Outcome-Based Technical Education - A Paradigm Shift towards improving its Effectiveness

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Abstract

This paper discusses challenges faced by technical education these days and OBE as a powerful tool to overcome some of those challenges. This study also compares OBE and traditional educational system for an analysis of the paradigm shift towards OBE. Tracing back to origin of OBE, Malan (2000) referred OBE not a new paradigm and according to Spady (1994) it is based on WHAT and WHETHER students learn successfully. Examples derived from previous studies have shown that when programs are designed and introduced in the curriculum to satisfy targeted program outcomes, effectiveness of the program has increased (Nordin et al., 2012). According to Hejazi (2011; 28), in OBE paradigm, education becomes a mean to an end instead of being an end to itself and recognized as an important component of education in knowledge based economies like India. Thus, based on the existing, validated studies, recommendations are given for enhancing effectiveness of technical education through OBE. This paper also shades light on use of technology and the changing or new role of faculty and students in the OBE paradigm. This paper not only discusses importance of OBE in technical education but also outlines its successful implementation in Indian technical educational system.

Keywords: OBE, Technical Education, Teacher Education

Wastewater Reutilization Scenario: An Overview of its Scope and Policies

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Abstract

The world is in the midst of a looming water crisis which is bound to have a major impact on developing economies like India. Considering the ever increasing population and the escalating demand of water, there is an urgent need to supplement the current water supply with secondary sources of water which mainly comprises of wastewater reclamation. Waste water reuse has the potential to bridge the gap that has emerged between water demand and supply and sewage generation and treatment. However, the incorporation of reuse schemes in the present scenario of the country comes with strings attached such as acceptability by public and feasibility in terms of technical and economical aspects. The objective of this paper is to investigate the necessity of incorporating wastewater reclamation for different uses and the scope of wastewater reuse in different sectors. The paper attempts to discuss the various policies and guidelines available for wastewater reuse.

Keywords: Wastewater reclamation, wastewater recycle, wastewater reuse, Decentralized wastewater treatment and reuse, Wastewater reutilization policy.

Modeling of Infiltration of Soil using
Adaptive Neuro-fuzzy Inference System (ANFIS)

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Abstract:

This paper investigates the potential of Adaptive Neuro-fuzzy inference system (ANFIS) approach to estimate the cumulative infiltration of soil and its performance is compared to Kostiakov and SCS models. Data set as many as 413 were obtained by conducting experiments in laboratory of N.I.T Kurukshetra. Out of 413 data set 289 arbitrary selected were used for training, whereas remaining 124 were used for testing the models. Input data set consist of time, ratio of sand and fly ash, ratio of sand and rice husk ash, suction head, bulk density and moisture content whereas cumulative infiltration was considered as output. Three memberships'

functions, i.e. triangular, generalized bell shaped and Gaussian was used with ANFIS. A comparison of results suggests that Gaussian membership function works better than triangular and generalized bell shaped memberships, function based on ANFIS and MLR modeling and it could be successfully used in modeling of cumulative infiltration.

Keywords: Adaptive neuro-fuzzy inference system, multi linear regression and cumulative infiltration.

Resurgence of Indian Technical Education: ICT as Enabler

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Abstract
India's current Gross Enrollment Ratio (GER) in higher education is around 23.6%. It is less than world's average GER in higher education which is 26%. Therefore, it is worth to mention that India is keen to become the next super power but world's leading countries are having their GER far better than India. GER of USA 34%, UK 59%, Japan 55%, and China is standing on 28%. GER is considered to be the quantity measure of success for education institutions in any country.

United Nation (UN) describes how GER of a nation impacts upon its Human Development Index (HDI). HDI is a statistic index comprising of three major parameters namely life expectancy at birth, access to education, and per capita income of a nation. It indicates that human being and their capabilities are the ultimate criteria for assessing development of a country, not the economic growth. In a recent report of HDI by UN, India got 135th, China 15th, and USA 5th rank.

Indian Ministry of Human Resource Development (MHRD) has been taking significant steps for a long time to improve the same. This paper begins with analysis of Indian Government's decision to start many higher education institutions to improve GER. Paper emphasizes upon the poor situations of engineering graduates being churned out by Indian education system. It summarizes the quality improvement initiatives of Indian Government through Information Communication Technology and suggests a model to improve the same.

Keywords— GER, HDI, ICT, MHRD, Education.

