed that their educators did not appear to be amped up for the material they were instructing. This is obvious to the students who wind up unmotivated to take the necessary steps. Students are searching for reason, fervor, and inspiration in their classes.

IV. DISCUSSION AND SOLUTIONS

Study environment of student should be free from distraction such as, watching TV & use of electronic gadgets. Possible solutions were provided to convert the non-compliance task into compliance mode. Self-Motivation is the key of success which will help to utilize energy in constructive manner. Focus should be given on self and collaborative learning for boosting up the self confidence among students learning behavior should be improved with proper time management. Improve learning behavior: Focus less on gratification in the presence and focus more on learning for the future. It enhances the behavior in tackling procrastination. Don't indulge fantasies: Stop fantasizing about desired results. "Imagination is the enemy of motivation". Being optimistic will help in fast completion of work. Motivate yourself towards achieving goals. Past success will help in building the self-confidence which will lead to completion of project on time.

V. CONCLUSION

It appears to be inevitable that all students will procrastinate at some point. Students work, have their social life, and attend numerous classes. Any individual who isn't a student can identify with that. To stay away from procrastination, students need to expand their assurance to see the master plan. They have to see that they will graduate in sometime and these little assignments will help them in future, despite all the trouble. In spite of the way that college teachers relegate a lot of work, it is at last up to the student how to finish the function. It is dependent upon them regardless of whether they will be a dynamic slowpoke or simply get the work done. This study unquestionably was not great. It was constrained to the limited people that we know. It would be very intriguing to see this investigation expanded to other colleges as well to perceive how they stand in general.

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Agile Model as a Software Development Paradigm

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***Abstract*— These days in software industry agile methodology is the most used model. It is a model based on uninterrupted** repetition **of progress and testing during the software development lifecycle of the project. In traditional development methods testing is conducted after implementation but in agile methodology, testing is done as a parallel activity along with implementation. Agile Methodology consists of Scrum and Extreme Programming which helps to identify user requirements and product backlog.The selection of model can have a high impact on the development on the end product and the testing activity that is carried out in SDLC. It can standardize the development processes and the testing techniques. Companies should choose their development model based on the nature of the application.**

Keywords:Paradigm,Scrum, Extreme Programming;

INTRODUCTION

A critical factor for the success of the software project is the flow of processes in Software development life cycle (SDLC). Selecting a SDLC methodology is a tough job for many organizations and software engineers. A software engineer should have adequate familiarity and understanding of software development models and he should be able to select one model over another on the basis of specific domain of the project. In this paper we will explore a relative analysis of SDLC models and why the software industry is moving towards agile methodology to achieve client approval. While choosing a framework for system Before considering a framework for selecting a given SDLC methodology, a detailed study of application area, participants constraints and demands, commercial significances need to be assessed. Organizations need to review their technical capability and ability, and technology constraints before choosing the right model.

SOFTWARE DEVELOPMENT MODELS

WATERFALL MODEL: In Waterfall model sequential development approach is followed. Here the development of software is an orderly process which starts from feasibility analysis, requirement collection up to maintenance phase. Output of each phase should be certified documentation/code which is known as a Baseline. All the phases are accompanied with an assured output of preceded phase. The main concern here is adhering to tome management and the deadline of completion dates. Once the client requirements have been frozen the focus is on completing the project without any delay

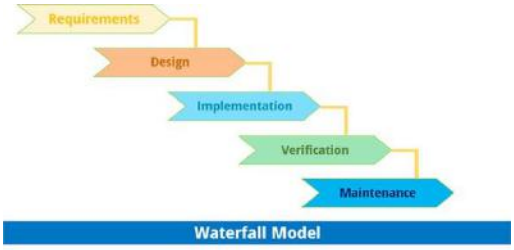

Fig. 1 Sequence of phases in Waterfall Model

Tight control is retained over the life of the project through written documentation. Since the baseline is defined the waterfall model is easy for tracking the progress of the activities in the cycle. From the point of view of understanding this model is the preferred one by analysts. But if some fault occurs in the middle phases we cannot return to preceding step. The whole activities can get complex for tracing. Often, the client is not very clear of what he precisely wants from the software. Any changes that he makes in between the project may result in a lot of misunderstanding

PROTOTYPING MODEL: The Prototyping Model is a systems development method (SDM) in which a simulation model is created, tested, and then modified based on client's feedback. The process is repeated until we get a simulator which satisfies all the features demanded by the client. This hastens the realization of actual system based on prototype. If the project requirements are not well defined at the starting of SDLC the simulator helps in clearing the demands of the client. The client feedback on preceding prototype is very crucial for the development of following prototype. The initial requirements can be collected from users through face to face interviews, questionnaires and by studying the existing processes. These system requirements should be written with sufficient details which can help in forming the design of initial prototype. This model acts as a trial product which user can carefully assess and give feedback. The clients feedback gives the system analyst an idea about the pros and cons of the prototype and what features need to be incorporated and what needs to be withdrawn. The trial product analysis is continued till the end users and clients are satisfied with the final prototype and give a go ahead for actual product implementation. The meticulous assessment and verification of simulator by the end user is very crucial in project success.

AGILEMODEL: In the Agile methodology the gradual progress approach is undertaken. An abstract design is the beginning point which can expand to small concrete modules. The modules are refined with weekly or monthly meetings. At the end of each client meetings project priorities are appraised and checks are performed. These sprints allow issue discovery, and we can incorporate customer feedback into the design before the next sprint is run. The critical point about agile model is that it focuses on principles rather than process.

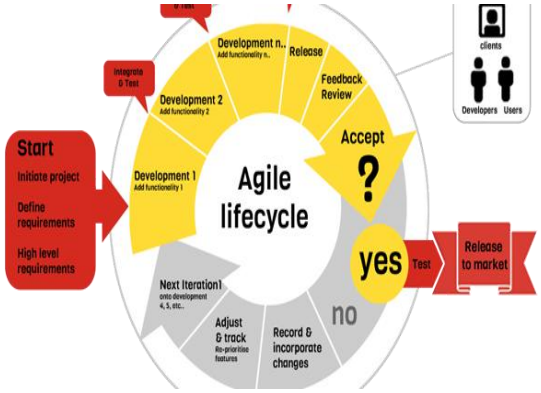

Fig. 2 Process flow in Agile Model

The Agile Methodology provides a flexible approach for SDLC plan modification. This helps in adding features which will keep the final system up to date with new developments in the industry. Each sprint is ended with the feedback session of the stakeholders which can vary from end users to clients and sponsors. Project priorities can also be evaluated through the sprint meetings. The stakeholders are satisfied because they are going to receive a product they desire. The rigorous and meticulous evaluation of product during sprint ensures that bugs are caught well in advance before it reaches the deadline of final product release. The scheduling of product release date is comparatively easy task in agile approach.

A less experienced project manager may not be able to make use of agile methodology characteristics. As a result, the project can become a sequence of code runs. It may cause delay in execution and over budget of project. The lack of definitive plan for the initial project may result in an entirely different product which was not visualized by the client

Waterfall uses a sequential approach where software development is categorized into a sequence of pre -defined phases like feasibility, planning, design, build, test, production, and support.

The risk feature of project better analyzed in Spiral Model. The horizontal axis covers the evolvement of the product and vertical axis covers the accumulated cost of the project. The budgeting of software project is taken care of in spiral model. Agile philosophies comprise of test-first methods. In spiral testing is an activity into itself and tests are not developed prior to code. They are made in advance, but developed in parallel or after coding. Many agile methods insist on developing tests in the beginning along with the code specification. When budget constraint and risk evaluation is a primary concern we can opt for Spiral Model.

Waterfall methodology profoundly depends on initial requirements. If these requirements are defective in any mode, the project is ruined. The plan doesn't consider a client's changing needs. In agile approach the client can see the working software in every two weeks or every month. A constant duration leads to a better rhythm. Product is designed, coded, and tested during the sprint.

CONCLUSION

Software development methodologies have progressed since the1970s. The evolvement of agile development methodology took place as a result of changing and diverse requirements of software industry. Since the agile method supports teams in responding to the volatility of constructing software theysatisfy the client by continually developing the software and changing requirements are incorporated for the client's competitive advantage.

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Gravity Light: Using gravity for Producing Light

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***Abstract*—In this modern world, we all have the pleasure of using electricity and other amenities but there are places where there is no electricity and so no light where the people's day starts when sun rises and ends when the sun sets and so they do not perform any activity after sunset like the medieval people. Now the answer to this problem rises, why don' they use solar and wind energy, well the problem is that they both are not available at every corner of the world specially in the hilly regions and some remote villages where the sun is hardly visible and so to solve this problem we need a force or energy which is available everywhere on the surface of earth and that is gravity, the gravitational force is available equally and constantly without any hindrance on every corner. This mechanism is new but some regions use it, this mechanism is used by entrepreneurs as a product. This mechanism is called Gravity Light is works on the concept of bicycle dynamo electricity generation. The only difference is that here we will be using gravitational force instead of pedaling. The overall setup can be made indoors by any layman having a little understanding of bicycle and it can be operated just by hanging some weight to gear train which in turn rotates the wheel and which rotates the motor which generates current producing light. It is a very low cost setup and the cost can be recovered in 3 to 4 months as compared to the cost of kerosene lamp or using wood to burn which will cause harm to health.**

Keywords—DC Motor, Electricity Generation, Gear Train, Gravitational Energy, Sustainability.

I. INTRODUCTION

There is a great demand of energy like electricity, fossil fuels including petroleum and coal etc. And so huge industries who setup their factories in rural areas demand more supply of electricity and so there are power cuts seen in the rural areas and due to these power cuts the rural people switch to kerosene and wood lamps instead of electric ones and so the use of these lamps cause harm to the people but as they don't have any other option they have to use these lamps to carry out their day to day activities. The solution to this problem is using the gravity light as it causes no harm to the people and is free to use, it provides electricity enough to run 3 LED and it provides energy enough to produce light for 3 LED for approximately 25 minutes. Today approx. 1 billion people including India and African continent don't have access to light on 24 x 7 basis. And due this they don't get equal opportunities to grow and prepare for the activities to compete with the world rather they hardly survive and to survive they migrate to urban areas which increase strain on the amenities of the municipal corporation and thus many other problems arise. Utilizing Gravity Light mechanism at least they have some electricity post sunset. The isolated perpetual system is the best way to generate electricity without and major input.

Without discussing more on the effects and Causes let's directly study the mechanism of gravity light. It's easy to make and can be assembled anywhere. We have done some of the research, experimentation and results are given in the course of the paper.

