

**PROCEEDINGS**

**ISET-2018**

**International Conference on Innovative  
Approaches in Sciences, Engineering  
and Technology**

**Venue: Osaka International Convention Center, Japan**

**Osaka, Japan**

**Date: August 23-24, 2018**



# ***CONFERENCE BOOK OF ABSTRACT PROCEEDINGS***

*Consortium-ET*

Consortium of Engineering & Technology



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# **Book of Abstracts Proceedings**

**International Conference on Innovative Approaches in Sciences, Engineering and  
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Proceedings of the International Conference on Innovative Approaches in Sciences, Engineering and Technology (ISET)

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***International Conference on Innovative Approaches in  
Sciences, Engineering and Technology (ISET)***

**Venue: Osaka International Convention Center, Japan**

**Conference Theme:** Forum for enhancement of research and developmental activities through networking and sharing ideas.



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## CONFERENCE TRACKS

- Computer and Software Engineering
- Mechanical & Metallurgical Engineering
- Electrical & Electronics Engineering
- Civil Engineering
- Bio-Technology & Food Technology
- Chemistry & Chemical Engineering
- Physical, Applied and Life Sciences
- Interdisciplinary

## CONFERENCE CHAIR MESSAGE

### **Michael Sasaoka**

“International Conference of Consortium of Engineering & Technology” is a platform that thrives to support the worldwide scholarly community to analyze the role played by the multidisciplinary innovations for the betterment of human societies. It also encourages academicians, practitioners, scientists, and scholars from various disciplines to come together and share their ideas about how they can make all the disciplines interact in an innovative way and to sort out the way to minimize the effect of challenges faced by the society. All the research work presented in this conference is truly exceptional, promising, and effective. These researches are designed to target the challenges that are faced by various sub-domains of the social sciences and applied sciences.

I would like to thank our honorable scientific and review committee for giving their precious time to the review process covering the papers presented in this conference. I am also highly obliged to the participants for being a part of our efforts to promote knowledge sharing and learning. We as scholars make an integral part of the leading educated class of the society that is responsible for benefitting the society with their knowledge. Let’s get over all sorts of discrimination and take a look at the wider picture. Let’s work together for the welfare of humanity for making the world a harmonious place to live and making it flourish in every aspect. Stay blessed.

Thank you.

Michael Sasaoka

Conference Chair

Email: [contact@consortium-et.com](mailto:contact@consortium-et.com)



# CONFERENCE AGENDA

DATE: August 23-24, 2018

LOCATION: Osaka International Convention Center, Japan

Event Title: International Conference on Innovative Approaches in Sciences

Engineering and Technology ISET-2018

## Start Time

- 09:00 am - 09:10 am: Registration & Kit Distribution
- 09:10 am - 09:20 am: Introduction of Participants
- 09:20 am - 09:30 am: Inauguration and Opening address
- 09:30 am - 09:40 am: Grand Networking Session

**Tea/Coffee Break (09:40 am - 10:00 am)**



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## 10:00 am - 11:20 am: First Presentation Session

### Room 1

### Track A: Engineering, Technology & Applied Sciences

Presenter Name	Manuscript Title	Paper ID
Deng-Min Lin	Impact of the Development of Inquiry Teaching Materials on Nanotechnology Application on the Learning Outcomes and Communication of Senior High School Students	ISET-AUG18-103
Ying-Chi Chang	Impact of the Development of an Instructional Model for the Manufacturing of Nanoparticles on the Learning Outcomes and Motivation of Senior High School Students	ISET-AUG18-104
Hsiao-Wen Li	Study on the Development of an Instructional Module about the Characteristics of Nanoparticles in a Senior High School	ISET-AUG18-105
Hyoung-Joon Jin	Catalytic Effects of Oxygen and Nitrogen Groups on Activate Carbon Electrodes for Redox Flow Batteries	ISET-AUG18-106
Dr Ren Zuo Wang	Using Functional Bearing Model (FBM) on Bridge under Near Fault Ground Motion	ISET-AUG18-107

**Lunch Break (11:20 am - 12:00 pm)**

# CONFERENCE AGENDA

DATE: August 23-24, 2018

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## 12:00 pm - 01:00 pm: Second Presentation Session

