LAPORAN

IConVET 2019

The 2nd International Conference on Vocational Education and Technology

LAPORAN

ICONVET 2019

The 2nd International Conference on Vocational Education and Technology (IConVET)

November 1, 2019

Banyualit Hotel, Singaraja, Bali – Indonesia

Dekan Fakultas Teknik dan Kejuruan
Universitas Pendidikan Ganesha

Dr. I Gede Sudirtha, M.Pd.
NIP. 197106161996021001

Ketua Panitia IConVET,

I Made Putrama, S.T., M.Tech
NIP. 198005242014041003

DAFTAR ISI

PENDAHULUAN

The 2nd International Conference on Vocational Education and Technology 2019 merupakan konferensi internasional tahunan ke-2 yang diselenggarakan oleh Fakultas Teknik dan Kejuruan, Universitas Pendidikan Ganesha untuk memfasilitasi bertemunya Akademisi, Peneliti dan Profesional untuk bertukar ide dan pengalaman di bidang saintifik akademis. IConVET menerima artikel ilmiah yang merupakan hasil kerja atau penelitian akademis dari peneliti dengan berbagai latar belakang termasuk mahasiswa, guru, praktisi dan penelit khususnya di bidang Pendidikan, Vokasi dan Teknologi baik dari dalam maupun luar negeri.

Konferensi ini merupakan kelanjutan dari konferensi yang pertama pada tahun 2018 yang telah terlaksana di Hotel Gran Inna Kuta, Denpasar, Bali pada tanggal 3 Nopember 2018 yang pada waktu itu mengusung tema *"Establishing Entrepreneurial Skills in Vocational Education and Technology (VET) towards Industry 4.0"*.

Di tahun 2019 ini, konferensi ini mengusung tema yang masih berkaitan dengan mendatangkan beberapa nara sumber yang pakar di bidangnya.

TEMA DAN LINGKUP KONFERENSI

Tema di tahun ini adalah:

"Harmonization of TVET and Industrial Revolution 4.0 towards Society 5.0"

Tema ini dimaksudkan untuk memberikan referensi bagi akademisi, praktisi, peneliti dan kalangan umum yang terlibat untuk dapat saling bertukar informasi terkait perkembangan teknologi khususnya bidang vokasi yang selaras dengan *Industry 4.0* namun mengedepankan ide-ide yang berkaitan dengan aspek keselarasan dengan lingkungan atau dikenal dengan *Society 5.0*.

Adapun lingkup makalah yang diharapkan untuk dipublikasikan dari hasil konferensi ini meliputi:

Engineering and Technology Innovation

- Innovation in Industry 4.0
- Computer software and applications
- Artificial Intelligence
- Computing
- Data Mining
- Data Warehouse
- Computer Networking
- Wireless and Mobile Technologies
- Digital Image Processing
- Engineering
- Information Technology & Design
- Food Technology
- Manufacturing
- Mining
- Nanotechnology and Smart Devices
- Renewable Energy
- Robotics
- Internet of Things
- Multimedia Technology
- Systems Engineering
- Transportation Technologies

Engineering Education

- Basic Science in Engineering Education
- Engineering Education Reforms
- New Technologies in Education
- Industry and Education: A Continous Collaboration
- Research and Development in Engineering Education
- Globalisation in Engineering Education
- Computers, Internet, Multimedia in Engineering Education
- Mechanical Engineering Education
- Electric and Electronic Engineering Education
- Informatics Engineering Education

Vocational Education and Training

- Industry-Driven Training Programmes and Collaborations
- Government and Policy
- Training Centre Programmes: Meeting Future Labour Market Needs
- Developing Entrepreneurship in TVET
- Delivering TVET through e-Learning
- TVET Innovation in Human Resource Development
- Bridging Competency Gap of TVET Educators and Trainers
- Work-based Learning in International Context-Sharing Experience

Innovation in Teaching and Learning

- Pedagogy Enhancement with e-Learning
- Blended Learning
- Collaborative Learning
- Game-based Learning
- Groupware-based learning
- Immersive Learning
- Multimedia-based Learning
- Project-based Learning
- Simulation-based Learning
- Synchronous and Asynchronous Learning
- Video-based Learning
- Performance Assessment

TANGGAL PENTING, TEMPAT PELAKSANAAN & PEMBIAYAAN

- October 14th 2019
  Abstract Submission Deadline
- October 16th, 2019
  Abstract Acceptance
- October 18th, 2019
  Early Bird Payment Deadline

- October 25th, 2019
  Payment Deadline
- November 1st, 2019
  Presentation Dates
- November 22nd 15th, 2019
  Full Paper Submission Deadline
- December 6th, 2019
  Full Paper Acceptance and Revision
- December 20th, 2019
  Revised Full Paper Deadline
- December 27th, 2019
  Paper Send for Publication

Konferensi internasional ini diselenggarakan di **Hotel Banyualit, Jl. Laviana, Kali Buk-buk, Lovina, Anturan, Kec. Buleleng, Kabupaten Buleleng, Bali 81110**.

Rincian biaya keikutsertaan konferensi ini adalah sebagai berikut:

Participant	Regular	Early Bird
Author (General)	1.750.000	1.500.000
Author Grad/Postgrad. Student (S2, S3)	1.500.000	1.250.000
Author Under-Grad. Student (S1)	1.250.000	1.000.000
Additional Paper	750.000	500.000
Participant	1.000.000	750.000

Untuk kepentingan publikasi, tambahan biaya dikenakan kepada masing-masing penulis makalah sebesar Rp. 1.200.000.

Konferensi ini menargetkan publikasi ilmiah bagi makalah yang telah dipresentasikan pada publikasi yang terindeks Scopus yang diterbitkan oleh IOP Science.

Susan acara kegiatan konferensi ini adalah sebagai berikut:

Time (WITA)	Event/Activites
07.00 - 09.00	Preparation & Registration
09.00 - 09.15	Coffee Break
09.15 - 09.45	Opening Ceremony: a. Welcome Dance b. Indonesian Anthem c. Praying d. Chairman of The Committee's Report e. Opening Remark from Dean of FTK Undiksha
09.45 – 12.00	Keynote Speech (Panel) :

	a. Keynote Speaker 1 (Dr. Sophea Prum)
	b. Keynote Speaker 2 (Kadek Yota Ernanda Aryanto, PhD)
12.00 - 13.00	Lunch
13.00 - 16.10	Parallel Session

TUJUAN DAN MANFAAT

Tujuan konferensi ini adalah:

1. Mendapatkan informasi terkini mengenai hasil studi, hasil penelitian, pengembangan, pemikiran dan penelaahan terutama dibidang vokasi dan teknologi.
2. Mendapat gambaran, masukan dan evaluasi dari instansi pemerintah, swasta, professional, dosen, guru, alumni dan mahasiswa mengenai inovasi pada bidang vokasional dan teknologi dalam membangun SDM yang kompeten dan kompetitifyang dilengkapi dengan keterampilan berwirausaha untuk menghadapi era Revolusi Industri 4.0.
3. Mengembangkan relasi dan sinergi antara instansi pemerintah, swasta, perguruan tinggi, professional, dosen, guru, alumni, mahasiswa dan umum dalam membangun SDM.

Manfaat konferensi ini adalah:

1. Bagi Peneliti/Dosen
   Konferensi ini sangat besar manfaatnya khususnya kepada dosen, praktisi maupun peneliti secara umum baik dari instansi swasta maupun negeri. Dengan mengikuti konferensi ini, pemakalah dapat mengikuti pemaparan pakar terkait tema yang diusung setiap tahunnya khususnya pada tahun ini terkait dengan harmonisasi TVET di dalam *Industry 4.0* dan *Society 5.0*. Peserta khususnya pemakalah juga dapat memaparkan hasil-hasil penelitian dan pemikirannya serta ikut berpartisipasi dalam forum ilmiah untuk saling bertukar pikiran, informasi dan ide-ide baru terkait perkembangan teknologi khususnya di bidang pendidikan vokasi. Selain itu, peserta pemakalah juga dapat memanfaatkan kesempatan untuk membangun *network* dengan peneliti dari berbagai universitas baik negeri maupun swasta serta dari mancanegara. Konferensi ini juga memfasilitasi pemakalah untuk mempublikasikan artikelnya pada *proceeding* terindeks Scopus yang merupakan jembatan bagi pemakalah untuk selanjutnya mempublikasikan karya-karyanya di jurnal internasional bereputasi.
2. Bagi Mahasiswa S2/S3
   Konferensi ini memberikan ruang kepada para mahasiswa yang terlibat baik sebagai peserta maupun pemakalah untuk menghasilkan thesis dan disertasi yang berkualitas dan berpeluang untuk dapat dipublikasikan secara internasional
3. Bagi Lembaga
   Sebagai penyelenggara, nama fakultas Teknik dan Kejuruan secara khusus dan Undiksha secara umum akan semakin dikenal oleh kalangan akademisi khususnya baik di dalam maupun di luar negeri.
4. Bagi Dinas Pariwisata

Penyelenggaraan konferensi yang dilaksanakan di Bali yang pada tahun ini secara khusus diselenggarakan di kota Singaraja akan semakin menunjang promosi daerah wisata di Bali dan di Buleleng secara khusus ke kalangan luar dan internasional.

SUSUNAN KEPANITIAAN

Steering Committees

- Prof. Dr. I Nyoman Jampel, M.Pd. (Rector of Universitas Pendidikan Ganesha)
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Organizing Committees

Chair:

- I Made Putrama, S.T., M.Tech.(Universitas Pendidikan Ganesha)
- Gede Aditra Pradnyana, S.Kom., M.Kom.(Conference Co-chair) (Universitas Pendidikan Ganesha)

Members

- Ketut Udy Ariawan, S.T., M.T. (Secretary) (Universitas Pendidikan Ganesha)
- I Ketut Resika Arthana, S.T., M.Kom. (IT) (Universitas Pendidikan Ganesha)
- I Gede Partha Sindu, S.Pd., M.Pd. (Publication) (Universitas Pendidikan Ganesha)
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Chair:

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Co-Chair:

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- Professor Harry Avelling (La Trobe University)

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- Dr. Michele Petrucci (Indiana University of Pennsylvania)
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- Prof. Susan K. Martin (La Trobe University)
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- Prof. Susan Palmisano (Indiana University of Pennsylvania)
- Dr. Claire Knowles (La Trobe University)
- Dr. I Ketut Eddy Purnama (Institut Teknologi Sepuluh Nopember)
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- Dr. Gede Rasben Dantes (Universitas Pendidikan Ganesha)
- Dr. Meyliana (Universitas Bina Nusantara)
- Harry Budi Santoso, S.Kom., Ph.D. (Universitas Indonesia)
- Prof. Dr. Anak Agung Istri Ngurah Marhaeni (Universitas Pendidikan Ganesha)
- Prof. Dr. Ni Nyoman Padmadewi (Universitas Pendidikan Ganesha)
- Dr. Ni Komang Arie Suwastini (Universitas Pendidikan Ganesha)
- Dr. I Nyoman Jampel (Universitas Pendidikan Ganesha)
- Prof. Dr. Ida Bagus Putu Arnyana (Universitas Pendidikan Ganesha)
- Prof. Dr. I Wayan Lasmawan (Universitas Pendidikan Ganesha)
- Drs. I Wayan Suarnajaya (Universitas Pendidikan Ganesha)
- Prof. Dr. I Made Candiasa (Universitas Pendidikan Ganesha)
- Prof. Dr. Putu Budi Adnyana (Universitas Pendidikan Ganesha)
- Prof. Dr. I Wayan Santyasa (Universitas Pendidikan Ganesha)
- Prof. Drs. Sariyasa, Ph.D. (Universitas Pendidikan Ganesha)
- Dr. Ketut Agustini (Universitas Pendidikan Ganesha)
- Dr. Lukman (Lembaga Ilmu Pengetahuan Indonesia)
- Dr. Elly Matul Imah (Universitas Negeri Surabaya)

MEKANISME PELAKSANAAN

A. Peserta

Peserta konferensi ini berasal dari kalangan mahasiswa S2/S3, dosen dari berbagai universitas di Indonesia, serta pemakalah dari mancanegara seperti: Jepang, Nigeria, Malaysia, Australia dan Indonesia. Adapun total abstrak yang masuk berjumlah 89. Dari jumlah abstrak tersebut, pemakalah yang akhirnya melakukan pengunggahan versi *Full Paper* berjumlah 70 denga rincian 1 makalah dengan afiliasi dari Malaysia dan Nigeria, 1 makalah dengan afiliasi dari Australia, 1 makalah dengan afiliasi dari Jepang, dan sisanya dari berbagai instansi dan universitas di Indonesia. Jumlah keseluruhan ini merupakan total makalah yang diikutsertakan di dalam konferensi. Informasi makalah yang diikutsertakan dapat dilihat pada lampiran.

