NCTechEd11 & ICTechEd6

March 19, 2019
KMUTNB Bangkok, Thailand

Organized by

Faculty of Technical Education

King Mongkut's University of Technology North Bangkok (KMUTNB), Thailand

Message from the President

It is extremely challenging time for Thailand to undertaken substantial reforms by accelerating the development of science, technology, research and development, and innovation as key factors in empowering the development of all aspects needed to increase the country's competitiveness with an exceedingly competitive global economy. In today's knowledge-driven economies, King Mongkut's University of Technology North Bangkok encourages research and academic work consequently.

"The 11th National Conference on Technical Education and the 6th International Conference on Technical Education" organized by The Faculty of Technical Education, KMUTNB is deemed in harmony with the university vision and commitment for the sustainable development goals. This undertaking has received substantial assistance from partnership networks includes nine vocational-technical education institutions along with participating universities. Besides, the active and supportive alumni network, enterprise cooperation, and current students have played a valuable role in fostering and carrying out the mission. Such collaboration is a vital element for the expansion of Technical Education into broader careers and academic horizons towards strength and abiding sustainability.

On behalf of the University administration, faculty, and staff, I wish the event fruitful deliberations and productive outcomes. I hereby acknowledge and appreciate the efforts and cooperation of everyone -- faculty members, former and current students of the Faculty of Technical Education, for project collaborative arrangement and coordination. In the meantime, my sincere gratitude is particularly extended to all those who encourage dissemination of knowledge and effective strategy implementation. Undoubtedly, your meaningful endeavors will contribute to the positive development of national studies and research relevant to advanced Engineering and Technical education for years to come.

Professor Dr.-Ing.habil. Suchart Siengchin

President of King Mongkut's University of Technology North Bangkok

Message from Dean

The National Conference on Technical Education was established for the first time in 2008 by Faculty of Technical Education of King Mongkut's University of Technology North Bangkok (KMUTNB). For this time, the 11th National Conference on Technical Education and the 6th International Conference on Technical Education are organized with the theme of "Technopreneur for Sustainable Growth and Development" starting on 19th March 2019 at Benjarat Hall, NavamindraRajini Building, KMUTNB. The conference offers an opportunity for researchers, academicians, educators, and traders interested in the area of Vocational and Technical Education, to share their knowledge and experience.

I trust the conferences devoted to the advancement of innovation in the field of Engineering and Technical Education both nationally and internationally.

On behalf of the Dean of faculty of Technical Education at KMUTNB, I would like to express my gratefulness and sincerely appreciate the effort put forth by both of Thai and foreign committees, instructors, specialists, administrators, staffs, and students of the Faculty of Technical Education for your corporation and assistance in the 11th National Conference on Technical Education and the 6th International Conference on Technical Education to reach its objectives. We would like to thank all of the sponsoring organizations for providing their generous support. Especially, thank you to King Mongkut's University of Technology North Bangkok, German-Thai Chamber of Commerce, IEEE Thailand Section and the Association of Industrial Education Thai.

I extend my best wishes for great success of the conference.

Assoc. Prof. Dr. Pairote Stirayakorn
Dean, Faculty of Technical Education
King Mongkut's University of Technology North Bangkok

Message from the Conference General Chair

Greetings!

Allow me to warmly thank the organizers of this important conference for giving me the privilege of welcoming and addressing you all. As General Chair, I take great pride in welcoming all the attendees of the 11th National Conference on Technical Education and the 6th International Conference on Technical Education which organized under the theme of "Technopreneur for Sustainable Growth and Development". Technopreneur is related to technology as the key, let us seize the opportunity this conference offers to keep up with the strong connection of Technology, Innovations, Entrepreneurship, and Education.

We have invited three keynote speakers to deliver their valuable talk on Professional Education System IUT method:

Professor Stéphane Lauwick, University Institute of Technology (France), will give a speech titled "System of DUT/LP/profession education", Professor Noureddine Takorabet, Université de Lorraine (France), will give a speech titled "IUT in a university cluster including engineering schools with professional curricula", and Professor Abdelmalek Benzekri, Université Toulouse III - Paul Sabatier (France), will give a speech titled "IUT&Research".

We look forward to bring an academic platform between higher institution and industry, promote research and education to build a global community as well as achieve sustainable development in the future.

As your host, all of us wish you all the best, hoping that you find the conference informative and worthwhile and continue to engage with the conference series.

Asst. Prof. Dr. Suchanya Posayanant
General Chair
The 11th National Conference on Technical Education
and the 6th International Conference on Technical Education
Faculty of Technical Education
King Mongkut's University of Technology North Bangkok

Conference Program

The 11th National Conference on Technical Education
and the 6th International Conference on Technical Education

"Technopreneur for Sustainable Growth and Development"

Tuesday, March 19, 2019

Time	Details	Places
08.00 – 09.00	Registration	Benjarat Hall, Navamindra Rajini Building
09.00 – 09.30	Opening ceremony NCTechEd11 and ICTechEd6	
09.30 – 10.00	Awards & Sponsor Recognition	
10.00 – 10.45	Special Presentation on *"Professional Education System, IUT Method"* *Sub-topic: System of DUT/LP/professional education* *- Mr. Stéphane Lauwick* *VP for International Affairs, ADIUT* *(the network of 113 University* *Institute of Technology (IUT)), France*	
10.45 – 11.15	Special Presentation *Sub-topic: IUT in a university cluster including engineering schools with professional curricula* *- Professor Noureddine Takorabet* *Université de Lorraine*	
11.15 – 12.00	Special Presentation *Sub-topic: IUT & Research* *- Professor Abdelmalek BENZEKRI* *Université Toulouse III - Paul Sabatier*	
12.00 – 13.00	Lunch hosted by FTE, KMUTNB	
13.00 – 14.15	NCTechEd11/ICTechEd6 Papers presentation	FTE Building (52)
14.15 – 14.30	Coffee Break	
14.30 – 17.30	NCTechEd11/ICTechEd6 Papers presentation	

NCTechEd11 Session

สถานที่	รหัสผู้นำเสนอบทความ	รหัสบทความ	ห้องที่ 1 ห้อง311A	รหัสผู้นำเสนอบทความ	รหัสบทความ	ห้องที่ 2 ห้อง MIAP 308
ประเภทบทความ			เทคโนโลยีการศึกษาและนวัตกรรม			เทคโนโลยีสารสนเทศและคอมพิวเตอร์
ผู้ดำเนินรายการ			รศ.ดร.ชัยวิชิต/ดร.อโนมา			ดร.กฤช /ผศ.ดร.จิระพันธุ์
13.00-13.15 น.	NC48	ETI01	กิตติ เสือแพร การศึกษาการแก้ปัญหาทางการเรียนรายวิชาไมโครคอนโทรลเลอร์ของนักศึกษาครุศาสตร์อุตสาหกรรมโดยใช้ชุดฝึกทักษะอย่างง่าย	NC07	ICT01	ณัฐภณ หรรษกรคณโชค การพัฒนาเกมคอมพิวเตอร์ทายคำศัพท์ภาษาอังกฤษโทอิค 100 คำศัพท์
13.15-13.30 น.	NC15	ETI02	พิมพ์มาดา โกจิราพันธ์ การพัฒนาสื่อและกิจกรรมการสอนสำหรับครู เรื่องบัตรคำศัพท์สีและกิจกรรมการเรียนรู้แบบสาธิตเชิงปฏิบัติ เพื่อส่งเสริมการอ่านออกเขียนได้ของนักเรียนระดับประถมศึกษา ของโรงเรียนในพื้นที่อำเภอสวนผึ้ง จังหวัดราชบุรี	NC38	ICT02	ชัชรินทร์ เลิศยศบดินทร์ แบบวัดความสามารถในการแก้ปัญหาสำหรับการจัดการเรียนรู้ทางวิทยาการคำนวณ
13.30-13.45 น.	NC17	ETI03	ทัศนีย์ ปราชญากุล การพัฒนาสื่อโมชันกราฟิก เรื่องการรับส่งภาพข่าวภูมิภาคผ่านระบบวิดีโอมายไทยวัฐ ร่วมกับกิจกรรมสื่อสารประชาสัมพันธ์แก่นักศึกษาระดับปริญญาบัณฑิต	NC58	ICT03	เทพวรรณ ปรีดาเกษมสิน การพัฒนาสื่อวีดิทัศน์ที่ใช้ประกอบบทเรียนคอมพิวเตอร์ช่วยฝึกอบรมแบบปรับเหมาะเพื่อพัฒนาสมรรถนะของอาชีพ นักออกแบบเนื้อหาอีเลิร์นนิ่ง
13.45-14.00 น.	NC05	ETI04	อนุสรณ์ จึงตระการ การสนับสนุนการศึกษารายวิชาการสื่อสารข้อมูลและเครือข่ายโดยการใช้ Online Interactive Quizzes	NC60	ICT04	เบนจามิน ชนะคช ระบบแนะนำการปรับปรุงหลักสูตรด้วยเหมืองข้อความ กรณีศึกษามหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัย
14.00-14.15 น.	NC32	ETI05	เกศริน ถั่วทอง การพัฒนาสื่อโมชันกราฟิกและสื่อสิ่งพิมพ์โดยใช้เทคโนโลยีคิวอาร์โค้ดร่วมกับกิจกรรมเพื่อประชาสัมพันธ์การท่องเที่ยวอุทยานธรรมชาติวิทยาตามพระราชดำริ สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี. สวนผึ้ง จ.ราชบุรี	NC64	ICT05	ธำรงกุล สุพงษ์ การประยุกต์ใช้วิธีอาณานิคมมดเพื่อหาเส้นทางการท่องเที่ยวในจังหวัดพระนครศรีอยุธยา
14.15-14.30 น.						

รหัสผู้นำเสนอบทความ	รหัสบทความ	ห้องที่ 3 ห้อง 312	รหัสผู้นำเสนอบทความ	รหัสบทความ	ห้องที่ 4 ห้อง 313	รหัสผู้นำเสนอบทความ	รหัสบทความ	ห้องที่ 5 ห้อง 216-217
		วิศวกรรม และเทคนิคศึกษา			วิศวกรรม และเทคนิคศึกษา			การจัดการและการบริหารการศึกษา
		ผศ.ดร.สยาม/ผศ.ดร.ภิตติวุฒิ			รศ.ดร.สมศักดิ์/ผศ.ดร.ชัยพล			ดร.ปิยะ/ผศ.ดร.นำโชค
NC03	ETE01	โชคชัย ลองกรณ์ทักษิณ การจัดการเรียนรู้โดยใช้โครงการเป็นฐานในรายวิชาโครงงานสำหรับศิษย์พระดาบสระดับประกาศนียบัตรวิชาชีพชั้นสูงในระบบทวิภาคี	NC06	ETE15	สมศักดิ์ ธนพุทธิวิโรจน์ การพัฒนาและหาประสิทธิภาพแผนการสอนเรื่องการวิเคราะห์เวกเตอร์สำหรับรูปแบบการเรียนรู้โดยใช้ปัญหาเป็นฐาน	NC11	EMA01	นิตยา อุดกฤษฎ์ ผลสัมฤทธิ์ทางการเรียนของนักศึกษาระดับปริญญาตรี ที่กลับเข้าศึกษาใหม่ในมหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ (มจพ.)
NC04	ETE02	ปริวรรต พุ่มวัฒน์ การศึกษาผลกระทบของสารเติมแต่งประเภทออกซิเจนเนตที่มีผลต่อสมรรถนะเครื่องยนต์ดีเซลขนาดเล็กที่ใช้ไบโอดีเซลปาล์มเป็นเชื้อเพลิง	NC28	ETE16	ณิชมน พูนน้อย วงจรคอนเวอร์เตอร์สามเฟสที่ควบคุมด้วยดีฟเฟอร์เรนเชียลแฟลตเนต	NC36	EMA02	ไพโรจน์ พิภพเอกสิทธิ์ ปัจจัยที่ส่งผลต่อเจตคติต่อการมีจิตสาธารณะของนักศึกษาระดับปริญญาตรี มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
NC09	ETE03	ประยิด พรหมสุวรรณ การพัฒนาและหาประสิทธิภาพของชุดฝึกปฏิบัติเครื่องยนต์คอมมอนเรล	NC29	ETE17	จิรโรจน์ สามารถโชติพันธุ์ ระบบควบคุมการใช้พลังงานไฟฟ้าในห้องเรียน และจำแนกสิทธิ์ด้วยอาร์เอฟไอดี	NC42	EMA03	จัดวา ชุณหบุญญทิพย์ การศึกษาความสัมพันธ์ระหว่างความมุ่งมั่นสู่เป้าหมายกับผลสัมฤทธิ์ทางการเรียนโดยมีทุนทางจิตวิทยาเชิงบวกเป็นตัวแปรคั่นกลาง: กรณีศึกษานักศึกษา ชั้นปีที่หนึ่ง มหาวิทยาลัยเทคโนโลยีราชมงคลอีสาน วิทยาเขตขอนแก่น
NC16	ETE04	ธนานันต์ เด็งจารึกชัย ชุดสื่อการสอนการได้เปรียบเชิงกล เรื่อง รอกและคาน	NC40	ETE18	ขอบคุณ ไชยวงศ์ การจัดกิจกรรมการสอนด้านเทคโนโลยีสารสนเทศโดยใช้รูปแบบการเรียนรู้ SIPEDA Model สำหรับนักศึกษาระดับปริญญาตรี	NC51	EMA04	ณัฏฐิรา หอพิบูลสุข กระบวนการเขียนภาษาอังกฤษของครูอาชีวะที่กำลังศึกษาในระดับมหาบัณฑิต โดยวิธีปรับแก้ไข
NC19	ETE05	ภาวนา พรหมสาลี การเปรียบเทียบผลสัมฤทธิ์การใช้สื่อมัลติมีเดียร่วมกับการให้ผู้เรียนได้ลงมือปฏิบัติจริงและการจัดการเรียนรู้ด้วยวิธีการสอนตามปกติ เรื่อง การตั้งศูนย์มุมล้อหน้ารถยนต์	NC39	ETE19	ณัฏฐ์ สิริวรรธนานนท์ การสร้างและหาประสิทธิภาพชุดฝึกระบบนิวแมติกส์ไฟฟ้า	NC14	EMA05	สุธิษา ดำทอง การศึกษาปัจจัยและกลยุทธ์การสื่อสารการตลาดที่มีผลต่อการตัดสินใจเลือกใช้บริการสินเชื่อเพื่อที่อยู่อาศัยของลูกค้าธนาคารกรุงศรีอยุธยาจำกัด (มหาชน) ในเขตกรุงเทพและปริมณฑล
พักรับประทานอาหารว่าง								

สถานที่	รหัสผู้นำเสนอบทความ	รหัสบทความ	ห้องที่ 1 ห้อง311A	รหัสผู้นำเสนอบทความ	รหัสบทความ	ห้องที่ 2 ห้อง MIAP 308
ประเภทบทความ			เทคโนโลยีการศึกษาและนวัตกรรม			เทคโนโลยีสารสนเทศและคอมพิวเตอร์
ผู้ดำเนินรายการ			รศ.ดร.ชัยวิชิต/ดร.อโนมา			ดร.กฤช /ผศ.ดร.จิระพันธุ์
14.30-14.45 น.	NC21	ETI06	นันท์ปพร จารุเกษตรวิทย์ การศึกษาพฤติกรรมการใช้บริการทัศนคติ แนวทางและการพัฒนาสื่อประชาสัมพันธ์ผ่านจอภาพเพื่อการสื่อสารภายในจุฬาลงกรณ์มหาวิทยาลัย	NC33	ICT06	ชว่าลา ผลสนอง การพัฒนาระบบฐานข้อมูลหน่วยงานบริหารงานจัดหาบนระบบปฏิบัติการแอนดรอยด์ กรณีศึกษา บริษัท พีทีที เมนเทนแนนซ์ แอนด์ เอนจิเนียริง จำกัด
14.45-15.00 น.	NC69	ETI07	กิตติ เสือแพร การพัฒนาชุดฝึกอบรมผ่านเครือข่ายอินเทอร์เน็ตด้วยกระบวนการเรียนรู้แบบ MIAP เรื่องระบบสมองกลฝังตัวและอินเทอร์เน็ตของสรรพสิ่ง	NC30	ICT07	มธุรส พูลการขาย การพัฒนาแอพพลิเคชั่นหนังสือเดินทางท่องเที่ยวอุทยานแห่งชาติประเทศไทยบนระบบปฏิบัติการแอนดรอยด์
15.00-15.15 น.	NC32	ETI08	จิรัชญา เพิกเอี่ยม การพัฒนาแอปพลิเคชันแนะนำการท่องเที่ยวในจังหวัดพระนครศรีอยุธยาบนระบบปฏิบัติการแอนดรอยด์	NC12	ICT08	กฤตยา ทองผาสุข การประยุกต์ใช้ Google Charts API สำหรับการนำเสนอข้อมูลภาพเพื่องานบริหารงานในยุคดิจิตัล
15.15-15.30 น.	NC18	ETI09	มารวย อินทร์แป้นพะเนาว์ การสร้างองค์ความรู้ด้วยตนเอง ในรายวิชางานระบบเครื่องยนต์แก๊สโซลีนควบคุมด้วยอิเล็กทรอนิกส์โดยการใช้โครงงานเป็นฐาน	NC35	ICT09	อัษพล พึ่งเสมา การพัฒนาเกม 2 มิติเพื่อการสอนภาษาอังกฤษระดับประถมศึกษา
15.30-15.45 น.	NC26	ETI10	คมกฤช ข่าย้ง ชุดการสอนแบบโครงงานเป็นฐานรายวิชาเทคโนโลยีสารสนเทศสำหรับนักศึกษา ระดับประกาศนียบัตรวิชาชีพชั้นสูง (ปวส.)เพื่อพัฒนาทักษะวิชาชีพอิเล็กทรอนิกส์	NC37	ICT10	จีระศักดิ์ น่าประดิษฐ์ การจำแนกกลุ่มบทความวิจัยโดยใช้การทำเหมืองข้อความ
15.45-16.00 น.	NC55	ETI11	พัชรนันท์ ยิ่งขยัน การพัฒนาบทเรียนคอมพิวเตอร์ช่วยสอนเรื่องการปฐมพยาบาลเบื้องต้นสำหรับผู้บกพร่องทางการได้ยิน	NC45	ICT11	อัจฉรียา ชัยปัญญาทัศ การวิเคราะห์ช่องว่างทางวิศวกรรมความต้องการในการพัฒนาซอฟต์แวร์
16.00-16.15 น.	NC34	ETI12	เสรี ขุนไชย การพัฒนาแอพพลิเคชั่นร่วมกับเทคโนโลยีอินเทอร์เน็ตของสรรพสิ่งสำหรับควบคุมระบบบ้านอัจฉริยะ	NC46	ICT12	นริศรา มีมาก ปัจจัยที่ส่งผลต่อการยอมรับการใช้โมบายแอปพลิเคชันด้านสุขภาพของผู้สูงอายุในเขตกรุงเทพมหานคร
16.15-16.30 น.				NC50	ICT13	กนกภรณ์ อุดมเดช เครื่องเขย่ายาสมุนไพรกึ่งอัตโนมัติ
16.30-16.45 น.				NC63	ICT14	สุภกิจ สวนกูล โมเดลการวิเคราะห์อารมณ์จากการแสดงออกบนใบหน้าด้วยเทคนิคการทำเหมืองข้อมูล