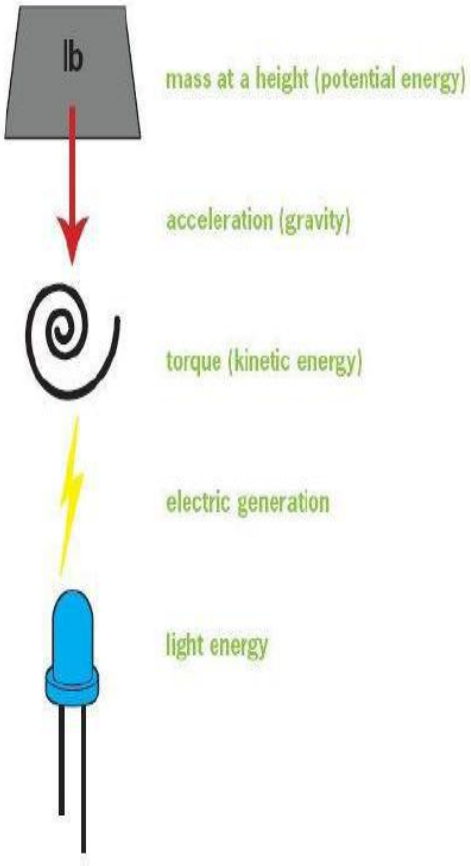

Fig.1. Parts of Gravity Light System [1]

As shown in the above picture, the whole idea is to have the masses fall as slowly as possible, while still causing the generator to turn fast enough to power the LED light. With the system above, even though the small sprocket is turning slowly, the outer edge of the large pulley/wheel that's attached to is turning fast. The generator we are using is a motor from a microwave oven, the one that slowly turns the tray inside the oven. If you turn the shaft of the motor manually then the motor acts as a generator and produces power as we know it. This motor has a lot of gears inside it, which make it such that turning very fast, produces a useful amount of power. It's in the use of the pulley system below, along with that particular motor as a generator, that the conversion from slow to fast is done. [1]

II. Methodology and Working

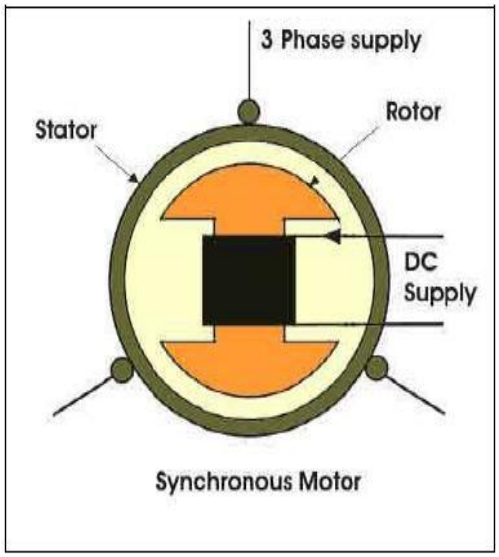

Fig.2.Mechanism of Gravity Light[1].

Fig.3.Prototype of Gravity Light[2].

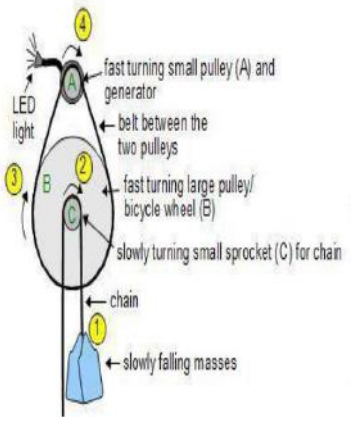

Fig.4.Working Gravity Light [1]

III. Cost Report

Table.1. Cost Report

Sr No.	Component	Quantity	Price (INR)
1	Synchronous Motor	1	100
2	Bicycle Wheel	1	300
3	Sprocket	2	200
4	Chain	1	50
5	Pulley	1	100
6	V Belt A95	1	300
7	Mild Steel Shaft	1	50
8	U Clamp	1	20
9	M12 Bolt	2	8
10	M6 Screw	2	4
11	Washer	8	16
12	Wood piece	2	30
13	0.5W LED Bulb	1	80
14	AC to DC Circuit	1	50
TOTAL COST			1308.00

IV. Results and Discussion

The following assumptions were made for calculations: No Slip in Belt drive, Frictional Losses are Negligible

Trial 1: Time of fall is calculated initially by keeping the mass constant and the values are tabulated.
For a Fixed mass = 4 Kg

Table.2: Time of Fall Vs Height for fixed mass

Height of Fall (In Metres)	Time of Fall (In Minutes)
1	4.23
2	12.45
2.5	15.39

For a fixed mass the time of fall is increased as the Height of the fall is increased.

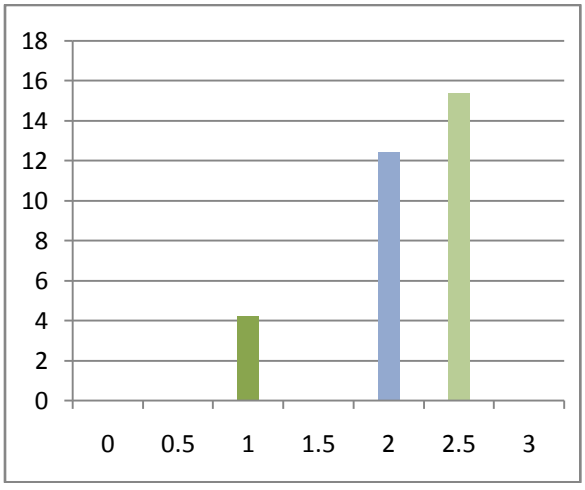

Chart 1: Time of Fall Vs Height for fixed mass (4 Kg)

Trial 2: Time of fall is calculated initially by keeping the mass constant and the values are tabulated.

For a Fixed mass = 5 Kg

Table.3: Time of Fall Vs Height for fixed mass

Height of Fall (In Metres)	Time of Fall (In Minutes)
1	5.30
2	9.50
2.5	13.10

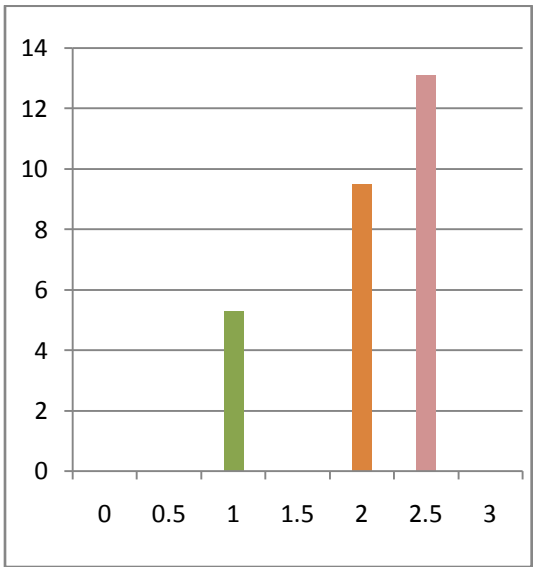

Chart 2: Time of Fall Vs Height for fixed mass (5 Kg)

Trial 3: For a Fixed Height of fall = 2 m

Table.4: Time of Fall vs Mass Hanged for Fixed Height of fall

Mass Hanged (In Kg)	Time of Fall (In Minutes)
4	12.45
5	9.50
10	7.15

For a fixed height, the time of fall is decreased as the Mass hanged is increased.

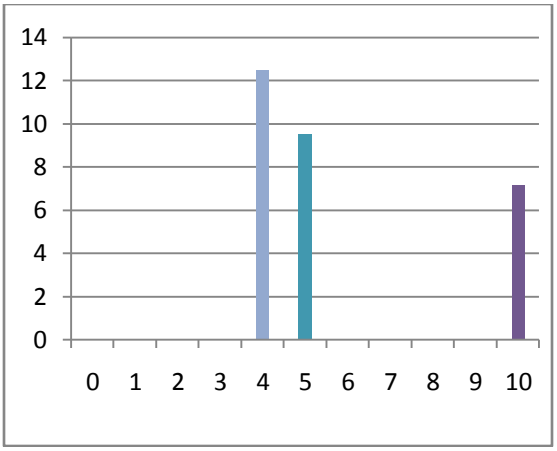

Chart 3: Time of Fall VsMass Hanged for fixed Height of fall (2 metres)

Table.5: Power Output Vs Mass Hanged for fixed height of fall = 2 metres

Mass Hanged (In Kg)	Power Output (In Watt)
4	0.285
5	0.362
10	0.712

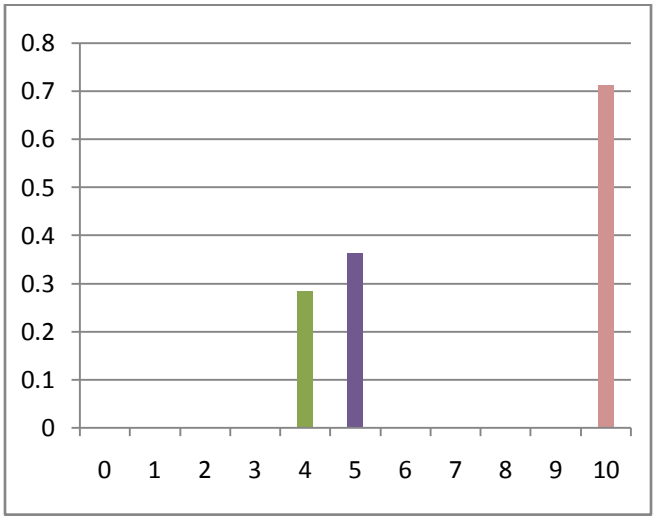

Chart 4 : Power Output (Watt) Vs. Mass Hanging (Kg)

V. EFFICIENCY

Efficiency of the System is calculated for a Height of fall of 2 metres and Mass of 5 Kg.[2]
Output Voltage Measured = 25V
Output Current Measured = 3mA
Output Power = 0.08W
Efficiency = (Measured power/Theoretical Power) * 100
Efficiency = 22.36%
Considering the Frictional losses, slip in belt drive and losses in circuit 22.36% efficiency is a fair value achieved.

VI. CONCLUSION

Hence, we can conclude that, gravity light meets all these drawbacks and its advantages over others are:[2] Lower expenditure on lighting and increased income, Safe, cheap and clean light, Access to better energy solutions, Increase time for productivity and lower fuel overheads, Ability to study after dark, Ability to work after dark, Eliminates health hazards of kerosene lamps: Burns, fumes and eye infections.

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Wind Power

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Abstract- **Wind power is the power that one can generate through wind by using wind turbine. Wind turbines are used in hilly areas and near the seashores, where there is a high flow of wind. Wind turbines is the device that change the kinetic energy of wind into mechanical energy and transfer it to the generator and then generator connected to it converts mechanical energy into electric energy. And then it supplies throughout the areas. Today the kinetic energy of wind is the most used renewable source of energy. It is one if the pollution free source. It uses sunlight and wind to produce electricity. Wind turbine consists of two types (1) vertical axis wind turbine (VAWT), in which the rotor blades are rotating vertically and (2) horizontal axis wind turbine (HAWT), in which the rotor blades are rotating horizontally. The VAWT is more used than the HAWT.**

Keyword- ***Wind turbines, kinetic energy, electric generator, vertical axis wind turbine, horizontal axis wind turbine, wind power.***

I. HISTORY

In the earlier generation, the wind energy system was used by the ancient period civilizations in the Persia. Vertical axis wind mill was mostly used for the grinding purpose for milling. In the medieval ages the post mill, one of the type of wind mill was first used northern Europe. In 1888, Charles brush erected first large size wind turbine which generates electricity. It is of largest length of 17 m diameter, which generates power of 12 kw. In 1890, Lewis electric company situated in New York had sold generators to retro fit to build wind mills.

II. INTRODUCTION

As we are using sun's heat energy to boil water and to produce electricity using photovoltaic cells. Like this way only we use wind energy to generate electricity. Our earth is getting heated by using sun's radiations. Because of this the wind(air) near the equator is becoming more hotter due to the suns solar energy and the air near the poles is becoming cooler. As the wind near the equator absorbs more energy from the sun as compared to the wind near the poles. The air near the equator is expanding as it is warmed air . And the air near the poles comes closer to each other. The flow of air from the warmed region to the cold region is called as wind . It can be strong or weak it depends on the sun solar energy. One can define wind energy as motion of flow of air from the hotter regions to the colder regions. At every corner region of the earth the effect of the wind has noticed which is varying time to time and place to place. Some part of the earth consists of flat deserts and geographic region where more wind energy has been received.