B. *Keynote Speaker*

Pada konferensi ini, *keynote speaker* yang diundang ada dua pakar:

1. Dr. Sophea Prum (A.I. Specialist, School of Computing & IT, Faculty of Innovation & Technology, Taylor's University, Malaysia)

2. Kadek Yota Ernanda Aryanto, PhD (Medical Informatics & IoT, Computer Science Department, Universitas Pendidikan Ganesha, Indonesia)

C. Luaran Publikasi

Makalah versi *Full paper* dari abstrak yang telah dipresentasikan di dalam konferensi selanjutnya diproses untuk dipublikasikan pada publikasi internasional terindeks Scopus yang diterbitkan oleh IOP Science. Berdasarkan *agreement* yang disetujui dengan pihak IOP Science, pemakalah dikenakan biaya sebesar Rp. 1.200.000. IOP Science menekankan proses *review, editing* dan *proof-reading* yang ketat sehingga biaya yang dibayarkan tidak akan dikembalikan jika akhirnya sebuah makalah tidak dapat dipublikasikan karena tidak mengikuti pedoman yang diwajibkan oleh IOP Science.

D. Sponsor

Dalam proses persiapannya, panitia melibatkan beberapa pihak untuk berkonstribusi mendukung penyelenggaraan konferensi ini, diantaranya:

- PDAM Buleleng
- Yeh Buleleng
- PT. Nara Jaya Dewi Sakti
- Matahari Bali Kebaya
- Biznet
- Kopi Banyuatis
- RRI Singaraja

PELAKSANAAN

Pelaksanaan kegiatan konferensi ini berjalan sesuai jadwal yakni pada Jumat, 1 Nopember 2019 bertempat di Hotel Banyualit, Lovina, Singaraja, Bali. Kegiatan diawali dengan penyambutan *Keynote Speaker,* Dr. Sophea Prum yang merupakan pembicara dari Malaysia. Dr. Sophea dijemput di bandara Ngurah Rai Denpasar sehari sebelumnya dan diantar ke tempat penginapan di Hotel Banyualit. Di saat kegiatan berlangsung, acara dibuka oleh Dekan Fakultas Teknik dan Kejuruan yang dalam hal ini mewakili Rektor Universitas Pendidikan Ganesha, karena rektor tidak dapat menghadiri acara pada saat itu. Adapun beberapa undangan yang hadir diantaranya dari perwakilan masing-masing sponsor dan juga dari dekanat di lungkungan Universitas Pendidikan Ganesha. Setelah acara pembukaan dan paparan dari Keynote Speaker 1 dan 2, acara dilanjutkan dengan diskusi ilmiah berupa forum *parallel session* yang dibagi menjadi 5 ruangan. Makalah yang dipresentasikan di masing-masing ruangan dapat dilihat pada lampiran. Acara kemudian ditutup dengan rangkaian foto bersama di akhir kegiatan.

REALISASI PENDANAAN

No	Uraian	Pemasukan	Pengeluaran
1	Dana Fakultas	30,000,000.00	
	Biaya Pendaftaran	67,950,000.00	
2	Banyualit, Belanja penyediaan barang dan jasa BLU lainnya berupa biaya sewa meeting room dalam rangka Internasional Conference on Vocational, Education and Technology dengan tema "Harmonization of TVET and Industrial Revolution 4.0 towards Society 5.0" Fakultas Teknik dan Kejuruan Universitas Pendidikan Ganesha yang dilaksanakan pada tanggal 1-2 November 2019		14,500,000.00
3	Banyualit, Belanja barang berupa pembelian konsumsi dalam rangka Internasional Conference on Vocational, Education and Technology dengan tema "Harmonization of TVET and Industrial Revolution 4.0 towards Society 5.0" Fakultas Teknik dan Kejuruan Universitas Pendidikan Ganesha yang dilaksanakan pada tanggal 1-2 November 2019		27,750,000.00
4	Sinar Giri, Belanja barang berupa biaya cetak dalam rangka Internasional Conference on Vocational, Education and Technology dengan tema "Harmonization of TVET and Industrial Revolution 4.0 towards Society 5.0" Fakultas Teknik dan Kejuruan Universitas Pendidikan Ganesha yang dilaksanakan pada tanggal 1-2 November 2019		6,000,000.00
5	Bismanik, Belanja barang berupa pembelian bahan habis ATK dan tas dalam rangka Internasional Conference on Vocational, Education and Technology dengan tema "Harmonization of TVET and Industrial Revolution 4.0 towards Society 5.0" Fakultas Teknik dan Kejuruan Universitas Pendidikan Ganesha yang dilaksanakan pada tanggal 1-2 November 2019		15,624,000.00
6	Perjalanan Panitia		8,280,000.00
7	Dr. Sophea Prum, dkk, Pembayaran honorarium Narasumber Dalam Rangka Kegiatan Internasional Conference on Vocational, Education and Technology dengan tema "Harmonization of TVET and Industrial Revolution 4.0 towards Society 5.0" Fakultas Teknik dan Kejuruan Universitas Pendidikan Ganesha Tahun 2019		8,000,000.00
8	Dr. Sophea Prum, Biaya perjalanan dinas dari Malaysia ke Singaraja dalam rangka menjadi narasumber Iconvet dengan Tema "Harmonization on TVET andIndustrial Revolution 4.0 towards Society 5.0" pada tanggal 31 oktober - 2 Nopember 2019 sesuai dengan SPD Nomor 193/UN48.11/KU/2019 tanggal 30 Oktober 2019		6,988,000.00
9	Konsumsi H-1		3,775,000.00

No	Uraian	Pemasukan	Pengeluaran
10	Sewa Hotel untuk Sekretariat		1,000,000.00
11	Honor Gita Pati, MC Fotocgrafer dan Penari		3,500,000.00
12	Spanduk		750,000.00
13	Konsumsi Narasumber		1,333,000.00
14	Sarapan untuk mahasiswa		450,000.00
	Jumlah	**97,950,000.00**	**97,950,000.00**

PUBLIKASI

Kegiatan dilanjutkan pasca konferensi untuk memproses artikel-artikel yang siap untuk dipublikasikan. Sayangnya, dari 70 abstrak yang dipresentasikan hanya 55 artikel versi *Full Paper* yang masuk ke panitia. Semua artikel versi *Full Paper* ini selanjutnya melalui tahapan *review, editing* dan *proof-reading* yang dilakukan oleh panitia internal dan selanjutnya akan diproses dan dikirimkan ke IOP Science untuk proses publikasi.

PENUTUP

Kegiatan konferensi IConVET yang ke-2 ini telah berjalan dengan baik dan lancar sesuai dengan jadwal yang direncanakan, walaupun ada beberapa perubahan-perubahan jadwal di awal persiapan harus dilakukan karena pengajuan publikasi ke IOP Science sempat mengalami beberapa hambatan. Dengan terselenggaranya kegiatan ini, FTK Undiksha telah mampu menunjukkan komitmen nya untuk turut serta mensukseskan program lembaga yang mengusung tema *Internationalization at Home* yang menjadi target Rencana Strategis lembaga di tahun 2019-2024.

FOTO KEGIATAN

IConVET

International Conference on
Vocational Education & Technology

IConVET 2019 - The 2nd International Conference
on Vocational Education and Technology

"Harmonization of TVET and Industrial
Revolution 4.0 towards Society 5.0"

APTIKOM

ADGVI

CONFERENCE
BOOK

Organizer:

**Faculty of Engineering and
Vocational**

**Universitas Pendidikan
Ganesha**

**Hotel Banyualit, Singaraja, Bali
November 1st, 2019**

THE CHAIR'S SPEECH

THE 2nd INTERNATIONAL CONFERENCE
ON VOCATIONAL AND TECHNOLOGY
Singaraja – Bali, November 1st 2019

Om Swastiastu,
First of all, allow me to praise Ida Sang Hyang Widhi Wasa, the Lord Almighty, for all His graces bestowing on us the opportunity to be able to assemble here in Kuta, one of the landmarks of the Island of a Thousand Temples - Bali. As the chair of the committee, I feel honored and delighted to welcome you all in the 2nd International Conference on Vocational and Technology which has a theme: "Harmonization of TVET and Industrial Revolution 4.0 towards Society 5.0". Also, welcome to Bali.
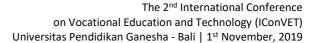
Ladies and Gentlemen,
This 2nd International Conference on Vocational and Technology is attended by participants who represent four different countries, namely Indonesia, Malaysia, Nigeria, Japan, and Australia. We received 89 submission of abstracts and through a quite tough review process, the conference finally accepted 70 abstracts for presentation. Therefore, on behalf of the committee and the Research Institute of Universitas Pendidikan Ganesha, let us extend our greatest appreciation to all of you who have supported us and contributed your manuscripts to our conference, as well as to the panel of reviewers who have helped us in the selection process.

Ladies and Gentlemen,
Next, let us proudly announce it to you that this 2nd year conference will present two esteemed keynote speakers. The first one is the honorable Dr. Sophea PRUM, an A.I. Specialist, School of Computing & IT, Faculty of Innovation & Technology, Taylor's University, Malaysia. The second one is the honorable Kadek Yota Ernanda Aryanto, PhD, a Medical Informatics & IoT, Computer Science Department, Universitas Pendidikan Ganesha, Indonesia. On this blessed occasion, let us express our heart-felt thanks and appreciation for all of our keynote speakers and panelists.

Ladies and Gentlemen,
This conference would not be possible if there were no encouragement and support with its various forms from many parties. Therefore, let us acknowledge, first, the

Ministry of Research, Technology, and Higher Education for the supports that have been given to our University through its research funding so that our researchers could conduct their research. Second, the Rector of Universitas Pendidikan Ganesha for his endless commitment, financial support which mostly derived from funds Budget Implementation List (DIPA) Undiksha, and encouragement to the organizing committee so that we can make this event a reality. The local government of Bali and Buleleng Regency for their commitment to maintain sustainable cooperation with Universitas Pendidikan Ganesha in conducting joint research pertinent to local societal issues. And last but not least, the Research Institute of Universitas Pendidikan Ganesha and all the organizing committee members for the hard work and never -ending cooperation to make this event come true.

Finally, in the name of the organizing committee, we thank you for participating in our 2nd International Conference on Vocational and Technology.

Have a nice and fruitful conference. God bless you.

Om Shanti, Shanti, Shanti, Om.

Singaraja, November 1st 2019
Chair,

I Made Putrama, S.T., M.Tech.

WELCOME NOTE

THE 2nd INTERNATIONAL CONFERENCE
ON VOCATIONAL AND TECHNOLOGY
Singaraja – Bali, November 1st 2019

Om Swastiastu,
Assalamualaikum Warahmatullahi Wabarakatuh,
Namo Buddhaya,
Shalom.
May peace be with all of us.

Praised be the Almighty God, Hyang Parama Wisesa, for only with his blessings we can gather today here in the beautiful island of Bali for having this 2nd International Conference on Vocational Education and Technology, hosted by the Faculty of Engineering and Vocational, Universitas Pendidikan Ganesha. Let me also extend my warmest welcome to the Keynote Speakers for this 2nd International Conference on Vocational and Technology, it is a great pleasure to having esteemed scholars like you to speak in our conferences.

Ladies and Gentlemen,

It is an honor for me to stand here and welcome you today as we seek to embrace scholars, researches, and practitioners in technology and vocational education into an academic discussion that is expected to bring forward the advances in technology and its application in vocational schools to help our nation facing Industry 4.0.

I congratulate the committee for choosing a very state of the art theme and for organizing this event from its most initial preparation, until today, and also all the post-conference activities in order to get the articles published by esteemed publisher, through which our discussions today can create ripple effects that reach the intended audience across the world.

Valued Scholars,

Allow me to extend my congratulations for all participants and presenters in this 2nd International Conference on Vocational and Technology, for taking the forerunner positions in Industrial Revolution 4.0. Thank you for your contributions for this conference and for the development of education, technology and vocational education.

And last but not least, I wish you a very productive conference and God Bless you.

Singaraja, November 1st 2019
Rector of Universitas Pendidikan Ganesha,

Prof. Dr. I Nyoman Jampel, M.Pd.
NIP. 19591010986031003

Rundown Activities

THE 2nd INTERNATIONAL CONFERENCE
ON VOCATIONAL AND TECHNOLOGY
Singaraja – Bali, November 1st 2019

Time (WITA)	Event/Activites
07.00 - 09.00	Preparation & Registration
09.00 - 09.15	Coffee Break
09.15 - 09.45	Opening Ceremony: a. Welcome Dance b. Indonesian Anthem c. Praying d. Chairman of The Committee's Report e. Opening Remark from Dean of FTK Undiksha
09.45 – 12.00	Keynote Speech (Panel) : a. Keynote Speaker 1 (Dr. Sophea Prum) b. Keynote Speaker 2 (Kadek Yota Ernanda Aryanto, PhD)
12.00 - 13.00	Lunch
13.00 - 16.10	Parallel Session

Parallel Session Schedule

THE 2ⁿᵈ INTERNATIONAL CONFERENCE
ON VOCATIONAL AND TECHNOLOGY
Singaraja – Bali, November 1ˢᵗ 2019

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Time Keeper	**I Made Dendi Maysanjaya, S.Pd., M.Eng.**
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AI and Preparedness for The Fourth Industrial Revolution (IR 4.0)

As the Fourth Industrial Revolution (IR.4.0) reshapes the future of work and businesses, we must prepare our people for the new world that lies ahead. The preparation for the IR.4.0 must involve all the related sectors, including educational organizations since they play a very important role in human resource development.

Although we talk about the nine pillars of Industry 4.0 which include Internet of Things, Cloud Computing, Autonomous system, etc., AI is the real brain behind the IR. 4.0. AI plays a big part in the IR.4.0. It has been integrated into our daily life usage, business applications, as well as a nationwide security enhancement.