รหัสผู้นำเสนอบทความ	รหัสบทความ	ห้องที่ 3 ห้อง 312	รหัสผู้นำเสนอบทความ	รหัสบทความ	ห้องที่ 4 ห้อง 313	รหัสผู้นำเสนอบทความ	รหัสบทความ	ห้องที่ 5 ห้อง 216-217
		วิศวกรรม และเทคนิคศึกษา			วิศวกรรม และเทคนิคศึกษา			การจัดการและการบริหารการศึกษา
		ผศ.ดร.สยาม/ผศ.ดร.กิตติวุฒิ			รศ.ดร.สมศักดิ์/ผศ.ดร.ชัยยพล			ดร.ปิยะ/ผศ.ดร.นำโชค
NC20	ETE06	จารุภา เสนารัตน์ การพัฒนาชุดการสอนเรื่องการบิด	NC53	ETE20	ดีเรก มณีวรรณ การพัฒนาชุดการสอนสำหรับการควบคุมแขนกลด้วยโปรแกรมคอมพิวเตอร์แบบต้นทุนต่ำ	NC01	EMA06	จิระพัชร์ คูเลิศตระกูล การสำรวจความจงรักภักดีต่อองค์การของทรัพยากรมนุษย์กลุ่ม Generation Y ในสถานประกอบการอุตสาหกรรมจังหวัดระยอง
NC23	ETE07	กฤษดา กลัดพิบูลย์ ชุดการสอนเฟืองท้ายรถยนต์โดยใช้เทคโนโลยีความจริงเสริม	NC56	ETE21	กฤษดา ยิ่งขยัน ระบบบันทึกข้อมูลจากมิเตอร์ไฟฟ้าโดยใช้โปรโตคอลมอดบัสอาร์ทียูผ่านเครือข่ายไร้สาย	NC08	EMA07	พลศักดิ์ เลิศหิรัญปัญญา ชุดฝึกการพัฒนาสมรรถนะทางโลหะวิทยาภาคปฏิบัติ
NC44	ETE08	ชนิกานต์ เพิ่มอุดสำห์ การสร้างและหาประสิทธิภาพของชุดการสอนแบบผสมเรื่องเสถียรภาพในงานกลึงปอก	NC57	ETE22	กิจจา ไชยทนุ การพัฒนาและหาประสิทธิภาพหลักสูตรการฝึกอบรม เรื่องระบบอินเตอร์เน็ตของสรรพสิ่งเพื่อการเกษตรกรรม สำหรับการถ่ายทอด	NC70	EMA08	ทัศนีย์ วัดนวงศ์แข ปัจจัยด้านแรงจูงใจต่อการทำงานของพนักงานสายสนับสนุนวิชาการสังกัดมหาวิทยาลัยเทคโนโลยีพระจอมเกล้า 3 สถาบัน
NC10	ETE09	สกล อิศรางกูร ณ อยุธยา สมบัติทางวิศวกรรมเทคนิคธรณีของเสาเข็มกรวดซีเมนต์เถ้าลอย	NC61	ETE23	ชัยรัตน์ อุปถัมภ์เกื้อกูล วงจรกรองความถี่เชิงซ้อนที่สามารถปรับความถี่แถบผ่านได้ด้วยวงจรปรับจูนอัตโนมัติ	NC25	EMA09	ศิริภัสสร ภูวเกียรติกำจร การศึกษาความพึงพอใจของนักศึกษาต่อการแจ้งข่าวสารกิจกรรมผ่านเครือข่ายสังคมออนไลน์กรณีศึกษานักศึกษาคณะบริหารธุรกิจและอุตสาหกรรมบริการ
NC24	ETE10	สุรายา สุร้าไพ การน้อมนำแนวคิดปรัชญาเศรษฐกิจพอเพียงสู่กระบวนการ AHP เพื่อการตัดสินใจคัดเลือกผู้รับเหมาก่อสร้าง	NC66	ETE24	นฤพนธ์ ปิ่นเอก การพัฒนาชุดฝึกอบรมด้านการเขียนโปรแกรมไมโครคอนโทรลเลอร์โดยใช้ LEGO Mindstorms Education	NC31	EMA10	จุรีพร ศรีค่า การวิเคราะห์รูปแบบการส่งเสริมและจัดจำหน่ายหนังสือ/ตำรา มหาวิทยาลัยให้แก่นักศึกษามหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
NC27	ETE11	อิทธิพล มีผล การศึกษากระบวนการจีโอโพลิเมอร์ไรเซชั่นของดินคาโอลิไนท์ด้วยสารส้ม หินเพอร์ไลต์และโซดาไฟ	NC68	ETE25	สมนึก วันละ การสร้างชุดฝึกสมองกลฝังตัวเอวีอาร์ ขนาด 32 บิต เพื่อการเรียนรู้และการประยุกต์ใช้งาน วิทยาลัยเทคนิคแพร่	NC13	EMA11	ทิพยวัลย์ ศรีพนม การศึกษาเปรียบเทียบการบริหารเงินยืมทุนหมุนเวียนภายในส่วนงานตามหลักธรรมาภิบาลของมหาวิทยาลัยในกำกับของรัฐในเขตพื้นที่กรุงเทพมหานครและภูมิภาค
NC49	ETE12	ณัฐวุฒิ ก็มเฉื่อย ผลกระทบของมวลรวมล้างต่อคุณสมบัติของคอนกรีตกำลังอัดสูงเร็ว	NC43	ETE26	กัญญวีทย์ กลั่นบำรุง การพัฒนาการเรียนการสอนด้านวิศวกรรมศาสตร์ด้วยกระบวนการสะเต็มศึกษา กรณีศึกษา : การสอนรายวิชาวงจรดิจิทัล	NC47	EMA12	ณัฏฐิรา หอพิบูลสุข กระบวนการเก็บคืนวัฒนธรรมชุมชนเพื่อผลิตสินค้าโดยใช้แนวคิด ชุมชน วัด โรงเรียน (ช.ว.ร) กรณีศึกษาชุมชนมอญ บางกระดี่ กรุงเทพ
NC52	ETE13	วิภาวี จันทพันธ์ ความสัมพันธ์ระหว่างกำลังอัดและโมดูลัสยืดหยุ่นของคอนกรีตในช่วงกำลังอัดสูงและกำลังอัดสูงมาก	NC41	ETE27	นุชนาฏ ชุมชื่น การจัดการเรียนการสอนโดยใช้รูปแบบการสอนแบบไทย-เยอรมัน เรื่องวงจรอิเล็กทรอนิกส์ สำหรับหลักสูตรเตรียมวิศวกรรม	NC02	EMA13	กฤษดา ศรีจันทร์พิยม การพัฒนารูปแบบการเรียนรู้แบบนำตนเองของนักศึกษาหลักสูตรเทคโนโลยีบัณฑิต คณะเทคโนโลยีอุตสาหกรรม สถาบันเทคโนโลยีจิตรลดา
NC62	ETE14	โชคชัย ไตรยสุทธ์ โปรแกรมจำลองสารสนเทศอาคาร (BIM) กับการเรียนการสอนเขียนแบบโยธาและสถาปัตยกรรมในศตวรรษที่ 21	NC67	ETE28	สิริชัย จันทร์นิ่ม การพัฒนาแบบวัดสมรรถนะที่เสริมสร้างทักษะการคิดวิเคราะห์ด้านเทคโนโลยีอุตสาหกรรม	NC65	EMA14	จุฑารัตน์ สวาคมพรรณ การประเมินหลักสูตรประกาศนียบัตรวิชาชีพ สาขาวิชาชีพช่างอิเล็กทรอนิกส์ พุทธศักราช 2552 โรงเรียนช่างมีมิอทหาร สถาบันวิชาการป้องกันประเทศ กองบัญชาการกองทัพไทย

ICTechEd6 Session

Time		Room 01 (52-703)		Room 02 (52-208)
13.00-13.15	G01 IC07	**Neeraj Bhandare**, Anil Bhandare and K. D. Ahire Role of Yoga in Technical Education: An Review	G13 IC16	**Worrapon Tamuang,** Sutee Olarnrithinun... Evaluation of a Mechanical Fatigue Behavior of SKD61 (JIS Standard) under Stress and Strain-Base Controlled by a Four-point Bending Test
13.15-13.30	G02 IC08	**Upeksha Walisundara** Integrating Technology for Developing ESL Learners' Academic Writing Skills	S01 IC28	Maria Rosario Rodavia and **Noreen Miranda** IT Infrastructure Auditing using COBIT Framework
13.30-13.45	G03 IC30	**Markus Hoffmann** and Kamonsak Suradom Implementing a Quality Analysis at Vocational Schools in Thailand through the German-Thai Dual Excellence Education Program (GTDEE) : Impulses for the Future Development of Schools	S02 IC04	**Pratya Nuankaew**, Direk Teeraputon.... Perception and Attitude Toward Self-Regulated Learning in Educational Data Mining
13.45-14.00	G04 IC29	Maria Rosario Rodavia and **Pilita Amahan** Evaluation of Information Technology Governance in Occidental Mindoro State College using Information Technology Assurance Framework	S03 IC18	Pongsarun Boonyopakorn Network Intrusion Detection Enhancement via Fuzzy Class Association Rule Mining
14.00-14.15	G05 IC21	**Mahdi Gandomzadeh**, Ehsan Malandish,.... Purposeful Learning Booklet, a method for teaching Engineering	S04 IC24	**Seree Khunchai** and Chaiyapon Thongchaisuratkul Development Smart Home System Controlled by Android Application
14.15-14.30	G06 IC06	**Sumeena Dangchai,** Pariyaporn Tungkunanan.... Capability Analysis for knowledge and experience transfer of Vocational Certificate and High Vocational Certificate	S05 IC20	**Zahra Pourreza-Movahed,** Mohammad Kabiri-Sedeh.... Science-based Discussions Using Imaginative Stories as a Method of Teaching in Urine Microbial Fuel Cells
14.30-14.45				

Please note that the schedule is subject to change due to unavoidable circumstances

Time		Room 01 (52-703)		Room 02 (52-208)
14.45-15.00	G07 IC14	**Phairhoote Phiphopaekasit** Recruiting, Developing and Retaining Talented People in Industrial Business in Bangkok Area	S06 IC19	**Mohammad Afkar**, Maryam Jebreilzadeh,... A teaching method based on storytelling of a student social activity in renewable energy education
15.00-15.15	G08 IC02	**Pirapong Limprasitwong** ..... The Competency-Based Training on the Renewable Energy for Organic farming by Solar Energy	S07 IC13	**Kanokwan Ruangsiri**, Somsak Akatimagool, ... Development of Virtual Experimental Package for Resonance Circuit Education
15.15-15.30	G09 IC03	**Withawint Srisuriyajan**,.... The Competency Based Training for Maintenance Technicians of Solar Power system focusing on Solar modules	S08 IC12	**Kanokwan Ruangsiri,** Somsak Akatimagool Development of P-PIADA Teaching Model based on STEAM Education on Communication Network Analysis
15.30-15.45	G10 IC25	**Ekkaphan Phacharoen** and Somsak Akatimagool Instructional Management using Simulation Based RISDA Learning Model for Teaching of Industrial Electronics	S09 IC17	**Kobkhun Chaiyawong** and Somsak Akatimakool Development of 5.8 GHz SWR Meter for Testing Telecommunication Systems
15.45-16.00	G11 IC27	**Prasit Phoosomma**, Nat Kasayapanand ..... Bidirectional dc-dc converter for high efficiency welding machines using the power of supercapacitors	S10 IC22	**Nattapong Intarawiset** and Somsak Akatimagool Microwave Filter Analysis with Hybrid Circuitry Structure using Wave Iterative Method
16.00-16.15	G12 IC09	**Tanyaboon Tawonwan**, Nat Kasayapanand ..... A Numerical Analysis of Wind Direction Performance of Flat Roof Wind Catcher for Natural Ventilation	S11 IC26	**Nattapong Intarawiset** and Somsak Akatimagool Analysis of Microwave Filter based on LC Chips in Microstrip Circuitry using K-Inverter Approach

Please note that the schedule is subject to change due to unavoidable circumstances

Keynote Speaker

Keynote Topic: **"***Professional Education System, IUT Method***"**

Sub-topic: System of DUT/LP/Professional Education

- Mr. Stéphane Lauwick
  VP for International Affairs, ADIUT
  (the network of 113 University
  Institute of Technology (IUT)), France

Sub-topic: IUT in A University Cluster Including Engineering Schools with Professional Curricula

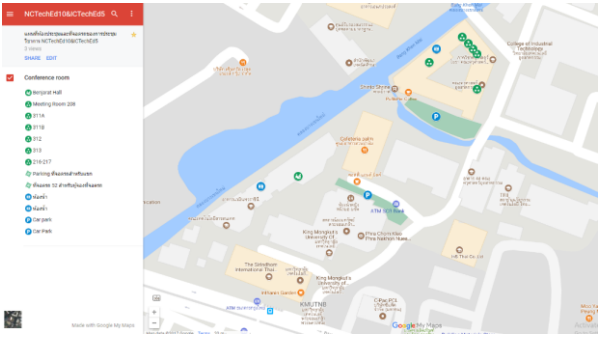
- Professor Noureddine Takorabet
  Université de Lorraine

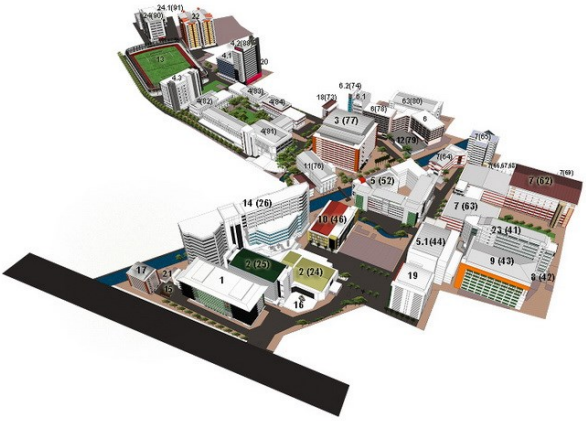
Sub-topic: IUT & Research

- Professor Abdelmalek BENZEKRI
  Université Toulouse III - Paul Sabatier

Map

https://goo.gl/k6KVD1





14(26) *Benjarat Hall, Navamindra Rajini Building*
5(52) *FTE Building*

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NCTechEd11

11th National Conference on Technical Education

Information Technology/ Computer Technology

เทคโนโลยีสารสนเทศและคอมพิวเตอร์

NCTechEd11**ICT01-ICT14**

ICT01:NC07

The Development of Computer Game Predictive 100 Words for Toeic Test

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This purpose of this research were to develop, identify the efficiency, quality for professor and satisfaction for students of Computer game predictive 100 words for toeic test, The sample test students of Faculty department of technical education major computer engineering Rajamangala University of Technology Thanyaburi. during the first semester in the academic year of 2018 consisted 27 students.The sampling group archived by purposive sampling method. The research tools were 1) Computer game predictive 100 words for toeic test 2) The test pretest and posttest for data were analyzed by using statistics which were mean and standard deviation. 3) The quality form of computer game to technical professor and content professor 4) The satisfaction form of computer game to students.

The result of this research found that 1) Researcher was develop computer game predictive 100 words for toeic test for students are learn and remember words with platy game. 2) the efficiency of Computer game develop at 1.18 which was higher than the criteria 1.00 as formula Meguigans ratio 3) The quality form by technical professor impressed at high level 4) The quality form by content professor impressed vocabulary at normal level and communicate language at high level 5) The satisfaction form by students at high level.

The result of computer game predictive 100 words for toeic test to students can remember vocabulary and learn new vocabulary more than. So students are repeat vocabulary all time and game make funny to students. Students don't boring remember vocabulary with game.

Online full paper at: https://is.gd/IEpuCF

ICT02:NC38

Problem Solving Ability Assessment for Computational Science Learning Management

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Office of the Basic Education Commission have announced the curriculum and indicators of computational science for every school, first time in the academic year of 2018. One of the important aspects of computational science will promote the development of learners in problems solving solution with technology in a better way. Therefore, in order to effectively learning management, it is necessary to have specialized learning measures for technology courses (ccomputational science). This research is designing of "Problem Solving Ability Assessment for Computational Science Learning Management" for teachers in every school that can be used in the management of computational learning in schools and bringing utilize the results of learning management to be improved in the future. At all events, The value of Item – Objective Congruence (IOC) of this problem solving ability Assessment was 1.00 and Rater Agreement Index (RAI) from five raters was 0.94

Online full paper at: https://is.gd/S1OVGO

ICT03:NC58

The Development of Video Media in Adaptive Aomputer Assisted Instruction to Train the Competency of E-learning Content Designer

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The objectives of this research are to develop and find the quality of the video media in adaptive computer assisted instruction to train the competency of E-learning content designers. The research tools are of 2 types: 1) video media in training with 10 topics and 2) the evaluation form to validate the quality of the media. The respondents were 5 specialists in the field of video media design with the experience not less than 3 years. The results of the media validation show that: 1) the quality of the media on the content is good. ($\bar{x}$ = 4.45 , S.D. = 0.63) 2) The quality of the media design is very good. ($\bar{x}$ = 4.54 , S.D. = 0.56) The evaluation of every aspect is in the level of good and above in every item. It can be concluded that the video media of this adaptive training model can be implemented in the real situation to develop the competency of E-learning content designers.

Online full paper at: https://is.gd/frgWMB

ICT04:NC60

The Recommendation System for Adjust Curriculum with Text Mining; A Case Study of Rajamangala University of Technology Srivijaya

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This research was aimed to 1. synthesis of a guidance model for curriculum improvement with text mining: a case study of Rajamangala University of Technology Srivijaya. 2. Develop recommendation of curriculum improvement system with text mining: a case study of Rajamangala University of Technology Srivijaya and 3. study of satisfaction by using the recommendation of curriculum improvement system with text mining: a case study of Rajamangala University of Technology Srivijaya. The representative sample consists of 1) 5 content experts to evaluate the developed system in the content. 2) 5 technical experts to evaluate the system that is developed system in term of technical. Research tools used in this research comprise of 1) guidance system for curriculum improvement with text mining, a case studies of Rajamangala University of Technology Srivijaya that developed system with PHP 5.6.30 language using MySQL 5.7.17 database. 2) content evaluation form used for evaluating the content of the system 3) technical evaluation form used for technical evaluation of the system. This developed system was passing from expert assessments of content, satisfaction of system usage as good level (the average score was 4.48, standard deviation 0.49), satisfaction of system usage as good level (the average score was 4.52, standard deviation 0.57) and technical expert's assessment in term of propriety content as very good level (the average score was 4.62, the standard deviation was 0.48), the efficiency propriety was good (the average score was 4.45, the standard deviation 0.41).

