Project-Based Learning in Technical Institutions

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Abstract

In outcome-based education project-based learning is a strong and direct method to develop programme outcomes, programme specific outcomes, and skills of 21st century in students when it is managed professionally by all teachers at the institute level. This paper is based on SNAP study conducted from May 2020 to December 2020 on 617 faculty members of technical institutes of India. The paper begins with a rationale for project-based learning that is drawn from various research studies conducted, experiences of the researchers, and document analysis. The institute should have a system to design, implement and assess the impact of project-based learning. Significant steps of managing project-based learning are highlighted. The training of teachers in managing project-based learning is highlighted to reap the full potential of project-based learning. Then justification for preparing policy and guideline document for managing project-based learning is stated. The process for selecting the project problems/themes for different level educational programmes (diploma, undergraduate, postgraduate, and Ph. D.) is explained diagrammatically with justification. The quality assurance mechanism at different stages of managing project-based learning is explained. Towards the end of the paper suggestions for the institute, faculty members, and students are noted.

Keywords: Project-based learning, outcome-based education, guideline document for managing project-based learning, 21st-century skills, associated skills, process by-product skills

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Institutional Design to Support an Educational Transformation in the Engineering Colleges in India

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Abstract

A critical review of higher education administration in India reveals that most of the engineering colleges follow a bureaucratic model. Most of the engineering colleges are not planned to innovate. Almost all the administrators take rigid decisions without any delegation to the faculty in project-based planning and implementing activities. Many institutes have around 50% of faculty vacancies. Further, the star performers suffer a lot in planning consulting works, bidding for development projects under international development agencies. This shows that a large number of institutes do not have any reliable strategy to fulfill their mission. A closer look at most of the engineering colleges the following drawbacks were identified: The structure of the departments is very obsolete; the transformation process is very lethargic; most of the engineering faculty members were not trained in the modern companies; they also need training in the interdisciplinary research methodology and colleges could implement an appropriate reward system. Hence, a snap study has been undertaken through a set of Quality Circles by utilizing 139 heads of the departments who attended faculty development workshops in higher education administration. They suggested utilizing an appropriate Organizational Design Process for the Transformation. The following four models have been considered: 1. Jay Galbraith Model, 2. Weisbord's Six-Box Model, 3. Nadler and Tushman's Model, 4. Burke-Litwin Model. The key elements of Jay Galbraith's Model for organizational design are as follows: 1. Strategy to provide an institute's vision, goals, and objectives to fulfill its mission, 2. Institutional Structure to communicate an institution's placement of administrative authority, 3. Transformational Process to enable academic workflow and resources allocation, 4. Human Resources Policy to govern the faculty recruitment, training, and promotion, 5. Rewards to align the goals of the faculty with the goals of the institute. All the models indicate further development to bring an effective transformation of the engineering colleges to develop human capital and knowledge capital. The pilot study conducted in a government aided polytechnic college substantially validated Jay Galbraith's Star Model.

Keywords: Institutional Design, Educational Transformation, Galbraith Star Model, Strategic Planning, Rewards

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Strategies for Promoting Good Urban Governance at Local Level

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Abstract

The systematic planning and development of urban areas is integral to the progress of any nation as they account for a lion's share of the country's Gross Domestic Product. India is one of the fastest growing economies in the world, and its growth is propelled by its cities. The Oxford Economics' Global cities report predicted that 17 of the 20 fastest-growing cities in the world between 2019 and 2035 will come from India. The studies have shown that the expanding network of Indian cities are likely to contribute around three fourth of the nation's GDP by 2030. While this signifies a turn towards greater economic growth and prosperity, it also comes with a set of challenges with regards to livability and quality of life offered in these urban centers. Diving deeper, an inherent limitation within the framework of urban governance, becomes visible. Right from the times India attained independence, the cities have grown in a haphazard and unplanned manner, not fully equipped to deliver basic services like housing, water and sanitation to the growing number of residents. Hence, despite high economic growth, Indian cities are also the centers of disparities, high-income inequality and poor quality of life. In 2019, New Delhi and Mumbai ranked 118th and 119th respectively, on the Economist Intelligence Unit's Global Livability Index 2019 that covered 140 cities. Since 2014, there has been a marked shift in policy focus by the Government of India, reflecting a greater acknowledgement of the importance of urban development. Hence, Smart Cities Mission, Pradhan Mantri Awaas Yojana, and Swachh Bharat Mission (Urban) (SBM-U) are some of the major urban development programmes initiated by the GoI to transform the urban landscapes. The 74th Constitutional Amendment Act, 1992 which contemplated Urban Local Bodies (ULBs) as the third tier of governance was successful in protecting their identity but still left many questions unanswered. The statute leaves a lot of discretion in the domain of the state government, which ends up depriving the local governments of the autonomy required by them to perform their designated role. This mindset is the root cause plaguing the ULBs in attaining their rightful place in the comity of governance. Analyzing India's rapidly expanding process of urbanization, the paper identifies the key challenges and opportunities, and proposes suitable managerial and policy reforms. It addresses critical issues and puts forth suggestions for better planning, financing alternatives and, most importantly, better governance for improved service delivery.