The supplies of non renewable sources are decreasing day by day. And the renewable resource is becoming more efficient. As the renewable sources such as wind energy is the free distribution of temperature in particularly different areas. In ancient period the kinetic energy of wind was used as for rotation of windmills and for sailing the boats. Windmill forms the rotation of the shaft which is generally used for various purposes such as pumping water and grinding corn etc. The motion of the shaft of the windmill can be used for generating electricity by connecting electrical generator to the rotating shaft of windmill. For this the wind turbine used. Wind turbine is one type of windmill that converts the kinetic of wind to produce the formation of electricity through electric generator. Wind turbine is used in each hilly area because in many areas there is no supply of electricity. For generating electricity for large areas the number of wind turbine are used which is called wind farms . These wind farms are used for the production of electricity for vast areas. These wind farms are located on flat lands, mountain tops, offshore in the sea.

The working of wind turbine start with the rotary motion of the shaft winds the central hub as its center. And which leads the motion of the low speed gear box and which turns on the generator producing electricity. And its further connection Is through the electricity cable for distribution of electricity throughout the area. The wind consists of different equipment which are as follows- rotor, pitch drive , nacelle , brake , low speed shaft , gear box, high speed shaft , generator , wind vane, yaw drive. Wind turbines works on the principle of that of the same as the magnets are rotating around the coil or the rotary motion of the coils in a magnetic field to produce the electricity. Here the wind turbines is consists of following two types vertical axis wind turbines (VAWT) and horizontal axis wind turbines (HAWT).

The wind turbine is to be placed where there is a high speed of flow of wind. If the wind turbine not comes in contact with rotor the wind turbine will not work and there will be electricity generated. And if there will be a case arise of strong wind flow , the shaft will rotate at a vey high speed than it may cause the damage of wind turbine. So the wind turbine should be plotted after judging the speed and direction of wind at that place. There is one device which measures the velocity as well as the direction of wind known as ANEMOMETER. It consists of an arrow shaped metal. It is mounted on a shaft, designed to show the path of flow of wind.

III. HOW WIND TURBINE WORKS?

Each wind turbine has wind vane constructed on the top which inspects the direction of the flow of wind. The kinetic energy of the flow of wind makes the blades of the wind turbine to spin. These blades are as long as 60 meters and it us very light in weight. That's why they can produce energy even with very light winds. It starts from 11kph and its maximum velocity is 90 kph. The blades are attach to the wind turbines through the hub and connected to the low speed shaft. It revolves with same speed as that of the blade. To produce electricity it is necessary to increase the rotating speed of low speed shaft that us done by the gear box, which raises the speed by 100 times and transfer lt to the high speed shaft. The high speed shaft rotates about a very high speed of 1500 revolutions per minute (rpm), this high speed is transferred to the generator. The generator converts the energy produced due to rotating of the high speed shaft into electrical energy. The electricity produced in the generator has direct current which passes through the base where the converter transformer converts it into alternating current and this ac current passes through the substations from where it get supplied throughout for industrial and commercial use.

The power in the wind can be extract which is used for working of wind turbine. Wind power can be calculated by the size of the rotor blades, the velocity of the wind, and the air density. It us given by the equation

$P=0.5 \times \rho \times A \times v^3 \times Cp$

Where P=power in winds in watt A=circular area that is covered by the rotor in m^2

P=air density in kg/m^3

Cp = coefficient of power (efficiency)

IV. FUTURE SCOPE

In future the wind turbine will be used in large scale for generation of electricity. Since from the medieval period till now the wind turbine has been modified a lot and made it efficient to generate high power electricity. And it has a very high scope in future and many engineers are working on it to make it to generate very high power so that there should be more use of wind energy except of using all other conventional sources. As the conventional sources are varnishing day by day and it will not help us for a longer extent, that's why the wind energy is becoming more is becoming more efficient and it will help us for a longer extent in our near future.

V. ADVANTAGES

It is pollution free and does not cause any harm to the environment. It does not contain any chemical processes. It does not cause very vast sounds of operation of machines. Very little mechanical noise is heard. It does not require any sources for its power generation, such as petrol, diesel, etc. It requires only sunlight and wind for its purpose. The wind farms can also used for other purposes such as grazing, agriculture, etc. Wind turbines are also constructed at the top of the mountains and seashore. It is of very low cost as compared to other renewable resources.

VI. CONCLUSION

Wind turbines are more affordable than any other resources. The maintenance cist if the wind turbine is also less and it does not requires fossil fuels to generate electricity. The use of Wind turbine is increasing day by day it is becoming more efficient in our daily life.

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Detailed Analysis on Polymer Coated Aggregate in Bitumen Pavement for Smart Road Construction

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***Abstract*- Nowadays demand of bitumen in bituminous road construction is increased therefore cost of bitumen also increases day by day. Bituminous construction road become costly, so that research of other alternative for Bituminous Macadam road is mandatory. In this project we will use polymer as a binder with respect to bitumen. This is because waste plastic increases various hazards and due to that the pollution also increases in the environment so that we used polymer with respect to bitumen. Many places where this project had successful result such as Tamil Nadu, Madras, Bangalore, Mumbai etc. In bituminous construction road we take materials like Aggregate (of various sizes 10mm, 20mm), grit and bitumen. The various tests on aggregate are conducted during project such as Crushing, Impact, Abrasion, Specific Gravity and Total flakiness and elongation Index test and also on bitumen we conduct specific gravity, Penetration, Ductility and softening point test. The use of this test is to determine various properties of aggregate, grit and bitumen. First we will adopt conventional method, according to that Marshall Stability test was done as per MORTH specification. After that without changing the source of material we conducted Marshall Stability with adding polymer. In this new mix, we used 8% of polymer with respect to bitumen and Marshall Stability is carried out. Addition of this polymer gives better results as compared to conventional mix design. The marshall mix design value with adding polymer increases Marshall Stability value and alsodecreases the flow value. So that our purpose behind this project is get successful. The use of polymer in the mix design lowers the pollution in the environment and also reduces the cost of construction.**

Keywords- Polymer, Smart Road, Bitumen

I. INTRODUCTION

Plastic waste is increasing day by day in the whole world, of the various waste materials, plastic and municipal solid waste are in great concern. On the other side, the road traffic is increasing, hence the need to increase the load bearing capacities of the road. Plastics waste constitutes a significant portion of the total municipal solid waste (MSW) generated in India. It is approximately examined that about 10 thousand tons per day of plastics waste is generated daily. There production as received a very severe issue and made plastics a target in the management of solid waste. Plastics are non-biodegradable. They also have very long life and the burning of plastics waste under uncontrolled and unconventional conditions could also lead to create many dangerous air pollutants depending upon the type of plastics and other harmful additives used. As, at the end plastics can be recycled into a second life application but after every thermal treatment, degradation of plastics takes place to a certain extent.

The use of aggregate which are coated by plastic for bitumen road pavement allows the reuse of plastic waste. As, plastic are versatile packing material and commonly used by man, in the other hand it also create a very severe problem to the surrounding environment. In India, mostly use plastic products are as bags, cups, films and foams, made up of polyethylene, polypropylene or polystyrene.

According to the prediction, in India consumption of plastics for different use in day to day life is about 15 million tonnes by 2015 and it set to be 3rd largest consumer of plastic in the world. Around in which 55% is being used for packing. The littered plastics and non-biodegradable materials get mixed with domestic materials and it made very difficult to make the disposal of municipal solid waste, contains PVC waste when burnt, it produces toxic gases like dioxin. Disposal of plastic waste is an eco-friendly way is the main thrusts are of today's works. Therefore, the use of plastic waste in the present of bitumen to make the road construction economical, more flexible, waterproof and also prevents in the formation of ruts, cracks, etc.

In the construction of bitumen asphalt pavement, hot bitumen is coated over hot stone aggregate mixed, laid and rolled. Bitumen here act as a binder .Yet, when water is stagnated on the road especially on rainy season, the waterpenetrate and result in potholes, a defective spot on the pavement. Therefore the use of anti-stripping agent is having limited use only and the process also increase the cost of road construction. Therefore the use of plastic (Recycling of plastic waste) to modify the bitumen and also use of plastic coated aggregates are being studied to improve performance of the pavements.

Bituminous mixes used in the surface coarse of the bituminous pavements are being improved in their performance by adding various types of additives to bitumen such as Rubber-latex, Crumb-rubber , Styrene, Butadiene-Styrene, Styrene-ethylene-butylenes, recycled polypropylene, low density polyethylene, polyethylene, Ethylene Vinyl Acetate (EVA) (5%) and polyolefin.

II. OBJECTIVES

The main Objective of this is to examine the performance of the pavement constructed using waste plastic coated aggregates.

Towards realizing this broad objective, the specific tasks of the study are given below.
To examine the properties of aggregates by coating plastic over it. To examine the properties of bitumen which is modified by polymer for different ratios of Low Density Polyethylene?

III. SCOPE

The main scope of this project is to examine the performance of Plastic tar flexible Pavement road construction using aggregate which are polymer coated in bitumen mix at Different places at Tamil Nadu during 2002-2007, spreading around 1500 Km all Over Tamil Nadu. They are as follows
Jambulingam Street, Chennai- 2002
Veerabhadra Street, Erode- 2003
Vandiyur road, Madurai- 2004
Vilachery Road, Madurai- 2005
Canteen road, situated inside Thiagarajar College of Engineering Madurai- 2006

IV TEST ON AGGREGATE

Following are test performed on aggregates:-

Abrasion value test,
Impact value test
Crushing value test
Water absorption test
Total flakiness and elongation index test
Sieve analysis
Specific gravity test

But only two of the above tests are performed on aggregates to study the difference between normal aggregates viz.
Impact value test
Crushing value test

WHY PLASTIC AS BINDER AND MODIFIER?

Soften at around 130^0C. Have a binding property hence used as a binder. Can also be mixed with binder like bitumen to enhance their binding property.

VI. DESIRABLE PROPERTY OF BITUMEN

Cohesive and Adhesive property of bitumen is excellent

Excellent water repellent property

It is mostly Thermoplastic in nature, (stiff when cold liquid when hot), that makes bitumen so useful.

VII. MERITS & DEMERITS

Merits
Excellent binding property. Penetration value is low and also bears higher load as compare to normal road pavement. Economical as compare to Bitumen pavements. Better disposal of waste plastics. Approximately Ten lakhs or one ton carry bags for one kilo-meter road. Due to polymer coating aggregates also reduces the voids. This results in reducing rutting , reveling, there is no formation of pot hole. The road can withstand heavy traffic & show better durability.
Demerits
Plastic creates severe air pollution when it burns.

VIII. FUTURE SCOPE

To check the amount of plastic content bounded to the aggregate. Floating test can be conducted. The test can be conducted by varying the percent of plastic content. The type of material used as binder in our project (i.e., plastic) can be replaced by any other material like rubber, fly-ash, slag furnace, etc. Tests can be conducted by changing the density of plastic. Tests can be conducted by varying the percentage of bitumen. Tests can be conducted by varying the grade of bitumen. Alterations can be done for mixing process of aggregate and bitumen with plastic. The chemical test on plastic mix in bitumen can be carried out. Coated aggregates can be used in increasing the strength of concrete.

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Impact of Green Intelligence on Rural Development and Urban Planning

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***Abstract*-The increasing population has increased the use of concrete in today's world, also there is a great decrease in green areas and these areas are becoming victims of deforestation. This is becoming a critical environmental issue. Appropriate urban planning, rural development and protection of natural resources are important for improving the environment and the well being of the human existence. This paper focuses on the use of artificial intelligence to curb pollution in cities i.e. proper urban planning and green development of rural areas has been proposed. Furthermore, the combination of two concepts: Green development and A.I. will be used for rural development. Remedies such as rainwater harvesting, solid waste management, use of non-conventional sources of energy are further discussed. Many simulation cases were executed and the results became valid. The solutions presented gives useful benefits for substantial development.**

Keywords: Artificial Intelligence (AI), Green Development, Green Intelligence, Environment.