In conclusion, this system can be used to improve quality of curriculum because of the advice given by the system be consistent with the stakeholders needs and courses. It can improve curriculum and quality of teaching and learning to produce graduates that meet the needs of the labor market.

Online full paper at: https://is.gd/pJwyNK

ICT05:NC64

Ant Colony Optimization Applied to Routing for Tourism of Phra Nakhon Si Ayutthaya

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Travel within 1 day, most tourists want to visit as many attractions as possible. Introduce the shortest path by using ant colony optimization to introduce tourist attractions in Phra Nakhon Si Ayutthaya. Define the initial value of 10 places, 9 temples and 1 Historical Park. Set the values weight of pheromones (α), weight of heuristic (β), pheromone evaporation rate (ρ) and initial pheromone value (q0) in two levels (Low, High) and Perform a Two-Level Full Factorial experiment adjust the value to increase the efficiency of the answer, found that the values $\alpha = 0.1$, $\beta = 2$, $\rho = 0.1$ and $q0 = 0.75$ and applied to the coordinates of the place give the best result is 37.636 kilometres which corresponds to the actual route that gives the shortest distance by determining Latitude and longitude from Google Map.

Conclusion, the ant colony algorithm to recommend the shortest distance possible, and can be developed to guide the shortest path to a real-time.

Online full paper at: https://is.gd/sYE9Hy

ICT06:NC33

Database Application For Supplier Department A Case Study Of PTT Maintenance And Engineering Company Limited

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The Research are intended to develop for Database application for supplier department A case study of PTT Maintenance and Engineering company limited. Development of Database application for supplier department A case study of PTT Maintenance and Engineering company limited developed by using Android studio to create android application, use SQLite Database for manage internal information and using Ionicframework for programing.

From the results of the operations found that the system generated is divided into 3 sections of users include administrators, employees and general users, administrators can view and manage all the information. Employees can browse all information including requests can be sent to administrators and general users can browse the data only partially. Which systems can reduce the problems that occur. Makes operation quick and easy.

The results of the assessment of user satisfaction, the conclusion is divided into three areas: the system users are satisfied the criteria. "Most satisfied" (a mean of 4.53, standard deviation 0.72), the function is active. User satisfaction is satisfactory. "Most satisfied" (a mean of 4.53, standard deviation 0.72) in the design. User satisfaction is satisfactory. "Most satisfied" (a mean of 4.65, standard deviation = 0.57) and a summary overview of the evaluation system has satisfied the criteria "Most satisfied" (with an average of 4.57. the standard deviation of 0.67).

Online full paper at: https://is.gd/iqnsQv

ICT07:NC30

A Development of Application for National Parks of Thailand's Passport on the Android Operating System

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Application for National Parks of Thailand's Passport on the Android Operating System. Prepared with the aim to develop a National Park Passport from the original book. Provided in the form of application functionality. for the convenience of visitors to the park each reward badge. And to the satisfaction of the users of the apps function passport Thailand tourist park on the operating system Android. A tool that helps to develop technologies for scanning the QR Code to collect national park logo, Android Studio, Adobe Photoshop for creating beautiful images enhanced functionality within apps. As well as the programming language JavaScript, PHP and HTML to write MySQL database management application to assist in the preparation of database management systems. The results of the testing of application functionality that can scan the QR Code to collect national park logo. Can tell a history, topography, weather, wild animals, admission charge, route, recreation activity, facilities and the function is more preferred accommodation nearby. Featured Travel Contact the Parks and telephone emergency notification when an emergency. The results of the satisfaction of users is divided into three aspects to meet the needs of system users. User satisfaction at the level of "good" ($\bar{x}$= 4.46, S.D. = 0.56), according to the work function of the system. User satisfaction at the level of "good" ($\bar{x}$= 4.36, S.D. = 0.51) and the easy-to-use system. User satisfaction is in "good" ($\bar{x}$ = 4.48, S.D. = 0.53) and a summary. The result is an overall rating of "good" ($\bar{x}$= 4.43, S.D. = 0.53)

Online full paper at: https://is.gd/3DrIjU

ICT08:NC12

Data Visualization with Google Charts API for Management System in Digital Transformation

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Using the information system for a long time, a lot of data was collected. The present information system showed the data; such as the remaining students and the staff's leave; in the pattern of table or text. Therefore, the data visualization concept was applied because the present data in the information system cannot immediately compared or decided. This paper presents the applying of Google Charts API for display the data in the Faculty of Information Technology, KMUTNB management system. The questionnaire covered the functional requirement testing, functionality testing, usability testing, and security testing. Five experts evaluated the performance of system. These experts consisted of three persons in the education area and two persons in the computer area. The experts rated an excellent level of functional requirement testing, an excellent level of functionality testing, a good level of usability testing, and an excellent level of security testing. Overall performance results of developed system were good.

Online full paper at: https://is.gd/6JZGv4

ICT09:NC35

Development of 2D Game for Primary Education English Teaching

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This research is development of 2D game for primary education English teaching aimed to support grade 4 students' English knowledge and to develop, motivate and enjoy playing game since English is essential for the students according to foreign language courses based on Basic Education Core Curriculum of 2008.

Content is difficult for children to learn, The research team divided the content into 5 topics include Tense, Question Words, Conversation, V.tobe, V,to have by chasing content according from easy to difficult, so the format of the game is Easy Level and Intermediate Level by using RPG Maker VX Ace.

Which is the main feature of the story and will insert content in various stages. There are options to answer questions of each stage. To pass to the next level Including conversations between characters.

Online full paper at: https://is.gd/jj7VUf

ICT10:NC37

Classifying Research Papers using Text Mining

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The aim of this research was to find the most effective approach to classify research papers using text mining techniques. Three algorithms were used, Logistic Regression, Neural Networks and Naïve Bayes. The data collected for testing were research papers from the International Conference on Computer and Information Technology, a total of 279 articles during 2011-2018. The research papers were divided into three categories: 1) Data Communication and Networking 100 articles 2) Data Science and Machine Learning 100 articles and 3) Other 79 articles. 10-Folder Cross Validation principles were used to segment the data into learning and test data sets. This was also used to measure the efficiency of data modelling focusing on accuracy, precision, recall and F-measure value. Results revealed that the Naïve Bayes technique gave the best results.

Online full paper at: https://is.gd/daep54

ICT11:NC45

Gap Analysis of Requirements Engineering in Software Development

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According to the disruptive technology that cause changes in requirements engineering for software development of several different domains, the organizations that implement software development projects in those domains need practical requirement engineering methods to resolve their particular problems as well as to be able to sustain in this changing world. Therefore, this research aims to perform gap analysis of requirements engineering to further propose the practical solution to bridge the gaps on the process improvement for a specific domain by means of content analysis on the sample in year 2013-2018.The results from the study demonstrate that the gaps in requirement engineering are (1) the requirement engineering process needs to be carried out by problem driven methods, (2) the process improvement on a specific domain, (3) the process improvement for solving the context of communication and cultural different, (4) the study on requirements engineering artefacts, (5) the study on a new technique of requirements elicitation and (6) the paradigm-shift on requirements engineering due to an impact by artificial intelligence technologies.

Online full paper at: https://is.gd/JvSlQm

ICT12:NC46

Factors Influencing Acceptance of Healthcare Mobile Applications by Elderly People in Bangkok

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Most of the mobile applications are nowadays not designed especially for the elderly. The percentage of acceptance of mobile applications by the elderly are thus low mainly because of complex user interface. To support the Thailand 4.0 policy, mobile applications appropriately for the elders' daily life especially in healthcare contexts are needed. For this reason, this paper performed an analysis of factors influencing acceptance of healthcare mobile applications by elderly people in Bangkok. Data was collected from 384 samples during February – April 2018, by purposive sampling. The data was then analyzed by factor analysis and multiple linear regression. The results revealed that there were 28 within three groups that influence Thai elderly people in Bangkok (76.60%) at the significance level of .05. The first group of user interface and user experience was the most influence factors (59.70%). The second group of functions and non-functions and the third group of behavior and life style had the significant influence levels at 52.50% and 36.60%, respectively. Moreover, there are six issues that can either support or impede the acceptance, i.e., health problem associated to the use of mobile application, no intention to use some functions, no benefits to use, and the needs of trainer, learning, and appropriate user interface.

Online full paper at: https://is.gd/ZGux6n

ICT13:NC50

Semi-Automatic Herb Shaking Machine

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An important process in the manufacturing production of homeopathy herbal medicine is mixing herbs with alcohol and vigorously shaking the mixture in a test tube by hand in the vertical direction on a hard surface material. Shaking the mixtures could be ten to million times that are required to achieve homogeneous mixtures. This mixing herbs by hand technique is both energy-intensive and time-consuming. This research is aim to develop a management system of semi-automatic shaking equipment for herb mixtures by using an Arduino board to control the machine and using a pulse-width modulation technique to control the speed of the machine. User will be able to set the number of shaking from one to million times, to set the speed from seventy to nighty times per minute, and to pause or to cancel the machine. The shaking information and the status of the process is shown on the LCD screen. The assessment by experts yields the result at a good level for efficiency and satisfaction. The machine and the software system are working well together according to defining objectives.

Online full paper at: https://is.gd/KiWnJ8

ICT14:NC63

Emotional Analysis Model from Facial Expression with Data Mining Techniques

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On-line social media has increased usage, so the classification of feelings is something that is of interest such as using symbols, messages, emotional expressions such as normal happiness, angry. This research therefore created the emotional analysis model from facial expression, starting with face detection by Haar-like feature and using Histogram of Oriented Gradient: HOG to extract specific features of face images and classify. Performance comparison with classification methods: Decision Tree (ID3), K-Nearest Neighbours (k-NN) and Support Vector Machine (SVM) Type C -SVC, nu-SVC, Linear SVM-L1 and Linear SVM-L2. The results showed that Support Vector Machine (SVM), nu-SVC type, using Polynomial kernel by adjusting Cost 0.2, Degree 3, Gamma 2, Coef0 1, providing the best 81.11% accuracy. After that, using the Vector Machine support algorithm to develop the emotional analysis system from facial expression and allow the expert to evaluate the accuracy of 3 persons, equal to 74.16%, which the system can be applied.

Online full paper at: https://is.gd/gJ7GNy

Education Technology and Innovation

เทคโนโลยีการศึกษาและนวัตกรรม

NCTechEd11**ETI01-ETI12**

ETI01:NC48

The Study of Problem-Solving in Microcontrollers Learning for Students of Technical Teacher Training Program with Easy Instructional Package

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The objectives of this research are to create the easy instructional package in the learning on basic of Microcontrollers theory. To evaluate quality the easy instructional package in the learning on basic of Microcontrollers theory. The sample group was 18 undergraduate students who were registered in 2018 academic year in the field of electrical engineering, department of Teacher Training in Electrical Engineering, faculty of Technical Education, King Mongkut's University of Technology North Bangkok. The statistics used in data analysis are the average, the standard deviation and T-test dependent. The result of this research were found that; The easy instructional package in the learning on basic of Microcontrollers theory had the efficiency was 1.02 according to Meguigan's formula, which was higher than the hypothesis. The learning achievements of the students after learning with the easy instructional package were higher than those of before learning at the .01 level of significance, and the student had satisfied in the learning with the easy instructional package was high level.

Online full paper at: https://is.gd/Uc5TCU

ETI02:NC15

The Development of Instructional Media and Activity for Teachers Entitled "Color Vocabulary Flashcards" and Workshop Demonstration Learning Activity to Support Literacy of Primary Students in Schools in Suan Phueng District, Ratchaburi Province

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This research was aimed to examine the demands of the teachers in Suan Phueng District, Ratchaburi Province in order to develop instructional media and activity for teachers, to develop as well as to determine the quality of the instructional media and activity, to evaluate the results and to examine the satisfaction towards the instructional media and activity for teachers entitled "Color Vocabulary Flashcards" and workshop demonstration learning activity to support literacy of primary students in schools in Suan Pheung District, Ratchaburi Province. The research tools consisted of 1) the survey questionnaire on the demands to develop instructional media and activity for teachers, 2) the instructional media and activity for teachers, both offline and online, 3) the quality evaluation form for contents and media presentation, 4) the observation form to evaluate the results, 5) the satisfaction questionnaire. The research results showed that the sampling group expressed the highest level of demands for instructional media and activity to support literacy ($\bar{x}$ = 4.70, S.D = 0.47). The demand which ranked the first was the demand for the offline media made of color vocabulary flashcards mixed with QR code technology. Regarding the online media, the top demand was a learning activity video clip. The researchers used the survey results to design and develop the instructional media and activity for teachers and the evaluation by the panel of experts showed that the quality of the contents was at a very good level ($\bar{x}$= 4.73, S.D = 0.35) and that the quality of the media presentation was at a very good level ($\bar{x}$ = 4.60, S.D = 0.50). The results from the use by the sampling group were at a very good level ($\bar{x}$ = 4.63, S.D = 0.45). The satisfaction towards the instructional media and activity for teachers was at a high level ($\bar{x}$ = 4.47, S.D = 0.57). It can be concluded that the development of instructional media and activity for teachers entitled "Color Vocabulary Flashcards" and workshop demonstration learning activity to support literacy of primary students in schools in Suan Pheung District, Ratchaburi Province was of good quality and can really be used as instructional media and activity for teachers to support literacy.

Online full paper at: https://is.gd/IqLqOa

ETI03:NC17

The Development of Motion Graphics Entitled "Regional News Image Reception and Transmission through My Thairath Video System" along with Public Relations Activity for Undergraduate Students

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The research aims to explore the demand of motion graphics for "Regional News Image Reception and Transmission through My Thairath Video System" along with public relations activity for undergraduate students, to examine the quality of the media and the activity, to evaluate the perception level and to evaluate the satisfaction of the sampling group. The data was collected with five instruments; (1) the motion graphic for "Regional News Image Reception and Transmission through My Thairath Video System" along with public relations activity for undergraduate students, (2) the questionnaire surveys on the media demanding, (3) the questionnaire surveys on the quality of content and media, (4) the evaluation in perception, and (5) the questionnaire surveys of satisfaction on sampling group. The results revealed the sampling group's demand for the motion graphics was at a high level with 4.07 on average. The result of motion graphic media development has length 5.42 minutes, consisted of 4 elements; (1) openings Thairath TV station, (2) the function of My Thairath Video system, (3) the process of news image reception and transmission, and (4) the example of images used in Broadcasting. The evaluation of content and media quality by six experts revealed the content quality was at a high level with 4.28 on average. Subsequently, the motion graphics for "Regional News Image Reception and Transmission through My Thairath Video System" along with public relations activity for undergraduate students, were used with the sampling group of 30 people. The study showed the evaluation in perception was at a high level with 4.36 on average. In summary, the development of motion graphics for "Regional News Image Reception and Transmission through My Thairath Video System" along with public relations activity for undergraduate students, could be used for public relations regarding the regional news image reception and transmission through My Thairath Video System.

Online full paper at: https://is.gd/XYD8sc

ETI04:NC05

Assisting on the Study of a Data Communication and Network Subject Using Online Interactive Quizzes

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This work aims to present the use of information technology to develop a teaching technique for a data communication and networks subject. This subject is a compulsory course for engineering student and it was found that the failure rate of students on this subject is relatively high in each term. As a result, it is necessary to develop a teaching method in order to rise student's comprehension as much as possible. This work proposes using a pre-testing and post-testing using online interactive quizzes (OIQ), a real time Q&A session done on a smartphone. The OIQ can adjust the focus and the mind-set of students, hence, improving comprehension on the lessons. The initial result shows that the use of OIQ helps the students in learning significantly, which leads those students to achieve higher summative scores in the final test.

Online full paper at: https://is.gd/28cLJL

ETI05:NC22

The Development of Motion Graphics and Printed Media through QR code Technology along with Activity to publicize the tourism of the Natural Botany Park under the initiative of Her Royal Highness Princess Maha Chakri Sirindhorn at Suan Phueng District, R

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This research was aimed to examine the demand and develop motion graphics and printed media through QR code technology along with activity to publicize the tourism of the Natural Botany Park under the initiative of Her Royal Highness Princess Maha Chakri Sirindhorn at Suan Phueng District, Ratchaburi Province, to examine the quality of the media, to examine the perception level and to evaluate the satisfaction of the sampling group towards the motion graphics and the printed media through QR code technology along with activity. The research tools included 1) the questionnaire on the demand for media and printed media, 2) the motion graphics and the printed media through QR code technology along with activity which were motion graphics, leaflets and rollups through QR code technology and public relations activity, 3) the evaluation form for contents and media presentation, 4) the perception questionnaire, and 5) the satisfaction questionnaire. The data were collected from the sampling group which consisted of 70 second-year undergraduate students who enrolled in the ETM 202 course on Advertising and Public Relations, King Mongkut's University of Technology Thonburi in the first semester of the academic year 2018. They were chosen using purposive sampling method out of those who participated in the activities from the beginning till the end and were willing to fill out the questionnaire. The statistical methods for data analysis were mean score and standard deviation. The results show that the demand for the motion graphics and the printed media through QR code technology along with activity was at a high level (average = 3.96, S.D. = 0.74). The researchers used the survey results to develop the motion graphics along with activity and then asked the experts to evaluate them. The quality of the contents as evaluated by 3 experts was at a very good level (average = 4.52, S.D. = 0.37) and the quality of the media presentation as evaluated by 3 experts was at a good level (average =4.44, S.D. = 0.61). The perception level for the motion graphics was at a high level (average = 4.10, S.D = 0.69). The satisfaction was at a high level (average =4.04, S.D. = 0.71). It can be concluded that the motion graphics and the printed matter through QR code technology along with activity to publicize the tourism of the Natural Botany Park under the initiative of Her Royal Highness Princess Maha Chakri Sirindhorn at Suan Phueng District, Ratchaburi Province could be used for actual public relations.