In this session, Dr. Sophea Prum, Program Director at Taylor's University in Malaysia, will present a pathway to become an AI expert. She will share her perspective on different levels of AI knowledge and how can an educational organization integrate AI in their program at different levels of knowledge.

Bio Data

Dr. Sophea Prum is a specialist in AI. Her research focuses on image/video processing, document image processing, handwriting recognition, object detection/recognition/tracking, machine learning and deep learning. She was a research engineer at Mimos (National R&D center of ICT) in Malaysia from August 2015 to June 2018. She used to work researcher and assistant lecturer at Laboratory of Information, Image and Interaction (L3i), University of La Rochelle (France) from 2012 to 2015. She received her engineering degree in computer science from Institute of Technology of Cambodia (ITC) in 2008. She received her Master and PhD degrees respectively in 2009 and 2013 from University of La Rochelle.

Keynote 2: Kadek Yota Ernanda Aryanto, PhD

Opportunities and Challenges towards IR 4.0 and Society 5.0: Are we ready yet?

The fast development of internetworking technology has brought big changes to human life. Various other technologies have also evolved along the development of the networking technology. The developments are not only on the side of infrastructure and technical operation but also related to the contents. It shifted from the text-based contents to the utilisation of the rich contents and digital streaming. Furthermore, the behaviour of the system has also changed. The advanced utilisation of the artificial intelligence (AI) has reduced human intervention since devices or systems can communicate among them and make decision by themselves. In this case, data become a very important part in order to provide the appropriate decision making and technology such as the Internet of Things (IoT) will be, or even already have been, the technology that plays an important role in such process.

In the world of education, especially in vocational education and training (VET), must be able to take advantage of the excellences offered by the technologies that are exist today. Along with the maturity of the internetworking technology, the teaching and learning method can be enriched with the presence of the virtual classes in the form of real-time streaming teaching process or the learning media/tools. Innovation of the methods or processes of teaching and learning will shift in order to tackle the limitation of space and time that are exist in the conventional class. Therefore, the output and outcome will be ready to answer the demands of the fourth industrial revolution (IR 4.0) nowadays.

The development of networking technology has put the integration and interoperability of the utilised systems. The trends of centralised system have also shifted to a more distributed systems with edges processing are more preferable. Many considerations that underlie the processing to be done within the edge. By processing in the edge, the costs that are needed by the central systems can be

reduce, economically or in sense of the usage of resources and time. The empowerment of edges is also possible because of the current development of devices which can handle the complicated yet sophisticated tasks. The standards and methods of the data communication become one of the important parts related to such processes.

Furthermore, there are many developments or shifts from the side of the human as users as well. With the help of the technology itself, people are not merely focused on the physical performance of the system or devices but also change to the accomplishment of tasks that emphasizing on the utilisation of the human intelligence. In the concept of Society 5.0, the enrichment of life values are done by continuously generating new values and services in order to improve the quality of life. Three actors; human, objects, and systems; will interact in the physical or cyber world. And again, data are the most essential matter in the concept of the society so that the focus of the improvements of data acquisition, processing, analysis or utilisation become a crucial factor.

The development of technology, of course, not only gives the advantages to human life, but also provided several problems and challenges to be solved. The matter of data/information security and privacy are among of those problems. The big challenges for researchers in order to tackle the problems are not only came from the technical issues but also by human factor. Humans are considerably easy to manipulate. Human error has been recognised as the main concern related to the data breach, especially when the awareness of the personal data security is not yet high.

Development of a New Ergonomics-Based Technology Education Curriculum for Nigerian Universities: Needs Analysis

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In this study, a needs analysis was conducted to identify the ergonomics awareness among technology education lecturers in Nigerian universities. In addition, the study was also designed to determine the gap in the existing technology curriculum with regard to ergonomic integration across the technology programs in Nigerian universities. Also to determine the perception of lecturers toward the introduction of ergonomics-based technology education. Participants were 119 lecturers' of technology education from selected Nigerian universities. Data were collected using questionnaires and interview protocol. Descriptive statistics such as frequency, percentage, means and standard deviation were used to describe the empirical data. The main result indicates a low level of ergonomics awareness among technology lecturers in Nigerian universities. Also, with regards to the need of a new curriculum of ergonomics-based technology education, the study reveals that most respondents concur that a curriculum is needed. In fact, the majority of the lecturers perceived the incorporation of ergonomics-based technology education into technology education of the Nigerian universities as a milestone.

Keywords: Curriculum development, ergonomics, needs analysis, technology education

Classification of Official Letters Using TF-IDF Method

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In this study, were developed application of official letter management in Sukasada 1 Public High School. Application development aims to contribute to government programs in improving public services, especially in correspondence. In the letter classification process, the researcher implemented the TF-IDF method whose working procedures included conversion, Optical Character Recognition (OCR), filtering, tokenizing and classification. Conversion is to convert official mail to digital form (jpg). OCR to get the text of the letter then carries out the official letter in the form of an image and then filtering and tokenizing are carried out. Classification is the process of grouping a letter into its category by calculating the cosine similarity value between the letter being tested and the letter in the system. To test the accuracy of the classification results, a confusion matrix is used. The results of the study are in the form of web-based and mobile-based applications. Operators and admins use the web application to manage official letters at SMAN 1 Sukasada. The mobile application serves to facilitate the principal in accessing mail data from a smartphone. The system is able to group letters with 78% accuracy (good), precision 77% and recall 77%.

Key words: official letter classification, tf-idf method, official letter application

Designing Database Lecture Model in Informatics Engineering Study Program

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Database lectures in the informatics engineering study program teach the life cycle of database system development, both in terms of concepts, utilization, administration to database application systems to be studied, practiced and understood by students. Database teaching in the informatics engineering department of a private university with very diverse student participants, the ability to master computer and information technology and skills requires teaching material, lecturing strategies, lecturer quality and facilities must also be able to adjust toward challenges, concept development and database technology. This database design research model uses Hevner's information systems research framework, starting with reference research, database lecture analysis, rigor and research relevance. This research will cover the steps of constructing artifacts in the form of constructs, models, methods, instantiation and evaluation of artifacts. The use of the framework is intended to support business strategies and processes in study programs and ensure the relevance of research. The benefits of this research will produce a database lecture model that can be used as a reference and lecture development in the informatics engineering study program. Reference to produce graduates with understanding and skills in database design, the use of Database Management System (DBMS), the ability in administration and professions capability in the database field. This research will relevant to the study program environment as well as scientific benefits in research and database teaching.

Keywords: database lecture, informatics engineering, information systems research framework

Need Analysis for Developing Applied Mathematics Teaching Materials Based on Blended Learning to Improve Communication and Problem Solving Abilities by the Students of State Polytechnic of Bali

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The purpose of this study are to: 1) describe the need for developing instructional materials in the form of textbooks and student activity sheets (SAS) based on blended learning, and 2) get draft textbooks and SAS, applied mathematics based on blended learning. The development used the 4-D model Thiagarajan and Semmel with several modifications, namely: 1) Define, 2) Design, 3) Develop and 4) Disseminate. At present, the developmen is in stages 1 and 2 and part of stage 3. The implementation was carried out in the engineering field of the State Polytechnic of Bali. The data were collected using survey methods, documents and questionnaires and analyzed using descriptive statistics. The results of the analysis found 13 mathematics learning achievements and 51 sub-achievements. The draft of applied mathematics textbooks based on blended learning approaches problem solving, the material was developed in reference to learning achievements, subject learning outcomes, and mathematics learning sub-achievements. The main material includes 4 fields, namely: 1) algebra; 2) geometry; 3) trigonometry; and 4) calculus. The material order, arranged with a hierarchical approach. The four materials were packaged into 2 SAS and textbooks. The learning approach used problem based learning models. The teaching material was integrated in the LMS Schoology model. The results of the validator of the draft teaching materials showed that the mathematics teaching materials based on blended learning by making small revisions were appropriate to be used as applied mathematics teaching materials based on blended learning.

Keywords: Blended Learning, Teaching Materials, Problem solving, Scholoogy, Applied Mathematics

Re-Skilling Vocational Education and Training practitioners in Indonesia

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Globalization, together with the escalating levels of internationalization of education, is placing emerging and unfamiliar pressures on the Indonesia vocational education and training system. Increasingly, Indonesia, like many other ASEAN nations, is being challenged by the requirements for employee mobility and currently, their educational institutions do not have the ability to provide the human resource development frameworks to provide a modern skilled and efficient workforce. Central to this re-skilling of the vocational education and training sector, are programs that: address the human resource capability development of the educator workforce; build viable and sustainable links to industry in order to provide seamless workforce needs; explore and examine models for successful industry development; and the nurturing of mutually beneficial 'strategic partnerships' both locally and internationally. Recognizing this need to meet these urgent demands for a modern skilled and trained workforce, the Indonesian government has focused on the introduction of upskilling technical and vocational education through a 'Revitalization Program for Vocational Higher Education Institutions'. This program is designed to improve the relevance, engagement and understanding between vocational higher vocational education institutions with business and industry, often calling on international educational support. In this paper, we examine the implications of importing 'external knowhow' into the Indonesian vocational education and training sector, placing particular focus on culturally appropriate training models, the growing reliance on 'external' models of engagement, and the implications for appropriate and sustainable vocational training models.

Keywords: Human Resource Development, Human Capability Development, Industry Engagement, External educational support, Vocational Education and Training, Cultural impact

Consideration of Issues and Countermeasures to Acquire Core Human Resources through Vocational Education to Improve Local Information Security in Japan

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In Japan, there are many reports on the need for information security personnel. Among them, the Ministry of Internal Affairs and Communications' "Cybersecurity Human Resource Development Committee First Summary" issued in June 2019 said indispensable to realize Society5.0 in order to resolve regional issues. It said that it will become increasingly important to acquire core human resources for cyber security of the region. This is a common issue in many countries. On the other hand, there seems to be a similar situation in other countries, but vocational education for re-employment is important for Japanese Self-defense officers to retire at a young age. In this paper, I will show an example of vocational education for re-employment of Self-defense officers as the Regional Disaster Prevention Manager for local governments. In addition, I will provide the situation where vocational education for veterans is utilized as information security personnel in private companies in the United States. On the other hand, there are very few re-employed Self-defense officers in the field of information security. Based on the above situation, I propose measures to utilize retired Self-defense officers with information security skills as information security managers for local governments through vocational education. Implementing appropriate vocational education for re-employment of Self-defense officers in the information security field could be expected to be effective in reducing the shortage of human resources in this field in local governments and raising the level of cyber security in the region.

Keywords: Information security, Core human resources, Vocational education, Local governments

The Development of a Trusted Mechanism in Building a Web Service to Ensure the Quality of Data and Information in the Jambi University Data Borang Application by Using the ADDIE Model

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Developers or users of an application that utilizes various databases demand accurate data through a web service, and it is a challenge to provide a trusted web service. This study aims to develop a trusted mechanism in building the Jambi University web service by applying the ADDIE model. Data from the web service will be queried by the Data Borang Application. The trusted mechanisms produced in this study are: 1) Analysis of data and information requirements, 2) Web service design, 3) Development of web service which has procedures: query development, validation of queries by experts, validation of results from users through the application of Data Borang, 4) Implementation, and 5) Evaluation . In a restricted deployment it was revealed that the user strongly believes in the truth of the data / information displayed by the application of Data Borang.

Keywords: ADDIE model, web services, Trust mechanism

Content Validity Determination of the Tri Kaya Parisudha-based Countenance Model Evaluation Instruments Using Lawshe's CVR Formula

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The good Instruments that are used as measuring instruments in the evaluation process are valid instruments. An attempt that is made to obtain a valid instrument is to calculate the instrument content validity correctly use the right formula. One formula that can be used to test the content validity of the Countenance model evaluation instruments based on Tri Kaya Parisudha is Lawshe's CVR. Based on that statement, the main objective of this study was to explain how to use the Lawshe's CVR formula to determine the content validity of a Countenance model evaluation instruments based on the Tri Kaya Parisudha concept. Subjects that were involved in conducting the trial of the instruments were 20 panelists. The tool that was used to test the instrument was a questionnaire consisting of 130 questions. Analysis of the instruments was done by comparing the results of validation with Guilford standards so that that instrument classification could be determined. These study results indicate that the Countenance model evaluation instruments based on Tri Kaya Parisudha were at a very high level of validation with a content validity ratio were 0.88.

Keywords: Content Validity, Tri Kaya Parisudha, Countenance, Instruments, Lawshe's CVR

Encrypted Real-time Communication Web (WebRTC) using The Principle of Virtual DOM Rendering Cycles

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Website is a collection of formatted pages that display text, image, audio or video content to provide information. Various fields in industry, science, government, non-profit agencies use the website as a medium for presenting information to public or stakeholders. Generally, websites present data synchronously so that it requires an effort to request data until it is displayed on a web page. Industries in the investment, stock and even weather reports require to present information with real-time results. This study aims: (1) Create and design architecture Web Real-time Communication using Virtual DOM Rendering Cycles principles. (2) Present encrypted data to real-time decryption process to render into web page. This research is expected to provide the solution of real-time rendering data encrypted. Process rendering with virtual DOM manipulation. Data encrypted collection have real-time decryption process, it results can be render in less interval time of request, that whole process running on asynchronous process. For the testing in this research, have three (3) test process stages are performed: (1) White-box and (2) Black-box testing (3) Performance consistency testing.