I. INTRODUCTION

The concept of living better and sound lifestyle is gaining importance worldwide. Also, **environment** degradation, depletion of natural resources and global warming are directly proportional to the rapid growth of cities and ever increasing population. There should be focus on rural areas so that their contribution in other sectors of country's development may increase. The solutions of these problems will be the use of Artificial Intelligence in green city planning. A green city can be defined as a city which does not generate any carbon trace, which has proper waste management, increases recycling, expands open space and has a healthy environment. Also the role of AI will play a crucial role in such planning, specially in the development of rural areas. So clubbing together green architectural concepts and use of AI will have a great impact towards establishment of a conceivable environment. AI can be define as a self learning mechanism or tool which is capable of real time observation of level of pollution and environmental quality in urban areas and giving quick solutions to a particular problem.

Target and objectives: To establish pollution free and conceivable with the help of advance technology, To maximize the use of non conventional sources, To generate less waste and recycle more, To convert rural areas into potential green cities, This will result in overall development of our country and protect the earth.

II. REVIEW OF LITERATURE

The concept of smart planning has been since 100's of years. In 400 B.C the concept of passive solar heating was first used. As per the current situation, it's a myth in the minds of people that smart building methods are often costlier, but the truth is the initial cost is high but the operating cost is low.

III. METHODOLOGY

Buildings are not just open spaces they are a valuable prospect of an urban site. The 3 key things involved are efficient resources, reason of operation and comfort in living. Summing all of these is the overall concept of smart building. Proper city planning and rural development is very essential, which includes the use of artificial intelligence combined with green architecture. The various areas where AI needs to be clubbed with building methods are: Database Management (real time data monitoring) Instant remedies to a particular problem Alternative construction methods. Sensors for detecting automobile discharge

Waste management: Green architectural methods must be economically sound, socially responsible and environmentally sustainable.

The various methods that needs to be implemented are presented in the table given below:

Methods	Purpose	Uses
Green architecture	Urban planning, rural development	Smart buildings
Waste management	Urban planning	Reduced waste due to AI.
Aeroponics	Rural development	Soilless farming , revenue generation.
Traffic management	Urban planning	Reduced traffic due to AI.
Rating system	Overall development	Scorecard for the area.

IV. TRAFFIC MANAGEMENT

Daily traffic jams are not a new thing in urban areas especially the metropolitan cities. Artificial Intelligence can be used to solve this problem. Generally, the traffic varies according to the time of the day. By real time monitoring of vehicles using sensors and cameras attached on street lights and traffic signals, we can record the traffic movements. This data will then be fed to a A.I. computer. The computer will then analyze the data by machine learning. Semantic networks can identify situations occurred in past, for which the solution is known. Once it investigates different zones, it can organize traffic in these areas with the help of signals and indicators. This will help reduce the pollution caused due to traffic jams.

VI.AEROPONICS

Aeroponics is the process of growing plants in air, without soil. In this process, the nutrients and minerals essential for the growth of plants are sprayed in the form of mist. These nutrients will be extracted from soil. Soil used for this purpose will be from rural areas. The extraction plants will also be setup in rural areas. This will help in the development of rural areas in

following ways: Increase employability in rural areas Generate more revenue for the development of the village/rural area The increased employment opportunities will encourage for better education Better education will in turn increase the literacy rate. The rural area/village selected for the above practice will be the drought ridden areas, thereby helping them in such hard times. The extracted nutrients will then be transported to the city where it will be used in (buildings where agricultural plants will be grown using aeroponics).This will also help reduce the pollution due to transportation of agricultural produce will be reduced as the volume of extracted minerals will be less than the entire agricultural produce.

VII. GREEN ARCHITECTURE

Vertical forest: The plants serve to filter dust, pollen and pollution from the environment surrounding the towers, they act as sun shields in summer months and weather shields in winter, thus reducing heating and air-conditioning cost. The building is equipped with Aeolian and photovoltaic energy systems and the tress will be watered by waste water produced by tower. Alternate construction materials: Cement- the ubiquitous gray materials whose importance in modern urban life is indisputable, but it has a dirty secret. It's responsible for emissions of greenhouse gases as well as climate change. Substitutes: Grasscrete : As the name suggests, its the method of laying concrete flooring, side walls in such a manner that there are open patterns for allowing the growth of grass and other flora. Hempcrete: A concrete like material created from inner fibres of hemp plant. These fibres are bound with lime to make light weight and concrete like mixture. Recycled plastic: It provides a new for landfill clogging plastic waste. Researchers are creating concrete that includes recycled plastic and trash.

V. VII. WASTE MANAGEMENT

Waste management [4] is of the most important aspect that needs to be focused on when city planning is being done. There should be a proper account of all the daily waste produced by each building. This can be done by bin monitoring [5]. There should be seperation of waste. All the dry organic waste can be used to run the biogas plant in each building. All garbage tubes can be used instead of using trucks to collect daily city waste. This will reduce the transportation cost and also pollution due to garbage trucks. The garbage tubes from all buildings will directly meet at city's dumping ground and as result all waste will be collected at a single place. Another problem faced by most of the mob is the sorting of waste. AI plays a vital role here, it can help people in the segregation part. Also through machine learning it can suggest various methods of treating the waste produced. Sensors can be used in garbage bins so that they can monitor day to day waste produced by various architectural structures. The bins can be made of light weight aluminum material instead of using plastic this will help in two ways i.e. there will not be use of plastic and the problem of rodents destroying plastic bins will be resolved. This will pave a way for clean environment.

VIII. RATING SYSTEM

Our proposed software will also have a **rating system[1]** which will give rating to a every area based on various factors like: Electricity consumption per person, Air pollution levels, Number of effluent discharging factories, Frequency of use of public transport, Cleanliness of the streets, Domestic waste production by occupants of buildings, Number of existing eco-friendly buildings
This will pave way for a healthy competition between different societies and encourage them to different methods for a greener future.

IX. DESIGN

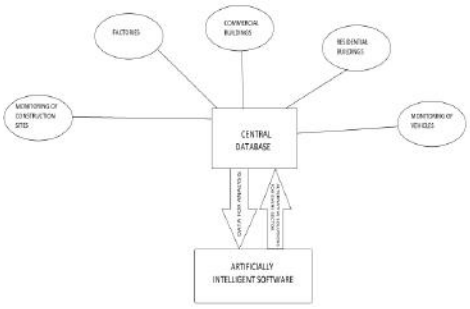

Fig:-1. Design

X. DISCUSSION AND RESULT

This paper will help in utilizing the software to fulfill the public demand for development of smart cities by using the concept of artificial intelligence. The main idea for proposing the software is to create competitive spirit among masses, to build the strong foundation of green cities. With the help of database information software will be helpful to analize the problem any time for future application. Revenue can be generated by using environmental friendly techniques such as use of greencrete, hempcrete, waste management etc. also pollution can be minimized through these techniques and this revenue will help us for the development of rural areas. It will also enhance the literacy level and minimize the migration of people from rural to urban areas as a result population ratio of urban and rural areas will be maintained with increase in job opportunities.

XI. CONCLUSION

This paper presented the comprehensive use of AI to develop areas lagging behind in the use of technology and utilizing resources from these areas in planning of green city.
Thus the use of digital technology will boost the confidence of masses staying in rural and urban, which will help to increase the number of smart cities. It is a small step to contribute for achieving the nation's target**.**

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Alternate Approach for Understanding Complex Numbers through Real Life Application

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***Abstract*—The idea of complex numbers is introduced to the higher secondary and graduate students at a very delayed stage when the basic fundamentals of number systems concept are completely developed according to students but it is not so, as they fail to analyse and apply the concept of complex numbers. This research will introduce the concept in an alternate way i.e. daily life situation example and will also help to apply the concepts to some of very difficult to solve academic questions via a complex numerical approach.**

Keywords- Complex Numbers, Complex Analysis, Imaginery Numbers.

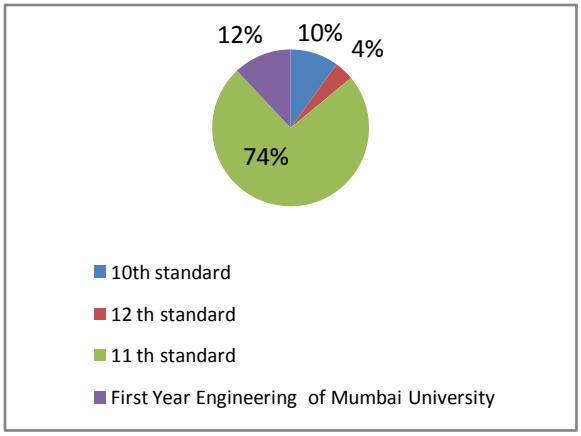
I. INTRODUCTION

Complex Numbers can be understood to be an extension to the real number system. Mainly expressed in form of z = a+ib, where mathematically i= $\sqrt{-1}$ which can be used for extending all usual calculations. The idea of a complex number system was introduced to mathematical society very long ago in 780-850 CE, but the new ideas for development and abstraction of the subject were unattended and were not worked upon due to focus on other tasks or due to decoherence with other subject's physical aspect and laws, ideas were discarded. It was during the 19th century, Mathematicians founded new branch of mathematics to explore the problems concerning imaginary numbers.

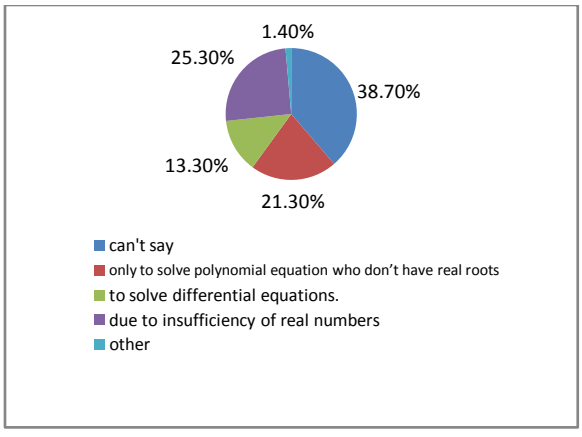
The main concern was HOW to explain the society about the significance and sophistication of the complex system for clearer understanding. Rather than terming i= $\sqrt{-1}$ as imaginary, if the term would have been lateral number and the analysis may call as lateral numbers analysis the society of learners may have given it more attention. The only thing imaginary about imaginary numbers is that it took an act of imagination to conceive for them in first place. But the terms, complex and imaginary numbers are misunderstood and taken literal meaning by a naive learner. So rather than grasping the context in a comprehensive manner he/she may repudiate the process of learning and not grasp the hidden essence of the pure logic in complex numbers.

In this paper authors aims to explain the concept of complex analysis to the naive learners of complex system especially engineering graduates via various examples of daily life, some riddles to be solved via complex analysis to incur attentiveness and increase the thought process of students for complex analysis and then exposure to methods of solving higher order differential equations problems in academic curriculum of First Year Bachelor of Engineering of Mumbai University via complex analysis for making an incline towards the thought process of seeing and solving problems in a complex numerical approach. For knowing the condition of knowledge of Complex Numbers of students who are studying in graduate courses, a survey was conducted via Google forms. *Crowd Analysed: First Year Engineering Students of Thakur College of Engineering and Technology, Mumbai, India* Students Surveyed 75, Questions were asked based on learning process of students and to test the limit of their knowledge. Results were analysed and are shown in statistical form below

When you were firstly introduced to complex numbers and their analysis?