Online full paper at: https://is.gd/YDixEZ

ETI06:NC21

The Study on Service Utilization Behavior, Attitude, Approach and Development of Digital Signage for Internal Communication within Chulalongkorn University

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This research was aimed to examine the utilization behavior, attitude, approach and development of digital signage for internal communication within Chulalongkorn University as well as the perception and satisfaction of the university's community toward digital signage for internal communication. The research tools of this study include structured interview, digital signage for internal communication in Chulalongkorn University, content and media presentation quality assessment form, perception evaluation form, and satisfactory questionnaire toward digital signage. The result from the interview of 15 specific selected participants in behavior of service utilization study shows that they usually passed on information within the work hours via their organization's e-mail addresses around 1-2 times a month. Most of the contents contain all the university's advertisement and announcement of general information to specific academic activities and services. The attitude shows results in the harmonized agreeing that the digital signage is easy to instantly access to the information. Besides, the appearance of digital signage is fascinating and modernistic, which helps in strengthening positive image of the organization. The approach survey result indicates that the digital signage need development in proper element positioning such as the position of still image, text, and motion; likewise, the contents' variety, correction, and conciseness are in the list of needed development. All the results were taken into the development process of the university's digital signage. The descriptive statistics included average mean and standard deviation. The content quality assessment by 3 experts results in excellent level (average = 4.60, S.D. = 0.52). The presentation quality assessment by 3 experts shows in excellent level (average = 4.80, S.D. = 0.35). The result of the research participants' perception evaluation by sample group of 40 persons indicates in high level (average = 3.63, S.D. = 1.04). The satisfaction evaluation result reveals in high level (average = 4.17, S.D. = 0.64).

Online full paper at: https://is.gd/6gOpXk

ETI07:NC69

The Development of Training Packages Online Based on MIAP Learning Model on Embedded System and Internet of Things

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The research aims to develop training packages online based on MIAP learning model on Embedded System and Internet of Things. The objectives of this training packages is to study achievement of using training packages online based on MIAP learning model and to study satisfaction of the users. The sample group was 18 bachelor's degree students in the field of electrical engineering, department of Teacher Training in Electrical Engineering, faculty of Technical Education, King Mongkut's University of Technology North Bangkok. The statistics used in data analysis are the average the standard deviation and T-test dependent. The result of this research were found that the achievements after training with the training packages online based on MIAP learning model on Embedded System and Internet of Things were higher than those of before training at the .01 level of significance, and the users of this training had satisfied in the training with the training packages online based on MIAP learning model was high level.

Online full paper at: https://is.gd/TyL9Iw

ETI08:NC32

A Development of Tourist Attractions Application in Ayutthaya Province on Android Operating System

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The development of the tour guide system in Ayutthaya on the Android operating system has the purpose of applying the Android technology for traveling in Ayutthaya, which helps travelers who have never been to the province travel easier.

The system on the Android operating system is developed by the Brackets program. Using the PhoneGap as a platform. Design the application using HTML and CSS. Control the application using PHP. Create functionality by using JAVAScript. Photo editing with Adobe Photoshop CS5 and using MySQL to create databases.

The result of developing the travel app can be found by searching in the search engine. The application can search for tourist attractions, restaurants and accomodations. It can also show travel options in the system or see other travelers recorded experience. The evaluation results from 30 different tourists in Ayutthaya can be summarized as follows: Satisfaction meets the requirements of the users. The satisfaction of the users was "very good", mean and stand deviation are 4.54 and 0.48. The performance of the system. The user satisfaction was "good", mean and stand deviation are 4.38 and 0.46. The ease of using the system. The satisfaction of the users was "good", mean and stand deviation are 4.33 and 0.53. The overall satisfaction of the system was "good", mean and stand deviation are 4.42 and 0.49.

Online full paper at: https://is.gd/fHoZ9P

ETI09:NC18

Creating Constructionism in Electronic Control Gasoline Engine Subject by Using Project Based Learning

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The objectives of this research were to construct, to determine the quality and efficiency of learning management plan in electronics control gasoline engine subject with project based learning, to compare learning achievement of learner between projects based learning group and normal learning group, to determine the satisfaction level of learner to learning management plan with project based learning. The instrument were learning management plan with project based learning which consist of 4 unit out of 9 unit. The learning unit consists of engine start control system, fuel injection control system, engine ignition control and electrical cooling fan control system. In each unit been 6 step for learning were basic knowledge, motivation, group arrangement, look for knowledge, conclusion and presentation with 2P-D-2O-R process for instructors and 2P-2D-CA process for learner. The sample group in this res research were the 1st year students in diploma level of auto-mechanics in academic year 2018 at Nakhon Ratchasima Technical College amount 40 students by purposive sampling which separate two group were 20 students for project based learning group and 20 students for normal learning group. The statistics used for analyzed were mean, standard deviation, percent of test (E_1/E_2) and t-test. The research result were shown as follows: 1) The quality of learning management plan was average in very good level ($\bar{x}$ =4.69,S.D.=0.11). 2) The efficiency of learning management plan (E_1/E_2) was equal 80.25/84.25 which this result above the criterion 80/80. The comparison of learning achievement between project based learning and normal learning group with t-test by calculation was equal 14.070 respectively which compared t-test from t-table was 14.070 at significant level .05(14.070 >2.024) so, the learning achievement project based learning group high than normal learning group. 4) The satisfaction level of learner to learning management plan was at most level ($\bar{x}$ = 4.64, SD.=0.10)

Online full paper at: https://is.gd/hxcMKa

ETI10:NC26

Project-based Learning Instructional Package on The Subject of Information Technology for Higher Vocational Certificate Students To Develop Electronic Skills

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The purposes of this experimental research were 1) to construct and find the efficiency of instructional package 2) to compare achievement scores of assignments and assessment sheet. The research instrument were 4 worksheets and 1 assessment sheet which is the integration of knowledge from assignment 1-4. The sample of this research were 36 higher vocational certificate students of Electronics department that enrolled Information System subject in the first semester of 2018 by using a simple random sampling.

The research outcome found that 1) the overall scores of assignments 1-4 was 80 scores, students got 506. scores, the average of score was 67.53 and percentage was 84.42 which higher than 75 percent of defined criteria. The overall scores of assessment sheet was 80 scores, students got 2077 scores, the average of score was 69.27 and percentage was 86.25 which higher than 75 percent of defined criteria. 2) the result of comparison of assignments score and assessment sheet were 84.42/86.25 reported that the instructional package had higher efficiency than 75/75 of defined criteria in statistically significant at the .05 level.

Online full paper at: https://is.gd/jOj8Xe

ETI11:NC55

Development of Computer Assisted Instruction on First Aid for Hearing Impairment

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Computer assisted instruction in first aid for hearing impairment are systemically designed in order to develop the computer assisted instruction in first aid, promote the reading student, and create the instruction media for hearing impairment. In the beginning of procedure, an appropriate subject description is studied. Next, the subject description is evaluated by the specialist for the subject description. Then, the computer assisted instruction having 12 contents and consisting of content, picture, animation, and sign language interpreter video is developed on Adobe Captivate Program. In addition, the Pre-test, Post-test, and rearranging game are included to the instruction in order to support for learning. After that, a quality evaluation of the instruction is evaluated using questionnaire by specialists in content and production of computer assisted instruction. Finally, the instruction is evaluated by representative sample from 20 students of Grade 12 in Anusan Sunthon School for the Deaf for satisfaction score.

The result of questionnaire from specialist in content shows a mean score of 4.20 being in high level. On the one hand, the result from specialist in production of computer assisted instruction shows a mean score of 4.50 being in high level. In addition, the result of satisfaction score is a mean of 4.06 being in the high level. Therefore, the computer assisted instruction is appropriate for support to learning content about first aid for hearing impairment.

Online full paper at: https://is.gd/3aX0RF

ETI12:NC34

A Development of Application with Internet of Things Technology for Smart Home Control System

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Presently, the Internet of things technology has become an important role in modern human life. The technology allows intelligent devices to connect to the Internet and thus enhance the ability to access and control of those devices. Smart home is one of innovative product of this technology. This paper presents a prototype system to control the smart home systems from smart phones by using Internet of things technology. The implemented system consists of android and iOS application, Netpie service, and microcontroller unit. Users are able to control illumination devices in the house through smart phones from anywhere that the Internet is available. The application has the features of touch screen control and voice control. This implemented prototype shows the potential for further development of smart home devices for Thailand 4.0 policy and a model for the development of a project-based learning package: a case study of smart home system.

Online full paper at: https://is.gd/UXjXG4

Engineering and Technical Education

วิศวกรรมและเทคนิคศึกษา

NCTechEd11**ETE01-ETE28**

ETE01:NC03

Project Based Learning in Project Course for Diploma Certificate Phrada Bos's Student in Dual Vocational Training

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The objectives of this paper were to manage the project based learning in project course for diploma certificate Phrada Bos's students in dual vocational training and increase knowledge and abilities of students, increase amount of passer who were studying project course and survey satisfaction of student. Starting from study project based learning, identify target group and then designed the project based learning that was approved by 5 professionals. And then took it was tested with 89 research samplers that were Phrada Bos's student. Before learning had pre-test and in between learning had exercises, after finished learning had post-test. The collected scores were calculated for checked the abilities of students by t-test which were significantly different at the .01 level. The result found that knowledge and abilities of students were improved, the amount of students passing the project course 1 was 85.39% which is higher than that of the first and second project, the student satisfaction survey was based on the project based in project course 1 overall satisfaction was at high level.

Online full paper at: https://is.gd/SZ4tlc

ETE02:NC04

A Study of the Oxygenate Additive On the Performance of Small Diesel Engine with Palm Biodiesel As Fuel

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This research objective is to study the impact of the oxygenate additive on the fuel properties and the performance of the diesel engine using the biodiesel blends. In this work, the Diethyl-Ether was used as an oxygenated additive to Palm biodiesel. The Diethyl-Ether was blended with the biodiesel in various percentages such as 99:1, 99:3 and 95:5 by volume. All of the biodiesel-blends were tested in a single cylinder diesel engine, YANMAR TF90 DI-L, at 1,200-2400 rpm using full load condition.

From the experimental results, the viscosity and specific gravity of the biodiesel blends were decreased when using the Diethyl-Ether as the additive. Moreover the heating values of the biodiesel blends were also reduced. For the engine performance, with the additive of Diethyl-Ether, the break thermal efficiency of the engine was increased while the BSFC was decreased in comparison to the biodiesel.

Online full paper at: https://is.gd/CeP04y

ETE03:NC09

The Development and Efficiency Assessment of Practical Training Set for Common Rail Engine

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This study aimed 1) to develop and evaluate the quality of the practical training set of common rail engine, 2) to find out the efficiency of the practical training set of common rail engine, and 3) to study of satisfaction of students on the practical training set of common rail engine. The sample was the expert Mechanical lecturers who had at least taught for 10 years selected by purposive sampling and 30 second-year mechanics power students in diploma level. The instruments used in the study were the quality assessment form of the practical training set, the learning achievement test, and the students' satisfaction questionnaire. The results of the study found that the quality of the practical training set both in aspect of design and usage evaluated by 7 experts was at a high level. The average score was 3.98. The developed practical training set had the efficiency at 81.66/82.11 which showed higher than the standard set. Likewise, the result of the students' satisfaction on the practical training set of common rail engine was at a high level with the average at 4.22.

Online full paper at: https://is.gd/XMadH3

ETE04:NC16

Instructional Package of Mechanical Advantage on Title of Pulley and Lever

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The objectives of this research were to construct, to determine the quality and efficiency of instructional package of mechanical advantage on title of pulley and lever, to determine the learning achievement of learners and satisfaction level to the instructional package of mechanical advantage. The research tools were instructional package which consist of mechanical advantage demonstration set, computer assisted instruction of mechanical advantage, learning achievement test set, and satisfaction level assessment form. The learning achievement test set has been the results of the index of congruence between 0.60 - 1.00, and discrimination between 0.20 - 0.80, and 0.40 – 0.80 for difficulty, and reliability was 0.94. The sample group in this project were 30 students of the 1st year in academic year 2017 at Department of Mechanical Technology Education, KMUTT by purposive sampling. The statistics used for analyzed were mean, standard deviation, percent of test (E_1/E_2), and t-test. The research results were showed as follows: 1) The quality of pulley and lever mechanical advantage demonstration set was average in very good level ($\bar{x}$ = 4.25, S.D. = 0.50), the quality of computer assisted instructional of mechanical advantage of pulley and lever was average in good level ($\bar{x}$ = 4.21, S.D. = 0.23). 2) The physical efficiency of mechanical advantage demonstration set was 92.87% and the efficiency of computer assisted instruction from calculation (E_1/E_2) was 80.22 / 83.22 which this result above the criterion 80/80. 3) The learning achievement of students were increased from using instructional package of mechanical advantage by t-test from calculation was 12.12 which compared t-test from table of t-distribution was 1.699 (12.12 > 1.699) at significance level .05. 4) The satisfaction levels of learners towards the instructional package was much level ($\bar{x}$ = 4.44, S.D. = 0.09)

Online full paper at: https://is.gd/tpiV5o

ETE05:NC19

The Comparison of Learning Achievement between Using Multimedia Aids with Students in Action and Normal Teaching Method of Front Wheel Alignment

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The objective of this research is to investigate the quality and efficiency of the lesson plan of front wheel alignment, to compare the achievement of pre-learning and post-learning between using multimedia aids with students in action and normal teaching method, and to find out the attitude and satisfaction of students on learning. The subjects were 79 first-year Mechanics Power students of higher vocational certification level, who studied in the 1 semester of academic year 2018. They were divided into 2 groups; 1) 26 subjects in the experimental group were practiced with multimedia aids with students in action, and 2) 26 subjects in the controlled group were taught with the normal teaching method. They were selected by classroom drawings. The instrument used in the study included the multimedia aid lesson plan, learning achievement test, attitude evaluation form and the questionnaire of students' satisfaction. The result of the study showed that 1) the overall average score of the multimedia aids lesson plan in 2 aspects was at a high level. The average score was 4.30, the standard deviation was 0.157. 2) The efficiency of learning management by using multimedia aids with students in action in the experimental group was at 89.62/88.21. 3) The efficiency of learning management by using normal teaching method in the controlled group was at 81.28/80.26. 4) The achievement of pre-learning and post-learning by using multimedia aids with students in action and using normal teaching method revealed that the experimental group gained higher scores of the pre-test than that in the controlled group with a statically significant difference at .05 level. Moreover, they gained higher score in the post-test than that in the controlled group with a statically significant difference at .05 level. That is in accordance with the hypothesis. 5) The overview of learning management of font wheel alignment, students had attitude towards the lesson at a high level. The average score was 4.19, the standard deviation was 0.138. And, 6) students were overall satisfied with learning by using multimedia aids with students in action at a high level, the average was 4.32, the standard deviation was 0.186.

Online full paper at: https://is.gd/nb36Vf

ETE06:NC20

Instructional Package Development of Torsion

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The objectives of this project were to develop the instructional package of torsion with the twisted angle sensor, to determine the quality and efficiency of instructional package, to determine the learning achievement of learners and satisfaction level to the instructional package of torsion. The research tools were instructional package of torsion which consist of torsion demonstration set with the twist angle sensor, computer assisted instruction of torsion, learning achievement test set, and satisfaction level assessment form. The learning achievement test set has been the results of the index of congruence between 0.80 - 1.00, and discrimination between 0.20 - 0.80, and 0.20 – 0.80 for difficulty, and reliability was 0.98. The sample group in this project were 30 students of the diploma level of the 1st year in academic year 2018 at Automotive Mechanics Division of Phetchaburi Technical College by purposive sampling. The statistics used for analyzed were mean, standard deviation, percent of test (E_1/E_2), and t-test. The research results were showed as follows: 1) The quality of torsion demonstration set was average in very good level (average = 4.13, S.D.= 0.03), the quality of computer assisted instructional of torsion was average in good level (average = 4.00, S.D.= 0.21). 2)The efficiency of instructional package of torsion from calculation (E_1/E_2) was 80.17/79.08 which this result according the criterion 80/80. 3) The learning achievement of students were increased from using instructional package of torsion by t-test from calculation was 26.59 which compared t-test from table of t-distribution was 1.699 (26.59 > 1.699) at significance level .05. 4) The satisfaction levels of learners towards the instructional package was the most level (average = 4.64, S.D.= 0.08)

Online full paper at: https://is.gd/LhQHoX

ETE07:NC23

Instructional Package of Differential with Augmented Reality Technology

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The objectives of this project were to construct the Instructional Package of differential with augmented reality technology, to determine the quality and efficiency of computer assisted Instructional package of differential with augmented reality technology, to determine the learning achievement and satisfaction level of the students after using the instructional package of differential with augmented reality technology. The research results were showed as follows:

1) The quality of instructional package of differential with augmented reality technology was average in good level ($\bar{x}$ = 4.35, S.D. = 0.24) 2) The efficiency of computer assisted instruction from calculation (E_1/E_2) was equal 80.00/82.88, which this result above the criterion 80/80. 3) The learning achievement of students from using instructional package of differential with augmented reality technology by using t-test from calculated equal 50.82. which compared t-test from the table of t-distribution equal 1.699 (50.82>1.699) at significances level .05. Also, the instructional package of differential with augmented reality technology could improve the learning achievement of students. 4) The satisfaction levels of learner from using the instructional package of differential with augmented reality technology was in much level ($\bar{x}$ = 4.33, S.D. = 0.01)

Online full paper at: https://is.gd/R4oFk0

ETE08:NC44

Construction and Efficiency Evaluation Mixed Instructional Model Teaching Package in Chatter of Turing Topic

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The purpose of this research was to construct and validate efficiency of mixed instructional package for chatter in turning process. The research tools consisted of information sheet, exercise sheet, operation sheet, laboratory sheet and examination sheet. The quality of instructional package used 5 rating scale questionnaires to survey the opinion from 10 experts. The quality assessment results was at good level with the mean equal 4.37. The efficiency evaluation of teaching package with 15 sample students revealed that the process efficiency (E1) and outcome efficiency (E2) was 81.46% and 78.47%, respectively. The E2 value was lower than 80%. However, this result was within the acceptable criteria. Therefore, the constructed instructional package can be used in classroom teaching.

Online full paper at: https://is.gd/zdfXEW

ETE09:NC10

Geotechnical Engineering Properties of Cement Fly Ash-gravel Column

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Soft clay is a geological material which problem soil due to its low shear strength and high settlement. The embankment construction on soft clay encounters problems with extremely lateral pressure, lateral movement, settlement, and low stability leading to failure frequently. This problem is solved widely by using cement column and stone column. This research assembled advantages of 2 soil improvement techniques together for solving the problem. In the construction, using a drill bore the hole like the stone column technique from soft clay to hardness clay or sand by dry process. After that, cement, fly ash, gravel and water are mixed and poured into the drilled holes This new material is called “Cement-fly ash gravel column” (CFG column). Advantages of this material can constructed to hard clay and the material bonded internally due to the using of cement and fly ash that had properties like a low strength concrete. Cement-fly ash gravel column (CFG column) had high porosity similar to vertical drainage which consolidation are rapid by using of similarly sized gravel. This research was mixed gravel size from 4.76 to 12.70 mm by Unified Soil Classification System with 22% portland cement type 1 and fly ash from Mae Moh, Lampang with 5,10,15,20,25 percent by dry weight of coarse aggregate. The research was studied about engineering properties and behavior of materials of CFG column by compressive strength Test and permeability test.