Keywords: website, DOM, synchronous, asynchronous, encyrption, decryption, render, virtual dom

Publication of The Society's Sensitive Personal Data In The Legitimate Site of The General Election Committee

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It is highly important to protect the society's sensitive personal data. The reason is that many personal data are published by the government institution without paying attention to the prevailing regulations. In this current study the search for the data in the form of hyperlink with its contents in the legitimate site of the General Election Committees was conducted with the assistance of Crawling Web. The obtained contents were preprocessed using the Preprocessing Text, which were then weighted using the TF-IDF method before they were classified using the Naïve Bayes method. After that analysis on the types of the sensitive personal data which were published and the extent of the publication based on the area groups was conduected. Out of 6,700 instances of the personal data which were analyzed, 6.430 were published. The personal data which were published were full name, place and date of birth, religion, marital status, ID Number of the government civil servants, identity card number, number of the tax payer, account number, mobile number, e-mail, address, position, and face photo. The level of publication based on the total data found was as follows: 11,45% in the Central General Election Committee, 21,60% in the eastern area, 17.01% in the central area and 49.94% in the eastern area. The accuracy of the Naïve Bayes method averaged 96.99%. Prior to publication, the General Election Committee is recommended to respect someone's personal data as privacy and the data which would be published should obtain approval and an easily-contacted contact person.

Keywords: Sensitive Personal Data, Crawling Web, Data Mining, TF-IDF, Naïve Bayes

The Implementation of Flipped Learning in Classroom Management Course

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In Flipped learning, the sequence is inverted. The activity which is traditionally conducted in class is done at home, while the activity which is traditionally completed at home is done in class. In this study, a flipped learning was implemented in the classroom management course. A total of 30 prospective English teachers learned the material from e-book and articles, watched the video, and read their friends' powerpoint presentation online at home. In-class time was devoted to the presentation of the group in charge, question and answer session, discussion, role play, problem-solving, or project accomplishment. The participants of the study were given open-ended questions to gain insight into their perceptions of flipped learning. Besides, this qualitative research aims to introduce the implementation of flipped learning into an English language class. Finding shows that pre-service English teachers respond positively to flipped learning. They are more engaged in the learning process, have enthusiasm learning the content before attending the class, increase their cooperation and interaction with other students, have feedback from peers and the lecturer, and enjoy in-class activities. The implication to English language teaching is also discussed in this study.

Keywords: flipped learning, implementation, perception, classroom management

A State Machine Framework for a Spider Robot

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The aim of this research is to make a framework that can be used for the purpose of developing a spider robot. This framework contains template codes and library codes. The template will be a guide of a process in developing a spider robot. To build this framework, we used a state machine model. A state machine model is suitable to develop real-time systems in which robotic programming is one part of them. The behaviour of a state machine is performing a predetermined sequence of actions depending on a sequence of events with which it is presented. We used the Yakindu Tool to generate the template codes in which the codes are in Arduino platform. The specific libraries were made manually. These libraries are additional codes that can be used if needed. In implementing this framework, developers should write codes-codes in action areas of a state. Based on the real implementation of this framework on developing a spider robot, some benefits came as positive signs. It makes the codes of the spider robot easy to understand and makes easy to work in a team.

Keywords: framework, state machine, spider robot

Development of Hexapod Robot Wall Follower

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This study aims to develop a six-legged robot that is able to walk in an arena that resembles a maze (maze wall) and is able to follow a wall (wall follower). The research design consisted of 4 stages, including: mechanical design, electronic design, joint movement design at the robot's foot, and software design. In mechanical design, a six-legged robot framework (hexapod) is made, the basic material of robot mechanics is acrylic with a thickness of 3 mm and 5 mm. The electronic design section consists of a power supply and regulator, Ping Parallax sensor, Arduino system mini board, and servo motor. In designing the movement of the joints on the robot's legs the tripod gait method is used. In designing software developed a robot navigation system in tracing the wall, which is implementing a PID controller. The final result of this research is a six-legged robot design (hexapod) with robot dimensions of 30 cm x 30 cm x 25 cm (length x width x height). From several tests, the robot's success rate in completing the mission is 100%, with an average time of 90.3 seconds and the fastest time to complete the mission reaches 87 seconds (1 minute 27 seconds).

Keywords: hexapod robot, tripod gait, arduino mega, servo motor, PID

The Evaluation of Governance of Regional Financial Management Information Systems within the COBIT 5 framework of the Goverment of Denpasar City

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Denpasar City Government is one of the government agencies that has implemented the Regional Financial Management Information System (SIPKD). SIPKD is an integrated application that is used as a tool for regional governments that is used to improve the effectiveness of the implementation of various regulations in the field of regional financial management based on the principles of efficiency, economic, effective, transparent, accountable and auditable. Research Evaluation of SIPKD governance in Denpasar City Government conducted based on the framework of the COBIT 5 (Control Objective for Information & Related Technology) framework of ISACA 2012, which was modified according to the conditions at the study site. The research method used was descriptive-quantitative evaluation and COBIT 5 Method, by distributing questionnaires to each admin for 40 respondents, to get scores in the form of numbers and conducting structured interviews with BPKAD leader to obtain the expected capability level conditions. Evaluation of SIPKD governance with COBIT 5 used PAM (Process Assessment Model) analysis as a reference in determining its attributes, with the results of the current capability level which is at the level 3 established process in the APO01 process of 77% achieved, APO012 of 78% achieved, DSS04 by 77% mostly achieved, EDM03 by 78% largely achieved, and MEA03 by 77% largely achieved, which means that Denpasar City Government has been well established in managing SIPKD conducted by all SIPKD administrators and operators along with BPKAD leader in Denpasar.

Keywords: SIPKD, COBIT 5, PAM, Cascading, ISACA 2012, Evaluasi tata kelola TI

Forecasting System Using Single Exponential Smoothing with Golden Section Optimization

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The limited liability company of Puri Wira Mahkota is the type of manufacturing company in the automotive parts industry. Puri Wira Mahkota has obstacles in the preparing weekly order on stock to the primary production unit. They predicting total sales of goods in the coming period using expectation of the stock administration then compared with sales data in the previous period without any calculations using a definitive formula. Forecasting system could support Puri Wira Mahkota to predicting stock. The purpose of this research is to be able to build a forecasting system that can predict how many items should be produced by the primary production unit every month and also to prevent over stock and out of stock. The method used in the forecasting system is Single Exponential Smoothing. To optimize Single Exponential Smoothing we used the Golden Section. The principle of the Golden Section is to reduce the alpha area boundary so as to produce the ideal forecasting value with the minimum MAPE (Mean Absolute Percentage Error). This research shows the results that the Golden Section found the optimal forecasting value with a MAPE (Mean Absolute Percentage Error) rate of 47,50%.

Keywords: forecasting system; single exponential smoothing; golden section

Development of Mobile Based Health Center Information System with Feature-Oriented Software Development (Case Study Of North Kuta Health Center)

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The health center is a district/city official technical unit that responsible for handling health development. At North Kuta Health Center the medical record has been managed using a web-based application information system. Most of the patients access the system via smartphone, while the system interface is not optimal if accessed via smartphone. Such as the buttons on the system are covered by other interface elements and image sizes that exceed the smartphone screen. For this reason, a mobile-based information system was developed from the existing health center system. When developing the system, a Feature-Oriented Software Development (FOSD) method is applied. The FOSD method has the stages of domain analysis, domain design and specifications, domain implementation, product configuration, and generation. The first step to do is domain analysis, from this stage produces a needs analysis. At the domain design and specification stage, requirements analysis is processed into system design. The system design is created into a system prototype at the domain implementation stage. At the product configuration and generation stages, the system prototype is tested with User Acceptance Test (UAT) and running time. Running time testing shows the average time needed by the prototype system to complete each process is 432 ms. The UAT test showed that the prototype system was running well under the health service business process at the North Kuta Health Center. The system prototype has also provided convenience in the operation of health services in the North Kuta Health Center.

Keywords: Feature-Oriented Software Development, Medical Records, Health Center

Making Kit and PLC Application with industrial applications for Practice Learning of PLC Technology in Electronics University of Nusa Putra Sukabumi

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The purpose of this research is to develop PLC technology lessons so that they are more easily practiced and so students can more easily master PLC Technology Studies, so that after graduation it is not difficult to find work, especially in the PLC field. The subjects of this research were students who studied PLC Technology were taken samples and then given a pretest and their grades were given training that was taken from the module, then after that they were given appropriate module lessons from the introduction of the Kit, PLC and HMI themselves, inputs and outputs, their functions and the application, then ladder diagram and finally the wiring and the application Methods for this research is research and development 1) Problem Analysis, 2) Data collection, 3) Product Design, 4) Design Validation, 5) Design Revision, 6) Product Testing, and 7) Analysis and Reporting. To determine the feasibility of the PLC trainer and jobsheet that has been made obtained from the validation results by 5 validator and student responses to determine student responses to the media The results of study are in the form of KIT and PLC applications for industry, video tutorials and modules and also outputs that are accredited and national journals, from the result show that student make progress from grade from mean 53 from pre test to mean 86 from the post test

Keywords: plc kit, hmi, omron, video, cx programmer

Content Validity of Quality Test Instrument the User Interface Design of THK-ANEKA-based Countenance Evaluation Application

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The quality of the user interface design greatly determines the success of the functionality of an application. The user interface design needs to be tested using a valid set of test instruments to obtain good quality. Valid instruments are obtained by performing instrument content validity. This research was a study that used an instrument development approach. The purpose of this study was to determine the content validity of test instrument that used to test the quality of user interface design the countenance evaluation application based on the basic concept of Accountability-Nationalism-Public Ethics-Anti Corruption (ANEKA) and Tri Hita Karana (THK). Subjects that were involved in testing the validity of instrument content were two experts, including an education evaluation expert and an informatics expert. The tool was used in data collection was a questionnaire consisting of 12 items related to the quality of the user interface design. The results were showed the validity of the contents of the instruments in the excellent category with a validity value was 0.83.

Keywords: Validity, Instrument, User interface design, Countenance, Tri Hita Karana, ANEKA

Enterprise Architecture Smart School Planning Uses TOGAF-ADM (case study Harapan Christian School Foundation)

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Enterprise architecture Harapan Christian School Foundation is designed to improve the quality of service to all parties involved, especially to students and parents of students and realize the vision and mission of the school to be more optimal and efficient. Until now Harapan Christian School Foundation does not yet have a well-integrated information system and has not utilized information technology to the full. firstly, This research doing preparation stage which analysed internal factors using the SWOT method, Value Chain, Balance Score Card, and external factors using methods, PEST and Five Force Porter, the second stage is the architectural vision, the three stages of business architecture, the four stages of information system architecture, the five stages of technology architecture, six stages of opportunity and solutions and the seven stages of planning migration, all of which will be validated using the Focus Group Discussion method. The results obtained from the information system architecture with TOGAF ADM consist of 17 information systems and the results of information technology architectures in the form of proposed devices or infrastructure to support planned applications. The enterprise architecture Smart School planning using the TOGAF-ADM framework produces a blueprint as a reference for the implementation Information System.

Keywords: Enterprise Architecture, Smart School System, TOGAF ADM

A Practical Method of Accurate Troubleshooting Mechanism in the Decision Objective Teaching Type on The Integrated Landing System

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An aircraft is a transportation system that works in conditions according to the standards. When an aircraft technician is aware of a system failure or damage, it must make the right decision to overcome the problems that occur. A relatively high level of accuracy decision making based is a necessary treat . This condition must be anticipated in aircraft vocational education. An integrated landing system is one of the subsystems on an aircraft that requires quick and precise handling if there are problems. A practical method that accommodates various concepts in troubleshooting is proposed to facilitate aircraft technicians' competence. This method performs standardization of troubleshooting steps in a particular algorithm so that it is more systematic. The appropriate validation and verification steps follow this troubleshooting mechanism to ensure that the system is up to standard .

Keywords: Integrated Landing System, Trouble Shooting Mechanism, Decision making based

Application of Mind Mapping Learning Method to Improve Learning Outcomes for Grade 10, Information and Communication Technology Students at SMK Wira Harapan, Bali-Indonesia

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The student-centered learning method is in line with the attitude of teachers and students who must be responsive to follow and master the development of science and technology. This study aims to determine the effect of mind mapping learning methods on students' understanding of concepts. The population in this study was Grade 10 Information and Communication Technology in Odd Semester 2019/2010 at SMK Wira Harapan, Bali Indonesia. The number of samples used in this study were 35 students. Data analysis used Paired T-Test Sample Test. The results showed that the application of mind mapping learning method was able to increase the score of learning outcomes in Computer System Subjects from by mean of 76 to 87. With 95% confidence level, the results showed that the application of mind mapping learning method was positively and significantly correlated with 47% student learning outcomes. The mind mapping learning method must be applied to subjects which require more understanding based on logic thinking. Efforts to increase learning outcomes must also pay attention to the characteristics of students and other factors.

