

Project-based Learning in Designing and Constructing Deep Foundations

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Abstract

In the last 20 years, a large number of global value chains have established production centers in India. Due to the severe shortage of urban land, they had to use deep foundations for constructing their high-rise buildings. The global research universities focus on the problems in construction and undertake consultancy works. They have given field-specific dissertation works, internships, and to the students who learn the advancement of knowledge capital. This model of 'Field to Theory' has to be implemented in the Postgraduate Programs in Geotechnical Engineering. The universities have to create policies to offer credits, stipend, and medical insurance to the postgraduate students who undertake internships. This constitutes project-based learning. In the long run, the postgraduate departments could become a center for innovation and can add to knowledge capital and human capital. To facilitate the success the government should tax exemption to the companies on the incurred expenditure. The government can also provide innovation funds to smaller companies to pay the universities for consultancy works.

Keywords: Deep Foundation, Internship, Project-based learning in Pile foundation, tax compensation and innovations funds, Dissertations based on the fieldwork, credits for internships.

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A Study of the Role of a Teacher as a Leader in the Classroom

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Abstract

Teaching is an **art, a craft, as well as a science** - some people are bestowed with this skill, while others cultivate and augment this with their experience and leadership and team building skills. It is the prerogative of the teacher to transform a group of students into a dynamic, cohesive and dedicated unit so thus, it is **fundamental for the teacher to understand how to be an effective leader**. The present study is a survey to assess the **type and effectiveness of the leadership styles** employed by teachers in colleges and universities. For the purposes of the study, the *Hersey-Blanchard model of leadership styles* was employed. The test used was the **Teacher Effectiveness and Adaptability Description (TEAD)**, an adaptation of Hersey & Blanchard's **Leadership Effectiveness and Adaptability Description (LEAD)**. The total number of participant teachers was 351, out of which 154 were females and 197 were males. The four styles of leadership - **authoritarian, participative, nurturing and delegation** - and their respective effectiveness were compared. For this, the means, SDs, t-ratios and correlations were calculated for the male & female sample separately. The data was then pooled for further analysis. There was little difference in the style of leadership and the effectiveness employed by males and female - the highest rating was on the **participative style**. The score on effectiveness, though positive, was low for both the sexes. A further comparative micro-study was conducted on the teachers who scored above 10 and below 6 on effectiveness, which demonstrated that a **nurturing style** is preferred for more effective teaching. This research is done in order to assess the predominant style of leadership and its effectiveness. It is hoped that the results help develop more effective teaching methodologies in the future.

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Employable Skills of Engineering Graduates from Assam

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Abstract

The college education in engineering was limited to Government funded institutions only in the state of Assam, India till recently. Recently few engineering colleges have also been setup in Assam under private management to meet the growing demands. However, the limitation in attracting qualified faculty, low input quality of students and lack of industry orientation leading to engineering graduates with shortage of employable skills in India and is further aggravated in Assam due to low penetration of industry in this area. A study was carried out in 2017-18 to find out the reasons for skill gaps in the final year engineering graduate students. Lack of industrial linkages, qualified faculty, research orientation were found to be the major reasons for the skill gaps. The survey also tried to check the students' orientation towards areas of interest in pursuing higher education and the mode of accessing employment information. The results have shown that there is an urgent need for collaboration of Assam engineering colleges with Industry to improve employability of students. The project works, internships have to result oriented and focussed.

Key Words: Passion, Teaching Learning outcomes, Industry Institute Linkages (IIL), Infrastructure, World of Work (WoW), All India Council for Technical Education (AICTE), Confederation of Indian Industries (CII), Information Technology Enabled Services (ITES), National Institute of Technical Teachers Training and Research (NITTTR), Google Docs, Skewness, Correlation.

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Viscosity effect on the Photophysics and Photoreactivity of 3-Hydroxyflavone Derivative: A Combined Spectroscopic and Kinetic Study

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Abstract

The comparative study of absorption and fluorescence emission properties of flavone derivative compound with 5-membered thienyl-substituted group at 2nd position were performed in certain solvents such as Cyclohexane (CH), Acetonitrile (CH₃CN), Methanol (CH₃OH), Isopropyl alcohol (IPA) and Ethylene glycol (EG) and their mixtures. The bioavailability, metabolism, and biological activity of flavonoids depend upon the configuration, total number of hydroxyl groups, and substitution of functional groups about their nuclear structure. The smaller-sized five-membered heterocyclic thienyl ring decrease or even remove the steric hindrance and have planar confirmation with respect to the chromone system. UV-visible absorption spectra of 3-hydroxythienyl substituted flavone compound showed a red shift at the peak maxima of band I by changing polarity from non-polar and non-hydroxylic to polar and hydroxylic and their mixtures. Due to close analogues of 3-hydroxyflavone (3HF), this compounds also undergo excited-state intramolecular proton transfer (ESIPT). Luminescence can occur from the normal N* state (blue) or from the tautomeric T* state (green). Whether blue or green emission was observed, it was strongly dependent upon hydrogen-bonding interactions with the environment. In emission spectra, perturbation effect on the ESIPT reaction was also interpreted due to the formation of H-bond between the hydroxyl group of the donor and C=O bond of the acceptor. It showed high-resolution with distinct emission band in the green region (T₀* - T₀). Fluorescence spectra of molecule exhibit significant red shift at λ_{max} of N* state upon addition of a viscosity impurity with ethylene glycol: methanol mixture. Above study proposed a new insight for further applications of 3Hydroxyflavone as viscosity sensor.

Keywords: Chromone derivative, Fluorescence spectroscopy, Polarity.

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Performance Study of Municipal Wastewater using Wetland Treatment System

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Abstract

The present study demonstrates a pilot scale assessment to treat the municipal wastewater for reuse purpose. Combination of vertical and horizontal flow wetland treatment system with fill and draw controls provides a design for effective contact of wastewater with the root system to achieve higher treatment efficiencies through creating necessary environments for nitrification-denitrification, removal of organic materials and phosphorus adsorption reactions. The results show that there is a marked difference in removal efficiencies of two cells with *Typhadomingensis* and other as control. The percentage reduction in various physico-chemical parameters such as TSS, BOD, N, P and FC are in the range of 85%, 90%, 70%, 60% and 95%. The study further reveals the effect of variable hydraulic loading rates on the treatment efficiencies.

Keywords: *Typhadomingensis*, nitrification, denitrification, phosphorus and physico-chemical.

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Analysing Techniques used for achieving Energy Efficiency in Cloud Computing

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Abstract

Requirement of resources have increased by leaps in today's environment. It is not possible for single physical machine to cope with such heavy needs. In order to tackle such situations cloud computing is utilized. The cloud provides mechanism to share resources and also provide platform for potentially unreachable resources for clients. The resource and platform sharing also tend to consume energy. This energy consumption leads to overhead. So energy consumption has to be minimized. This paper provides comprehensive survey of techniques used in order to enhance utilization of resources with minimal consumption of energy. Comparison table of various techniques under this scheme of thing is also presented.

Index Terms: Energy, Physical Machine, Platform and resource sharing, Resource.

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