Online full paper at: https://is.gd/Y3Dpdx

ETE10:NC24

Inducing the Sufficiency Economy Philosophy and AHP Method for Contractor Selection

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The need for judicious construction contractor selection is important in the process of construction management. During the prequalification process, there are several factors used in contractor selection such as price and quality, performance history, experience, expertise, project management capability, trust and partnership with supplier, financial stability, etc.In order to enhance the efficiency, effectiveness, and good corporate governance, the selection should list the relative weights, importance, or value, of the factors. Accordingly, this study intends to induce the Sufficiency Economy Philosophy and the Analysis Hierarchy Process (AHP) for contractor evaluation and examine the selection of contractors applied in the Crown Property Bureau which places greater importance on “value” than on “price”. Thus, the organization should focus on maintaining the balance of 4 dimensions; economic, social, cultural, and environmental dimensions of life, a fundamental tenet for achieving sustainable development.

Online full paper at: https://is.gd/k4GfzN

ETE11:NC27

Investigation of Geopolymerization Process of Kaolinite Treated by Alum, Perlite and Sodium Hydroxide

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This research aims to improve the mixture between kaolinite clay with perlite and activated by 12 molar sodium hydroxide solution (NaOH) as replacing mixed water at optimum moisture content. Moreover, pure alum ($KAl(SO_4)2.12H_2O$) was added to observed further reaction. After preparation, the samples were incubated at room temperature of 25°c, 60°c and 80°c. The curing time was 7, 14, 28 days and the samples were tested for Unconfined Compressive strength. The results showed that the optimum ratio between kaolinite and perlite was 60:40 by weight and optimum content of 12 M NaOH solution that gave the highest dry density of 20%. The compressive strength of the sample at 28 days of incubation increased significantly as the curing temperature increased. The compressive strength increased from 5000 kN/m^2 to 18000 kN/m^2 and to 31,000 kN/m^2 as temperature increased from 25°c to 60°c and to 90°c respectively. It can be concluded that the polymerization reaction is complete when curing temperature and curing time increased while alum is not capable of inducing a polymerization reaction.

Online full paper at: https://is.gd/jOj8Xe

ETE12:NC49

Effect of Wash-out Aggregate on Properties of High Early Strength Concrete

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This research aims to study the properties of concrete made from washed recycled aggregates (WRA). The aggregates were derived from the separation of cement paste and aggregates in fresh condition by washing method. Then replaced it to natural aggregates in the ratio of 50 and 100 percent, respectively in order to obtain 350 ksc high early strength concrete within 1 day. The studies composed of series of tests such as slump, slump loss, setting time, compressive strength, modulus elastic, water permeability and chloride penetration resistance.

The results revealed that, the replacement of WRA dramatically affected to fresh concrete. For example, when the replaced WRA 100% in concrete, the initial slump reduced to 10 cm and the slump loss started within 45 minutes. While, the control exhibited 24 cm of slump and slump loss started after 90 minutes. However, the replacement of WRA did not have much effect on compressive strength and elastic modulus of concrete. The deviation was around 2-4%. The water permeability of concrete was increased when the higher replacement was applied. Replacement of both coarse and fine washed recycled aggregate 100% increased 40% of water permeability to that of the control. Finally, the chloride penetration resistance of WRA concrete showed trend of decrease with the increase of degree of replacement.

Online full paper at: https://is.gd/DzyhY8

ETE13:NC52

Relationship between Compressive Strength and Modulus of Elastic of High Strength and Very High Strength Concretes

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This research aims to find the mechanical relationship between cylindrical and cubic shapes of concrete at high and very high compressive strength. By designing the compressive strength of cube concrete mixture at the age of 28 days, equal to 50, 70, 90, 100, 110 and 130 MPa in order to study the mechanical relationship between both shapes of concrete. The study was composed by the series of tests such as the compressive strength according to ASTM C39, split tensile according to EN12390-6: 2000 and also the elasticity according to ASTM C469. The results were to compare the difference between those properties.

The research showed that compressive strength conformed to the equation or data given by EIT 1014-40, TIS 2525 and EN206-1: 2000. The most important finding of this paper is that the elastic modulus of concretes of our test are lower than those of the predicted by the equation given by ACI 318-2014 when the compressive strengths of concretes are greater than 100 MPa.

Online full paper at: https://is.gd/UnlN4z

ETE14:NC62

Building Information Modeling (BIM) for Instruction in Civil and Architect Drawing in the 21st Century

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This paper is a review article aim to present application of building information modeling (BIM) to instruction in civil and architect drawing. In present, BIM is widely used in both for Thailand and international design. At present, Thailand has begun to pay attention in BIM. Therefore, the preparation of teaching and learning in educational institutions is an important issue that needs to be taken in order to keep paces with the rapidly changing of situation and technology. Additionally, This will support teaching learning and work in 21st century.

Online full paper at: https://is.gd/SSuCfz

ETE15:NC06

Development and Efficiency Validity of the Vector Analysis Lesson Plan For Problems Based Learning Model

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This aims of this research were to develop and efficiency validation of the lesson plan and find the satisfaction of the student's on a vector analysis lesson plan for the problems based learning model, 11-052-307 engineering electromagnetic subject, bachelor degree of electronics and telecommunication engineering, Rajamangala University of Technology Isan, khonkaen Campus. The hypothesis of this research has an efficiency validation more than the criterion 80/80 and the student's satisfaction on the vector analysis lesson plan for the problems based learning model is in the high level. The procedures of this research were as following: to study the development principle of a lesson plan and problems based learning mode. Next, we analyzed the curriculum and created the content of vector analysis topic that consist of the definition of scalar and vector, vector algebra, unit vector, vector components, coordinate systems, and coordinate systems transformation. Next, we created the after learning tests and achievement tests. Next, the instructional media to be constructed for a problems based learning model. Then, the evaluation forms were created for the experts and the students. After that, the lesson plan and the media to be developed were evaluated the quality by 5 experts. Finally, the data was analyzed and concluded. The results of this research showed that the quality of a lesson plan for the problems based learning model to be created is in the good level (average is 4.5) , and the efficiency validation of the lesson plan is 95.30/92.50, and the student's satisfaction on a lesson plan for the problems based learning is more satisfy level (average is 4.44) in accordance with the hypothesis.

Online full paper at: https://is.gd/Fxm2pT

ETE16:NC28

Differential Flatness Based Control for Three-Phase PWM AC/DC Voltage-Source Converters

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This paper proposes a new control law for a three-phase rectifier (AC/DC converter) for grid connected applications. The study mainly focuses on the innovative control law based on the flatness properties for a three-phase rectifier. Utilizing the flatness principle, we propose simple solutions to the control and stabilization problems. The effectiveness of the proposed controller is validated through experiments on a prototype 1-kVA testbed with a dSPACE 1104 controller platform. Experimental results are presented to demonstrate that the proposed algorithm achieves an excellent performance such as fast transient response.

Online full paper at: https://is.gd/ScwUDO

ETE17:NC29

The Electrical Energy Consumption Control System in Classroom and Authority Classification with RFID

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This research aimed to create and evaluate the electrical energy consumption control system in classroom and authority classification with RFID. The control system are included RFID reader, microcontroller for processing unit, relay, and projector on-off switch mechanism. The data from RFID is used for authority classification which have 2 RFID card types. One for teacher and the second for students. The results found that the control system work very well according to the data in RFID, where the operation error is not found, it can be saved electrical energy consumption, and the satisfaction of 5 teachers was high level ($\bar{x}$=4.20). In conclusion, the control system can be used effectively for saving electrical energy consumption in classroom.

Online full paper at: https://is.gd/wCQq3i

ETE18:NC40

Management of Instructional Activity on Antenna Technology using SIPEDA Learning Model for Undergraduate Students

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This objective of research aim to a management of instructional activity on antenna technology using the SIPEDA learning model in the teaching of telecommunication engineering for undergraduate students. The SIPEDA learning model is focused on the laboratory-based and consistent to the 21st century learning skills that encourage learners to engage in learning and teaching activities, practical skill, applying knowledge, solving problems, sharing knowledge and diverse experience in the classroom. The SIPEDA learning model consists 6 step process such as Searching (S), Information (I), Preparation(P), Experiment(E), Discussion (D), and Assessment (A). The research tools were constructed and evaluated using the 10 experts. Results shown that the quality of the SIPEDA learning model was at a high level ($\bar{x}$ = 4.67, SD = 0.47). The developed SIPEDA learning model can used in the teaching of telecommunication engineering curriculum as well.

Online full paper at: https://is.gd/8yv0pg

ETE19:NC39

Construction and Evaluation The Efficiency of Electropneumatics System Training Kit

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The research aims to evaluate the efficiency of electro-pneumatics system training kit. The samples are twenty student of Teacher Training in Mechanical Engineering, Faculty of Industrial Education, Rajamangala University of Technology Suvarnabhumi, Thailand, selected by the purposive sampling. The statistics used in this research are the mean and standard deviation.

The results of the research showed that 1) the evaluation of the efficiency of the electrical pneumatic system training from 5 experts in the level of the most appropriate ($\bar{x}$= 4.66 SD = 0.51). 2) The content validity assessment evaluated by 5 experts in teaching hydraulic and pneumatic courses. Each expert considers each question and evaluates the questions are consistent. The results shown that the content validity is absoluteness. 3) Evaluation of the efficiency of electro-pneumatics system, the researcher has evaluated by measuring students' achievement. The students had an average academic achievement of 96 percent which shows that electro-pneumatics system training set can be encouraged learners more understand.

Online full paper at: https://is.gd/otLpHj

ETE20:NC53

Development of Instructional set of Low-Cost Robotic Arm Controlled by Computer

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This research aims to develop instructional set of low-cost robotic arm controlled by using computer for applying in the STEM based training course. The developed instructional set comprises of a low-cost robotic arm, content sheet, presentation media and test. The sampling group was 54 trainees as teachers, educators and general participants. The research results are as follows: 1) the quality evaluation by 5 experts had the average score of 4.47 (good), 2) the learning efficiency using the developed instructional media was efficient in according to Meguigans's theory. The trainees' satisfaction by using developed instructional media was at very high (average score of 4.76). The STEM based education management using appropriate innovation will encourage trainees to have expected learning competencies.

Online full paper at: https://is.gd/sUeWZg

ETE21:NC56

Power Meter Data Logging System using Modbus RTU Protocol via Wireless Network

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This paper presents the system that records data from the electricity meter that uses the Modbus RTU protocol via a wireless network. Prepared to help with the management of the electricity system that can estimate the cost and be able to check back electricity usage data. To help monitor electricity consumption, the operation of the data recording system from the electric meter that uses the Modbus RTU protocol via the wireless network will use a device to measure the use of electrical energy, also known as a digital power meter. The measurement and delivery of the information use the NodeMCU V.2 ESP8266 microcontroller to connect to digital power meter using Modbus RTU protocol. The working principle divided into two parts. The first part is the recording of electrical energy usage, transmitted data to ThingSpeak website via the wireless network to store energy usage data and data can be display via the TFT display, and the second part is to download the electrical energy data from ThingSpeak website and save the data to the SD Card.

From testing, the system records data from digital power meters that use the Modbus RTU protocol via a wireless network and it can provide the values that are necessary to the user. For example, the value of voltage, current, power and frequency when compared to the traditional power meter.

Online full paper at: https://is.gd/M4iZju

ETE22:NC57

Development and Efficient Validation of Training Package of Internet of Things Technology for Agriculture in Transferring Knowledge to Community

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This article aims to develop and to validate efficiency a training package of internet of things technology for agriculture in transferring knowledge to community. The developed training course consists of training package, mobile application, content sheet, presentation and test. The developed training course was implemented and evaluated using the selected 32 trainees as sampling group. The research results can be stated as follows: 1) the quality evaluation assessed by 5 experts obtains the average score of 4.28 (good appropriate), 2) the developed training course is efficient in accordance to the Meguigans's theory (equaled to 1.47). The trainee satisfaction towards developed training package obtains the average score of 4.35 (more satisfy). Therefore, the developed training package can been applied effectively in training course as well in transferring knowledge to agricultural community.

Online full paper at: https://is.gd/CK0Y1y

ETE23:NC61

Complex Filter with on Chip Automatic Tuning

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This paper presents complex channel select filter for low-IF transceiver. Complex filter was designed to compensate errors in circuit operation due to fabrication deviation, temperature drift and aging ect. These lead to the demand for the accurate on-chip tuning circuit by using charge pump phase-locked loop technique that has been adopted for automatic tuning system. A 1-MHz center frequency fifth-order Chebyshev complex filter has been designed in a standard 0.18-m CMOS process with 1 MHz bandwidth and 0.5-dB equiripple passband response for Bluetooth application. Simulation results show that it consumes only about 1.2mW.

Online full paper at: https://is.gd/Z4M46u

ETE24:NC66

Development of Training Package on Microcontroller Programming using LEGO Mindstorms Education

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The objectives of this research were to develop a training package on microcontroller programming using LEGO mindstorms education. The research tools consisted of training plan, training manual, information and work sheets, presentation, instruction media and the achievement test. The research sample group was 25 students in lower and upper secondary education or guneral public at Satrinonthaburi School, Nonthaburi. The training time period was 36 hours of 6 days. The research results shown that 1) the developed training package was at high quality (mean=3.82) 2) the trainees' satisfaction towards using the training package was at a highest level (mean = 4.54) and 3) the developed training package had efficiency which is in accord to the standard criteria of Meguigans's formula (1.43). Therefore, the developed training package can be used in the training effectively courses.

Online full paper at: https://is.gd/cvar0e

ETE25:NC68

A Construction of Embedded Training Kit AVR 32bit for Learning and Applications Phrae Technical College

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This research aims are to 1) create a 32 bit embedded training kit for learning and application in teaching activities. The development board that are used for a microcontroller course code 3105-2007 of effectively according to the standards 80/80 2) fine the efficiency of the 32 bit embedded instruction set, 3) study students' satisfaction level. This research is experimental. The researchers use one group to pre-test and post-test design experiment. The sample are 25 Industry electronics students, the 2nd year, group 1 in diploma level at phrae technical college, the students were selected by simple random sampling. The tools used in this research are using embedded AVR 32 bit board, learning achievement tests (course code 3105-2007) which are multiple choice tests (each item have 5 choices) and students' satisfaction level of questionnaires, the data analysis for finding the learning achievement tests, mean, standard deviation, percentage, difficult, discrimination and reliability and the diagnostic tests by statistical analysis program by Dr.Pakorn Prajunban.

The results found that 1) testing electrical properties by comparing with electric measuring instruments which is the same as test point requirements 2) the performance comparison E1 and E2 of embedded training AVR kit made the students had learned during class activities and can do the achievement test after learning. The results of the E1 / E2 were equal to 82.44 / 85.20 which was higher than the criteria. The achievement of the sample students, t is calculated over the crisis t at the level of significance .05 which is equal to 33.73 over the tables of the t df = 24, α = .05, that data is 1.711. Show that the results of pre-test and post-test are significantly higher than the pre-test at .05 level. 3) The students' satisfaction level for using AVR board is the high level by mean equal to 4.40 and data of standard division equal to 0.50.

Online full paper at: https://is.gd/EaWSN4

ETE26:NC43

Instructional Development of Engineering Education using STEM Process, Case Study : Teaching of Digital Circuit Course

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The objectives of research were: 1) development of engineering education based on the MIAP model using STEM education and 2) to validate performance of the instructional management; case study in the teaching of digital circuit course. The research instruments consist of teacher's manual, a lesson plan, teaching aids and achievement tests. After that, the research instruments was tried out by using a sampling group of 32 students of Matthayom 5th in semester year of 1/2018, program in electrical engineering preparation at Satrinonthaburi School in Nonthaburi. The research results shown that 1) The performance of developed MIAP learning process model based on STEM education was an average of 84.43 / 73.85 and 2) the students' satisfaction was at high level (mean = 4.37). Therefore, the developed of learning and teaching process can be applied effectively in the teaching of electrical engineering education.

Online full paper at: https://is.gd/fKLWPP

ETE27:NC41

Learning and Teaching Management using Thai-German Instructional Model on Electronic Circuits for Engineering Preparation Curriculum

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The purposes of this research were 1) to evaluate the appropriation of the Thai-German instructional model and 2) to validate performance of the learning and teaching management using the Thai-German instructional model on Electronic Circuits. The research instruments consist of the teacher's manual, a lesson plan, teaching aids, quizzes and rating–scale questionnaires to evaluated satisfaction. The purposive sampling of this research were high school' students who enrolled in the 1st semester in 2018 in the Science-Mathematics education program (engineering preparation) at Satrinonthaburi School. The research results were 1) the appropriation of the Thai-German instructional model was at high level ($\bar{x}$ = 4.22) and 2) the overall learning achievement of learners was equal to 75.65%. The students' satisfaction for the learning and teaching management using the Thai-German instructional model was at a high level ($\bar{x}$ = 4.39). The learning and teaching management using Thai-German instructional model can encourage students in engineering preparation curriculum to have efficient knowledge, skill and attitude corresponding to expected learning outcome.

Online full paper at: https://is.gd/9vSvio

ETE28:NC67

A Development of Analytical Thinking Ability Test to Enhanced Critical Thinking skills for Industrial Technology

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The objectives of research were: 1) to construct an analytical thinking ability test, 2) to validate quality of an analytical thinking ability test for industrial technology. The sampling group was 32 bachelor students of second year in the Electrical Teacher Training department and department of computer education, faculty of technical education at King Mongkut's University of Technology North Bangkok. The research instrument is four multiple-choice test of analytical thinking ability corresponding to the Marzano's Taxonomy concept of 5 characteristics evaluation for the basic robotic education course. The statistical quality evaluation of test consists of difficulty, discrimination index and reliability. The research results shown that 1) the difficulty index of the test ranged between to 0.22 - 0.78. 2) the discriminations index of the test 0.25 - 0.63. 3) the reliability of test (KR.-20) was 0.72. For the test that do not pass the quality evaluation criteria, the researcher was improved the test by the instructors and experts. Therefore, the analytical thinking ability test to enhanced critical thinking skill can be applied effectively in the teaching of industrial technology education.

Online full paper at: https://is.gd/2Ac2uv

Education Management and Education Administration

การจัดการและการบริหารการศึกษา

NCTechEd11**EMA01-EMA14**

EMA01:NC11

Academic Achievement of Re-Entry Bachelor Degree Students at King Mongkut's University of Technology North Bangkok

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This research aims to study on demographic information, and academic achievement of the re-entry Bachelor degree students from 6 faculties at King Mongkut's University of Technology North Bangkok (KMUTNB). The academic achievement comparison, and the academic achievement relationship of studying level, together with re-entry students' opinions toward KMUTNB were investigated. Target groups consisted of 3 batches of students on Academic Year 2010-2012. The data were collected by searching from the information technology system for registration together with telephone interviewing from re-entry students. The research results revealed that of the 10,873 target groups, 1,193 were the graduated skilled worker certificate level students from Thai-German Pre-Engineering School at KMUTNB. Within this group 1,166 students (97.7%) studied at the Faculty of Engineering, and the College of Industrial Technology. The achievement of Bachelor degree students who finished their studies at skilled worker certificate level of KMUTNB compared with those who finished their studies from other schools were not different. The academic achievement of skilled worker students of certificate level related at the relatively high to the achievement of Bachelor degree in total. There were 945 re-entry Bachelor degree students who studied in different faculties, departments, and field of studies. From the mentioned number, 214 (22.6 %) already graduated their studies. The result of the interview re-entry students had shown the positive opinions toward KMUTNB of both re-entry students who graduated their studies and those who did not graduated their studies.