Keywords: mind mapping, learning method, learning outcomes

Design of Academic Data Warehouse For STP Bali Using Kimball Method

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To manage data from a number of information systems at STP Bali, we need a system that is able to handle all data and analyze it. Data warehouse is the right solution for this problem. To design a data warehouse we can use nine-step methodology from Ralph Kimball so we can get the right design. This paper describe the proposed solution for data warehouse utilization at STP Bali especially for academic data that is the main bussiness process at STP Bali.

Keywords: Data Warehouse, Data, Database, Kimball Method

Developing an Inventory Information System Using Mobile Computing with Quick Response (2d-Barcode) and Geotagging

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Inventory management is the main task of an organization to reach its objective of maintaining the number of stocks precisely and minimizing waste. Web-based inventory management in a university environment is expected to help the employees in keeping up with innovations on the status of tools and equipment. It is only fitting that inventory data management is also capable of accommodating distance. The use of the internet by using mobile computing which automatically can do tagging of inventories including information about the coordinate will broaden the potential of database using mobile computing technology with wireless data communication aided with 2D-barcode decoding automatization makes it possible to synchronize (record and track) on-line to the central database using some computers that work simultaneously and directly from the field. This inventory system can synchronize data directly from the field and the information can simultaneously be accessed by the users. Mobile computing (android Smartphone, computer tablet) is used as a mobile station that is capable of decoding the tags of inventories and buildings (in the 2D-barcode) and associating automatically with the database wireless networks and the internet to eliminate the distance factor and overhead-process (pre processing of data from the field to the data storing station).

Keywords: system information, web-based, barcode tag

Android Game Development of Balinese Folklore I Sangging Lobangkara

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This research is about developing media based on Balinese stories that tell about a man who was very famous for his expertise in drawing. In the story, after hearing the news, the King asked the man to go to several palaces to challenge his skills. In this media, the challenge is packaged and applied as a rule in a game application called 'I Sangging Lobangkara'. This game was developed under the Android platform with the aim of introducing and maintaining Balinese Folklore which has many moral values but is starting to be forgotten. Game development uses Android Studio with a library called LibGdx. Application testing is carried out through various tests such as White Box and Black Box testing and verified by content and media experts along with user usability testing. The results showed that the game was considered to be well developed with a range of features implemented and therefore accepted by respondents.

Keywords: I Sangging Lobangkara, Balinese Folklore, Game, Drawing, Android

Development of a Car Rental System based on Geographical Information Systems and Decision Support Systems with the AHP (Analytical Hierarchy Process) and SAW (Simple Additive Weighting) Method

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The purpose of this study is to develop an application of a car rental system with geographic information system and recommendations using the AHP (Analytical Hierarchy Process) and SAW (Simple Additive Weighting) methods in a decision support system. The purpose of developing this system is to help the public in knowing the car rental system and carry out the car rental process complete with recommendations. The development of this system uses the ADDIE method which consists of five stages, namely Analysis (Analyze), Design (Design), Development (Development), Implementation (Implementation) and Testing (Evaluation), There are 3 tests carried out namely the blackbox test, whitebox, and user response test. This research succeeded in developing a car rental system after passing the blackbox test and whitebox test. User response test conducted on this car rental system is included in a very good range with the System Usability Scale (SUS) 93.13

Keywords: Media, Rental, Decision, Hierarchy, Weighting, Information

Self-Assessment to Improve Student Performance in Technology and Vocational Fields

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Evaluation, or lately more appropriately termed as assessment, should be able to describe the development of students' abilities gradually and lead to better final results. Description of students' learning abilities, whether in the form of mastery of concepts, theories, practices, and attitudes towards practical subjects in detail is contained in a complete proof of learning outcomes. This study aims to determine the implementation of a comprehensive self-assessment in the field of practical subjects. Furthermore, the self-assessment instrument is validated by lecturers in a practical learning in the field of technology and vocational. The results showed that the use of self-assessment instruments can help students find a clear line of thinking about the competencies they learn, starting from the lowest level to mastering competencies at a higher level. The self assessment instrument used with this model emphasizes the formative and summative functions in the assessment process, because feedback obtained from the results of self-assessment and lecturer assessment can help guide students to improve their learning outcomes.

Keywords: self-assessment, performance, comprehensive

Landscape and Housekeeping Government Building Preventive Maintenance Guidebook Based on Work Breakdown Structure

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Buildings suffer deterioration and function failures during its lifecycle even for landscape and housekeeping components in government buildings. Maintenance includes cleaning, inspecting, repairing, and replacing can provide buildings the ability to maximize the utilities of the building's lifecycle. Corrective maintenance is the most used maintenance method in Indonesia although there are several alternatives. Such as preventive maintenance that prevent any occurrences of building failures without neither repairing nor replacing any components throughout its lifecycle. Work breakdown structure (WBS) is an effective method to define preventive maintenance activities. However, in Indonesia there is still lack of preventive maintenance based on WBS activities guidebook and preventive maintenance policies. Therefore, the purpose of this study is to develop a guidebook of preventive maintenance landscape and housekeeping activities based on WBS to improve maintenance performance. The Research Method used is activities defined from policies, literature studies, and case studies drawn into WBS and validated by maintenance expertise. Experts validate the preventive maintenance activities using questionnaires and provide any maintenance performance improvements after using the guidebook. Result of the research showed that landscape and housekeeping preventive maintenance activities guidebook based on WBS improve government buildings maintenance performance.

Keywords: Landscape, Housekeeping, Guidebook, Preventive Maintenance,Work Breakdown Structure

The Development of Online Vocational Aptitude Test

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Directing students to choose the right program to follow is a very important activity for education, in an effort to increase graduate competence. In order to be able to direct students into appropriate study programs, the aptitude of students is very important to know. Aptitude tests have been widely developed, but there are still many limitations to use them, such as limited access to respondents, difficulty in presenting various tests, and difficulty in scoring. Efforts towards the development of online aptitude tests have been widely sought. This research attempts to develop an online vocational aptitude test. This test was developed to detect the vocational aptitude of junior high school graduates who will enter a vocational high school which is currently the leading education program. The vocational aptitude test developed was based on numerical aptitude, logical aptitude, technical aptitude, linguistic aptitude, and administrative aptitude. The aptitude test developed adopts a multiple choice test model with four choices. Expert test shows that the developed vocational aptitude test has a content validity ratio (CVR) which is in the range of 0.78-0.86 and content validity index (CVI) = 0.82, so it meets the content validity requirements. Tryout of the test found that the reliability of the test had met the requirements with an alpha cronbach coefficient (α) = 0.83. Tests on students who have chosen vocational programs get precision = 0.76; recall = 0.82; and accuracy = 0.83. Therefore, vocational aptitude tests already meet the requirements to be developed into online vocational aptitude tests.

Keywords: online, vocational, aptitude test

Effect of Image Partitioning on Content-Based Image Retrieval using Color and Texture Features

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Image retrieval from large of data and image variations using image content or CBIR is still an important challenge and problem. One of the things that can be added in CBIR is segmentation beside feature extraction process. Purpose of segmentation is to partition image into sections using the Grid Partitioning method. In this research, we observed images that were not partitioned, images that were partitioned into 2 (two) parts, and images that were partitioned into 3 (three) parts. Extraction of image features on color and texture features using Color Moments and Co-Occurrence Matrix methods. In this paper we present how effect of partitions on images on precision and recall using the Confusion Matrix method. Based on the test results with the Wang dataset we found that the image without partitions resulted in better precision. In image which is partitioned into 2 (two) and 3 (three) parts there is a decrease in precision but there is an increase in the recall and the image retrived. For further research more partitions on images can be use. For further research, more partitions can be use or using other image feature extraction methods.

Keywords: CBIR, Grid Partitioning, Color Moments, Co-Occurrence Matrix

Planning Strategy of Regional Revenue Management Information Systems Using the Enterprise Architecture Planning (EAP) Approach (Case Study: BPKPD Klungkung Regency)

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BPKPD Klungkung is a Type of Agency that carries out financial support functions and assisting the functions of government affairs that is authority of Region. BPKPD Klungkung doesn't have guidelines in framework of developing a regional revenue management information system in Klungkung. Considering large amount of regional revenue managed by Klungkung Government, it is necessary to have good, efficient, effective and accountable local revenue management procedures. To realize the use of information systems and information technology (SI/IT) through implementation of applications in various organizational functions. In this case, a planning strategic needs to be held so that the system developed in accordance with business processes of BPKPD Klungkung. Enterprise Architecture Planning (EAP) methodology is a method or frame of reference in building an information architecture that focuses on business needs that consist of data architecture, applications and technology as well as the implementation plan of architecture created to support business activities to achieve the objectives organization that will be produced portfolio of future applications according to the needs in an organization. From results of research using Enterprise Architecture Planning (EAP) data architecture methodology is first to be defined so as to produce 19 data entities, which underlie defining application architecture and defining technology. Based on application portfolio 6 key operational applications are displayed, 2 strategic applications, 2 high potential applications, 1 supporting application. With existence of strategic information system planning using Enterprise Architecture Planning (EAP), it is hoped that it can increase optimization of regional income in Klungkung Government.

Keywords: Strategic Planning, Information Systems, Enterprise Architecture Planning, Application Portfolios

Balinese Character Recognition On Mobile Application Based On Tesseract Open Source OCR Engine

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The Balinese script is a part of Balinese culture is rarely used today. The Provincial Government of Bali with the Governor Regulation number 80 of 2018 is trying to preserve the Balinese language and script. This study aims to preserve the Balinese script through a mobile technology approach which is the recent trend with worldwide coverage for supporting ubiquitous learning anywhere anytime. This research integrated the Android application to recognize Balinese characters in the form of images into text with Tesseract open source Optical Character Recognition (OCR) engine. The input of this application is a Balinese script image captured by a mobile camera or from a Balinese script image. The application recognized input image into text that can be further processed based on training data available in the application. The new Balinese script training data was created based on eighteen Balinese script's basic syllables and numbers only. This application can be operated offline with mobile hardware that supports camera functions. This application can be further developed to recognize other character repertoire i.e., vowels (Akśara Suara), semi vowels (Arda Suara), additional syllables (Akśara Şwalalita), sound killers (Pangangge Tengenan).

Keywords: Balinese, mobile, OCR

Strategic Planning of Information System at Dinas Pekerjaan Umum Dan Penataan Ruang Provinsi Bali

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Dinas Pekerjaan Umum dan Penataan Ruang Provinsi Bali (DISPUPR) is organization that has the authority, duties and responsibilities developing, maintaining and providing basic infrastructure services to the society of Bali. DISPUPRuse Information Systems (IS) as a tool for helping solving problems. A strategic planning of information system (SPIS) is needed which will plan and analyze a system that suits the needs of the DISPUPR. In the compiling of IS, Anita Cassidy's method is used. Visioning phase, an analyze to the internal and external situations of the business processes of the DISPUPR, analysis used in this phase that is Value Chain, SWOT Analysis, Critical Success Factor (CSF), and PEST analysis. The second stage is Analysis Phase, at this stage the analysis was carried out on the existing IS in DISPUPR both in terms of internal and external. The Direction Phase constitute the phase in which direction will be determined in the decision making of the IS development plan based on the IS recommendations that have been formulated previously, the compiling of the vision, mission of information systems carried out in this phase. Last the recommendation phase, the compiling of the roadmap and the compiling of cost estimates are carried out at this stage. All phases and analysis have been passed so then obtained 17 information systems that are expected to support the achievement of the vision and mission of the Governor of Bali.

Keywords: Strategic Planning, System Information, Anita Cassidy

The Use of Computers, Internet and Multimedia in the Electronic Engineering Study Program Department of Electrical Engineering, State Polytechnic Semarang

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This research is an exploratory study from the perspective of lecturers on how to use computers, internet and multimedia (CIM) in teaching and assignment in the Electronic Engineering Study Program Department of Electrical Engineering, State Polytechnic Semarang (Polines). There were seventeen teaching lecturers involved as respondents in this study. Three things are considered in taking respondents, namely the teaching experience, the subject matter and gender. The analysis used in this research is a descriptive analysis of quantitative and qualitative data. Stages of research include literature studies, questionnaires using Google Form with seven questions, in-depth interviews with six selected lecturers, transcribing and coding the interviews and drawing conclusions. The results obtained are as many as 100% of respondents using the Whatsapp application to communicate with students. There is 17.65% (three lecturers) who always use CIM in teaching and assignment. One lecturer in this group is female, who has ten to twenty years of teaching experience and teaching theoretical courses. While the two other lecturers in this group are male and teach practical subjects. One male lecturer has more than twenty years of teaching experience and the other lecturer has less than ten years of teaching experience. Interestingly the same results, namely there were 17.65% (three lecturers) who did not use CIM in teaching and assignment. One lecturer in this group is male, has more than twenty years of teaching experience and teaching theory courses. Whereas the other two lecturers in this group are women, one lecturer teaches theory courses with teaching experience of more than twenty years and the other lecturers teach practical courses who have less than ten years of teaching experience.