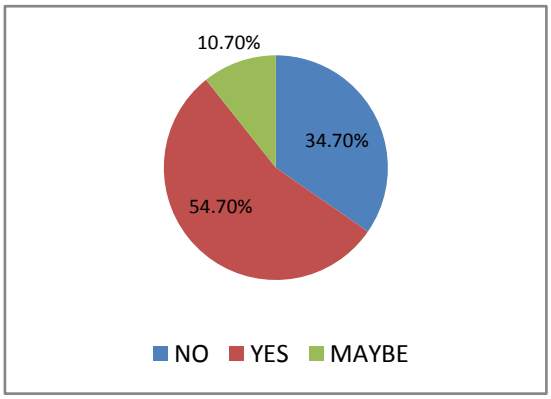


Why do you think complex numbers are needed in math?

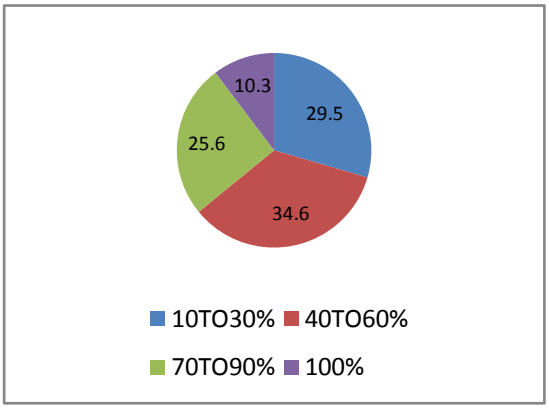


Based on your personal experience, did you while learning from the instructor who first introduced you to complex

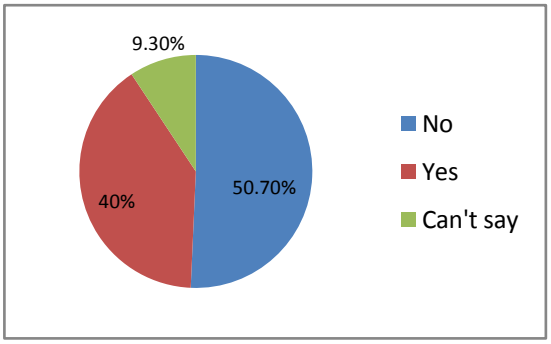
numbers were you exposed to the topic as a topic difficult to understand and apply?



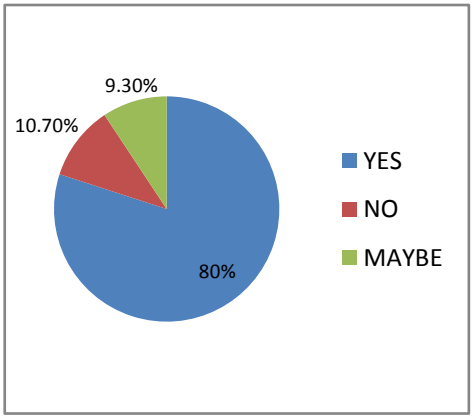
On the scale given, rank your knowledge and attention given by you to complex no. knowledge Apart from identities of complex analysis. Knowledge about their concept, need and unending application.



Do you have any idea that there is physical significance can be related to complex numbers just like real numbers.



Would you like to learn about complex numbers more by an real life application based approach?



II. Exposure to Complex Number System

Introduction to complex numbers can be given by following example for relating physical significance of i=$\sqrt{-1}$ in daily life common problems.

"If I am a teacher and there are *n* number of students in a group and I have called half of them, then how many of them will come to me?"

Mainly the answer that will come out of the naive learners who have not yet known about the complex systems will give the answer as $k = {}^{n}/_{2}$ …. (1), where *k* is number of students who come to the teacher. Putting n=2 in (1), we come to know that one student will come to the teacher. But putting *n* as odd numbers, number of students which will come to the teacher will be

For $n=3$ $k=1.5$
$n=5$ $k=2.5$
$n=7$ $k=3.5$

Such valves of *k* do not have any physical significance as 2.5 students do not exist. It doesn't mean that for one student will be cut into half for sake of teaches instruction. So, there is something wrong with either the equation (1) and the outputs from it or the inputs we are giving to the equation.

Clearly, the inputs we are giving are purely logical as we are giving whole number inputs to the equation which symbolize one complete human, but the outputs we are getting in form of real numbers do not have physical significance. So real number system does not have physically valid solution to our problem. So, we need to change the equation, also we need to extend our number system for having a solution to this problem.

This is the time when we introduce a number which will have such a valve by which we can distinguish between a physically significant and insignificant solution. Assume now i=$\sqrt{-1}$ be that number. Now another equation can be generated for solution.

$$k = \frac{i^n.n}{2} \ldots\ldots (2)$$

For *n=1* $k=i/2$
n=2 *k=-1*
n=3 $k=-3i/2$
n=4 *k=2*
n=5 $k=-5i/2$
n=6 *k=-3*

As we assigned physical insignificance to terms containing *i*, so for n=1, 3, 5 and odd numbers input for *n* the equation gives physically insignificant answer. Specialty of this i=$\sqrt{-1}$ is that it will not affect the logical result what we want that is number of student who come to teacher. Here we are just reflecting the ideas that led to formation of *i* an imaginary number so just for convenience negative sign can be neglected and taking only numerical values we reach to desired result. For mathematicians who intend to get exact solutions with positive sign can refer to *Mandelbrot set for complex number* which acts like a modulus or sign changing function for complex numbers.

So, in above problem the idea and necessity of complex analysis is introduced and students can be explained about complex numbers as they are an extension to real number system for the problems real numbers are not valid solution. So *i* can be regarded as an entity which can tell us about the physical significance of a solution or equation.

To keep clear about the phenomenon of distinguishable significant and insignificant results in complex approach, one more example can be related for clear understanding by showing application complex analysis in other parts of fundamental science.

Significance of Complex Analysis in Quantum Physics: The eminent Time Dependent Schrödinger Wave equation of quantum mechanics is also introduced to students in their physics curriculum. It is analyzing the physical contents of its solutions that form the basis of that branch of quantum mechanics known as wave mechanics. It signifies the allowed energy levels of quantum mechanical systems such as atoms. The associated wave function gives the probability of finding the particle at a certain position.**ref**

$$-\frac{\hbar}{2m}\frac{\partial^2\psi}{\partial x^2}+V(x)\psi=i\hbar\frac{\partial\psi}{\partial t}\quad\ldots.(3)$$

The imaginary number *i* in above equation signifies the importance of Heisenberg uncertainty principle for quantum particles. Heisenberg's reciprocal relation between position measurement error and momentum disturbance is rigorously proven under the assumption that those error and disturbance are independent of the state of the measured object.**ref.** If at a certain wave function, this equation is applied and the *i* term sustain then it signifies the momentum disturbance, at that portion of wave is so high that the particle cannot be dynamically present there. So here also the property of *i* to distinguish between physical significance and insignificance can be clearly seen.

III. RIDDLES TO INCUR THE THOUGHT PROCESS

At the end of classes on complex analysis, riddles can be provided to students in increase students thought process and for analyzing their understanding of topic. A riddle to analyze the skill of Geometric interpretation of complex numbers for complementary conjugate manipulations. "How do you trap a Lion using complex numbers identities?"

Let z=a+ib. Build a cage in the shape of the unit circle |z| = 1. Get inside the cage. Make sure that the lion is outside the cage. Apply the function $1/z$ to the whole plane. The lion is now inside the cage, and you are outside it. But there's a lot of other stuff inside the cage too. Also, don't stand too close to z = 0 when you apply $1/z$

IV. SOLVING DAMPED OSCILLATOR PROBLEMBYCOMPLEX ANALYSIS

In Semester II of First Year Engineering Course of Mumbai University there is a chapter Linear Differential Equation with constant coefficient and Variable Coefficient of Higher Order. The problem posed in the chapter is

"Derive the condition for over damping, critical damping and under damping of Damped Oscillations which are governed by following relation

$$\frac{d^2x}{dt^2}+\gamma\frac{dx}{dt}+\frac{k}{m}x=0$$

Where x displacement of particle from origin t time taken by the particle γdrag force constant. The students have solved the problem in calculus and algebra-based approach which require tedious manipulations. But all those can be written in few lines if problems are solved by complex analysis.

Initial steps of solving by both approach is same that is assumption of a suitable solution of the differential equation.

Assume $x(t)=A\cos(\alpha t)+B\sin(\alpha t)$ as we know output oscillations will be in form of sinusoidal waveform. A and B are chosen to match the initial conditions. For example let $v(0)=(dx/dt)|_{t=0}=0$ and $x(0)=x_0$

Then $A=x_0$ and $B=0$ then it may be written as

$$x(t)=A\cos(\alpha t+\phi_0)$$

With initial conditions chosen above $A=x_0$ and $\phi_0=0$ then there is another way in which we can write

$$x(t)=\mathrm{Re}[\tilde{x}(t)]$$

Where $\tilde{x}(t)=Ae^{i(\alpha t+\phi_0)}$

Where $\alpha=\sqrt{\frac{k}{m}}$

$\mathrm{Re}[\tilde{x}(t)]$ Means real part of $\tilde{x}(t) \cdot \tilde{x}(t)$ Works in damped condition.

$$\frac{d\tilde{x}}{dt} = i\alpha A e^{i(\alpha t+\phi_0)}$$
$$= i\alpha \tilde{x}(t)$$

Then $\frac{d^2\tilde{x}}{dt^2} = -\alpha^2 A e^{i(\alpha t+\phi_0)}$
$$= -\alpha^2 \tilde{x}(t)$$

Each derivative brings down the power αi. When we put these values in differential equation

$$\frac{d^2\tilde{x}}{dt^2} + \gamma\frac{d\tilde{x}}{dt} + \frac{k}{m}\tilde{x} = 0$$
$$\tilde{x}(t)(-\alpha^2 + i\gamma\alpha + \frac{k}{m}) = 0$$
$$-\alpha^2 + i\gamma\alpha + \frac{k}{m} = 0$$

By simple quadratic equation

$$\alpha = i\frac{\gamma}{2} \pm \sqrt{\frac{k}{m} - \frac{\gamma^2}{4}}$$

When we put value of α

$$e^{i\alpha t} = e^{-\alpha\frac{t}{2}} e^{\pm i\sqrt{\frac{k}{m}-\frac{\gamma^2}{4}}t} = e^{-\alpha\frac{t}{2}} e^{\pm i\omega t}$$

Where $\omega = \sqrt{\frac{k}{m} - \frac{\gamma^2}{4}}$

The ± up in the exponential means that either the plus or the minus solution is valid. Indeed, since the real part of $e^{i\omega t}$ is identical to the real part of $e^{-i\omega t}$ there's no useful distinction between the two solutions. We might as well just pick one and use it to get final solution. It is thus simple to make the final solution for the damped harmonic oscillator:

$$\tilde{x}(t) = Ae^{-\gamma\frac{t}{2}} e^{i(\omega t+\phi_0)}$$

So that $x(t) = \mathrm{Re}[\tilde{x}(t)]$ is given by

$$x(t) = Ae^{-\gamma\frac{t}{2}} \cos(\omega t + \phi_0)$$

Where $\omega = \sqrt{\frac{k}{m} - \frac{\gamma^2}{4}}$

V. CONCLUSION

"If this subject has hitherto been considered from the wrong viewpoint and thus enveloped in mystery and surrounded by darkness, it is largely an unsuitable terminology which should be blamed. Had +1, -1 and $\sqrt{-1}$, instead of being called positive, negative and imaginary (or worse still, impossible) unity, been given the names say, of direct, inverse and lateral unity, there would hardly have been any scope for such obscurity."