Online full paper at: https://is.gd/WuFTNI

EMA02:NC36

Factors Affecting Attitude towards Public Mind of Undergraduates King Mongkut's University of Technology North Bangkok

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The research objectives was to explore the relationship between factors affecting attitude towards public mind of undergraduates King Mongkut's University of Technology North Bangkok. Sample were 420 bachelor degree students of King Mongkut's University of Technology North Bangkok. Data collection was carried out through an online questionnaire (Google Forms). The samples were selected by convenience sampling method. The data was analyzed using percentage, mean, standard deviation and multiple regression equation. The finding showed that the relationship between self-concept, relationships between students and teachers, and family values had positively relationship with attitude towards public mind of undergraduates King Mongkut's University of Technology North Bangkok at significant .05. Suggestion; undergraduates requested to establish a public-spirited club to help the rural people.

Online full paper at: https://is.gd/clTy9i

EMA03:NC42

The Study of Relationship between Self-determination and Study Achievement with Psychological Capital as a Mediator: A Case Study of The First Year Students of Rajamangkala University of Technology Isan Khonkaen Campus

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The research has purposes to study the casual model of the relationship between self-determination and study achievement with psychological capital as a mediator. The participants are the students who took the course of Information literacy skills, Psychology for teachers and Personality development subject in the first semester of 2017. The research instruments are 1) Psychological capital scale 2) Self-Determination. The finding research: 1). The causal model of Self-determination effect fits the empirical data ($\chi 2 = 39.76$, df = 31, N = 480, p = .134, RMSEA = .024, GFI = .983, AGFI = .971). 2). Self-determination has no significant direct effect on study achievement (b=0.24, SE=0.32, t=0.75) Psychological capital has significant direct effect on study achievement at alpha level .05 (b=0.093, SE=0.036, t=2.454). 3). Self-determination has a positive indirect effect on study achievement with Psychological capital as a mediator which is 0.038 (SC=0.069, t=2.473, p <.05).

Online full paper at: https://is.gd/OGfKfi

EMA04:NC51

The English Writing Process of Vocational Teachers studying in Master Level by Recorrection

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The purposes of this research were to 1) studying the English writing process by recorrection and 2) comparing the extent of learning of pre-test & post-test, before & after correction the assignments, midterm & final examination and satisfaction survey. The population was 14 vocational teachers with the average age of 35 years old studying Master's degree at College of Management, University of Phayao in the field of tourism, hotel, mathematics and Thai language. All the teachers in tourism and hotel had some experiences in the fields. All of them learnt English by using communication-oriented approach. This research was an action research using the 4 pieces of writing as an intervention. The adjustment came from researchers' advice and peer review. The statistics used in this research were descriptive statistics including percentage, mean, standard deviation and t score.

The results found that the English writing process for this group of the learners were repeatedly editing in 4 assignments: 1) process writing, 2) essay writing, 3) explaining figure, and 4) abstract writing. In each topic, the learners would receive a one-on-one instruction from the researchers and adjust to a maximum of 4 times per report. In addition, learners were grouped together for discussion and peer review started from the 3rd report onwards. The sub-group comprised of the learners with similar writing problems. For the 4th report, all of them were joined together in group discussion. The results of the research showed that the process of writing English by recorrection was suitable for adult English language learners studied English by using communication-oriented approach. The results found the learning progress from the following assignments; 1) pre and post-TOEFL-liked test which the post-test scores were increased to 5 points. All of the recorrection scores from the first and last time of all 4 assignments were significantly different at the level of .05. The final examination's score was higher than the midterm one. The overall satisfaction score was considered to be a good level ($\bar{x}$ = 4.18 and S.D. = 0.15).

Online full paper at: https://is.gd/6tOC9b

EMA05:NC14

The Study of Marketing Communication Factors and Strategies that Affect Decision Making Home Loan of Bank of Ayudhya Public Company Limited Customers in Bangkok Metropolitan Area

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The objective of this research is to analysis the marketing communication factors and strategies that affect decision making home loan of bank of Ayudhya Public Company Limited customers in Bangkok metropolitan area by using quantitative research and qualitative research. The quantitative sample collected from 400 home loan customers and analysed with statistical methods including average, standard deviation and factor analysis. The factors analysis result found that the 6 independent variables influence to customers decision making home loan between 0.560 – 0.991 with accuracy 83.333%. From the result can be sort elements of the influence that affect decision making home loan are 1. advertising 2. sales promotion communication 3. personal communication 4. sponsorship and event 5. direct marketing communication and 6. public relations. The qualitative sample interview from 10 real estate developer relationship officers. The result found that the bank of Ayudhya Public Company Limited use 6 strategies are 1. advertising 2. public relations 3. direct marketing communication 4. sales promotion communication 5. personal communication and 6. sponsorship and event by use advertising, public relations and direct marketing communication for design the marketing communication strategies that affect decision making home loan.

Online full paper at: https://is.gd/OVPN6q

EMA06:NC01

A Survey of Generation Y Human Resource's Organisational Loyalty in Rayong Industrial Establishments

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The objectives of this study were to investigate different personal characteristics and organisational factors affecting the generation Y human resource's organisational loyalty in Rayong Industrial establishments. The instrument used to collect data was closed-ended questionnaires. The sample consisted of 434 employees. Data were analyzed through descriptive statistics including frequency, percentage, mean, and standard deviation as well as inferential statistics including statistics Independent-Samples T Test, One-way Analysis of Variance (One-way Anova), and Scheffe's pairwise analysis.

The results of this study showed that the level of the generation Y human resource's organisational loyalty in Rayong Industrial establishments as a whole were falling in high level. The hypothesis testing results showed that different personal factors including gender, education level, position level, income per month level, the choice of occupation, the knowledge of the job, the convenience to go to work and the core product of the organisation affected differently the generation Y human resource's organisational loyalty in Rayong Industrial establishments with the statistical significance level of .05

Online full paper at: http://bit.ly/2CdKYAw

EMA07:NC08

Training Package for Competency Development of Metallographic Practice

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The purposes of training package for competency development of metallographic practice were to determine efficiency of the training package, learning achievement and student's satisfaction to the package. The research tool was competency based training package for the metallographic laboratory that consisted of metallographic practice manual, standard specimens, pre-test, module test, post-test, and satisfaction test. The training package had been evaluated by the experts. The sample group composed of the 35 person from Department of Production Technology Education, Faculty of Industrial Education and Technology, King Mongkut's University of Technology Thonburi. The learning achievement of students was calculated using t-test to compare pre-test and post-test scores. The result revealed that the training package efficiency was 80.9/80.9. The result from students higher achieves the statistically significant of .01. Therefore, the evaluation of student satisfaction to the training package was determined to be 4.35, which showed very good satisfaction to the training package. The result of this study is that the effective training package, can be used as a tool to improve the performance of microstructure analysis in accordance with the metallographic practice principles.

Online full paper at: https://is.gd/UUVNC8

EMA08:NC70

Work Motivation Issues of Academic Supporting Staffs of King Mongkut's University of Technology in 3 Institutions

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The objective of this research was to study and compare work motivation issues of academic supporting staffs of King Mongkut's University of Technology North Bangkok, King Mongkut's Institute of Technology Ladkrabang and King Mongkut's University of Technology Thonburi. The sample group was 455 academic supporting staffs. The research tool is the questionnaire using analyzing statistical data, such as frequency, mean, standard deviation, t-test and F-test. The research results shown that the overall of work motivation of academic supporting staffs in 3 institutions was at the rather high level. The issues effecting to work motivation consist of difference in sex, salary, graduate level. The important motivation factors include job success, recognition, work practices, responsibility, carrier path and prospects for future progress. Conclusion, staff motivation and satisfaction in the work will promote enterprise development and growth continuous.

Online full paper at: https://is.gd/tLgNm3

EMA09:NC25

The Satisfactions of Communication on Social Network; A Case Study of Student Faculty of Business Administration and Service Industry

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This research was conducted to determine students' satisfaction with the Faculty news thru social networking at King Mongkut's University of Technology North Bangkok Prachinburi Campus. A group of 213 students from the Faculty of Business Administration and Service Industry was used to represent the population by using Krejcie and Morgan's sampling method to determine the sample size from the given population. The minimum number required using this method was 213 people. These samples were sampled by using multistage random sampling. The representative sample was random sampling from students in the Faculty of Business Administration and Service Industry. A questionnaire was the method used to study the satisfaction of the faculty members' news thru social networks. The data was analyzed with Descriptive analysis include frequency, percentage, mean and standard deviation (S.D.).

The results of the study showed that the satisfaction of students at the Faculty of Business Administration and Service Industry received the information of faculty social events through Facebook 73.2% all the rest through faculty websites 13.6% and other included the Line. The information that was received through Facebook and faculty website was Course Outline Information 31.9%, Scholarship 16.9%, Continuing Education 20.7%, Course Schedule 46.9%,Personnel Information 7.5%, Photo News 35.7% and Student Satisfaction Report Activity via Social Network The overall score was very satisfactory ($\bar{x}$ = 3.90, S.D. = 0.62)

Online full paper at: https://is.gd/oXdXsO

EMA10:NC31

Support and Distribute University's Textbook to Student at King Mongkut's University of Technology North Bangkok

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This research was to support and distribute university's textbook to student at King Mongkut's University of Technology North Bangkok. This purposes of this study were 1. To study and to synthesize factors of publishing and Distribution University's textbook to student at King Mongkut's University of Technology North Bangkok 2. To create supporting format and Distribution University's textbook to student at King Mongkut's University of Technology North Bangkok. Using research integration that is quantitative and qualitative research, population and samples are academic administrators of educational institutions that is president, vice president of university and directors who accept a publishing assignment in government sector and private sector. This study use quantitative and qualitative education, the tool that use in qualitative education is interview and focus group. The tool that use in quantitative education that is questionnaire and analysis data. Quantitative data analysis use frequency, average, standard deviation and factor analysis by computer programming. The result found that be to support and distribute university's textbook to student at King Mongkut's University of Technology North Bangkok. From research, the component of factors have 10 factors. Using the survey analysis was created a format of supporting and distribution university's textbook to student at King Mongkut's University of Technology North Bangkok and approaching to the focus group with experts in publishing business for voting format of supporting and distribution university's textbook to student at King Mongkut's University of Technology North Bangkok. From voting, the result found that factor of supporting and distribution university's textbook to student at King Mongkut's University of Technology North Bangkok can adapt to create a managing format 10 composition 1. service 2. product and design 3. qualitative of publishing 4. moderate price 5. qualification of customers 6. sexual qualification 7. service price 8. corporate image 9. location 10. fairly price

Online full paper at: https://is.gd/gNuLjH

EMA11:NC13

A Comparative Study of the Management of Borrowed Working Capital within the Good Governance Framework in Autonomous University in Bangkok Metropolitan and Regional Area

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This research aims to (a) study opinions about the management of borrowed working capital within the good governance framework in autonomous universities in Bangkok metropolitan and regional areas and (b) compare the aforementioned opinions as categorized by personal factors. Samples consisted of 33 executives from King Mongkut's University of Technology North Bangkok and 15 executives from Thaksin University, totaling 48 executives. The opinions were obtained through a questionnaire. Data was statistically analyzed and displayed in terms of frequency, percentage, mean, and standard deviation. Hypothesis testing was performed using one-way analysis of variance. The questionnaire results showed that in every aspect and overall the executives of both universities had strong opinions about the management of borrowed working capital within the good governance framework. Three aspects with the highest means were the rule of law, principle of decentralization and effectiveness. The aspect with the lowest mean was the principle of participation. The hypothesis testing revealed that the executives of autonomous universities with different education background and work experience had significantly different opinions on the management of borrowed working capital within the good governance framework ($p < .05$).

Online full paper at: https://is.gd/TTxhq4

EMA12:NC47

The Retrieving of Community Cultural Heritage for Producing Local Cultural Products by Using the Community, Temple and School's Concept: Mon at Bang Kradi's Case

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The purposes of this research were to 1) studying the retrieving of community cultural heritage for producing local cultural products by using the Community, Temple and School's concept: a case study of Mon's community at Bang Kradi, Bangkok and 2) reviewing the result of community cultural awareness & appreciation program done with students at Wat Bang Kradi's School. This research was a qualitative. The data collection of the objective No. 1 was collected by 2 methods: 1) in-depth interviews with 8 key informants. They were a teacher at Wat Bang Kradi's School, a Monk at Wat Bang Kradi's Temple, the Bangkok Cultural Centre's staff, two artisans mastering in producing local cultural products and three local micro enterprise owner. 2) Non-participant observation from participating in cultural activities; Songkran Festival and Buddhist Lent day, was used. There were 2 methods of data gathering for the objective No. 2: 1) An arrangement of the community cultural awareness & appreciation activity with 30 students at Wat Bang Kradi's school. The satisfaction result of the program was collected by using the questionnaire survey. 2) The participant observation in the above program. The period of collecting data was 5 months inclusively.

The result found that the retrieving of community cultural heritage for producing local cultural products by using the Community, Temple and School's concept employed the traditional concepts entitled: "Home, Temple, School" as foundation. Bang Kradi's community had unique knowledge's retrieving activities. This community engaged the worship of supernatural entity. That was the respect of local divines; Bang Kradi godfather, Hua Laharn goddess mother and household deity of each clan. It played the key role alongside with the religious days such as Songkran and Buddhist Lent day. In addition, the community was involved in connecting each household as a network to create travel route, which generated incomes to the society. The temple was considered as an important learning centre for the succession of traditional activities related to Buddhism. The school employed community artisans to provide knowledge for producing the local cultural products and appreciating cultural heritage to students. The research also found that informal learning outside the school; i.e. at the artisan's house, engaged students' awareness of their local culture more than formal learning one. The overall satisfaction score of the community cultural awareness & appreciation program was considered to be a good result ($\bar{x}$ = 4.8 from 5 and S.D. = 0.15).

Online full paper at: https://is.gd/HatzPO

EMA13:NC02

A Development of Self-Directed Learning Model for students of the Technology Program, Faculty of Industrial Technology, Chitralada Technology Institute

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The purpose of this research was to development of Self-Directed Learning model and find out the effectiveness by using Meguigans's theory and checked the level of student satisfaction in using the model. This is a development model from the problem to management is expected to allow students to thinking process and limitations of learning with variable internship implications.

Operations start from the course analysis using by course development process of Surat Promjan. [1] Then the information is set as a learning objective and prepare 10 worksheet and then, researcher developed the model with the expert to evaluate the efficiency of the use averaged 4.80 show that the highest efficiency. The Self-Directed Learning model has 4 stages: 1) Motivation 2) Responsibility 3) Control and 4) Reflection

The results showed that Self-directed learning model developed the experts evaluate the efficiency average of all evaluations is 4.80 and average of standard deviation equal 0.36 indicates the highest level of performance. The results of the performance evaluation of the model developed by Meguigans's formula were 1.05 and the results of the assessment of the learner's satisfaction based on the developed model. The average total score of 4.58 was the highest.

Online full paper at: https://is.gd/BxJ7a2

EMA14:NC65

The Evaluation of Vocational Certificate in Electronic Technical, B.E. 2552 at Military Technical Training School, National Defence Studies Institute, Royal Thai Armed Forces Headquarters

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The objective of this research was to evaluate the vocational certificate program in Electronic Technician, B.E. 2552, Military Technical Training School, National Defence Studies Institute, Royal Thai Armed Forces Headquarters. The sample of this study was 33 teachers - instructors, 80 students, and 240 alumni. The research tool was a questionnaire, divided into three parts: Part 1 was general information of the respondents. This part contained checklist items. Part 2 was evaluation of program use and production. This part contained five-rating scale items. Part 3 was suggestions for the trends of program use and future production results. Data were analyzed using frequency, percentage, and standard deviation. The results of this study could be summarized as follows:

The evaluation of the program use process showed that teachers / instructors opinioned that the efficiency of teaching and learning was at high level and the maximum utilization of teaching and learning resources was at a low level. Students opinioned that the consistency between theory and practice was at a high level and the maximum utilization of facilities was at a low level.

The production evaluation showed that alumni opinioned that ability of being employed of graduates was at a high level and career advancement and promotion was at a low level.

Online full paper at: https://is.gd/8LkCJO

ICTechEd6

6th International Conference on Technical Education

Section 1

March 19, 2019
FTE Building 52-703

1.00 PM – 4.30 PM

ICTechEd6**G01-G13**

G01:IC07

Role of Yoga in Technical Education: An Review

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With industrial development, the need for technical manpower grew to a large extent. Technical education in the India has generally starts after completion of 10th standards. To cater the need, new industrial training institutes, polytechnics and engineering colleges were started. These institutes produced skilled workers, technically qualified supervisors, and shop floor and design engineers. But, along with raising the no of branches of technical education, depression among the engineering students commonly observed in India. Many engineering students tend to have psychotic symptoms or bipolar disorder, which leads to depression. The present paper focuses on the details of technical education which increases depression in students and effective solution Yoga to reduce stress, depression etc. Yoga has positive effects on a psychophysiological level that leads to decreased levels of stress in college and technical education passed students. Yoga is affordable and easily implemented solution for the mental health issues of the students of technical education. Further research is needed to examine the extent to which different types of yogic practices address the needs of different sub-populations e.g. overweight, sedentary, smokers etc.

Online full paper at: https://is.gd/yGNV6o

G02:IC08

Integrating Technology for Developing ESL Learners' Academic Writing Skills

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The focus of the current study was to investigate the effectiveness of Computer Assisted Language Learning (CALL) for developing academic writing skills among English as a second language (ESL) learners. It was conducted for thirteen weeks with 82 second year Allied Health Science undergraduates of General Sir John Kotelawala Defence University in Sri Lanka. Switching Replication was used for the research design of the current study. The participants were randomly assigned for two groups: treatment and control and there were three waves of measurements: pre-mid-post-tests. Those who were in the treatment group received the intervention and worked collaboratively in CALL while the control group worked collaboratively in-class. Both groups were given the same treatments in both phases except the learning mode. After the midpoint test, the two groups switched the learning mode, which supported in mitigating the external threats to the internal validity as well as in strengthening the research findings. The findings indicate that the participants' lack of experience in CALL, poor writing and vocabulary skills and technical faults were the major issues that they experienced in CALL for academic writing skills. Yet the success of the intervention both in the first and second phases indicates the effectiveness of CALL for developing academic writing skills. Blended learning is also suggested since the participants accept that there are both advantages and disadvantages in CALL and in-class. It is believed that the knowledge obtained in this study can contribute to the field of CALL and applied linguistics.

