

THE EFFECT OF ENTRY QUALIFICATIONS AND GENDER TOWARDS STUDENT PERFORMANCE

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ABSTRACT

Student entry qualifications are vital issue. This paper presents the influence of gender, entry qualification and entry results towards the student performance in university. 65 students were randomly selected in Faculty of mechanical engineering, University Malaysia Pahang. Entries qualifications are from Foundation Program, Higher Certificate of Malaysian Education (STPM) and Diploma Certificate. STPM is form six examinations in secondary school level. Genetic Algorithms (GA) and Radian Basis Function Network (RBFN) method was used to measure and predict the student's performance. Gender not plays the major role but entry results plays important role. Good entry results student normally maintain their momentum. GA and RBFN plays important role to study the student performance with different type of variables.

Keywords: Genetic Algorithms, gender, entry qualification, Radial basis function network

INTRODUCTION

Keeping in view the physical requirements on the adjustor described above, it could be argued that women in general are at a mechanical disadvantage which is not caused by inadequate psychomotor abilities but merely a result of being lighter and possessing less muscular force than men. Indeed, a longitudinal study by Barnekiw-Bergvist *et al.* [1] on physical capacity in adolescence and adulthood offers support for such an assumption. The authors investigated the development of muscular endurance and strength from the age of 16 to the age of 34 and found, in accordance with previous studies, Although such findings suggest that women, and female mature students in particular, may be disadvantaged as far as certain physical properties of the adjustment are concerned, the consequence need not be that they will be less successful adjusters. It does, however, require them to make up for lack of physical stamina by increasing their adjustive fitness. This, for example, can be achieved by increasing the speed with which an adjustment is carried out [2 – 6]. Speed of performance is a frequent outcome variable used when effects of age and gender on psychomotor performance are assessed. Mazaux *et al.* [7] looked at the effects of age, gender, and education on visuospatial attention and on psychomotor performance in elderly community residents and found that greater age and female gender were both associated with lower performance.

Numerous studies have been carried out in medical schools in an attempt to delineate those factors or personal qualities which determine the best physicians. According to Entwistle and Brennan [8] there are a variety of paths that lead to either success or failure. Entwistle *et al.* [9] found that next to study methods (including learning style and approach), motivation showed significant correlation with academic success. This was later confirmed by Rhoads *et al.* [10], although they felt that motivation was the determining factor for students' performance. As stated by Shen [11], it is known that medical students' level of achievement is influenced by both student characteristics and the characteristics of the school they attend. Shen [11] analyzed student performances in Part I, II, and III of the National Board of Osteopathic Medical Examiners (NBOME) to look for the existence of gender effects. The results revealed that men performed better than women in Part I, while performance was equal in Part II. In Part III women outperformed the male students. Similar findings have been reported in other studies [12, 13]. According to Shen [11], the gender differences did not vary among different schools, however, they could not be used as strong predictor for osteopathic medical students' performance. According to K.Kadrigama *et al.* [14] in order to have good graduate engineer the foundation must be very strong, if the students want to perform better in final year subjects. Sani *et al.* [15] claims that survey was found to be an essential tool to measure the performance of the student. Research from M.M.Noor *et al.* found that it's

very important for all the lecturers to understand and implemented student performance and can be measured and continuously improvement can be done [16].

Neural network and multiple regression methods were used to understand the relationships between process parameters and top-bead width, and to predict the process parameters on top-bead width in robotic gas metal arc welding process [17]. Polar coordinate model were established to characterize the weld pool geometry. A neural network was therefore proposed to identify the parameters in real time. By using pulsed laser elimination, clear images of the weld pool could be captured. The developed image processing algorithm extracts the boundary of the weld pool in the real time, to determine the optimized welding process parameters and to obtain the desired weld bead geometry in gas metal arc welding [18]. The output variables were the bead height and depth of penetration of weld bead. These output variables were determined according to the input variables, which are the root opening, wire feed rate, welding voltage and welding speed [19]. Neutral network was constructed to obtain the relationship between welding process parameters and weld pool geometry in TIG welding process. An optimization algorithm called simulated annealing (SA) is then applied to the network for searching the process parameters with optimal weld poor geometry. From the observations made on the above literature optimization of friction welding parameters will be of time consuming if the conventional technique of optimization is used, by concentrating on a single parameter whereas keeping the others as constant [20]. A hybrid intelligent method for Electric Discharge Machining process discusses on cultivating the advantages of the two methods namely artificial neural network (ANN) and genetic algorithm (GA) [21].