### Room 1

#### Track A: Engineering, Technology & Applied Sciences

Presenter Name	Manuscript Title	Paper ID
Guan-Rong Li	A Novel Real-Time DDoS Detection System Using Machine Learning	ISET-AUG18-108
Zh-Wei FAN	Determination of Sources of Faults for an MIMO System Using Artificial Neural Network and Rough Set Approaches	OSA-488-101E

#### Track B: Business, Economics, Social Sciences & Humanities

Yuehjen Shao	Forecasting PM2.5 in Taiwan Using Multiple Regression and ARIMA Approaches	OSA-488-102B
Angel Nga Man LE-UNG	Moral Disengagement, Hostility and Cyberbullying Involvement among Chinese Students	IRBEMSH-088-ANI101

Ending Note (01:00 pm - 02:00 pm)

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## Conference Day 02 (August 24, 2018)

Second day of conference will be specified for touristy. Relevant expenses are borne by Individual him/herself.



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***TRACK A***

***ENGINEERING, TECHNOLOGY & APPLIED SCIENCES***



## **Impact of the Development of Inquiry Teaching Materials on Nanotechnology Application on the Learning Outcomes and Communication of Senior High School Students**

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**Keywords:** 5E Inquiry Teaching, Nanotechnology Application, Learning Outcomes, Scientific Communication

This study explored the impact of the use of inquiry teaching materials on nanotechnology application to teach senior high school students on their learning outcomes and scientific communication. In this study, a qualitative research method was adopted, and data collection and analysis were based on qualitative data supplemented by quantitative data analysis. The study participants were students in a class of first-year senior high school in central Taiwan. The quantitative data included the Achievement Test for the Lesson of Nanotechnology Application and the Scientific Competence-Communication Ability Scale, which were tested before and after teaching. A paired sample t-test was performed to determine the difference between the pre-teaching and post-teaching results. The results of the study were as follows: 1. In terms of learning outcomes and scientific communication skills, significant differences were found between the pre-teaching and post-teaching scores of Achievement Test for the Lesson of Nanotechnology Application as well as between the pre-teaching and post-teaching scores of Scientific Competency and Communication Skills Scale, indicating that the use of inquiry teaching materials about nanotechnology application can achieve good results in learning outcomes and scientific communication skills. 2. The qualitative data analysis shows that the use of inquiry teaching materials about nanotechnology application can significantly improve students scientific communication skills and learning outcomes.

## **Impact of the Development of an Instructional Model for the Manufacturing of Nanoparticles on the Learning Outcomes and Motivation of Senior High School Students**

<sup>1\*</sup>Ying-Chi Chang, <sup>2</sup>Jang-Long Lin

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**Keywords:** 5E Inquiry Teaching, Nanoscale, Manufacturing Of Nanoparticles, Learning Outcomes, Learning Motivation

The main purpose of this study was to explore the impact of a 5E inquiry instructional module for the lesson of manufacturing of nanoparticles on the learning outcomes and motivation of first-year senior high school students. The study participants were first-year students from one national high school in central Taiwan. A qualitative research method was adopted in this study, and researchers designed teaching activities for the lesson of the manufacturing of nanoparticles based on a 5E inquiry instructional model. Data collection and analysis were mainly based on qualitative data that was supplemented with quantitative data. The researchers performed a paired sample t-test on the pre-teaching and post-teaching scores of Achievement Test on the Lesson on the Manufacturing of Nanoparticles, and conducted statistical analysis of each dimension score of a post-teaching learning motivation questionnaire for the lesson of manufacturing of nanoparticles. The results of the study were as follows: 1. In terms of learning outcomes, significant differences were found in the students scores before and after the lesson on the manufacturing of nanoparticles, and the post-teaching results for the lesson that was taught using the 5E inquiry instructional module were substantially better than the pre-teaching results. 2. In terms of learning motivation, significant differences were present between the pre-teaching and post-teaching scores of the learning motivation test, and the 5E inquiry teaching material for the manufacturing of nanoparticles provided positive help for students learning motivation. In addition, the results of qualitative data analysis also showed that the contents of teaching material on the manufacturing of nanoparticles allowed students to feel lively, vivid, and engaged in daily life, and exhibited positive help in maintaining students learning motivation.