Online full paper at: https://is.gd/pFTm91

G03:IC30

Implementing a Quality Analysis at Vocational Schools in Thailand through the German-Thai Dual Excellence Education Program (GTDEE) : Impulses for the Future Development of Schools

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Through an improved qualification of vocational colleges in Thailand, the young people should be more reliably trained professional in their vocational training. Thinking and acting is an important process of young growing people who are going to work in the economic and social systems in the future. During the School Assessments in several vocational colleges in the GTDEE project quality analysis were carried out in order to determine information on school quality from an external perspective. The findings of these evaluations and analysis are of great importance for the further development of schoolwork, the accountability of a school and the management of the school system in the dual vocational education in Thailand.

This analysis reveals the strengths and weaknesses of a vocational college as a system and a concrete goal and action planning of the school development is thereby made possible. The quality analysis is functionally and personnel-separated from the local school supervision and takes into accounts the school framework conditions as well as the cooperation and coordination with the training enterprises. In a partial result during the school assessment and hence connected visits of the classrooms, it was difficult to recognize a standard of competent teaching methods. Overall, it appears that the professional competencies are weak developed of vocational teachers.

Online full paper at: https://is.gd/1lFaqU

G04:IC29

Evaluation of Information Technology Governance in Occidental Mindoro State College using Information Technology Assurance Framework

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Assessing the case of information technology governance becomes one of the essential task of varied organizations today. By means of evaluation, it determines the possible extent that will benefit the organization, programme, or even the organization's policy. The study focuses on the evaluation of IT governance in Occidental Mindoro State College using (ITAF). With the use of ITAF principles the study were able to evaluate the IT conditions in terms of its general standards, performance standards, and reporting standards. The top management of IT department consisting of 25 respondents were able to evaluate the study. As a result, the study reveals that the organization needs to pay attention in the management perspective especially in dealing with IT outsourcing to prevent risk that would have an eventual effect on the environmental stressors of ecosystem and in human health.

Online full paper at: https://is.gd/CvJaH3

G05:IC21

Purposeful Learning Booklet, a method for teaching Engineering

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Iran

Today, the engineering educational system of a country as a social institution that is responsible for the education of people in the community is known as the development and development of a country depends on the development of knowledgeable and responsible people. The point that in the development literature as development It is human. Hence, many countries are paying a lot of money to increase the efficiency of their educational system so that this investment will lead to the development of efficient and expert forces in all parts of that country. Iran is always categorized as developing countries, where the inefficient educational system in the country has led to a long developmental path in this country. The proposed scheme in this study includes providing a booklet to all students in the classroom, which completes the pamphlet during the course of the semester. The structure of the booklet is planned in a way that meets Bloom's revised levels of classification and has a positive effect on the academic status of the students. The results indicate students' progress in understanding the content of the course, enhancing motivation, creativity and communication skills, especially in engineering disciplines such as electrical engineering.

Online full paper at: https://is.gd/bZFUlk

G06:IC06

Capability Analysis for knowledge and experience transfer of Vocational Certificate and High Vocational Certificate

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This is a documentary research that aims to analyze the capability of knowledge and experience transfer of vocational certificate and high vocational certificate by to study the data from primary sources and secondary sources from foreign countries. The research used content analysis. The data analysis found that the capability of knowledge and experience transfer of vocational certificate consisted of 1) knowledge about basic principles of vocational and basic analysis, technique and working process, concept and theory about learning, English for basic communication, and basic information technology, 2) skills involved with working to achieve the plan, use of knowledge and skill to solve the problem occurred in working, to choose and adapt the data, method, tool, technology and materials to work and solve the problem, to interpret data by use of information, number and data management by basic digital technology to support education and simple work, to be able to communicate efficiently by variety ways such as to communicate and write in another language at least one language apart from mother language, to be able to think systematically , to be able to work in team, skill in safe, and to give basic advice about working or learning, 3) qualifications in term of responsibility in working and learning, leadership, adaptation to changes, morality in working or learning of variety culture, having self-improvement by studying or additional training, and follow and participate with community. High vocational certificate consisted of 1) knowledge about technique of working process in specific task, concept, theory about learning, English for basic communication, and basic information technology, 2) skill of working by use of data, method, tools, technology and materials to solve problem properly, skill of wisdom, skill of presentation by high technology and calculation, skill of relation and communication and skill of being businessman, 3) qualification in term of responsibility, adaptation to changes, critical thinking, self-improvement for career, to participate and be the leader of activities in community, local and region, and having morality of working..

Online full paper at: https://is.gd/zRFwLE

G07:IC14

Recruiting, Developing and Retaining Talented People in Industrial Business in Bangkok Area

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The research objectives were to explore the relationship between recruiting, developing and retaining talented people in industrial business in Bangkok area. The sample was 400 staff such as Supervisor Level, Primary Level Manager, Middle Level Manager and Higher Level Manager who working in industrial business in Bangkok area. Data collection was carried out through an online questionnaire (Google Forms). The samples were selected by convenience sampling method. The data were analyzed using percentage, mean, standard deviation and multiple regression analysis.

The finding showed that the relationship between recruiting, developing and retaining talented people in industrial business in Bangkok area, it was found that recruiting, developing talented people which predicts the retaining talented people in industrial business in Bangkok area at significant .05, which describes the variation (R2) to retaining talented people in industrial business in Bangkok area by 43.5 percent. General suggestions; respondents required the organization to specify the development plan and maintain the talented people for sustainability.

The result of analyzed the relationship between recruiting, developing and retaining talented people in industrial business in Bangkok area, the finding showed that the recruiting and developing talented people had positively, which was predicted the retaining talented people in industrial business in Bangkok area at significant .05, and described the variation (R2) to retaining talented people in industrial business in Bangkok area 43.5 percent.

Online full paper at: https://is.gd/Ccbifz

G08:IC02

The Competency-Based Training on the Renewable Energy for Organic farming by Solar Energy

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The Competency-Based Training on the Renewable Energy for Organic farming with apply by Solar Energy is very popular topic, it's not only in Thailand especially in Asaen-Countries. The Asean-Countries have increased by farming and mixed organic cultivate variety. As a result of the market changes to organic farming because the consumption demands of the world market. The farmers are interested in developing and reducing production costs in organic farming by using the renewable energy. However, those of them lack the knowledge to apply the renewable energy technologies to agriculture and also lack of appropriate equipment and training course to apply in organic farming. The competency-base training is the process of enhancing the performance of a person by focusing on knowledge, skills and attitudes which lead to the standardization work highly and achieve the goals to reduce the electricity cost of organic farming.

The training is an important part of improving the knowledge and performance of organic farmer. The learning module was support to reduce the farmer operating and management cost. This paper uses the training of solar energy. The samples were used in the research are 30 students who study the electrical power of Industrial Technology Faculty, The training included: 1) solar pump demonstration, 2) pre and posttest training, 3) satisfaction surveys. From the competency-based training found that the average score was 86%, which meet quality criteria 80% of the training and the result of the post-test training score was higher than the pre-test training. The satisfaction of the training was a very high level from the mean.

Online full paper at: https://is.gd/Lnk6AI

G09:IC03

The Competency Based Training for Maintenance Technicians of Solar Power system focusing on Solar modules

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This paper studies the competency-based training in order to increase efficiency of maintenance technicians of solar power system by using the work process as a learning module. This paper uses the training of solar module. The samples were used in the research are 30 students who study the electrical power of Industrial Technology Faculty. The tools of the training are solar power system demonstration, pre and post testing, satisfaction questionnaire. The training found that the maintenance technicians' competency-based training has a total score 85.54%, which meets 80% of the training requirements. As a result of this training, the post-training test scores were higher than pre-training test at .05 significantly and the satisfaction of the training was high ($\bar{x}$ = 4.00, S.D. = 0.14).

Online full paper at: https://is.gd/crflM9

G10:IC25

Instructional Management using Simulation Based RISDA Learning Model for Teaching of Industrial Electronics

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This research presented an instructional management using the RISDA simulation-based learning model for industrial electronics education. The research process was to survey the needs of stakeholders about graduate recruitment, to develop the RISDA simulation-based learning model consisting of 5 activities as 1) Recall 2) Information 3) Simulation 4) Discussion, and 5) Assessment and to construct the activity plan and instructional media. The research results found that the appropriation by experts in developing RISDA learning model was appropriate (mean=3.87), the mean of students' satisfaction was at appropriate level (mean=4.16), and the RISDA learning model was efficient in according to Meguigans's theory. The developed RISDA learning model can be used in producing graduates in responding to enterprise' needs in the 21st learning century.

Online full paper at: https://is.gd/lRhWhc

G11:IC27

Bidirectional DC-DC Converter for High Efficiency Welding Machines Using the Power of Supercapacitors

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This paper describes the design of bidirectional dc-dc converters and a dual-quadrant dc-dc converter, which is the dual-mode system in a single device. The concept of this paper is introduced of bidirectional dc-dc converter. The main system device includes the double use of 500-F, 16.2-V supercapacitors (SC), the main control circuit, the power supply, and the buck converter circuit. Software of the system control by a microcontroller. The experimental results are intended to realize the closed-loop control of the double. By supercapacitor charge current and supply power for welding copper pipes.

Online full paper at: https://is.gd/WaWosp

G12:IC09

A Numerical Analysis of Wind Direction Performance of Flat Roof Wind Catcher for Natural Ventilation

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In this research is study for air flowing and ventilation rate in flat roof wind catcher models, which methodology of numerical method of fluid dynamics or CFD (Computational Fluid Dynamics) program. The flat roof wind catcher models are geometry with 165 mm of height, 70 mm of width and 40 mm for depth, and the models are setting in the model of wind tunnel with geometry of height, width and length of 460 mm, 460 mm and 2400 mm. The boundary condition have been determined for wind velocities of free stream (Vref) at 0.1, 0.5, 1.0, 5, 10, 15 and 20 m/s and the wind direction is rotated as 0o, 15o, 30o, 45o and 60o, which the wind velocities of free stream are defined according to average of wind speed rate in Bangkok, Thailand at 0.5 to 5 m/s by Thai Meteorological Department data reference. The result of flow patterns can be shown with wind velocity contour profiles, which the wind velocity of free stream have be increased and have effected to airflow profiles to addition, but it is decreased with enlarge of wind direction angle. The vector of wind velocity has been air vortex inside of wind catchers, which the vortex will be influenced to reduce for the discharge coefficient quantity of wind catcher. Therefore, the natural ventilation efficiency of flat roof wind catcher has been found that decrease by rotate angles with addition. The ventilation efficiency for maximum is based on wind direction at 0o and increased with addition of wind velocity of free stream. On the other hand, the ventilation efficiency will be reduced with addition of wind direction angles and have been least of efficiency with wind direction angle at 60o.

Online full paper at: https://is.gd/lRkmFr

G13:IC16

Evaluation of a Mechanical Fatigue Behavior of SKD61 (JIS Standard) under Stress and Strain-Base Controlled by a Four-point Bending Test

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The major failures occurring during the mechanical loading of a forging die are divided mainly to 3 main types, namely catastrophic fracture, fatigue fracture and wear which will make it to reduce their strength. The problem due to catastrophic mostly comes from the wrong process design, while the fatigue fracture comes directly from the mechanical property changing during the repeated loading conditions. The material could show the cyclic hardening or softening behaviors. The cause of wear comes from the surface or coating at the die surface. The aim of this research will be focused on the evaluation of the mechanical fatigue behavior of the steel material. Normally, the uniaxial tensile test based on ASTM standard E606 with full reversed loading is used. However, this test cannot be used to evaluate the surface crack which is a major cause occurring in the forging die. The 4-pointed bending test is proposed in this study. The material grade SKD61 (JIS standard) with hardness of 49 HRC will be tested with 2 loading conditions, i.e. constant bending stress amplitude and constant bending strain amplitude. The deviation of the measured force (bending stress) and surface strain will be used as indicators to evaluate the changing in mechanical property under the constant repeated loading conditions.

Online full paper at: https://is.gd/E6QBLT

Section 2

March 19, 2019
FTE Building 52-208

1.00 PM – 4.30 PM

ICTechEd6**S01-S11**

S01:IC28

IT Infrastructure Auditing using COBIT Framework

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Information Technology Infrastructure is currently being seen as an important factor affecting a firm's competitive performance. It is critical to globally competing firms and to those which employ a diverse group of technologies. IT infrastructure must be flexible and ready for future needs. This study aims to assess the IT infrastructure of Northern Luzon Adventist College based on the four domains of COBIT 4.1 framework namely; Plan and Organize (PO), Acquire and Implement (AI), Deliver and Support (DS), and Monitor and Evaluate (ME). The different question that was used in this study is tailored to these four domains. These questions aim to determine the different practices of the organization among the four IT activities as describe by COBIT framework and to identify the value of the maturity level of information technology governance in the organization. Furthermore, this study aims to evaluate the practices of the organization concerning information security with the purpose of giving recommendations for improvements.

Online full paper at: https://is.gd/u5v2hE

S02:IC04

Perception and Attitude Toward Self-Regulated Learning in Educational Data Mining

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The Self-Regulated Learning (SRL) strategies can be the best achieved by achieving a sub-goal that will lead to a broader future in the younger generation. This paper proposes the process of developing factors (attributes) related to the development of learning styles through SRL strategies. The objectives of this paper are (1) to study the perception and attitude toward the attributes of students with SRL of the students in higher education, and (2) to find the level of acceptance towards the factor of SRL using applied statistics and machine learning. The results show that the two tools have proved that the respondents accept the factors of SRL in the accepted level. Besides, the results show that Thai higher education students still focus on formal learning. For the future, the authors aim to develop and apply an SRL strategies model with a combination of collaborative learning strategies of blended learning for undergraduate students.

Online full paper at: https://is.gd/FoUHkF

S03:IC18

Network Intrusion Detection Enhancement via Fuzzy Class Association Rule Mining

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This paper aims to analyze the performance of a network intrusion detection system using a fuzzy class association rule mining method based on genetic network programming (GNP). The fuzzy set theory with GNP was combined to enhance detection ability. The proposed approach is an extension of the intrusion detection method using GNP, so this can detect and distinguish normal, known and unknown intrusion. 10% of the original KDD cup 99 data set was used for training as well as testing purposes. The test results from the algorithms were then compared.

Online full paper at: https://is.gd/CSOwcw

S04:IC24

Development Smart Home System Controlled by Android Application

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This paper presents a low-cost smart home system with an efficient system. The hardware consists of NodeMCU Arduino, PIR sensor, temperature sensor, light dependent resistor and a motion sensor in IP Camera. The software includes ArduinoIDE and MIT app inventor II for Android mobile phones. The system developed based on Android user Interface for controlling a smart home. The NETPIE platform, which is a network of IoT, is used for interfacing between a user and a smart home. This system consists of lighting system, fan and security system. The notification is through LINE Notify app. The system includes two control systems; manual and automatic. From the results, it is shown that the control system is well performance while it is developed just low-cost devices.

Online full paper at: https://is.gd/n89t3r

S05:IC20

Science-Based Discussions Using Imaginative Stories as A Method of Teaching in Urine Microbial Fuel Cells

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Improving the quality of education is not possible without the transformation of teaching methods and techniques. Nowadays, the audience is always exposed to a wealth of different information, it is necessary to find a method for learning them in the least amount of time. This is vital, especially in academic environments requiring extensive and complex learning. The edutainment technique, despite its old age, is one of the new concepts introduced today to simplify complex concepts. A branch of this applied technique is the expression of concepts in a simple way by using graphic stories. In this research, a sample of modern scientific issues in a university level thought using science-based discussions, fictional expressions and various images in the statistical society of 60 students of engineering and the results of the project's effectiveness in various aspects of education have been studied. These results show an overall satisfaction of over 72% of the statistical population.

Online full paper at: https://is.gd/ffBioc

S06:IC19

A Teaching Method Based on Storytelling of A Student Social Activity in Renewable Energy Education

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In recent years, renewable energy sources have been of great interest, because they are reversible, available, the environment-friendly and cheaper than conventional fossil fuels. Therefore, suitable policies to expand the use of this type of energy in all countries are important which requires precise planning and investment. One of the first important steps toward these planning is a proper introduction of this kind of energy in the society. Education in schools, universities and mass media can play a major role in building a culture and introduce renewable energy sources. The purpose of this paper is to present and introduce an innovative scheme to introduce renewable energies. This idea is based on a fictional story with real photos of the mountaineering. Because the type and method of teaching is an important factor in the proper induction of concepts to learners, in this paper, after studying the different methods of learning and teaching in different ways, this plan has been proposed. To evaluate the effectiveness, the project has been applied to three groups of students at undergraduate and postgraduate levels. Polls from these groups show acceptable satisfaction from the plan.

Online full paper at: https://is.gd/y4jMEY

S07:IC13

Development of Virtual Experimental Package for Resonance Circuit Education

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This paper aims to develop the virtual experimental package for resonance circuit education. The research tools were the content sheet, lab sheet and virtual experimental package. The performance of research tools was the expert's evaluation and the student's satisfaction. Samples were 15 students who registered in fundamentals of electronic devices and circuits course at Chitralada technology institute. The research results shown that the appropriation of virtual experimental package by 5 experts was at high level and the students' satisfaction of the sampling group was high level. Therefore, the virtual experimental package can be applied and developed for learning in electronic and electrical engineering course and related.

Online full paper at: https://is.gd/Vi9SRA

S08:IC12

Development of P-PIADA Teaching Model based on STEAM Education on Communication Network Analysis

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This paper aims to develop of the instructional package using the P-PIADA teaching model. First, issues and environment in the teaching of telecommunication engineering were surveyed and studied. Next, the P-PIADA teaching model based on STEAM education was developed. The P-PIADA teaching model consists of six processes including 1) Preparation; P), 2) Pre-learning; P, 3) Informing; I, 4) Activity; A, 5) Discussion; D and 6) Assessment; A). Then, the instructional package consisting of teacher's manual, PowerPoint presentation, simulation tool, teaching aids and an achievement test, was constructed for applying in the teaching of communication network analysis subject. Finally, the quality of the developed P-PIADA teaching model was evaluated by ten experts and implemented by a sampling group of 25 bachelor's students. The results shown that the efficiency of the developed P-PIADA teaching model is equal to 78.20 percentage and students' appropriation was at high level (mean=4.16, S.D. = 0.14).

Online full paper at: https://is.gd/aU0RTS

S09:IC17

Development of 5.8 GHz SWR Meter for Testing Telecommunication Systems

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This article presents the development of 5.8 GHz SWR meter for testing telecommunication system and applying in the teaching of telecommunication engineering. The hardware based on Arduino microcontroller consists of two parts including the multi-frequency oscillator and the digital SWR meter using a directional coupler of 5.8 GHz operating frequency. The research results shown that the quality of developed SWR meter evaluated by expert is at high level. After testing the accuracy, it can be seen that the developed SWR meter has not exceed ±5 % of error in comparing to standard instrument. The developed SWR meter can be used in testing the telecommunication system and can be as an instructional aid for telecommunication engineering education as efficiently.