This paper concentrate on developing RBFN and GA models to investigate effect of the variables (gender and entry results) towards current cumulative grade point average (CGPA).

ARTIFICIAL INTELLIGENT

From the examples ANN captures the domain knowledge. ANN can handle continuous as well as discrete data and have good generalization capability as with fuzzy expert systems. An ANN is a computational model of the brain. They assume that computation is distributed over several simple units called neurons, which are interconnected and operate in parallel thus known as parallel distributed processing systems or connectionist systems. Implicit knowledge is built into a neural network by training it. Several types of ANN structures and training algorithms have been proposed. The basic form of RBF architecture involves entirely three different layers. The input layers is made n, of source nodes while, the second layer is hidden layer of high enough dimension which senses a different purpose from that in a multilayer perception. The output layer supplies the response of the network to the activation patterns applied to the input layer. The transformation from the input layer to hidden is nonlinear whereas the transformation from the hidden from unit to the output layer is linear. Genetic Algorithm (GA) was used to find the optimum weight, momentum and step size to be used in RBFN. Later the optimum weight will be fed to the RBFN. Then, train the network until the R.M.S.E reaches a satisfactory value. The training data acquired from Response Surface Method to RBFN mode, and the epoch number is 10,000 [22]. After 1,000 iterations, the RBFN is better enough to produce acceptable results. Transfer function used as sigmoid, while for the momentum used is 0.7.

RESULT AND DISCUSSION

Gender by number one in the Table 1 represents the male students; meanwhile number two represents female students. The prediction results by RBFN shown in Table 1. The predictions very impressively since the values very close with the real result. The results shows that female students achieve a very good Cumulative Grade Point Average (CGPA) if it is compare with male student as shown in Figure 1. Most of the female students maintain their CGPA around 3.15 to 3.30. Whereas, the CGPA for the male students around 3.00 to 3.13. On the other hand, the entry results influence most of the student CGPA as shown in Figure 2. The higher entry results students maintain their performance by keeping high CGPA. Those entry results range 2.50 to 2.80, their current CGPA almost the same group ranged from 3.00 to 3.20.

Table 1: Prediction results by RBFN

Entry Result	Gender	Current CG2A	Current Output	CG2A
3.23	1	3.27	3.30	
3.19	1	3.18	3.27	

3.19	1	3.05	3.27
3.13	1	3.71	3.24
3.09	1	2.71	3.22
3.12	1	3.31	3.23
3.48	1	3.53	3.51
2.84	1	3.33	3.15
2.87	1	3.11	3.16
2.96	1	3.51	3.17
2.88	1	3.42	3.16
3.07	1	3.09	3.21
2.98	1	3.29	3.18
3.03	1	2.95	3.19
3.05	1	3.25	3.20
2.90	1	3.15	3.16
3.06	1	2.89	3.21
2.93	2	3.38	3.46
2.92	1	3.29	3.16
2.96	1	3.27	3.17
2.84	1	3.40	3.15
2.87	1	2.78	3.16
3.18	1	2.95	3.27
2.72	2	3.42	3.35
3.00	2	3.45	3.51
3.00	2	3.67	3.51
2.67	1	3.49	3.15
2.58	2	3.38	3.32
2.67	1	3.38	3.15
2.54	1	2.89	3.16
2.57	1	3.07	3.16
3.06	1	3.65	3.21
2.98	2	3.67	3.49
2.54	1	3.51	3.16
2.62	1	3.13	3.15
2.56	1	2.83	3.16
2.67	2	3.27	3.34
3.07	1	3.73	3.21
2.56	2	3.38	3.31
2.53	2	3.36	3.31
2.61	1	3.49	3.16
2.52	1	3.25	3.16
2.30	1	2.87	3.20
2.43	1	3.55	3.18
2.42	1	3.60	3.18
2.39	2	3.45	3.31
2.35	1	3.60	3.19
2.23	1	3.22	3.21

