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Gender differences in lymphocyte subset levels in young adults in a local population

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Introduction: Lymphocytes are critical in maintaining health and well-being but are also implicated in many diseases as a result of over-inflammatory responses or suppression. Factors influencing these changes may play a role in advancing or protecting these conditions. Gender has been identified as one of the key factors that may influence human immune cell responses. Higher antibody levels in females have been linked to higher incidence of autoimmune diseases among females. Gender differences in lymphocytes subsets levels are being investigated in different populations. **Objectives:** Lymphocyte subset counts were determined in healthy young adult population of both genders recruited in the Faculty of Medicine and Health Sciences, UPM. **Methodology:** Healthy individuals (n=31, 14 males and 17 females) within the age of 20-30 years old were recruited for the study. Blood samples were collected in EDTA tubes, and absolute number and percentage of lymphocyte subsets of CD4+ and CD8+ T cells, CD19+ B cells and CD16+ CD56+ NK cells were determined using BD MultitestTM IMK kit together with BD TrucountTM and analysed using the Multiset software on flow cytometer. **Results & Discussion:** Percentage of T helper cells (CD4+) in CD3+ lymphocytes were increased in females. Absolute count of NK cells (CD16+/CD56+) in CD3- lymphocytes were significantly increased in males, 492.2 X 10⁶ vs. 345.5 X 10⁶ cells/ml (p=0.044). No other significant differences were observed. The results are consistent with the findings by other studies. **Conclusion:** NK cells in this local population may play a role in health differences in genders.

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A Comparison of Integrated Problem-Based Learning Approach in Theoretical and Mathematical Courses in Physics towards Students' Critical Thinking: A Case Study in University Malaysia Sabah

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This paper aim to discuss the findings of integrated Problem-based learning (PBL) implementation on Physics students' critical thinking. Discussion will be focusing on performances and perceptions of Physics student critical thinking skills after implemented for 28 weeks. Based on results revealed prior of this study, it show students able to develop their critical thinking skills when integrated PBL implemented in more theoretical course (i.e., Thermodynamic and Modern Physics) rather than course with more mathematical such as Statistical Physics. Detailed discussion on students' performances and perceptions was revealed in this paper.

Keywords: Critical thinking skill, problem-based learning

Students' Perceptions of Knowledge Gained from Problem-Based Learning Online in a Malaysian Public University

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This paper reports the results of a study concerning of Malaysian public university undergraduate science physics students' and pre-service science teachers' perceptions of learning through online. The main focus is to seek students' feedback after exposed with a student-centered learning (i.e., problem-based learning online) approach, particularly their feedback and perception on knowledge gained from online learning. Hundred and two (102) students were involved in this study which consists of 61 students from the School of Science and Technology (SST, science student) and 41 students from the School of Education and Social Development (SESD, pre-service science teachers). Both programmes were offered in a Malaysian public university which is University Malaysia Sabah. The students followed all online learning activities for sixteen weeks. The online learning environment (i.e., learning management system, LMS) was used as the main medium to delivered learning process throughout the second semester of 2008/2009 academic year. Analysis of the open-ended questionnaire and interview data indicated that majority of students felt they i. Gained a large amount of knowledge; ii Learning activities helped enhance understanding in Modern Physics; and iii. Improved computer skills.

Keywords: Problem-based learning; online learning; knowledge gained.

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Keywords: Critical thinking skill, problem-based learning

Jackson Chang Hian Wui

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Development of a Near-Sea-Level Calibration Algorithm for Aerosol Optical Depth Measurement Using a Ground-Based Spectrometer

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Aerosol optical depth (AOD) is a measurement that represents the total attenuation of solar terrestrial radiation caused by aerosols. Measurement of AOD is often performed using ground-based spectrometers, because this approach has the highest accuracy, as well as high spectral and temporal resolutions. However, frequent calibration of a ground-based spectrometer is often difficult for both absolute laboratories and the conventional Langley method. This is because the

former are usually not readily available for most users, whereas the latter is always complicated by possible temporal drifts in the atmosphere. In this paper, a new Langley calibration algorithm was developed to allow frequent calibration, even at near-sea-level sites. The proposed algorithm uses a combination of clear-sky detection, the Perez-Du Mortier (PDM) model and a statistical filter to constrain the extrapolation to get the closest possible extraterrestrial constant over a wide range of the light spectrum. A high degree of linearity was observed between the near-sea-level irradiance predicted by the proposed algorithm and the reference value simulated by the SMARTS model. Overall, the results indicate that Langley calibration at low altitude is feasible provided that strict data screening is imposed.