Keywords: electronic engineering, learning, computer, internet, multimedia

Comparison of Microcontroller-Based and Mechanically Controlled Water Rate Control Systems in Solar Energy Water Distillation

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The current problem of solar energy water distillation is in its low efficiency caused by inefficient water evaporation processes. The commonly used mechanical control system has weaknesses such as the instability of the water. The water rate input system for distillation in this study is based on a simple microcontroller. The microcontroller-based input water rate control system allows the rate of input water with a small but continuous flow rate. This study aims to compare the stability of these 2 systems. The parameters variation were: the rate of input water which was 0.3 l/hour, 0.5 l/hour and 1.2 l/hour. Parameters measured in this study were: (1) temperature absorber, (2) temperature of the cover glass , (3) temperature of cooling water, (4) input water temperature, (5) ambient air temperature, (6) distilled water results, (7) solar energy coming in and (8) time of recording data. The results of this study indicate that regulating the flow of water in a distillation device with a peristaltic flow regulator produces a more constant flow than a mechanical regulator. Changes in the flow rate of inflow to the smallest initial flow rate with a peristaltic regulator is 0.2% at the variation of the initial flow rate of 1.2 liters/hour. The change in the mechanical regulating flow rate at a variation of the 1.2 liter/hour flow rate is 20%. It can also be concluded that microcontroller based water speed regulators are more stable than mechanical water flow regulators, especially in small flow

Keywords: microcontroller, rate of input water, distillation of water, solar energy

Analysis of Digital Identity Transactions with Blockchain Ethereum in a Case Study of Credit Applications at The Bank

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The falsification and embezzlement of personal data are still found in several cases in the past year. This is because personal data in physical form can still be manipulated and difficult to distinguish from the original. The most detrimental impact is if personal data are used for loan application fraud in banks. One of the implementations of blockchain technology is Ethereum which allows the use of the smart contract as a rule that must be fulfilled by the parties involved. All stored transactions are immutable, easy to audit, transparent, and distributed at each participating node. This study aims to examine Ethereum in personal data transactions with case studies of applying for a loan at the Bank. For testing, the authors develop a trial application using the prototype method. Testing is done by the black box testing method in the local lab with 10 loan submission data to be transacted. The result of this study is that all loan application data can be transacted and stored in a smart contract. Interviews with employees of Unit in Bank Rakyat Indonesia (BRI) Kanca Semarapura, Customer Service, Mantri, and Kepala Unit positions resulted in the opinion that Ethereum can be used as a media for submitting credit applications at the Bank because of the prospective debtor's personal data are valid and cannot be falsified. The results of the analysis on testing and interviews concluded that blockchain technology can be used as a medium for storing personal data and credit applications that are trusted.

Keywords: ethereum, personal data, loan application

Preventive Maintenance of Mechanical Component Development Guideline on Government Building Based Work Breakdown Structure (WBS) to Improve Maintenance and Care Performance

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Building is a physical form of construction work which integrated with its domain, partly or fully on the surface and underneath the land and water. Buildings must be able to fulfill their functions and reliability. But over the course of time and utilization, they will suffer from damage caused by various aspects, such as the mechanical components of the building. One of the efforts that can be done to reduce the damage is by doing preventive maintenance work. Preventive maintenance work includes tasks or measures taken to prevent the need for repairs. In the buildings preventive maintenance process, the scope of work can be arranged using Work Breakdown Structure (WBS), hence a structured and activity oriented grouping can be achieved. However, in the application of government buildings there are no guidelines for WBS-based preventive maintenance work yet. Therefore, developing preventive maintenance work guidelines to improve care and maintenance performance is an important task in project management. The purpose of this study is to develop work breakdown structure based preventive maintenance work guidelines on the mechanical components of government buildings to improve care and maintenance performance. The research methodology includes several stages, namely the literature study, archives analysis with data and information from previous research and related projects, case studies, and Delphi techniques through the validation of experienced experts. The result of this research is WBS-based preventive maintenance work guidelines for mechanical components of government buildings that can improve the quality of buildings and the effectiveness of building maintenance.

Keywords: government buildings, guideline, preventive maintenance, work breakdown structure

Comparative Study of Classification Methods on Diagnosis of Plasmodium Phase

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Malaria is a disease in human caused by Plasmodium parasite, and transmitted by the bite of female Anopheles mosquitos. Once getting into human blood circulation, this parasite undergoes asexual propagation which divided into three phases (trophozoite, schizont, and gametocyte). To determine the phases, the paramedic will examine the blood sample of the patient through the microscope. In fact, this method is still potential to lead misdiagnosis. A number of CAD-based research works to minimize the misdiagnosis has been developed. This research aims to develop a scheme of CAD-based that can help the paramedic in diagnosing Plasmodium parasite, and particularly in this section aims to obtain the classification algorithm that can be suitable to classify the Plasmodium phases. Based on the test result, Naïve Bayes was mostly effective used as classifier achieved the accuracy of 97.29%, the sensitivity and specificity of 97.30% for the P.vivax case. In the case of P.falciparum, it resulted the accuracy, sensitivity, and specificity of 98.36%, 98.40%, and 98.40% respectively. Meanwhile, Perceptron was ineffective algorithm used as classifier that gained the accuracy up to 81.08%, sensitivity and specificity of 93.80% on each for the case of P.vivax, while in the case of P.falciparum achieved the accuracy, sensitivity, and specificity of 80.33%, 92.50%, and 92.50% respectively.

Keywords: malaria, plasmodium, classification, ann

Augmented Reality (AR) Based Application to Introduce Animals for Children

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The development of technology is now very helpful in the multimedia-based learning process. Children will be more interested in learning if the application can be installed on a Smartphone, because children enjoy playing Smartphones. In teaching children to recognize animals, teachers at school use pictures. With the presence of multimedia based on Augmented Reality (AR) can help display images of animals in the form of 3 dimensions so that it is more interesting. application created to provide knowledge and information about sounds, habitat, breeding about animals in the form of 3D objects. In making Augmented Reality Animal Recognition adopted the SDLC (System Development Life Cycle) method. At the trial stage the Alpha version of the application is carried out to determine the quality, shortcomings and smoothness of the applications that have been made. Application test results can run well. So with this application children are more interested in getting to know animals so that it provides a learning experience and is easily accessed on a Smartphone.

Keywords: Augmented Reality (AR), Application to Introduce, Animals for Children

Art Sticker Based Application to Introduce Crown (Gelungan) of Wayang Ramayana in Bali

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Puppet on the island of Bali is a cultural heritage that is very important to maintain and introduce to the younger generation. Puppet in Bali now requires innovation to be accepted by the people so it is not boring. With the development of smartphones, young people are increasingly lazy to watch puppets. They need to be introduced puppets in different ways, one of which is based on Art Sticker. With this application the user can choose the desired puppet character and take a photo directly using the crown (Gelungan in Balinese), special attributes of the character eg mustache and feather, and the Necklace (Badong in Balinese). The application developed is based on Art Sticker (AS) which is a modification of Augmented Reality (AR). The method used to develop this application is Waterfall. The results of this study are the application of AR with face tracking where the face becomes a marker. How to use is taking a selfie so that an Art Sticker in the form of a 3D puppet shape appears on your face. Application testing is done by installing on several different Smartphone Models and can run well on several models that have been tested.

Keywords: Art Sticker, Application to Introduce, Crown of Wayang Ramayana

E-learning module for Lectures on Cultural Tourism Information Systems Based on Local Wisdom

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In education in the 4.0 revolution it is necessary to carry out reforms and innovations related to national education. Reforms and innovations in the implementation of components of the education system involve changes in curriculum, graduate competencies and assessments, teacher qualifications, funding, facilities and infrastructure, decentralization and educational autonomy. Bali as a world tourist destination, has become a positive trend that must be maintained and passed on to the younger generation. The younger generation can use information technology to help promote Balinese culture. Bali has a lot of local wisdom that can be implemented in the tourism sector. So to help make that happen, a module that can be accessed through e-learning is needed to help students develop a cultural tourism package based on local wisdom to be promoted online. The modules developed have been tested by content and media experts, which can be used independently by students. Modules can be accessed online at e-learning and there are instructions that must be read so that students can work on assignments and projects. The target of this module is the creation of brochures, tour packages, videos, and websites, all of which are connected to promote tourism based on local Balinese wisdom.

Keywords: E-learning module, Cultural Tourism Information Systems, Local Wisdom

Evaluation of User Experience in E-Report Applications using Cognitive Walkthrough (CW), Heuristic Evaluation (HE) and User Experience Questionnaire (UEQ)

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E-Report application is developed based on the web to make it easier in preparing students' assessment reports in the form of rating reports, competency achievement reports, report cards, and ledgers. Even many high schools/vocational schools in Bali have not implemented the E-Report application. Report using cognitive walkthrough techniques, heuristic evaluation, user experience questionnaire (UEQ) based on aspects of usability. In the usability aspect, what is measured is effectiveness, efficiency, user satisfaction and provides recommendations for improvement Based on the results obtained in terms of users, applications E-Report is not yet effective and efficient for the first time respondents use the E-Report Application. The application can be said to be effective and efficient if the user has often used E-Report. Applications can be said to be effective and efficient if the user is already frequently used E-Report and access the internet. So that on user satisfaction, respondents who are the object of research are respondents who have used the E-Report application. The results obtained are the respondents' experiences during the use of the E-Report application. It can be concluded that respondents are satisfied with the E-Report Application. Problems obtained from the experts for recommendations for improvement using Heuristic Evaluation techniques and through the target prospective users of the E-Report Application are sourced from the results of Cognitive Walkthrough. Improvements made to the start page, value page, value page results by making wireframe. Extracting the problem between the two sources can further optimize usability and improve user experience on the E-Report Application.

Keywords: E-report cards, user experience, cognitive walkthroughs, heuristic evaluations, user experience questionnaire (UEQ)

Analysis of Vocational High School Teacher Competency Gaps:Implication for Vocational Teacher Training Needs

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This study proposes a novel approach that integrates qualitative and quantitative methods to identify the competency gaps of vocational teachers in Vocational High Schools (VHSs). It comprises of four research steps, namely (1) determining the ideal teacher competencies through Fuzzy Delphi technique, (2) arranging the competency priorities by using the analytic hierarchy process, (3) conducting vocational teacher performance evaluation by using a 360-degree rater, and (4) the competency gaps analysis using the IPA matrix. The sample members involved in this study were 7 experts from the industry, academia, and government, and 50 VHS teachers from several regencies in Bali Province, Indonesia. This study suggests that the gaps between the existing vocational teacher competencies and the ideal ones include (1) the pedagogical competency – the low level of factual knowledge mastery in vocational knowledge and skills; (2) mastery in the application of contents; (3) mastery of content knowledge related to vocational teaching subjects; (4) networking and collaboration between the relevant industry and government; (5) continuous professional development; and (6) entrepreneurship. These findings imply that these needs of competencies should be the focus of teacher training programs for VHS teachers.

Keywords: vocational, teacher competency, competency gap

Optimization of Artificial Neural Networks to Improve the Accuracy in Predicting the Selection of Competency Competencies of Vocational Students Using Nguyen-Widrow

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The use Neural Network Backpropagation combined with Nguyen-Widrow to optimize the disadvantages of ANN, which is the difficulty in initializing initial weights. The test was conducted on a dataset of values in semesters 1 and 2. The test results show that the best performance in training model of artificial neural networks with Nguyen-widrow is the smallest average MSE error of 0.002 and the highest average accuracy of 96.38%. Training on artificial neural network model training data with Nguyen-widrow has the smallest MSE error, 0.000996 and the highest accuracy is 97.49% on architecture ANN 9-9.1 with training function parameters: traingdx, epoch: 1000, learning rate: 0.1, and error: 0.001 . The best performance was also seen in testing the testing of artificial neural network models with Nguyen-widrow with the smallest average error-MSE of 0.026 and the highest average accuracy of 87.85%. Training data testing on artificial neural network models with Nguyen-widrow has the smallest error-MSE which is 0.004436 and the highest accuracy is 94.50% on architecture ANN 9-9.1 with training function parameters: traingdx, epoch: 1000, learning rate: 0.1, and error: 0.001 . The artificial neural network model with Nguyen-widrow has an accuracy difference of 8.53% smaller than the artificial neural network model with an accuracy difference of 9.28%. It can be concluded that the Artificial Neural Network with Nguyen-Widrow can overcome the ANN problem in determining initial weights so that it gives an increase in the accuracy of the prediction of students' competency selection better than the Artificial Neural Network without Nguyen-Widrow.

Keywords: Selection of specialization of vocational students' expertise, artificial neural networks, nguyen-widrow

Improve Self-Efficacy in Teaching of Prospective Mathematics Teachers by Involving Them in The Online Teacher Community

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Self-efficacy in teaching is very important for prospective teachers. Prospective teachers who have good self-efficacy inteaching can carry out the profession as a teacher well in the future. This study aims to improve the self efficacy in teaching of prospective mathematics teachers by involving them in the online teacher community. A total of 58 prospective mathematics teachers were included as samples. They are divided into two groups. The experimental group attended micro teaching courses while involved in the online teacher community, on the other hand the control group attended a micro teaching course while assisting the model teacher. Self-efficacy in teaching is measured by a questionnaire at the beginning of the semester as a pre-test and at the end of the semester as a post-test. The results showed that prospective mathematics teacher who took micro teaching courses while involved in the online teacher community experienced a higher increase in self-efficacy compared to those who attended micro teaching courses while assisting the model teacher. These results indicate that the association of prospective mathematics teachers in the online teacher community has a positive effect on increasing their self-efficacy in teaching. In-depth interviews indicate that a combination of synchronous and asynchronous communication plays a role in increasing their self-efficacy. Computer-mediated communication that is context-free and not too bound by social conventions greatly helps increase the self-efficacy of prospective teachers.