## Study on the Development of an Instructional Module about the Characteristics of Nanoparticles in a Senior High School

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**Keywords:** 5E Learning Cycle Teaching Module, Characteristics Of Nanoparticles, Scientific Inquiry Ability, Learning Outcomes

The 5E learning cycle teaching model was combined with the characteristics of nanoparticles in this study to develop an instructional module, exploring the impact of the instructional module on first-year senior high school students scientific inquiry ability and learning outcomes. The study participants were 29 students from one first-year class of senior high school in central Taiwan. A qualitative research method coupled with qualitative data analysis was employed as the primary study method, with quantitative data analysis as a secondary study method; the impact of the instructional module on the students scientific inquiry ability and learning outcomes was thus extensively explored. The qualitative data collection included pre-teaching and post-teaching achievement tests, student transcripts, a lecture video, recording material, feedback forms, interviews, and so on. Quantitative data included pre-teaching and post-teaching achievement tests on the characteristics of nanoparticles and scientific inquiry ability scale, and a paired sample t-test on the pre-teaching and post-teaching results was performed. In terms of learning outcomes, the study results showed significant differences between the total scores of the pre-teaching achievement test and those of the post-teaching achievement test. In particular, significant differences were found in the achievement tests on optical characteristics, electromagnetic characteristics, thermal characteristics, and surface characteristics, suggesting that the teaching materials on the characteristics of nanoparticles based on the 5E learning cycle teaching module can help students to learn the characteristics of nanoparticles. Additionally, the study results indicate that this instructional module also helps to cultivate the three aspects of students scientific inquiry ability: proposing plans and hypotheses, plans, and data analysis and interpretation, all of which showed significant differences.

## Catalytic Effects of Oxygen and Nitrogen Groups on Activate Carbon Electrodes for Redox Flow Batteries

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**Keywords:** Redox Flow Batteries, Activated Carbon, Polarization

Redox flow batteries (RFBs) have design flexibilities for a target application and long-term electrochemical stability, because active redox-couples with no host structure were dissolved in two separated electrolytes which are stored in container with the desired size, allowing them to be one of the promising candidate as the large-scale energy storage systems. Carbon felt (CF) typically has been used as an electrode for vanadium redox flow batteries (VRFBs), because of their three-dimensional macroporous structure for mass transport, high electrical conductivity and chemical stability in strong acidic electrolytes as well as easy-of-use to mass production. However, owing to the poor electrochemical activity and kinetic reversibility, several researches have been focused on alleviating activation polarization of the CF through a surface modification including redox-active heteroatoms and/or nanocomposites with metal-based electrochemical catalysts. In this study, thin pyroprotein coating layers containing numerous oxygen and nitrogen heteroatoms were introduced on the surface of CFs, and their catalytic effects on the redox reaction of  $V^{2+}/V^{3+}$  couples for VRFBs were investigated. In addition, in order to confirm the correlated catalytic effects of oxygen, nitrogen or oxygen and nitrogen co-doped carbonaceous coating layers on the surface of CFs were prepared by using glucose (O-CFs) or melamine (N-CFs) adsorption, respectively, and following heating. The pyroprotein coated CFs (P-CFs) showed significantly lower anodic and cathodic peak potential separation ( $E_p$ ) of 0.17 V, compared with them (0.32 and 0.24 V) of O-CFs and N-CFs, respectively, and even in the P-CF sample with smaller heteroatom contents than those of O-CFs and N-CFs, the superior  $E_p$  value was achieved. These results clearly demonstrate the synergistic catalytic effects of oxygen and nitrogen heteroatoms on the  $V^{2+}/V^{3+}$  redox reactions. Furthermore, full cell VRFBs based on P-CFs shows an enhanced energy efficiency, rate capability and stable cycling behavior compared with those of CFs, O-CFs and N-CFs.

## Using Functional Bearing Model (FBM) on Bridge under Near Fault Ground Motion

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**Keywords:** Functional Bearing Model (FBM), Near Fault Ground Motion, Design Spectra.

In this paper, functional bearing model (FBM) on bridge system is adopted. Top and bottom of bearing have sliding behavior under near fault ground motion. In order to model sliding responses of bearing, FBM use three link elements under SAP2000 structural software. Top and bottom of two link elements are to simulate sliding response of bearing. These two link elements are called by frictional element. Friction element is in the top of sliding interface between bearing and deck. Middle link element is to simulate rubber deformation. There near fault ground motions such as Chi-Chi earthquakes TCU068, TCU102, and TCU052 are used. A numerical simulations of bridge using FBM is to compute responses of bridge under shaking table test. From simulation results prove the accuracy of proposed FBM. In addition, the effects of near fault ground motion for bridge using FBM are studied under different PGA of design spectra.