Keywords: Aerosol optical depth; Langley extrapolation; Sky classification; Spectrometer calibration; Statistical filter.

Che Haziqah Che Hussin

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Comparing Linear and Nonlinear Differential Equations of Differential Transformation Method by Other Numerical Methods

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In this study, we solve fifth-order boundary value problems by using the DTM for linear and nonlinear differential equations and compare the results with other methods such as Adomian Decomposition Method (ADM), Noor Decomposition Method and Variational Iteration Method. We provide several numerical examples in order to show the accuracy of the method. Further, we also solve sixth-order nonlinear boundary value problems and compare the result to ADM. The present study shows that the DTM is able to provide good results with high accuracy and the method is also easy to apply.

Keywords: Ordinary Differential Equations, Numerical approximation and analysis

Compression-RSA Technique: A More Efficient Encryption-Decryption Procedure

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The efficiency of encryption-decryption procedures has become a major problem in asymmetric cryptography. Compression-RSA technique is developed to overcome the efficiency problem by compressing the numbers of k plaintext, where k and Z , becoming only 2 plaintext. That means, no matter how large the numbers of plaintext, they will be compressed to only 2 plaintext. The encryption-decryption procedures are expected to be more efficient since these procedures only receive 2 inputs to be processed instead of inputs. However, it is observed that as the numbers of original plaintext are increasing, the size of the new plaintext becomes bigger. As a consequence, it will probably affect the efficiency of encryption-decryption procedures, especially for RSA cryptosystem since both of its encryption-decryption procedures involve exponential operations. In this paper, we evaluated the relationship between the numbers of original plaintext and the size of the new plaintext. In addition, we conducted several experiments to show that the RSA cryptosystem with embedded Compression-RSA technique is more efficient than the ordinary RSA cryptosystem.

Keywords: Asymmetric Cryptography, Continued-Fraction, Euclidean Algorithm.

ElGamal Cryptosystem with Embedded Compression-Crypto Technique

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Key distribution problem in symmetric cryptography has been solved by the emergence of asymmetric cryptosystem. Due to its mathematical complexity, computation efficiency becomes a major problem in the real life application of asymmetric cryptosystem. This scenario encourage various researches regarding the enhancement of computation efficiency of asymmetric cryptosystems. ElGamal cryptosystem is one of the most established asymmetric cryptosystem. By using proper parameters, ElGamal cryptosystem is able to provide a good level of information security. On the other hand, Compression-Crypto technique is a technique used to reduce the number of plaintext to be encrypted from k plaintext become only 2 plaintext. Instead of encrypting k plaintext, we only need to encrypt these 2 plaintext. In this paper, we embed the Compression-Crypto technique into the ElGamal cryptosystem. To show that the embedded ElGamal cryptosystem works, we provide proofs on the decryption processes to recover the encrypted plaintext.

Keywords: Asymmetric cryptography, ElGamal cryptosystem, Compression-Crypto technique.

Solving Eighth-order Boundary Value Problems Using Differential Transformation Method

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Abstract. In this study, we solved linear and nonlinear eighth-order boundary value problems using Differential Transformation Method. Then we calculate the error of DTM and compare the results with other methods such as modified application of the variational iteration method (MVAM), homotopy perturbation method (HPM) and modified Adomian decomposition method (MADM). We compared the errors of each method with exact solutions. We provided several numerical examples in order to show the accuracy and efficiency of present method. The results showed that the DTM is more accurate in comparison with those obtained by other methods.

Keywords: Differential Transformation Method, Ordinary Differential Equations, Series Solution, Boundary Value Problems.