Were the words of Carl Friedrich Gauss (1777-1855), who gave the first ideas on geometric interpretations of complex numbers. He also thought that if procured in a virtuous way, complex numbers can provide captative results

Every problem which can include mathematical abstractions can be solved by using complex number approach. Complex number system when introduced to student in a comprehensive and conceptual way can help them not only in academics but also in increasing their problem solving skills as they can see the physical world around them in a new approach obtained from this brilliant complex number system.

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The Estimation of Flowing Current in RLC Circuit Using Higher Order Linear Differential Equations with Constant Coefficients

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***Abstract*— This paper revolves around the discussion made on the higher order linear differential equation, particularly second order differential equation. There are many real-life problems which can lead to second order linear differential equations. This discussion is carried over by making an attempt solving a differential equation for estimating the value of current in RLC circuit. This also shows a relation between Basic Electrical Engineering and Applied Mathematics. The circuit consists of a resistance (R), capacitance (C) and an inductance (L), connected in series where R, L and C are constants. Firstly, the auxiliary equation is considered and the complimentary function (CF) is obtained. There are 4 cases to be considered in CF namely; Real and distinct, Real and repeated, Complex distinct and Complex Repeated roots. After determining the CF, the Particular Integral (PI) is evaluated by observing the nature of right hand side of the differential equation. Then the complete solution is the sum of CF and PI.**

***Keywords*— RLC circuit, Higher order linear differential equation with constant coefficients, Characteristic equation, Complementary Function (CF), Particular Integral (PI)**

I. INTRODUCTION

The solution of nth order linear differential equations with constant coefficients is obtained in two parts namely Complementary Function (CF) and Particular Integral (PI). For an n^{th} order homogeneous linear equation with constant coefficients: $\frac{d^n y}{dx^n}+P_1\frac{d^{n-1}y}{dx^{n-1}}+P_2\frac{d^{n-2}y}{dx^{n-2}}+\ldots\ldots+P_n y=X$

Where P_1, P_2 ……., Pn are constants and X is a function of x alone is known as linear differential equation with constant coefficients. Thus, if y is a differential function of X then D(y) = $\frac{d}{dx}(y)$ which reduces the above equation into

$D^n y+P_1D^{n-1}y+P_2D^{n-2}y+\ldots\ldots+P_n y=X$ …… (1)

which is equivalent to f(D) y = 0

where f(D) = $D^n+P_1D^{n-1}+P_2D^{n-2}+\ldots\ldots+P_n$ is algebraic polynomial of degree n. The complementary function is obtained by solving the (characteristic) auxillary equation f(D) = 0 and depending upon the nature of roots of auxillary equation complementary function will be determined as follows:

Case 1: when roots are real & distinct

If auxiliary equations contains distinct roots say $m_1, m_2, \ldots\ldots, m_n$ then

C.F. = $c_1e^{m_1x}+c_2e^{m_2x}+c_3e^{m_3x}\ldots\ldots+c_ne^{m_nx}$

Case 2: when roots are real & repeated

If an auxiliary equation contains first real root repeated twice and rest of the roots are real and distinct then

C.F. = $(c_1+c_2x)e^{m_1x}+c_3e^{m_3x}\ldots\ldots+c_ne^{m_nx}$

Case 3: when roots are complex and distinct

If equation contains roots $\alpha\pm i\beta$, then

C.F. = $e^{\alpha x}\left[c_1\cos(\beta x)+c_2\sin(\beta x)\right]$

Case 4: when roots are complex and repeated

If equation contains roots $\alpha\pm i\beta$ repeated twice, then

C.F. = $e^{\alpha x}\left[(c_1+c_2x)\cos(\beta x)+(c_3+c_4x)\sin(\beta x)\right]$

Now to find the particular integral (PI) of equation (1) when X is in the form of sin(ax) or cos(ax);

P.I. = $\frac{1}{f(D)}X=\frac{1}{f(D)}\sin(ax)=\frac{1}{g(D^2)}\sin(ax)$

then we replace D^2 by - a^2 which gives

$PI=\frac{1}{g(-a^2)}\sin(ax)$ provided $g(-a^2)\neq 0$

If $g(-a^2)=0$ then

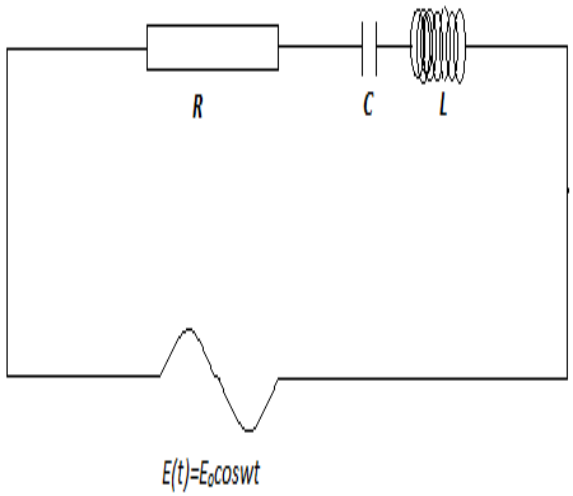
$PI=x\frac{1}{g'(-a^2)}\sin(ax)$ provided $g'(-a^2)\neq 0$

Further if $g'(-a^2)=0$ then

$PI=x^2\frac{1}{g''(-a^2)}\sin(ax)$ provided $g''(-a^2)\neq 0$

and so on.

II. FORMULATION OF THE PROBLEM



Consider a single closed circuit consisting of a resistance (R), capacitance (C) and an inductance (L), connected in series where R, L and C are constants. The current flowing in the RLC circuit is given by the differential equation

$$L\frac{d^2i}{dt^2}+R\frac{di}{dt}+\frac{1}{C}i=E_0\cos(\omega t)$$

On solving this differential equation one can get the value of a flowing current in the circuit. The equation of single closed circuit gives second order linear differential equation with constant coefficients which can be solved by finding complementary function and particular integral. The auxillary equation is given by $D^2+\frac{R}{L}D+\frac{1}{LC}=0$

On solving we get $D=\frac{-\frac{R}{L}\pm\sqrt{\left(\frac{R}{L}\right)^2-\frac{4}{LC}}}{2}$

Depending on the value of $\left(\frac{R}{L}\right)^2-\frac{4}{LC}$,

there are three cases to solve:

Case(i): Real and Distinct roots for which $\left(\left(\frac{R}{L}\right)^2-\frac{4}{LC}\right)>0;$

Case(ii): Real and Repeated roots for which $\left(\left(\frac{R}{L}\right)^2-\frac{4}{LC}\right)=0;$

Case(iii): Complex roots for which $\left(\left(\frac{R}{L}\right)^2-\frac{4}{LC}\right)<0$

Therefore there will be three cases of C.F.,

Case(i): $CF=C_1e^{m_1t}+C_2e^{m_2t}$

$$=C_1e^{\left[\frac{\frac{R}{L}-\sqrt{\left(\frac{R}{L}\right)^2-\frac{4}{LC}}}{2}\right]t}+C_2e^{\left[\frac{\frac{R}{L}+\sqrt{\left(\frac{R}{L}\right)^2-\frac{4}{LC}}}{2}\right]t}$$

Case(ii): $CF=(C_1+C_2t)e^{mt}$

$$=(C_1+C_2t)e^{\left[\frac{\frac{R}{L}\pm\sqrt{\left(\frac{R}{L}\right)^2-\frac{4}{LC}}}{2}\right]t}$$

Case(iii): $CF=e^{\alpha t}[C_1\cos(\beta t)+C_2\sin(\beta t)]$

$$=e^{\left(-\frac{R}{L}\right)t}\left[C_1\cos\left(\sqrt{\frac{4}{LC}-\left(\frac{R}{L}\right)^2}\right)t+C_2\sin\left(\sqrt{\frac{4}{LC}-\left(\frac{R}{L}\right)^2}\right)t\right]$$

Now particular integral is given by:

$$PI=\frac{1}{\left(D^2+\frac{R}{L}D+\frac{1}{LC}\right)}\frac{E_0}{L}\cos(\omega t)$$

$$=\frac{E_0}{L}\frac{1}{\left(-\omega^2+\frac{R}{L}D+\frac{1}{LC}\right)}\cos(\omega t)\qquad \text{replacing } D^2 \text{ by } -\omega^2$$

$$=\frac{E_0}{L}\frac{1}{\left(\frac{1-LC\omega^2}{LC}\right)+\frac{R}{L}D}\cos(\omega t)$$

$$=\frac{E_0}{L}\frac{1}{\left[\left(\frac{1-LC\omega^2}{LC}\right)+\frac{R}{L}D\right]}\frac{\left[\left(\frac{1-LC\omega^2}{LC}\right)-\frac{R}{L}D\right]}{\left[\left(\frac{1-LC\omega^2}{LC}\right)-\frac{R}{L}D\right]}\cos(\omega t)$$

$$=\frac{E_0}{L}\frac{\left[\left(\frac{1-LC\omega^2}{LC}\right)-\frac{R}{L}D\right]}{\left[\left(\frac{1-LC\omega^2}{LC}\right)^2-\frac{R^2}{L^2}D^2\right]}\cos(\omega t)$$

$$= \frac{E_0}{L} \frac{\left[\left(\frac{1-LC\omega^2}{LC}\right) - \frac{R}{L}D\right]}{\left[\left(\frac{1-LC\omega^2}{LC}\right)^2 - \frac{R^2}{L^2}(-\omega)^2\right]} \cos(\omega t) \quad \text{...replacing } D^2 \text{ by } -\omega^2$$

$$= \frac{E_0}{L^2} \frac{\left[\left(\frac{1-LC\omega^2}{C}\right) - RD\right]}{\left[\left(\frac{1-LC\omega^2}{LC}\right)^2 + \frac{R^2\omega^2}{L^2}\right]} \cos(\omega t)$$

$$= E_0 \frac{\left[\left(\frac{1-LC\omega^2}{C}\right) - RD\right]}{\left[\left(\frac{1-LC\omega^2}{C}\right)^2 + R^2\omega^2\right]} \cos(\omega t)$$

$$= E_0 \frac{\left[\left(\frac{1-LC\omega^2}{C}\right)\cos(\omega t) - RD\{\cos(\omega t)\}\right]}{\left[\left(\frac{1-LC\omega^2}{C}\right)^2 + R^2\omega^2\right]}$$

$$= E_0 \frac{\left[\left(\frac{1-LC\omega^2}{C}\right)\cos(\omega t) + R\omega\sin(\omega t)\right]}{\left[\left(\frac{1-LC\omega^2}{C}\right)^2 + R^2\omega^2\right]}$$

$$PI = E_0 \frac{\left[\sin\theta\cos(\omega t) + \cos\theta\sin(\omega t)\right]}{\left[(\sin\theta)^2 + (\cos\theta)^2\right]}$$

$$= E_0 \sin(\theta+\omega t)$$

where $\frac{1-LC\omega^2}{C} = \sin\theta$ and $R\omega = \cos\theta$

gives $\theta = \tan^{-1}\left(\frac{1-LC\omega^2}{R\omega C}\right)$

Therefore the complete solution of the RLC circuit is given by adding complementary function and particular integral which gives i = CF + PI in the following three cases:

Case(i): Real and Distinct roots for which $\left(\left(\frac{R}{L}\right)^2 - \frac{4}{LC}\right) > 0;$

$$i = C_1 e^{\left[\frac{\frac{R}{L} - \sqrt{\left(\frac{R}{L}\right)^2 - \frac{4}{LC}}}{2}\right]t} + C_2 e^{\left[\frac{\frac{R}{L} + \sqrt{\left(\frac{R}{L}\right)^2 - \frac{4}{LC}}}{2}\right]t} + E_0 \sin(\theta+\omega t)$$

Case(ii): Real and Repeated roots for which $\left(\left(\frac{R}{L}\right)^2 - \frac{4}{LC}\right) = 0;$

$$i = (C_1 + C_2 t) e^{\left[\frac{\frac{R}{L} \pm \sqrt{\left(\frac{R}{L}\right)^2 - \frac{4}{LC}}}{2}\right]t} + E_0 \sin(\theta+\omega t)$$

Case(iii): Complex roots for which $\left(\left(\frac{R}{L}\right)^2 - \frac{4}{LC}\right) < 0$

$$i = e^{\left(-\frac{R}{L}\right)t}\left[C_1 \cos\left(\sqrt{\frac{4}{LC} - \left(\frac{R}{L}\right)^2}\right)t + C_2 \sin\left(\sqrt{\frac{4}{LC} - \left(\frac{R}{L}\right)^2}\right)t\right] + E_0 \sin(\theta+\omega t)$$

where $\theta = \tan^{-1}\left(\frac{1-LC\omega^2}{R\omega C}\right)$

III. CONCLUSION

This study focuses on the review and development of the techniques for solving higher order linear ordinary differential equations with constant coefficients. This solution could be applicable to the development of special solutions of engineering models for various types of real problems. Mathematicians and scientists interested in the recent results and methods in the theory and applications of ordinary differential equations will find the paper useful.