2.68	1	3.09	3.15
2.68	2	2.60	3.34
3.12	2	3.38	3.60
3.19	2	3.93	3.65
2.46	2	3.53	3.31
3.04	1	3.00	3.20
2.58	1	1.87	3.16
2.57	1	3.29	3.16
2.64	1	2.98	3.15
2.62	1	3.02	3.15
2.63	1	3.02	3.15
2.89	1	3.13	3.16
2.90	1	3.27	3.16
2.40	1	3.42	3.18
2.43	1	2.91	3.18
2.50	1	2.93	3.17
2.50	1	3.02	3.17

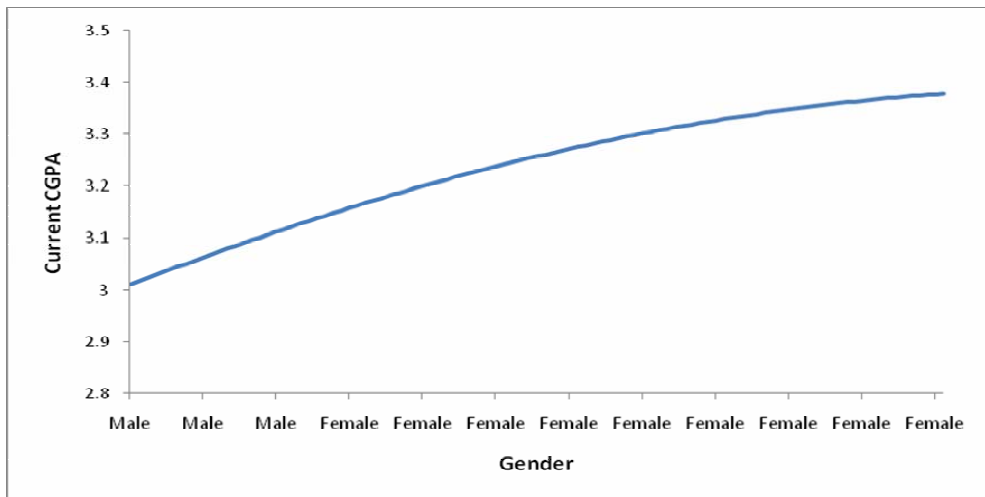


Figure 1: Analysis gender with current CGPA

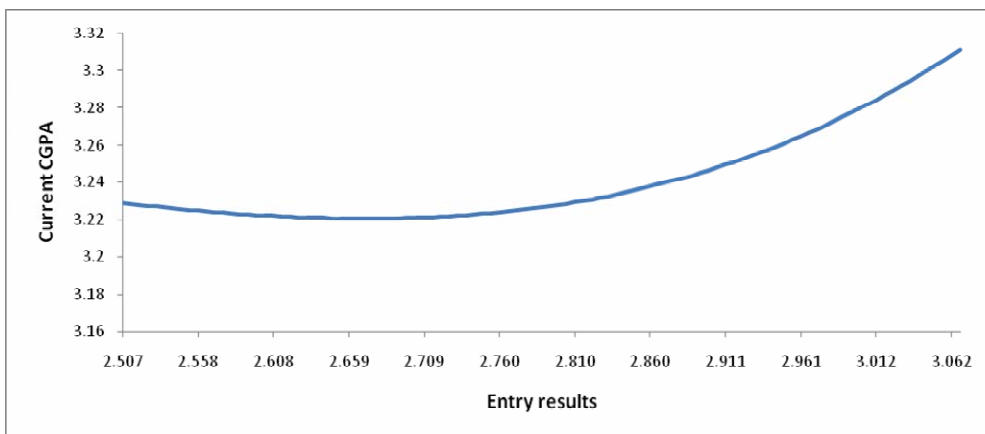


Figure 2: Analysis entry results with current CGPA

CONCLUSION

Artificial Intelligent is a very useful tool to investigate the student performance and to analyse the variables. The results prove that entry results effect directly to the student performance in CGPA. Meanwhile female students achieve better CGPA compare to male students. While many of the generated models did not have sufficient predictive power to be useful, the stronger models and other observations from the analysis provide useful insight into the relationships between the variables (entry results and gender). There are still numerous analyses that can also provide valuable information. While most of the models presented in this paper use only two variables. It is possible that more information and additional insights could be provided if more data available such as students, age, students background and etc. This information would ensure the complete analysis of subject performance and investigate the main effect of the CGPA.

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