Keywords: self-efficacy in teaching, online teacher community, prospective mathematics teacher

Structural Equation Model of Safety Culture Dimensions in Foreign Construction Company in Indonesia

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The level of work accidents in one project, greatly influenced by the level maturity of safety culture which actually founded by some structural elements. In Indonesia, the construction industries is growing up and many foreign construction company come and expand their business In Indonesia which well-known have better maturity. The Aim of this research to knowing safety culture dimensions in foreign construction companies in Indonesia are and how the relationship model of those structural elements is. Methodology of this research is Survey Respondent and analysis using SMART PLS application software to obtain the results of relationships between dimensions. The Results are ten safety culture dimensions in foreign construction companies in Indonesia and 16 relationships that are significant relationship in developing safety culture in foreign construction company. The most influence dimension are Leadership and The Value of Safety among the workers to developing safety culture and expected to be applied to public and private companies in Indonesia.

Keywords: Safety Culture, Structural Equation Modelling, Foreign Construction Company, Work Accident

Decision Support System for Determining the Location of internship program with Simple Additive Weighting Method (Case Study of Program Studi diluar Domisili Jembrana - Politeknik Negeri Bali)

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The Internship program is an educational activity carried out off-campus which aims to improve the quality of students so that they can become equipped with skills when entering the real world of work. Study Program Studi Diluar Domisili Jembrana - Politeknik Negeri Bali conducts practical work programs every semester. Sometimes the choice of internship place practice for students is often not suitable with the abilities possessed by the students themselves, so students cannot carry out internship optimally. Decision Support System is a system that can manage data and provide the best alternative solutions. Determination of the location of the field workplace is determined based on criteria and weights, namely: the value of English, parents' income, average attendance, and student achievement index. Furthermore, the data from these students are processed using the Simple Additive Weighting (SAW) method. This Simple Additive Weighting (SAW) method gives a weighting to each of the criteria used to produce the best alternative values. This system is expected to be able to assist in making decisions more quickly in determining the location of field practice work.

Keywords: internship program, Decision Support System, Simple Additive Weighting (SAW)

Next Generation of Avionic Learning Based on Virtual Instruments in Vocational Education

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At this time aerospace technology is very advanced. This is very closely related to advances in information technology and aerospace, so the learning process in aerospace vocational education also progresses. The learning process that was originally very manual now has used a computer as a support system. Learning methods or content of learning materials are also adjusted. One of them is the next generation of avionic. At this time many types of aircraft have used electronic flight bags to control the aircraft. This technology is very advanced using many automatic electronic devices such as sensors, actuators and other sophisticated devices that are connected by wireless networks and applications on computers. A learning method that approaches the real conditions facilitates the process of understanding, namely utilizing virtual instruments. A teaching technique that is supported by applications on computers that resemble conditions in an aircraft. In this paper, a sub-section of avionics is assisted with computer applications, so the actions taken will have an effect on what the conditions of the aircraft are. The perceived benefit is that learning material is easier to understand and implement.

Keywords: Avionic, virtual instrument, learning method

Comparison of Classification Model and Annotation Method for Undiksha's Official Documents

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Shakuntala is a system that manages official documents and letters at Universitas Pendidikan Ganesha (Undiksha). The system stores various documents in PDF format which are categorized by type of document. But Shakuntala can only receive scanned documents, and document categorization ware done manually by the administrator. Documents uploaded to Shakuntala ware also generally contain information about people who were manually tagged by the administrator. This causes inefficiencies that should be carried out automatically by machine. This study aims to find the best classification model for determining document categories. In addition, this research is also looking for the best method for tagging the people listed on the document. The results of the study showed that the Decission Tree classification model was the best model with an accuracy of 83.06% compared to KNN and Naive Bayes. As for the annotation of the person's name, the Levenshtein distance method with a similarity threshold of 95% obtained an accuracy of 68.2%.

Keywords: document annotation, classification, shakuntala

Developing a Jobsheet for Basic Programming Based on Performance Assessment

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This study aimed at producing a jobsheet for basic programming based on performance assessment through a development process with a series of reviews and try-outs, both in terms of content and effectiveness so that a good jobsheet can be produced which can be used as an aid in the ADDIE model which consists of 5 stages: Analysis, Design, Development, Implementation and Evaluaction. The data collected in this study were related to content and effectiveness of the jobsheet that has been developed. The data were analyzed using descriptive quantitative data analysis. The data collected were subjected to a review and try-out and were reduced and presented, from which a conclusion was drawn. The result of this study showed that the jobsheet for basic programming based on performance assessment has been successfully developed with the content validity falling into the good category and the level of the students' responses (the effectiviness) was in the good category too. This means that it is effective to be used as the guidelines in the students'practicum activities which makes it easy for them to follow the lesson, hence it will have a significant effect on the enhancement of the students in understanding the material taught.

Keywords: jobsheet, basic programming, performance assessment, ADDIE

Students' Vlog: Speaking Application

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Speaking skill is one of the important things in language teaching where the students are expected to communicate orally in their daily lives. However, making the students concretely involve in speaking activities becomes the hardest part for the teachers. This has been identified by Brown and Yule (1983:25) that the most difficult aspects of language learning for the teacher is making the students to use the language orally in their daily communication. Through Vlog (video-based learning) found as a media which explored students creativity and enhanced their speaking skill. This study observed 30 students speaking achievement in and after making the vlog. Qualitative research was employed to analyse data, which concerned on the students speaking skill. The result of the study affirmed that vlog was proven greatly facilitated students speaking skill. It was also found that the students were not only had good progress in speaking but they also gained another discipline of knowledge; IT and the most impression was they had amazing learning experiences.

Keywords: speaking skill, video, student

Development of Population Document Authentication System Using a .p12 Certificate

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Government policies related to electronic transactions provide many positive responses. One of them is improving service to the community. If previously carried out conventionally with the existence of this policy, government services relating to authentication such as population documents can be done electronically while still paying attention to their validity. In the current service process, there are several issues such as the distance between the houses of the village office residents and the distance of the village office to the sub-district office, the application process or the procedure for making unclear documents, which means that one particular document category has a different format, the document archive less organized both in village and sub-district offices, the use of excess paper that drains the budget both for paper or the organization of special places for certain papers or documents, the completion of documents is hampered for days because the official responsible for ratification of documents is not in place. To overcome this, we need a system that can overcome these problems. Then, in the development of this system using the waterfall model. There are three tests carried out namely the blackbox test, whitebox test, and user response test. The development of this system has passed the blackbox test and whitebox test, the overall results are in line with expectations. User response tests conducted on five user roles and obtained results with an average percentage that is in very good range.

Keywords: Digital Signature, E-government, Information Systems, Waterfall Model, Document Management

Design of IOT based Facial Recognition Door Access Control Locker Services at Tourist Attractions in Bali

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Safety and comfort are things that everyone wants to get on a trip. Every tourist who wants a vacation to one of the tourist destinations will prioritize these two things. Leisure in travel is influenced by the availability of supporting facilities. From accommodation, restaurants to facilities provided by tourism actors in each tourism object. One problem is the lack of facilities in attractions such as luggage storage (locker), many tourists in enjoying tourism objects carrying luggage such as backpacks, groceries to backpacks for tourists classified as backpackers. Of course this will disrupt the comfort of traveling. In the research conducted, researchers wanted to design a system of goods storage services as a form of supporting industry 4.0 in the tourism environment. By designing an image of the storage media of goods by implementing access control for doors in each locker based on image processing supported by a microcontroller. The design as a blueprint makes it easier to develop the next item of storage media (locker).

Keywords: internet of things, tourism, recognition

Lecturers' Preparedness and Preparation for Blended Learning: An Exploratory Study at Universitas Jambi

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Commonly defined as a mix between face-to-face and online learning, blended learning (BL), has been advocated as being advantageous in improving the educational practices (Graham, 2006). Even in Indonesian context, Kemenristekdikti has advocated and promoted the implementation of BL through the establishment of SPADA. In spite of the perceived benefits of BL, studies at institutional level on how prepared the teaching staff with BL are and how institutions should prepare them for successful blended learning remain quite limited. The current study aims at exploring the preparedness of lecturers teaching university-wide compulsory courses in Universitas Jambi in implementing BL, and the preparations required for such implementation. The qualitative data were collected by conducting three sessions of focused-group discussion involving three groups of lecturers, respectively teaching English, Basic Natural Science, and Basic Social Science and Humanities as compulsory courses in Universitas Jambi. The data were analyzed qualitatively to find perpetual themes related to the study. Khan's (2005) e-learning framework was utilized in to frame the discussions. Four main themes were found in the study, namely: 1) Common misconceptions on BL; 2) The needs for technical and procedural guidelines for the implementation; 3) Kinds of preparations needed by the lecturers; and 4) The importance of establishment of a support system for BL. Implications of the study as well as further directions towards the possibility for implementing BL in Universitas Jambi are also discussed.

Keywords: ICT in Education, Blended Learning, Higher Education, Lecturers' Preparation

Gamification Design to Improve Student Motivation on Learning Object-Oriented Programming

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Object-oriented Programming (OOP) is the most popular programming paradigm that using in information technology industry so far. OOP can help to reduce complexity and easiest to maintain. Most common programming language support OOP this day. OOP is a skill that students must know to compete in the information technology industry. The problems that occur during OOP learning are some students are unmotivated during class. Caused by passive learning styles and the impact of the lack of understanding from the previous programming class. Based on these problems, this research aims to design gamification to increase student engagement and motivation in learning OOP. Gamification provides an element of fun that is obtained in the game so that it stimulates the activeness and creativity of students. This research used Marczewski's Gamification Framework with the selected user type is archiever because according to the user needs such as want to learn new things to improve themselves and challenges to overcome. Game mechanics for user type archiever such as level, challenges, and reward with game elements such as points, badges, and trophy. The test has shown that Marczewski's Gamification Framework has applied according to the user's functional needs. This research contributes to the use of gamification in increasing student motivation and engagement in learning OOP programming.

Keywords: Object-oriented Programming, Gamification, Marczewski's Gamification Framework

End User Practices towards Green IT Readiness in University

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Increased use of IT also encourages increased energy consumption. The potential problems caused by the use of IT have led to new studies in the use of IT that pay more attention to its impact on the environment called Green IT. Students, lecturers and administrative staffs are the end users of IT within the university. All IT users, especially in university, have a responsibility in using IT that is more environmentally friendly. This research was conducted to identify IT utilization activities by end users in order to support the University's capabilities in utilizing IT to be more environmentally friendly or termed as green IT readiness.

Keywords: end user, practice, green IT, readiness, university

Balinese Glyph Recognition with Gabor Filters

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Recognizing Balinese glyphs from the Balinese script on palm leaf manuscripts is not trivial. In Balinese script, there are more than a hundred glyphs which represent basic syllables and compound syllables, and also some punctuation marks. They naturally share a strong interclass similarity between each other related to the form of their writing curves. The degraded image of textured palm leaf manuscript also offer some challenging parts in recognizing the Balinese glyph. In this paper, we investigate the use of Gabor filter bank as the feature extraction method to recognize the Balinese glyphs. By using Gabor filter, we can detect many texture variations with different orientations and frequencies. In our experiments, we use the published dataset of AMADI_LontarSet to compare the performance with some previous works on glyph recognition.

Keywords: glyph, recognition, Balinese script, Gabor filter, feature extraction

Melajah Pupuh Bali Application "AngGita" as a Medium of Learning in Multimedia

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Entering the industrial revolution 4.0, technological development is very important to be utilized for various fields. In this case, technology can be a media to support education especially at an early age or children, in this case, primary school. As with technology, culture is one of the most important things in life, especially Balinese culture. Melajah Pupuh Bali application "AngGita" is an application to introduce and guide the learning to experience Bali. Based on the Bali Governor's Regulation No. 80 of 2018 Regarding the Protection and Use of Balinese Language, Literacy, and Literature as well as the Implementation of the Balinese Language Month. This application teaches how to sing pupuh correctly for beginners. On the menu, there are three buttons that go to each of the poems, namely: Pupuh Ginada, Pupuh Ginanti, and Pupuh Pucung. There are videos on each of the verses. In sustainable development, at this time the role of this application is very appropriate to be applied in the field of multimedia and learning because it will increase interaction and effectiveness in the delivery of information to students.

Keywords: Melajah, Pupuh, Bali, Application, Learning, Multimedia

Development of the Learning System Astra Industrial Base Education (AIBE) to Increase Student Awareness in Making Product

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This paper aims to introduce the vocational education system implemented at Polman Astra, the Astra Industrial Base Education (AIBE). The AIBE system was developed by way of project learning, which is the integration between several practicums to make a product that can be commercialized. One product that is being developed is Toolbox, where the manufacturing process involves several practicums, including: Sheet Metal Forming, Welding, Painting, Assembling, 3D Printing, and others. The aim of the AIBE learning process is that each student can make products in an integrated manner with a specified time and commercialized product quality, so that the awareness of each student in making quality products increases.