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Disaster Resistant Buildings: The future of Civil Engineering

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Abstract— **This paper presents an introduction towards the current conditions and implication of the study of seismology particularly, in the construction of buildings and the loss of lives and damages experienced during the disasters. Zones like seismic micro zonation, geotechnical issues, and probabilistic evaluation of disasters, hazard estimation, and global implication scheme, seismic vulnerability assessment are introduced and addressed in this paper.The risk of disaster is well versed by all as it costs a lot of capital and humanitarian loss, and sets back the economic growth of a country. Hence at this extent of life it's the need of the hour to reduce the risk of disasters. The most essential part is to change the perception of post-disaster reaction to pre-disaster action [1]. And for that there would be a need of science and technology, understanding the intensity of its urgent need and capacity building features. There should be advanced and effective knowledge about the field of seismology and earthquake engineering. In the following paper, the comparative study on providing seismic retrofitting to unreinforced masonry walled structures (URMWS) is done. Earthquakes don't kill people it's the unsafe structures that do. The following points are giving light to the future of civil engineering and most importantly to reduce the damage of disasters for non-engineered buildings and to save precious lives.**

Keywords— Earthquake, disaster, non-engineered buildings, planning.solution

I. INTRODUCTION

Hence, establishing earthquake resistant regulations and monitoring their implementations is vital. To match the intensity and frequency of the disaster, a building should be highly ductile, and be adequately strong to stand still on any ground motions. It is the duty and responsibility of the architect to plan an earthquake proof structure if the site falls in to an earthquake prone area, the structural engineer must do and perform a proper structural analysis on the site and on the designing software like Staad.pro where there is a possibility to identify the defects in the structure, the geotechnical engineer must do and submit a proper analysis of the soil at the site so that it's properties can be fed into the software to check its ability to absorb the shocks, Construction engineer and contractor must follow all guidelines for building the structure and also supervise the workers and inform them about the guidelines so as no mistakes are done and the environmental engineer must do a survey of the site and inform the architect about nearby industries . Well, in the following paper the study is being conducted on unreinforced masonry walls structure which hardly any contractors or engineers follow when they are given the job to construct the structure .Also most rural people build the structure by themselves

Effects on structures:

Shaking of ground:

Inertia force: the contents of any superstructure or any non – engineered structure tend to shake in an irregular pattern due to inertia forces possessed by the masses. This process is more complicated then it seems to be.

Seismic Load or Lateral Load: Upliftment of vertical load is seen on slabs, beams, cantilevers, and columns due to vertical vibrations, which may cause damage and also is an irreversible change.

Conditions of the site of construction: The buildings developed on solid rock and firm soil are way better in its performance and sustainability as compared to soft ground.(example: 1985,1957: Mexico earthquake, 1976 Tangshan Earthquake, China,1967 Kenya Earthquake, India and the 1980 North Yemen Earthquake.)

Potential ground acceleration (PGA), Potential ground velocity(PGV), Potential ground displacement (PGD), seismicity, earthquake potential based on the historical and instrumental data, regional and geotectonic, crustal structure, geohydrology, observed soil-liquefactions, shear wave velocity, site response are few parameters which are constructive and should be considered while constructing a building.

The basement topography of any building is the base of deciding whether a building would collapse or not in disasters, as it showcases the soil overburden thickness, which is connected to the site-specific hazard depicting the contrasts which exist in the geographical properties between the basement and soil deposits.

Proposal of Earthquake resistant design

Planning and layout of the building; General design of the structural framing system; Quality of structural entities; Tightened connections between the roofs and the walls to prevent separation; Special strengthening could be provided by avoiding soft soil field for construction; Indigenous design and fabrication test are also helpful; Novel earthquake resistant features for masonry buildings; Shock table test facility Containment reinforcements: Placing vertical reinforcement either on the surface or close to the surface and surrounding the wall. It doesn't increase the lateral strength of the wall but it permits large ductile deformation which avoids total collapse and also acts as an energy absorbing element.

II. CONSTRUCTION

For construction of any structure there are some steps to be followed which are:

Site Analysis

Planning of the structure, Cost estimation, Execution of the plan

Site Analysis:

Site Analysis include the study of the site, the area calculation, study of the vicinity, study of the soil beneath and the study of the area.

Planning of the structure

Planning of the structure include the planning of the number of floors to be build, for safety reasons a load bearing structure must not be build more than 1 story, the structures higher than 1 story are very prone to earthquake and also collapse early if there are any machinery industries nearby the site of construction.

Cost Estimation

Depending upon the area of construction and the number of floors to be built, the cost of construction usually goes high leading to use cheap and bad quality materials for construction. Therefore, the construction must be only perform with good materials like red bricks made in kiln and not on any local site, the cement must be new or maximum 1 year old, as the cement manufactured gets old without usage it's binding properties get affected, the sand must be wet before and during the construction.

Execution of the plan

The workers must do proper leveling of the bricks as a little deformation in leveling weakens the structure. There must be a plaster of around 10 to 20 mm thick to save the structure from weathering and also keep it bind during the earthquake. After an earthquake the structure has to be retrofitted in order to keep it safe for residing purposes.

III. METHODS FOR RETROFITING UMWS

Surface Treatment

Surface treatment is a common method which is highly developed through experiencing. This approach of retrofitting covers the surface of masonry walls and sometimes it is not suitable for historical structures with architectural values. Recent methods are categorized below [7]:

Bamboo – Band Retrofitting Technique

Bamboo – band retrofitting is simple enough to be understood and applied by layman without any prior special expertise. In this method a bamboo mesh is created and is applied on the sides in and out of the structure. It is then weaved at the corners using polypropylene strings. Then both the in and out meshes are connected by drilling the hole in the wall, the holes are drilled at a distance of 200 mm apart. Research and experiments have shown that the structures on which this method is applied withstand as twice as energy as compared to the structures without. It's low cost and no skills are required to do so.

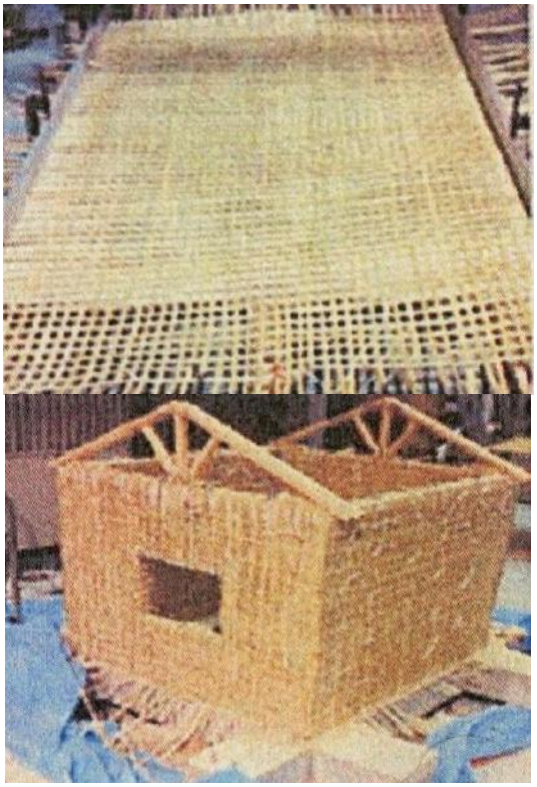

Fig.1. Preparing Bamboo-band mesh and application [7].

Shotcrete

Shotcreting is a process in which a steel frame mesh is connected on the outside of the structure and is then plastered up to a thickness of 60 mm using high energy pumps which don't leave space for air voids. Doing shotcreting add considerable weight on the structure which puts more load on the foundation of the structure.

Fig.2. Applying Shotcrete

Post Tensioning

Post Tensioning is a process to be done during the construction, in this method the wall is compressed by applying pressure to the freshly placed bricks which is dried and placed properly and whose cement is dried and fixed properly. This method has shown improvement in the lateral strength of URMWS by a factor of 2. It has shown improved flexural strength and good performance of the structure in long run and during the earthquake. It is expensive and also requires skilled labour.

Fig.3. Applying Post - Tensioning Method

Confinement

In this method, the columns, intersection and the border of the openings are confined. In some countries like Iran, the confinement is done alone on the walls. It is seen that it improves the material properties and increases lateral resistance by a factor of 1.2 and for higher aspect ratio walls lateral resistance is increased by factor of 1.5.

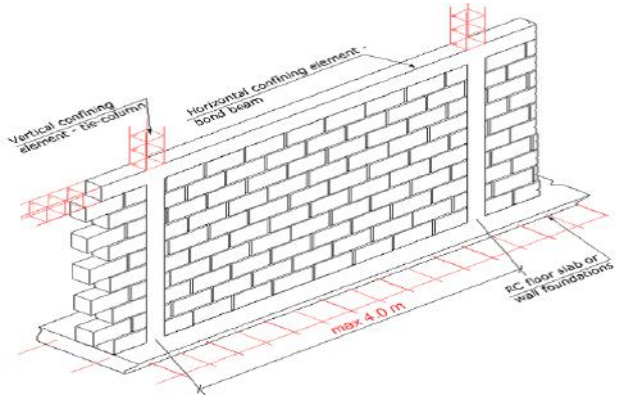

Fig.4. Confinement of masonry brick walls

IV. EFFECTS AND MEASURES

Factors influencing damage:

Building configuration, Opening size, Stiffness distribution,, Ductility, Strength of Buildings, Foundations, Construction quality.

Measures taken by countries till now:

In various countries, there are responsibilities undertaken by the civil engineers and various scientists in the following concern. For example Cannon Beach, city hall design features concrete stilts reinforced with steel cables supporting a 900-square-meter building. Beams and concrete pilings at the base of the building will help prevent the powerful waves from eroding the foundation. The Cannon Beach city hall design features concrete stilts reinforced with steel cables supporting a 900-square-meter building. Beams and concrete pilings at the base of the building will help prevent the powerful waves from eroding the foundation [2]. Seismic micro zonation is a term used for dividing areas into different potentials hazardous earthquake effects, detecting their seismic behavior for structural designs and other engineering design planning. The role of geotechnical and geological study is very important in micro zonation as it provides an overview for planning city infrastructure, which would analyze, prevent, regulate and control natural hazards. The government of India has initiated 63 cities under micro zonation as it's a primary step which helps in reducing the effects of a disaster.