Online full paper at: https://is.gd/DRLnis

S10:IC22

Microwave Filter Analysis with Hybrid Circuitry Structure using Wave Iterative Method

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Microwave filters with hybrid circuitry structure are analyzed using the Wave Iterative Method (WIM). The proposed BPF and BSF filter prototypes were designed and implemented using microwave LC chips connecting to microstrip line on the FR4 circuit board. The proposed filters were analyzed using the wave iterative method based on electromagnetic wave propagation in conducting gravity. After implement the designed filters, measured results are consistent to simulated CST software. The usefulness of the developed WIM analysis has been confirmed through the designed microwave filters with hybrid circuitry structure.

Online full paper at: https://is.gd/M5aMpO

S11:IC26

Analysis of Microwave Filter based on LC Chips in Microstrip Circuitry using K-Inverter Approach

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This research presents an analysis of microwave filter based on LC chips in microstrip circuitry using K-inverter approach. The microwave filters were analyzed and implemented using the immittance inverter parameters that can transform the ideal transmission line on microstrip circuitry structure to equivalent filter circuit. A simulator based on GUI function of MATLAB® is developed to be flexible in designing filters. In this paper, the BPF filter was implemented using microwave capacitor and inductor chips fabricating on FR4 printing circuit board. The filter prototype has accomplished in operating frequency range of 1.07 – 1.69 GHz and was tested in comparing to commercial simulator. The simulated results of designed BPF filter are consistent to filter theory and commercial simulator.

Online full paper at: https://is.gd/DJBAxb

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The 6th International Conference on Technical Education

"*Technopreneur for Sustainable Growth and Development*"

March 19, 2019

at Benjarat Hall, NavamindraRajini Building &
at Faculty of Technical Education

King Mongkut's University of Technology North Bangkok

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According to the changing of the global economy, Thailand's economic highly depends on manufacture and service industries whereas the expansion in agricultural sector decreases in numerous areas and agriculturists. The movement of some agriculturists to the industrial and service sectors causes the problem of higher low-quality labors. The vocational education reform is a way to solve the problem as stated by emphasizing on production and developing teachers and students to be quality. For this reason, the instructional model and curriculum development should be designed considering the academic and vocation increasingly.

The Faculty of Technical Education (FTE), King Mongkut's University of Technology North Bangkok (KMUTNB) has continuously concentrated on producing and developing qualified technical teachers in Bachelor's, Master's and Doctoral levels while conducting and publicizing research in both technical education and engineering over 50 years. That is a consequence of the academic cooperation between the Thai Government and the Federal German Government especially in the knowledge transfer regarding the "Engineering Teacher". Until now, the FTE has always encouraged instructors, students, and researchers to conduct the research in vocational development in order to upgrade the career development and the sustainably learning developments. Moreover, knowledge networking on technical education, especially with the Office of Vocational Education Commission (VEC), is aimed at increasing the number of academic staffs with graduate level that will be emphasized on the potential of knowledge transfer corresponding to the industrial demand. That is the concept of creating the master of learning models, which reflects on the research potential continuously.

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ณ หอประชุมเบญจรัตน์ อาคารนวมินทรราชินี และ คณะครุศาสตร์อุตสาหกรรม
มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ

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คณะวิศวกรรมศาสตร์ มหาวิทยาลัยเกษตรศาสตร์ บางเขน
27. ผู้ช่วยศาสตราจารย์ ดร.รุ่งอรุณ พรเจริญ กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีราชมงคลพระนคร
28. นางธิภาภัทร บุญยะผลานันท์ เลขานุการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
29. นางสาววลัยพร ยอดคำมี ผู้ช่วยเลขานุการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
30. นางสาวศิริพร ยางสวย ผู้ช่วยเลขานุการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ

รายนามผู้ทรงคุณวุฒิพิจารณาบทความ (ภายใน)

1	รองศาสตราจารย์ ดร.ชัยวิชิต	เชียรชนะ	คณะครุศาสตร์อุตสาหกรรม
2	ดร.กฤตยา	ทองผาสุข	คณะครุศาสตร์อุตสาหกรรม
3	ดร.กฤช	สินธนะกุล	คณะครุศาสตร์อุตสาหกรรม
4	รองศาสตราจารย์ ดร.อุไร	อภิชาตบรรลือ	คณะครุศาสตร์อุตสาหกรรม
5	รองศาสตราจารย์ ดร.ธานินทร์	ศิลป์จารุ	คณะบริหารธุรกิจ
6	ดร.ประดิษฐ์	เหมือนคิด	คณะครุศาสตร์อุตสาหกรรม
7	ผู้ช่วยศาสตราจารย์ ดร.สยาม	แกมขุนทด	คณะครุศาสตร์อุตสาหกรรม
8	ดร.ปิยะ	กรกชจินตนาการ	คณะครุศาสตร์อุตสาหกรรม
9	ดร.คมสันต์	ชไนศวรรย์	คณะครุศาสตร์อุตสาหกรรม
10	ดร.สุธิดา	ชัยชมชื่น	คณะครุศาสตร์อุตสาหกรรม
11	รองศาสตราจารย์ ดร.วัชรินทร์	โพธิ์เงิน	คณะครุศาสตร์อุตสาหกรรม
12	ผู้ช่วยศาสตราจารย์ ดร.จรัญ	แสนราช	คณะครุศาสตร์อุตสาหกรรม
13	ผู้ช่วยศาสตราจารย์ ดร.เอกกมล	บุญยะผลานันท์	คณะครุศาสตร์อุตสาหกรรม
14	ผู้ช่วยศาสตราจารย์ ดร.ศักดิ์ชาย	ตั้งวรรณวิทย์	คณะเทคโนโลยีสารสนเทศ
15	รองศาสตราจารย์ ดร.มานพ	ชูนิล	คณะศิลปศาสตร์ประยุกต์
16	ผู้ช่วยศาสตราจารย์ ดร.จิรพันธุ์	ศรีสมพันธุ์	คณะครุศาสตร์อุตสาหกรรม
17	ดร.วรรณชัย	วรรณสวัสดิ์	คณะครุศาสตร์อุตสาหกรรม
18	รองศาสตราจารย์ ดร.ปณิตา	วรรณพิรุณ	คณะครุศาสตร์อุตสาหกรรม
19	ผู้ช่วยศาสตราจารย์ ดร.ประสิทธิ์	ประมงอุดมรัตน์	คณะครุศาสตร์อุตสาหกรรม
20	ผู้ช่วยศาสตราจารย์ ดร.กฤษชัย	ศรีบุญมา	คณะครุศาสตร์อุตสาหกรรม
21	รองศาสตราจารย์ ดร.จิระศักดิ์	ชาญวุฒิธรรม	คณะวิศวกรรมศาสตร์
22	ผู้ช่วยศาสตราจารย์ ดร.ชูชาติ	สีเทา	คณะครุศาสตร์อุตสาหกรรม
23	ผู้ช่วยศาสตราจารย์ ดร.วาทินี	นุ้ยเพียร	คณะครุศาสตร์อุตสาหกรรม
24	รองศาสตราจารย์ ดร.คณิต	เฉลยจรรยา	คณะครุศาสตร์อุตสาหกรรม
25	รองศาสตราจารย์ ดร.บัณฑิต	สุขสวัสดิ์	คณะครุศาสตร์อุตสาหกรรม
26	อาจารย์นฤเบศ	คำมงคล	คณะครุศาสตร์อุตสาหกรรม
27	ดร.ศุภกฤต	โสภณจิตต์	คณะครุศาสตร์อุตสาหกรรม
28	รองศาสตราจารย์ ดร.วรรณวิทย์	แต้มทอง	คณะวิศวกรรมศาสตร์
29	ศาสตราจารย์ ดร.พิทยา	แจ่มสว่าง	คณะวิศวกรรมศาสตร์
30	รองศาสตราจารย์ ดร.เมธีพจน์	พัฒนศักดิ์	คณะครุศาสตร์อุตสาหกรรม

31	ผู้ช่วยศาสตราจารย์ ดร.มาลีรัตน์	โสดานิล	คณะเทคโนโลยีสารสนเทศ
32	ดร.ธัญญรัตน์	น้อมพลกรัง	คณะครุศาสตร์อุตสาหกรรม
33	รองศาสตราจารย์ ดร.สมศักดิ์	อรรคทิมากูล	คณะครุศาสตร์อุตสาหกรรม
34	รองศาสตราจารย์ ดร.ปิยะธิดา	ช้างพึ่ง	คณะศิลปศาสตร์ประยุกต์
35	ดร.สมคิด	แซ่หลี	คณะครุศาสตร์อุตสาหกรรม
36	ผู้ช่วยศาสตราจารย์ ดร.กิตติ	เสือแพร	คณะครุศาสตร์อุตสาหกรรม
37	ผู้ช่วยศาสตราจารย์ยุทธนา	เกาะกิ่ง	คณะเทคโนโลยีและการจัดการอุตสาหกรรม
38	รองศาสตราจารย์ ดร.อนันต์	สืบสำราญ	คณะครุศาสตร์อุตสาหกรรม
39	รองศาสตราจารย์ ดร.ปรัชญนันท์	นิลสุข	คณะครุศาสตร์อุตสาหกรรม

รายนามผู้ทรงคุณวุฒิพิจารณาบทความ (ภายนอก)

1	รองศาสตราจารย์ ดร.นนทลี มหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี	พรธาดาวิทย์	
2	รองศาสตราจารย์ ดร.อัคครัตน์ มหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี	พูลกระจ่าง	
3	รองศาสตราจารย์ ดร.ชัชพล	ชังชู	มหาวิทยาลัยเกษตรศาสตร์
4	รองศาสตราจารย์บรรจบ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี	อรชร	
5	ศาสตราจารย์ ดร.สุขสันติ์	หอพิบูลสุข	มหาวิทยาลัยเทคโนโลยีสุรนารี
6	ดร.จริยา	เอียบสกุล	วิทยาลัยเทคนิคภูเก็ต
7	ผู้ช่วยศาสตราจารย์ ดร.วรปภา	อารีราษฎร์	มหาวิทยาลัยราชภัฏมหาสารคาม
8	ผู้ช่วยศาสตราจารย์ ดร.หฤทัย	นำประเสริฐชัย	มหาวิทยาลัยเกษตรศาสตร์
9	ผู้ช่วยศาสตราจารย์ ดร.อัจฉรีย์	พิมพิมูล	มหาวิทยาลัยราชภัฏอุบลราชธานี
10	ผู้ช่วยศาสตราจารย์ ดร.สันติ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี	เจริญพรพัฒนา	
11	ผู้ช่วยศาสตราจารย์ ดร.ศิริโรจน์	ศิริสุขประเสริฐ	มหาวิทยาลัยเกษตรศาสตร์
12	ผู้ช่วยศาสตราจารย์ ดร.สุภาณี	เส็งศรี	มหาวิทยาลัยนเรศวร
13	ผู้ช่วยศาสตราจารย์ ดร.มนตา	ตุลย์เมธาการ	มหาวิทยาลัยศรีนครินทรวิโรฒ
14	ผู้ช่วยศาสตราจารย์ ดร.พรสวรรค์	วงค์ตาธรรม	มหาวิทยาลัยขอนแก่น

15 รองศาสตราจารย์ ดร.รัตติกร วรากูลศิริพันธุ์ สถาบันเทคโนโลยีไทย-ญี่ปุ่น

16 ดร.ธงชัย แก้วกิริยา สถาบันเทคโนโลยีไทย-ญี่ปุ่น

17 รองศาสตราจารย์ ดร.ปิยะ ศุภวราสุวัฒน์
สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง

18 ผู้ช่วยศาสตราจารย์ ดร.สุรพล บุญลือ
มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี

19 ผู้ช่วยศาสตราจารย์ ดร.จิรโรจน์ สามารถโชติพันธุ์
มหาวิทยาลัยเทคโนโลยีราชมงคลอีสาน วิทยาเขตขอนแก่น

20 รองศาสตราจารย์ ดร.วารี กงประเวชนนท์
สถาบันเทคโนโลยีนานาชาติสิรินธร มหาวิทยาลัยธรรมศาสตร์

21 ผู้ช่วยศาสตราจารย์ ดร.ทวีเดช ศิริธนาพิพัฒน์ มหาวิทยาลัยเกษตรศาสตร์

22 รองศาสตราจารย์ ดร. สถาพร โภคา มหาวิทยาลัยอุบลราชธานี

23 รองศาสตราจารย์ ดร.พีระยศ แสนโภชน์ มหาวิทยาลัยเกษตรศาสตร์

24 ดร.แก้วกัลยา อภัยบัณฑิตกุล มหาวิทยาลัยรามคำแหง

25 รองศาสตราจารย์ ดร.ทวิช พูลเงิน
มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี

26 รองศาสตราจารย์ ดร.สุรชัย สุขสกุลชัย
มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี

27 ผู้ช่วยศาสตราจารย์ ดร.นรังสรรค์ วิไลสกุลยง สถาบันเทคโนโลยีไทย-ญี่ปุ่น

28 ผู้ช่วยศาสตราจารย์ ดร.กันต์พงษ์ วรรัตน์ปัญญา
สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง

29 ผู้ช่วยศาสตราจารย์ ดร.ทักษิณา เครือหงส์
มหาวิทยาลัยเทคโนโลยีราชมงคลสุวรรณภูมิ

30 รองศาสตราจารย์ พ.ต.ท. ดร.ศิริพงษ์ เศาภายน มหาวิทยาลัยรามคำแหง

31 ผู้ช่วยศาสตราจารย์ ดร.อนุศิษฏ์ อันมานะตระกูล
มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี

32 ผู้ช่วยศาสตราจารย์ ดร.วิไลลักษณ์ สระมูล มหาวิทยาลัยเทคโนโลยีมหานคร

33 รองศาสตราจารย์ ดร.วิทยา จันทร์ศิลา มหาวิทยาลัยนเรศวร

34 ผู้ช่วยศาสตราจารย์ ดร.สุวิมล กฤชคฤหาสน์ มหาวิทยาลัยรามคำแหง

35 ผู้ช่วยศาสตราจารย์ ดร.ณัทณรงค์ จตุรัส
มหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี

36 รองศาสตราจารย์ ดร.อาทิตย์ ศรีแก้ว มหาวิทยาลัยเทคโนโลยีสุรนารี

37 ดร.กิตติมา เมฆาบัญชากิจ สถาบันเทคโนโลยีไทย-ญี่ปุ่น

38 รองศาสตราจารย์ ดร.สุมาลี ชัยเจริญ มหาวิทยาลัยขอนแก่น

39 ผู้ช่วยศาสตราจารย์ น.ต.ดร.สัญชัย พัฒนสิทธิ์ มหาวิทยาลัยเกษตรศาสตร์

40 ผู้ช่วยศาสตราจารย์ ดร.สุปรียา ศิริพัฒนกุลขจร
มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี

41 รองศาสตราจารย์ ดร.พีระวุฒิ สุวรรณจันทร์
สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง

42 รองศาสตราจารย์ ดร.วันชัย สะตะ มหาวิทยาลัยขอนแก่น

43 ผู้ช่วยศาสตราจารย์ ดร.จารุณี ชามาตย์ มหาวิทยาลัยขอนแก่น

44 ผู้ช่วยศาสตราจารย์ ดร.นิมิต บุญภิรมย์ มหาวิทยาลัยศรีปทุม

45 ผู้ช่วยศาสตราจารย์ ดร.ภาสกร เรืองรอง มหาวิทยาลัยนเรศวร

46 ดร.นพศักดิ์ ตันติสัตยานนท์
มหาวิทยาลัยเทคโนโลยีราชมงคลรัตนโกสินทร์ วิทยาเขตวังไกลกังวล

คณะกรรมการผู้ดำเนินการนำเสนอบทความประจำกลุ่ม (Chair Session)

1.	ศาสตราจารย์ ดร.พานิช	วุฒิพฤกษ์	ประธานกรรมการ
2.	รองศาสตราจารย์ ดร.ชัยวิชิต	เชียรชนะ	กรรมการ
3.	รองศาสตราจารย์ ดร.สมศักดิ์	อรรคทิมากูล	กรรมการ
4.	ผู้ช่วยศาสตราจารย์ ดร.จิรพันธุ์	ศรีสมพันธุ์	กรรมการ
5.	ผู้ช่วยศาสตราจารย์ ดร.กิตติวุฒิ	ศุทธิวิโรจน์	กรรมการ
6.	ผู้ช่วยศาสตราจารย์ ดร.ชัยยพล	ธงชัยสุรัชต์กูล	กรรมการ
7.	ผู้ช่วยศาสตราจารย์ ดร.นำโชค	วัฒนานัย	กรรมการ
8.	ผู้ช่วยศาสตราจารย์ ดร.สยาม	แกมขุนทด	กรรมการ
9.	อาจารย์ ดร.ปิยะ	กรกชจินตนาการ	กรรมการ
10.	อาจารย์ ดร.กฤช	สินธนะกุล	กรรมการ
11.	อาจารย์ ดร.อโนมา	ศิริพานิช	กรรมการ
12.	นางสาววลัยพร	ยอดคำมี	กรรมการและเลขานุการ

คณะกรรมการจราจรและสถานที่จอดรถ

1.	รองศาสตราจารย์ ดร.สมศักดิ์	อรรคทิมากูล	ประธานกรรมการ
2.	นายศรชัย	ผาสิน	กรรมการ
3.	นายหนูแดง	ยืนนาน	กรรมการ
4.	นางสาวรติภัทร	ไกรศรีวรรธนะ	กรรมการ
5.	นายดนัย	พรมแดน	กรรมการ
6.	นายนันทวัตร	ภัสดา	กรรมการ
7.	นางสาวทีปพรัตน์	แซ่อึ้ง	กรรมการ
8.	นายสุกฤต	อุจะรัตน	กรรมการและเลขานุการ

รายนามผู้สนับสนุน

สมาคมศิษย์เก่าครุศาสตร์อุตสาหกรรม มจพ.

บริษัท เจริญชัยหม้อแปลงไฟฟ้า จำกัด

คณะวิศวกรรมศาสตร์
มหาวิทยาลัยเทคโนโลยีราชมงคลล้านนา

บริษัท เอ็กซ์เพิททีม จำกัด

ศูนย์วิจัยวิศวกรรมน้ำและโครงสร้างพื้นฐาน

สถาบันการอาชีวศึกษาภาคตะวันออก

บริษัท พัฒน์กล จำกัด (มหาชน)

บริษัท เอส.เอ็ม.ซี. (ประเทศไทย) จำกัด

บริษัท แม็คเอ็ดดูเคชั่น จำกัด