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Global Journal of Engineering Education

A journal of the World Institute for Engineering and Technology Education (WIETE)

Global Journal of Engineering Education

Contents

Editorial

In order to summarise the activities and achievements of the World Institute for Engineering and Technology Education (WIETE) in 2015, this year's annual Conference was held in Europe. The 7th WIETE Annual Conference on Engineering and Technology Education was held at Piraeus University of Applied Sciences (PUAS) in Piraeus-Athens, Greece, between 4 and 8 April 2016, and it commenced with a meeting of the WIETE International Academic Advisory Committee (WIETE-IAAC). The host University is a long-standing partner institution of the WIETE, and is the abode of the Mediterranean Centre for Engineering and Technology Education (MCETE), a *satellite* centre of the WIETE with Professor George Metaxas, a Vice-President of the WIETE-IAAC, as its Director.

This Conference attracted participants from 12 counties worldwide from as far afield as Australia, China, India, Canada and Panama, to name a few. The Conference resulted in the presentation of close to 20 excellent research papers, most of which have been published in the World Transactions on Engineering and Technology Education (WTE&TE), Vol.14, No.1 and this issue of the Global Journal of Engineering Education (GJEE), marked as Vol.18, No.2, with Professor George Metaxas as the Guest Editor of the two issues. Altogether, 15 highly informative and enlightening research articles have been included in this issue.

Later in April, a Memorandum of Understanding on cooperation between the WIETE and the Faculty of Architecture at Cracow University of Technology, Kraków, Poland, was signed with Professor Jacek Gyurkovich, Dean of the CUT Faculty of Architecture, and Professor Zenon J. Pudlowski. These institutions will be collaborating in organising of the International Conference on New Building Technologies and Architectural Design - NBTAD 2016, to be held at the University between 13 and 14 October 2016, specifically through an additional Conference Panel on *Education of Architects and Engineers* that was added to the Conference in order to broaden its scope. This new collaborative venture was facilitated by Professor Sabina Kuc of the CUT Faculty of Architecture, with the support of Professor Waclaw Celadyn, Director of the CUT Institute of Civil Engineering Design, the Conference General Chairman.

Our readers are cordially invited to participate in this Conference and propose a paper to be presented in the Conference Panel on *Education of Architects and Engineers*. More information can be found in the Conference announcement on the WIETE main page on the Internet. It is envisaged that selected papers concerned with the education of architects and engineers will be published in the GJEE, Vol.18, No.3.

In releasing this issue for the general public, I wish to express my sincere gratitude to the authors of the papers included in this issue, Professor G. Metaxas for his contribution to the Journal as Guest Editor, and to the international referees for their work in assessing the papers. Special thanks are also directed to the members of the WIETE editorial team Dr Dianne Q. Nguyen, Mrs Dorota I. Pudlowski and Dr Ian R. Dobson for their invaluable assistance in the preparation of this issue.

Zenon J. Pudlowski

Global Journal of Engineering Education

Guest Editorial

The 7th WIETE Annual Conference on Engineering and Technology Education and the 4th Mediterranean Seminar on Engineering and Technology Education were held at Piraeus University of Applied Science (PUAS) in Piraeus-Athens, Greece, between 4 and 8 April, 2016. These events had been arranged by the Mediterranean Centre of Engineering and Technological Education, (MCETE), a *satellite* centre of World Institute for Engineering and Technology Education (WIETE) based in Melbourne, Australia, in collaboration with the WIETE.

The Conferences attracted distinguished participants from all over the world. They presented research papers on a range of topics with an overarching focus on engineering and technology education, some of which have been published in the current issue of the Global Journal of Engineering Education (GJEE), Vol.18, No.2.

It is hoped that our readers will find the articles of interest and relevant to their research and development work.

George Metaxas

Predicting the probability of students' final passing results using the multinomial regression method

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ABSTRACT: This research has an aim similar to that of three earlier studies [1-3], that is, to facilitate lecturer in helping students to predict their final results (high distinction, distinction or pass) based on their performance in several subjects in the first four semesters of their study period. The main difference is that instead of predicting the students' final pass results, in this research, *the probability* of a student getting those results is to be predicted. This is done through a data mining and multivariate technique called the multinomial regression method. Three cases are presented and discussed in this article.

INTRODUCTION

This article extends earlier research by identifying several common goals with three previous research programmes [1-3] to assist academic supervisors in:

- predicting students' final results after pursuing their undergraduate programme based on their first four semesters' academic achievements in several subjects;
- helping lecturers to assist their students in setting up their study plans each semester in order for them to perform to their full potential.

While the three previous research programmes offered an explicit prediction of students' final results, this research aims to provide implicit prediction by computing the probability of getting each type of result (high distinction or *cum laude*, distinction or very satisfactory and pass or satisfactory predicate).

This will be done through a data mining or multivariate statistics tool called the multinomial logistic regression. The data set used is the same as that used in [1-3] and for confidentiality reasons, the arena is called the Faculty of Information Technology, University X in Bandung, West Java, Indonesia.

OVERVIEW OF BACKGROUND THEORY

As a modelling tool, linear regression has been widely used. However, this tool is inappropriate when the required model parameters need to be non-linear. For example, this is the case when modelling the probability that a case will experience the event of interest or that a case is in a particular category of the binary response. As a probability must fall between 0 and 1, the linear regression model cannot accommodate it. In this case, the logistic regression model can serve as an alternative [4].

The multinomial or polytomous logistic regression model is a regression model, in which the dependent (response) variable has more than two categories. Like other univariate and multivariate data analysis methods, this technique has been considered as instrumental in the medical, engineering and the manufacturing industries [5]. The basic concept of the multinomial logistic regression model was generalised from binary logistic regression [4][6].