Random Effect Negative Binomial Model for Prediction of Road Accidents on Non-Urban Sections of Highways in Haryana

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Abstract
This work proposes the use of random effect negative binomial model for accident prediction on non-urban sections of highway in Haryana (India) as an alternative to conventionally used fixed effect negative binomial regression models. Road accident data for a period of 2 to 6 years on different sections of 8 National and State Highways in Haryana collected from police records was used in this study. Data related to road geometry, traffic and road environment related variables was collected through field studies. Highways were divided into 68 sections with certain uniform geometric characteristics. Two modeling approaches: Fixed/Random effect Negative Binomial (FENB/RENB) regression models were compared to predict the accident frequencies using fifteen input parameters. Results suggest that RENB model performed better than FENB model suggesting existence of temporal and spatial correlation in the data. Both models clearly indicate that to improve safety on Indian highways merely widening of the road and provision of paved shoulders is not sufficient. In addition, minor accesses to the highways need to be properly designed and controlled, the service roads to be made functional and dispersion of speeds is to be brought down.

Key words: Predictive modeling, Road safety, Mix model, Random effect negative binomial model.

Planning for a Course on Entrepreneurship in the Indian Engineering Education

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Abstract

Current engineering curriculum in India does not focus on the entrepreneurship. There is no policy to incorporate the entrepreneurship development in the programs. By introducing a course on entrepreneurship development, the faculty could bring the concept of the business plan, incubation of new product development, getting loans from the venture capitalists. The costing and estimation in testing, product development, and field services have to be market oriented. The cost of testing, analyzing the results and suggestion could be included in every lab works and skill development programs in workshops, surveying, planning, design, and estimation. The traditional courses in cost estimation for buildings in civil engineering center on the government practices. There is a big difference between the current market costs and the standard rates of the government. If the students take up works, they have to properly plan to collect the cost of construction at various stages. In addition, they have to perform value analysis. The business model has to be developed and the students are to be trained in analyzing the client needs, costing based on the market prices, taking the risk, bid preparation, and negotiation. In the long- term entrepreneurs could be developed. They have to know the process developing innovative products and services. The program educational objects are to be prepared from these viewpoints. Best business models could be incubated and startups could be mentored through investors.

Keywords: Entrepreneurship in the engineering programs, a course on Entrepreneurship, realistic costing, value analysis, product planning, incubation, and innovation.

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Effect of Treated Waste Water on Flexural and Split Tensile Strength of Concrete of Variable Grades

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Abstract

This research study discusses the efficient use of huge amounts of treated waste water which is being generated all over the world and especially in the city of Chandigarh. With a treating capacity of 56.25 MGD of waste water out of 70 MGD of waste water that is being generated, the city has an effective system already in place. This treated waste water which is being drained off into surface streams can be used as mixing water in the concrete industry. Requirement of water for making structural concrete is a major area in which treated water can be efficiently used. In this paper the flexural and split tensile strength of M25, M30 and M35 grades of concrete were tested with different combinations of potable and treated waste water. From the results, in can be concluded that in general, the mixes prepared using 50% treated waste water and 50% potable water gave satisfactory results. Thus, the use of this combination of mixing water is recommended over the use of 100% potable water, saving enough water for human consumption especially during hot weather when availability of potable water is scanty.

Keywords – PPC Cement, Flexural Strength, Split Tensile Strength, Treated Waste Water.

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Growth and Innovation in Education Sector – An Indian Perspective

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ABSTRACT

Since Independence, India has come forth as a strong transcending economy and undoubtedly education has been a cornerstone towards its growth. India has made great efforts to strengthen its education sector. Especially in last two and half decades many reforms, both for K-12 education and higher studies have been introduced. Schemes such as Mid Day Meal scheme, Rashtriya Madhyamik Siksha Abhiyan, Saakshar Bharat, Rashtriya Uchchatar Siksha Abhiyan, and many more have been implemented to accelerate the literacy rate, equity, gender equality and equality among people of all classes and race. These reforms have been fundamental for the upliftment of the education in India. Beside this, Government of India has taken special innovative policy measures to ensure quality education, enhancement of the potential of students, exploiting new technology in studies and promoting research and innovation in education. Such initiatives will not only make our education system at par with global standards of education but will also ensure that each and every child in India proves to be an asset for the country. With this forethought, this paper attempts to summarize the growth of education sector in India and the progress of higher education sector. The paper also includes the problems that can possible be faced while working on new policies and includes suggestion to overcome those problems.

Key Words: K-12, Innovation in Education.

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Effect of Treated Waste Water on Cement Concrete Workability

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Abstract

This research paper highlights the investigation results of the effect of treated waste water on the workability of mixes of grade M25, M30 and M35 with w/c ratio 0.45, 0.42 and 0.40 respectively and cement as well. The results show that the cement when tested with combination of 50% treated waste water and 50% potable tap water had similar normal consistency as compared to potable tap water, but the initial and final setting time is reduced remarkably. It shows higher workability of concrete in fresh state, after ½ hour and 1 hour for all grades of mix.

Keywords – OPC cement, Treated Waste Water, Normal Consistency, Initial and Final Setting Time, Compaction Factor.

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