Key words: Urbanization, municipal, reforms, Missions, leadership, laws, finance.

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How to Develop a Charismatic Teacher for NEP-2020

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Abstract

The New Education Policy – NEP-2020 aims at revolutionizing our orientation, focus and methodologies for educating our future generations. The success of any policy depends on the stakeholders. For NEP-2020, the major stakeholders who will implement this policy are the teachers. Teachers interact with and leave an imprint on students, right from pre-school to higher education. Teachers are preparing young people not just on how to make a living but also how to improve quality of life and contribute to the society. Thus education, skill training as well as self-development of teachers, are of prime importance. The present paper highlights the need of proper selection of teachers based on educational qualifications, training and aptitude. This should be followed by training – at the time of induction as well as periodic and continuous upgradation of knowledge and skills – both technical and soft skills and self empowerment. The modal of "Self Growth Skills was explained for self empowerment this review emphasizes the significance of developing creative educators and preparation of teachers to be charismatic leaders. The author has put emphasis on this with case studies and conclusions drawn from extensive workshops carried out with teachers from different parts of the country. The paper concludes that education should be a priority for any system to prosper and educators should be aptly selected; followed by appropriate and continuous training in academic developments as well as self-growth skills.

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A Robust Framework for Deep learning based Diabetic Retinopathy Abnormality Classification

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Abstract

Diabetic Retinopathy (DR) prognosis requires regular eye examination as the ophthalmologists rely on retinal fundus segmentations for the treatment of DR abnormalities. Automated detection, segmentation and classification approaches have become an eminent research area for effective DR diagnosis for the treatment of severe eye diseases preventing visual impairment. Diagnosis of different DR lesion as well as disease severity grades help the ophthalmic experts in analysing the variations in the fundus images and taking necessary action before disease progression. Deep learning techniques have evolved as an improvement over the conventional approaches that are dependent on the handcrafted feature extraction. This paper proposes a Convolution Neural Network based abnormality classification method using the InceptionResnet-V2 deep neural network framework. The presented model incorporates image pre-processing along with the data augmentation step for improving the network performance. DR abnormality classification yields a superior accuracy performance of 97.04% along with network sensitivity value of 95.10%, specificity 98.99% and precision value of 99% for the benchmark MESSIDOR dataset. The analysis is also done in terms of cross-entropy loss and computational time which reveals that the proposed approach minimum cross entropy loss of 0.351 consuming the time of 15 minutes 31 seconds. Significant performance improvement is seen for the other IDRiD dataset utilized for feasibility justification of the proposed approach when compared with the other mainstream models. The proposed approach outperforms the other state of the art classification algorithms and provides the maximum accuracy improvement of 9.89% over the state-of-the-art technique.

Keywords: *Diabetic Retinopathy; visual impairment; Machine Learning; Deep Neural Network; Convolution Neural Network; DR abnormality classification..*

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Technology-enabled Immersive Learning

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Abstract

The world is witnessing the incredibly increasing use of technology in all spheres of life. In absence of technology, even routine life seems tough. In this scenario, conventional teaching- learning seems a thing of the past. The teacher today is trying their best to create a congenial environment for students to learn faster and better through immersive learning techniques. Teachers are utilizing augmented reality, simulated or artificial environment for students to experience the concepts and theories in real like artificial conditions. Immersive learning is an effective tool to explore the hidden capabilities and potentials among the learners and can bring relatively permanent change in their behaviour but the teacher still holds a vital place in the process of teaching-learning. Teacher's appropriate involvement raises the level of teaching- learning itself and outcomes.

Keywords: Technology, Immersive Learning, Artificial Environment.

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Institute -Institute-National Labs- Research Units of Industry-Alliances: Building Cooperation for Innovation in Engineering Education

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Abstract

For more than a century, global universities have created alliances and joined in cooperative associations and a few have been successful at producing breakthrough innovations and cost savings that individual universities couldn't achieve on their own. The alliances have simply created groups of campuses working side-by-side rather than together. National Institutes of Technical Teacher Training and Research have created alliances from 1991and provided academic consultancy to the project polytechnics under World Bank assistance. They provided project-specific faculty development, state-specific resource, and need-based curricula. They undertook sponsored consultancy programs under the World Bank project. In the knowledge-based economy, a new type of alliance is beginning in engineering education through a common set of problems that multiple campuses need to address that they cannot solve on their own. They are planning MOOCs for faculty development. They need to develop strategic solutions and many leveraging technologies to solve some of the engineering education's toughest problems like meeting the human capital for disruptive technologies. To tackle the most pressing curriculum development problems, deemed universities and state technical universities must build alliances efficiently and effectively with International Research Universities, R&D units of the industries, and National Labs around common problems. A model has been developed for this. Deemed universities, state technical universities, and autonomous colleges can build alliances in the digital technology-based programs using this model.

Keywords: Institutional Alliances, Consultancy through Alliance, National Lab, MOOCs, Strategies to Develop Human Capital through Effective Alliances.

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