Japan is a very well-known country for its implementation on disasters as it's an earthquake and tsunami prone region. But still, it hasn't progressed to any extent and is taking primary measures of disaster management instead of advancing their engineered structures for the same [6]. Taiwan has a history of earthquakes associated with it. Recently a 5.7-magnitude tremor with a high-intensity level of 6 was felt on 7 February 2018, where reports said that majorly the injured were due to the collapse of buildings as it was leaning on one side dramatically [7]. Wherein engineers have tried their best to secure buildings in this earthquake-prone region by using steel and concrete blocks but it hasn't given any positive results as their efforts are getting worsened and complicated due to the falling tremors and rainfall. Malfunctions in the creation of buildings have raised questions over the contractors as well as engineers, as tin cans were spotted being used as filler in some of the concrete pillars, although some construction experts have said that may not have caused any structural problems.

V. CONCLUSION

Build structures with reinforced concrete instead of wood, even though wood construction is more resilient to earthquakes. RCC is highly ductile and have enough strength and are recommended for vertical evacuation structures. Structures should be designed in a way to let the water flow in any case of floods or tsunami. Less damage would be caused if the water flows underneath the structure. Redundant design of structures would lead to partial failure without progressive or harsh collapse [4]. Leaving vegetation and reefs intact is the best way to strengthen the connection. Design structural connectors that can absorb stress. This is an emergent need as it is a grave issue for urban states across the globes. The compilation of data pertaining to geological, geophysical, geotechnical and seismological aspects comprises a major part of the venture, which necessitates a consortium of several public and private organizations engaged in diversified but related domains. The efforts of our understanding towards the disasters and related effects are still going on process and therefore, the framework and tools used for reducing the risk of disasters need to be continuously updated in the light of ongoing advancements as well as experienced gained due to these disasters Active programs related to advancements in infrastructural improvements and response planning can lead to reduction if hazards. These measures should be taken into consideration, also the future of sustainability and better living lay in the hand of us and as an aspiring civil engineer, I oath to take further advancements and research into reality for the sake of humanity and progress of science and technology.

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Green Building: The Future of Sustainable Development

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***Abstract*— Green Building is swiftly becoming a powerful momentum in the construction industry after identifying many negative environmental concerns and problems and likely social and economic convenience. There are little improvements in the sustainability of buildings or in the energy regulation of their design and construction. In recent years, many organizations have been coming in order to establish, maintain, observe from planning to design for a sustainable building considering environmental responsible and resource-efficient. There are many such non-profit organizations like LEED, WGBC, and GRIHA etc. Therefore, the execution of green building is influential because it has become an increasing important feature of economic activities regarding methods of production.**

Keywords— Green building, Energy Efficiency, LEED, WGBC, GRIHA.

I. INTRODUCTION

Green building is the operation of producing structures and utilizing processes that are environmentally accountable and resource-efficient in every portion of a building's life-cycle from preparation to design, construction, operation, continuation and destruction. Fossil fuels are getting exhausted at a quicker rate, threatening toxins are multiplying at an alarming rate in the atmosphere and the world is becoming a more toilsome place to live in. This is not something our future generations should inherit from us. There is a noticeable trend across the world. The population growth rate is lesser than the growth rate in total energy consumption. The expected population growth rate in India is 1.3% whereas the energy consumption is expected to grow at 4.3%. There are notable economic, environmental and social effects of the construction industry on the civilization. These effects are mainly seen during the lifecycle of the constructed structures. The consequences of the construction activities comprise of waste disposition during the construction project, noise pollution and water pollution, dust, traffic obstruction etc. Also, according to the world business council for sustainable development, a building accounts for 40% of overall energy intake. Apart from the consumption of energy, the buildings create Green House Gas emissions (GHG's) which are accountable for the global warming. The world is in desperate need of a sustainable and perceptive development as this problem of global warming and pollution is quickly increasing all over the globe. Hence the concept of a green building was introduced. Green buildings are those buildings that support to the principle of diligent handling of natural resources. Those means causing very little interference in the environment as possible, using eco-friendly materials, using low working energy, utilize renewable sources of energy to fulfill its needs, follow high-quality and longevity as guidelines for construction and lastly must be economically feasible. Green buildings are the only solution to the current trend of construction to minimize the excessive consumption of resources due to buildings. Green Buildings are planned in such a way so as to lessen the net impact on physical health and the surroundings by handling water, energy and other resources efficiently and thus reducing pollution, waste and environmental deterioration atmosphere and the world is becoming a more toilsome place to live in. This is not something our future generations should inherit from us. There is a noticeable trend across the world. The population growth rate is lesser than the growth rate in total energy consumption. The expected population growth rate in India is 1.3% whereas the energy consumption is expected to grow at 4.3%. There are notable economic, environmental and social effects of the construction industry on the civilization. These effects are mainly seen during the lifecycle of the constructed structures. The consequences of the construction activities comprise of waste disposition during the construction project, noise pollution and water pollution, dust, traffic obstruction etc. Also, according to the world business council for sustainable development, a building accounts for 40% of overall energy intake. Apart from the consumption of energy, the buildings create Green House Gas emissions (GHG's) which are accountable for the global warming. The world is in desperate need of a sustainable and perceptive development as this problem of global warming and pollution is quickly increasing all over the globe. Hence the concept of a green building was introduced. Green buildings are those buildings that support to the principle of diligent handling of natural resources. Those Green Building as a sustainable prototype can protect the ecosystem and natural habitat. It helps to improve the water and air standards as it manages the resources in an efficient way. It also helps to minimize the waste streams and provides a better way to cope with it. Green Building preserves the depleting natural resources which other buildings fail to do by using non-destructive and recycled/recyclable materials for construction. It also provides a space efficient model by minimally interfering with the landscapes and site surroundings. It minimizes the building footprints to lower the effect on environment. Green Building model benefits economically by refining the inhabitant productivity. It also reduces the utility cost by providing resources such as electricity, water, etc. at a cheaper rate. It also generates, broadens and shapes markets for green products and services. Looking though the social aspects, Green Building enhances the inhabitant comfort and health. It improves the artistic qualities enriching the design of the building. This model reduces strains on the local infrastructure. In general, it enhances the overall quality of life. To create a sustainable model that benefits the environment and us socially as well as

economically, solar panels are used. This basic idea benefits us tremendously by using renewable source of energy i.e. sunlight to generate electricity and avoids the exhaustion of non-renewable sources of energy. It is cost efficient as well as sustainable which helps us socially.

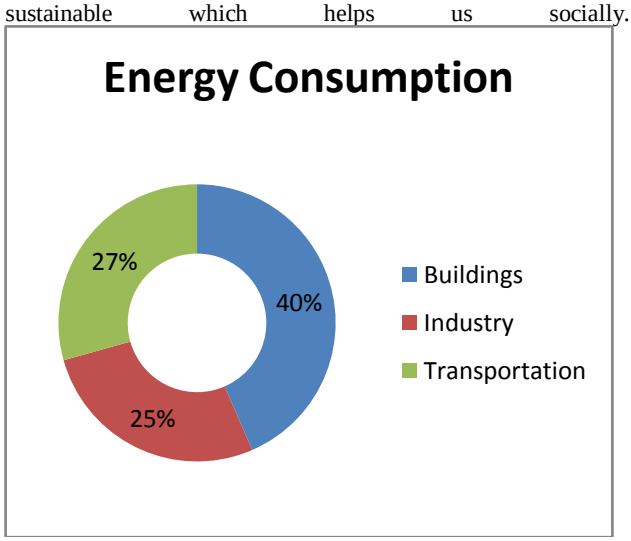

Fig:-1 Energy Consumption

I. Green Building As a Sustainable Prototype

Buildings have a huge influence on the economy, human health and the surroundings. The successful approval of green buildings can advance both the environmental, economic and social performance of the society. One of the most substantial green building global network is World Green Building Council (WGBC). The WGBC was initiated in November 1999 in California, USA and afterwards that was formerly established in 2002 by united assembly. It's a non-profit organization that has pledged to attain the following goals by 2050 that is: Curbing global temperature rise to 2 degree Celsius. Minimizing the building and construction region's CO_2 discharge by 84gigatonnes. Making sure that all buildings have net zero emissions. The WGBC motivates the member countries to set their own green building evaluation guidelines. In India, more than 3456 buildings are registered with IGBC i.e. Indian Green Building Council, out of which 754 buildings are confirmed and fully functional. IGBC was established by the Confederation of Indian Industry (CII) in 2001. The group is based out of the CII Green Business Centre, Hyderabad which is India's first platinum green building. The insight of the council is to warrant a 'Sustainable built environment' for everyone. IGBC is the country's leading body for green building attestation and associated services. Indian Green Building Council (IGBC) has established numerous other products for rating of dissimilar typologies of buildings incorporating homes, factories, midst others. LEED (Leadership in Energy & Environmental Design)was founded and designed in the US in 1998 as a consent-based building rating system based on the utilization of existing building technology. The rating system labels specific environmental building related influences using an entire building environmental performance strategy. The Indian Green Building Council has habituated LEED system and has instigated LEED Indian adaptation for rating of new construction. GRIHA (Green Rating for Integrated Habitat Assessment)is the nationwide rating scheme of India. It assesses environmental performance of buildings holistically over its complete lifecycle, thereby issuing conclusive standards for what comprise a green building. GRIHA has been developed by TERI (The Energy and Research Institute, New Delhi) and introduced together with the Ministry of New and Renewable Energy, Government of India. It is a green building 'design assessment system' and is adequate for all categories of buildings in various climatic zones of the country.

ADARSH, Association for Development and Research of Sustainable Habitats initiated together by TERI and MNRE (Ministry of New and Renewable Energy, Government of India) alongside with a number of experts in the sustainability of the environment form across the entire country. ADARSH encourages GRIHA as a design & assessment tool for Green Buildings and habitats.

Name of building	**Certification**	**Features**
Suzlon One Earth, Pune	LEED	It is completely driven by onsite and offsite renewable sources. It has total 18 hybrid wind turbines that satisfy the 7% of total energy usage. The building is constructed in a way to make sure maximum daylight exposure. It is also constructed to let water penetration and raising the water table level.
CII-Sohrabji Godrej Green Business Centre, Hyderabad	LEED	This building does not let out any waste and recycles it all inside the structure. The structure is made up of recycled materials only.
Infosys Limited, Mysore	LEED	While constructing the building, 5 areas were kept in mind i.e. Sustainable site expansion, reduction of water usage, energy regulation, selection of materials and indoor environmental condition The acute mechanism and well planned equipment lead to 40% of low energy usage.
Infinity Bench Mark, Kolkata	LEED	The structure is supplied with CO_2 monitor sensors, rain water harvesting, recycling system of waste water and controls for humidification. The outer surface of the building is fabricated by brick wall block and the roof is made up of thick polyurethane for superior insulation.
I-Gate Knowledge Centre, Noida	LEED	It is constructed in a way so that it captures 73% of day light inside the office.Around 50% of the land is enveloped by grass which does not let the waste and sewage water to go out.
Olympia Tech Park, Chennai	LEED	This structure has the lowest energy utilization It also has high systems of natural lighting. This building has 100% water recycling and various other ecofriendly practices.

IV. Conclusion

A green building approach is necessary if we are to acquire the short and long term goal of sustainability, including conserving water, energy and materials savings and improving inside air quality in the constructed surroundings. To productively apply green building techniques, all stake holders including engineers, architects and contractors would benefit from an inclusive framework or model

that incorporates green building schemes and technology in every period of a buildings life cycle. Green buildings are today the most widely used form of architecture. Constructing green buildings is an important focus of building owners and governments worldwide. At present, there has been an attempt in the way to make societies, people and the overall public aware about the benefits of green buildings for the sustainable development.

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