## A Novel Real-Time DDoS Detection System Using Machine Learning

<sup>1</sup>Hong-Yi Chang, <sup>2</sup>Yu-Fong Wu, <sup>3</sup>Tzu-Fan Hsu, <sup>4</sup>Yu-Shiang Shen, <sup>5\*</sup>Guan-Rong Li  
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**Keywords:** DDoS Detection System, Intrusion Detection, Machine Learning, Real-Time, Network Security.

In recent years, DDoS attacks have caused huge losses in various industries due to their remarkable effects and easy implementation. Therefore, how to use information technology to help security staff identify attack traffic is the goal of researchers. The proposed prediction models in the previous researches has high accuracy, but there are few prototypes that can be monitored in the real-time environment. Due to proposed prediction models limitations, the prediction model cannot determine whether the packet is attack traffic one by one, it can only be determined by batch method. In this paper, the proposed prediction model using machine learning algorithm by combining statistical features and original packet features. According to the experiment results, the accuracy of the proposed prediction model has a good performance. In addition, the proposed prediction model can accurately identify attack traffic in a real environment.

## Determination of Sources of Faults for an MIMO System Using Artificial Neural Network and Rough Set Approaches

<sup>1</sup>Yuehjen SHAO,<sup>2\*</sup>Zh-Wei FAN,<sup>3</sup> Hong-Ci SYU

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**Keywords:** Artificial Neural Networks, Rough Set, Process Fault, Multiple Inputs  
Multiple Outputs.

Recently, the issue of determination of process faults has attracted considerable attention because it is able to greatly improve the process. Typically, for a univariate process, it is straightforward to investigate the sources of a fault since there is only one quality characteristic. However, because the quality characteristics of a multivariate process is equal to or more than two, it is complicated to identify which one or which set of quality characteristics are at faults. Although some statistical decomposition methods may provide the possible solutions, the mathematical difficulty could confine the applications. Also, although the issue of identification of process faults has been widely studied, there has been very little research focused on the identification of the faults for a multiple inputs and multiple outputs (MIMO) system. As a consequence, this study proposes the artificial neural network (ANN) and rough set (RS) mechanisms to determine the source of a multivariate process fault for a MIMO system. A series of computer simulations are performed to evaluate the effectiveness of the proposed ANN and RS approaches.



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***TRACK B***

***BUSINESS, ECONOMICS, SOCIAL SCIENCES & HUMANITIES***



## **Moral Disengagement, Hostility and Cyberbullying Involvement among Chinese Students**

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**Keywords:** Modal Disengagement, Cyberbullying, Hostility .

This study aims at investigating the predictors of cyberbullying involvement among Chinese students. Moral disengagement and hostility have been found to be related to cyberbullying perpetration, yet, few studies investigated the pattern in a Chinese population. 253 Chinese students filled out questionnaires which asked about their basic demographics, frequency in cyberbullying perpetration, moral disengagement and hostility. Results showed that there were positive correlations among moral disengagement, hostility and cyberbullying perpetration. After controlling the total time spent on social networking sites and gender, hostility and moral disengagement still positively and uniquely explaining 9.5% of the variance in cyberbullying perpetration. The findings implied the importance of enhancing students morality and reducing their hostility for future anti-cyberbullying regimes.

## Forecasting PM2.5 in Taiwan Using Multiple Regression and ARIMA Approaches

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**Keywords:** Forecast, PM2.5, Multiple Regression, ARIMA

Recently, air pollution is growing worse in Taiwan. The PM2.5 is the particulate matter (PM) that has a diameter less than 2.5 micrometers. Because high level of PM2.5 can cause immediate health problems, the accurate prediction of PM2.5 is an important issue. This study uses the multiple regression (MR) and autoregressive integrated moving average (ARIMA) approaches to forecast the PM2.5 in Taiwan. In this study, the forecasting accuracy measure is based on the mean absolute percentage error (MAPE). The practical dataset, from the years 2003 to 2017, for PM2.5 in Taiwan, are collected and analyzed. The empirical forecast results are used to evaluate the effectiveness of the proposed MR and ARIMA approaches.

## ***UP COMING EVENTS***

You can find the details regarding our upcoming events by following below:

<http://consortium-et.com/upcoming-events/>

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# MISSION

*To disseminate knowledge and help scholars, practitioners and administrators to promote the high quality research.*