Keywords: AIBE, Polman Astra, Manufacturing Process

Application of Multi-level Integrated Projects to Meet the Achievement of Learning Special Skills in Mechatronics Vocational Education

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One of the special skills learning outcomes in Mechatronics Department referring to fifth level of KKNI is being able to design, analyze, improve design performance, and realize the design parts in the maintenance and repair process, operation, and assembly of automation machines, with proper consideration of occupational safety, health and environmental issues. Fulfilling this learning outcome is not easy. This paper presents learning experiences in Mechatronics Department of Politeknik Mekatronika Sanata Dharma in an effort to fulfill it. The effort made is to carry out project-based learning in the form of workshop lectures, called Mechatronics Workshop. These workshops held in second to fifth semester, and each project was an integration of all lecture material in that semester. The project results from workshop will be used in the next workshop, therefore the project is called a multilevel integrated project. For example, the project that has been implemented is the manufacture of conveyors of goods suppliers. The project was carried out in stages, from constructing mechanical conveyors, adding electronic circuits to move the conveyors, adding a PID control to adjust the conveyor's movements according to the pattern, and adding HMI and data communication between conveyors. Student assessment is determined by giving a checklist on the rubric of assessment, that include the ability to design, manufacture, operate, assemble, improve design and performance, in accordance with predetermined learning outcomes. Until now, the results of this workshop lecture have met the learning outcomes, and show high satisfaction scores, both in terms of teachers and students.

Keywords: Multi-level Integrated Projects, Vocational education, Workshop lecture, KKNI, Learning outcomes

The Effectiveness of Learning in Vocational Education in Mechatronics Through Making a Simple Simulation Program

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As one of vocational education in Indonesia, Politeknik Mekatronika Sanata Dharma must be able to produce graduates who are competent and skilled in the field of mechatronics. In order to achieve this, practical and workshop learning must be given a large portion. However, some practical tools available are limited, due to constraints in the cost of procuring equipment that is quite expensive. This paper presents an alternative learning through the practice of developing a simple industrial control simulation program, using Proteus and LabVIEW software. One example of the control simulation presented here is the control on the conveyor of the supplier of goods. From the observations and evaluations of learning, it was found that by making simulation programs, students became more able to develop their mathematical logic and creativity. The effectiveness of learning is considered quite high because there is student involvement in the learning process, starting from the beginning of the design to its realization, and completion and improvement of the program.

Keywords: vocational education, mechatronics, proteus software, labview software, a simple simulation program

Development of TRIZ Based Competency Test Material And Its Influence on Improving Problem Solving Skills

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Vocational education is synonymous with skills education, which are directed at the mastery of certain expertise. Special skill learning achievement for graduates of Politeknik Mekatronika Sanata Dharma is able to solve engineering problems in terms of maintenance and repair, operation, and assembly of industrial automation machines. For this reason, problem solving skills are important to learn. This paper presents a research on the effect of developing TRIZ-based competency test material on improving problem solving skills. The subjects of this study were students of Politeknik Mekatronika Sanata Dharma. After several TRIZ-based competency tests, the results of problem solving carried out by students on the basis of a systematic approach have increased, while problem solving on the basis of intuition (trial and error) have decreased.

Keywords: TRIZ, Competency Test Material, Problem solving skills, a systematic approach, trial and error

The Correlation of English Proficiency and OOP Learning Outcome Using Oracle Academy Java Fundamental Curriculum

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Object-oriented programming (OOP) is one of the fundamental programming that must be mastered by students. OOP has a structured modular concept to create a software. OOP code can be managed more easily and only requires a slight modification if a new object is created with properties similar to existing objects. However, learning the concept of OOP is relatively not easy to do. Therefore, OOP learning materials must be made interestingly. Oracle Academy provides a Java Fundamental curriculum that teaches the basic concepts of OOP through Oracle Academy iLearning. However, the curriculum provided by Oracle Academy does not yet exist in Indonesian. Judging from the results of previous studies, students at Informatics Management of Undiksha have English skills that are not evenly distributed with each other. Therefore, this study was conducted to determine whether there is a relationship between students' English proficiency with OOP learning outcomes by utilizing curriculum from Oracle Academy. Before the lecture begins, data on students' English proficiency is taken. The lecture is conducting 14 meetings, where each meeting is held for 3x50 minutes. Each meeting uses material provided by Oracle Academy which is delivered in English. Learning outcomes are obtained from quizzes, midterm tests, and final tests which are all provided by Oracle Academy iLearning. The results showed that there was no correlation between students' English proficiency with OOP learning outcomes by utilizing curriculum from Oracle Academy. This shows that the use of English material and evaluation in OOP lectures does not affect student learning outcomes.

Keywords: Object Oriented Programming, Oracle Academy, English proficiency

The Effectiveness of Using Audio Visual Media in Learning of Fashion Design to Improve Student's Self-Efication in Fashion Design Education Study Program

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This study aims to: 1) determine the student's self-efficacy in Fashion Design course, 2) describe the effectiveness of using audio-visual media in fashion design learning to improve the self-efficacy of students in Fashion Design Education Study Program. This research was conducted on the third semester of students at Fashion Education Study Program in the academic year 2019/2020. This type of research is a Pre-Experiment with One Shot Case Study design. This study uses one group of samples that using audio visual media. The population in this study were all students in the third semester of Fashion Design Education Study Program which is consisted of 22 people. The determination of the sample in this study was carried out with a saturated sample technique in which all members of the population were used as samples. Data collection in this study is used a questionnaire to determine student's self-efficacy. Based on the results of the calculation of descriptive statistics, the average results that obtained by student's self-efficacy score is 102.4 after being treated using audio-visual media and this is categorized into a high category. By using the t-test calculations, the t-score result is 28.69. The t-table result is 1.69 with dk = (22-1) and significant level of 5%. This is means that the t-score result is greater than the t-table result (t-score > t-table), so that H0 is rejected and H1 is accepted. This is shows that there is an increase of student self-efficacy in Fashion Design course after using the audio-visual media.

Keywords: self-efficacy, media, audio visual, fashion design

The Tensile and Impact Properties of Ramie Fiber Reinforced Polyester Composites for Dulang Craf Applications

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Fiber volume fraction plays an important role in determining the mechanical properties of composite materials. The purpose of this study is to investigate the effect of fiber volume fraction, Vf, on tensile and impact strength of ramie fiber reinforced polyester composites. The composite specimens with volume fraction of 30%, 40%, and 50%, were characterized using tensile testing machine and charpy impact test. The result of this study and the implementation conducted by the research team had created dulang craf (Bali traditional souvenirs) which was made of ramie fiber reinforced polyester composite material. Rami fiber-reinforced-polymer composite at reinforcement volume fraction of 50% has characteristic value which is very close to the ideal value with tensile strength 42.34 MPa and impact strength 4.77 MPa.

Keywords: ramie fiber, polyester, tensile strength, Impact, dulang

Open Source Software Implementation in Peer Assessment

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The purpose of this study is to implement Open Source Software in learning assessment. The learning assessment, in this case, is specifically for assessments involving peers known as peer assessment. The peer assessment process uses iPeer software version 3.4 which is an open source software. iPeer 3.4 software, is software that is developed based on the web, so it can be accessed from anywhere and with a variety of existing devices. This iPeer 3.4 software has been implemented in a course with 2 (two) groups of students, and a survey related to the assessment involved students in the process. Also, iPeer 3.4 has done usability testing using the System Usability Scale (SUS) developed by John Brooke in 1986. The usability testing results show that, iPeer version 3.4 is categorized B with a "Good" rating. This means that iPeer 3.4 is suitable to be used as a learning assessment software that involves peers.

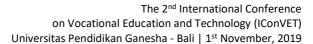**Keywords:** peer assessment, SUS, *open source software*

Development of Interactive Media on Formative Tests in Productive Subjects of TKL Department in SMK Negeri 1 Labuapi, West Lombok

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This research aims to develop formative interactive test media on productive subjects majoring in Computer Network Engineering (TKJ) at SMK Negeri 1 Labuapi Lombok Barat. This research was conducted using the Research and Development method in the field of education.Theformative interactive test media was developed in accordance with the simulated subjects namely Network Systems Administration.Formative interactive test media are designed with Wondershare Quiz Creator, and in media inserted multimedia content in form of images, sounds and videoswith final result in the form of an exe file.From the development of interactive media through a validator test using questionnaire, results are obtained: (1) Media experts get 87% with very decent qualifications, (2) Material experts get 88% with very decent qualifications, (3) Teacher responses get 93% with very decent qualifications, (4) Responses from students each received 77% from small group trials and 87% from field trials. Based on the results of research data analysis, interactive formative test media on productive subjects in TKJ department at SMK Negeri 3 Singaraja deserve to be applied as a formative evaluation tools with very significant advantages.

Keywords: Interative media, Formative tests, Wondershare Quiz Creator

Development of Mathematics Interactive Learning Media Gamification Concept for Mentally Disabled Students

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The Delivery of material with conventional media and the limitations of students in understanding abstract learning materials has made it difficult for teachers to deliver material so there is a need for interactive media, especially mathematics with the concept of gamification. This study aims to develop interactive learning media with the concept of gamification to increase concentration and learning interest of mentally retarded students, and to know students' responses to the media developed. This is a research and development study. Data collection using instruments. The subjects of this study were mentally retarded students in the D2 class of SLB Negeri 2 Buleleng. Data were analyzed using descriptive analysis techniques. The results showed that the learning media developed were able to become the source and student learning guide and the results of the analysis of student responses to the development of interactive learning media with the concept of gamification were 91.1% if converted into student response tables included in the Very Good category.

Keywords: gamification mathematics subjects, interactive learning media, mentality

Gamelan Data Repository: The Implementation of Information and Communication Technology Preserving the Balinese Traditional Musical Orchestra

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As the knowledge to build Balinese orchestra are passed down from generation to another within the clan, the orchestras across makers and across areas in Bali show subtle but distinctive differences in their tones, which may be altered when the knowledge is passed down manually. A research aimed at digitalizing these distinct differences in the creations of the Balinese Orchestra across craftsmen clans in Bali is conducted as an effort for preserving the unique differences produced by the respective clans through the development of a system prototype and database for storing the tones in the orchestra sets. The steps design to attain these purposes comprised of (1) analyzing the needs of preserving the Balinese Orchestra and mapping the problems faced by traditional craftsmen in maintaining standard tones; (2) designing a system to record the standard tones among craftsmen in Bali, i.e. sampling two most two groups of craftsmen from two regencies recognized as having the most distinctive tones in Bali, namely South of Bali and North of Bali; (3) developing the prototype; and (4) developing the database of Balinese Orchestra. When the database is ready, it will provide a reference for craftsmen to standardize their sets according to the intended tradition while opening a wide possibility of uses ranging from evaluation to the creation of collaborative musical compositions across media, while at the same time preserving the standardized tone in digitalized storage.

Keywords: data repository, Balinese orchestra, digitalization of standard tones, distinctive characteristics of respective Balinese orchestra sets

Enhance User Experience of Wadaya by Provide Voice Based Virtual Assistant

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Wadaya (in Bahasa: Warisan Budaya Indonesia) is crowdsourcing based information system to collect and spread of cultural heritage information of Indonesia. In previous research, we have developed and tested the usability of Wadaya information system. To enhance the user experience, in this research we provide Voice-Based Virtual Assistant on Wadaya to enhance the user experience when user search information from Wadaya. This system we call Wadavira (Wadaya Virtual Assistant). The users can ask questions about the cultural and heritage of Indonesia to Wadavira by voice, and the Wadavira will answer based on data collection in Wadaya database. We use DialogFlow as a question-answer engine and integrate with Google Assistant to provide the voice-based command. The step on DialogFlow is Identify What User Wants, Entity Extraction and Dialog Control. After we have done in DialogFlow, we integrate with Google Assistant that can be accessed from Google Devices such as Android phones and Google Home. We evaluate the user experience of Wadavira with the User Experience Question (UEQ) Questioner.

Keywords: Cultural Heritage, Virtual Assistant, User Experience

Potential of Beet Extract (Betroot) as a Natural Coloring Agent in The Manufacture of Tempe Noodle Products

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This study aims to obtain tempe noodles by optimizing the natural coloring ingredients of beetroot extracts to support the empowerment of natural dyes as functional ingredients by: (1) Beetroot extract formulation in processing tempe noodle products, (2) Knowing the nutritional value of tempe noodle products using beetroot extract natural dyes, (3) Determine the quality (taste, color, and texture) of tempe noodle products using beetroot extract natural dyes. This type of research is experimental research. The design of this study provides 150 ml, 100 ml and 50 ml beet extract formulations. While the data collection techniques were carried out through organoleptic quality tests with parameters namely color, taste, and texture. There were 30 panelists involved. The data collected was analyzed descriptively. The results showed that: (1) tempeh noodles with a 150 ml formulation of beet extract were quite preferred in terms of color and texture. (2) tempe noodles with formulation of 100 ml beetroot extract are very preferred in terms of color, texture and taste. (3) tempe noodles with formulation of 50 ml of beetroot extract are quite preferred in terms of texture and taste, while in terms of color are less preferred. nutrient content (protein) with a 100 ml formulation of 27.355 gr, higher than the 150 ml (23.418 gr) and 50 ml (24.4108 gr) formulations. Thus optimizing the processing of noodle products using beet extract is a 100 ml formulation because it produces the best quality taste, color, texture and protein concentration.

Keywords: beet extract, food natural coloring, tempe noodle