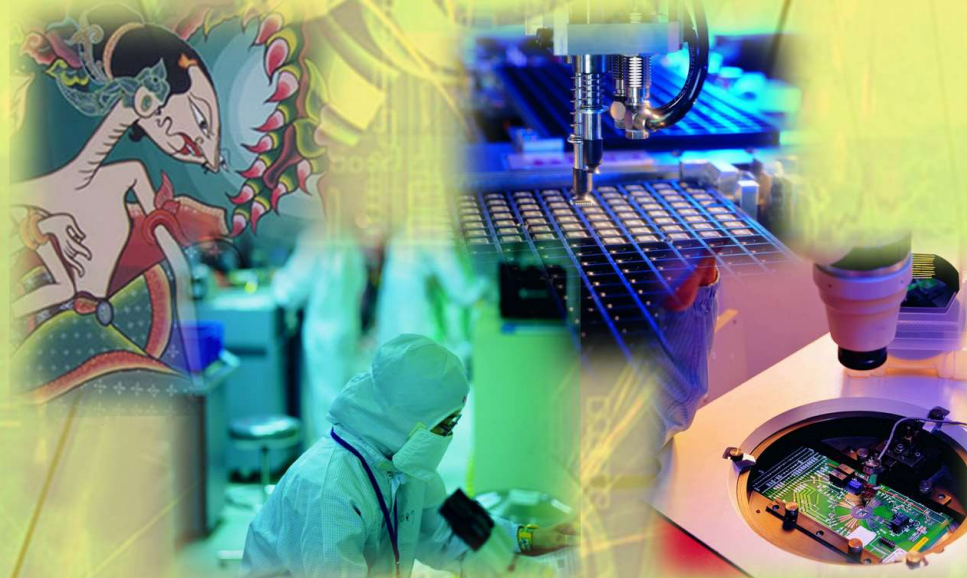


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ASIA PACIFIC CONFERENCE On ART, SCIENCE, ENGINEERING & TECHNOLOGY
(ASPAC On ASET) LETTER OF TRANSMITTAL

Solo, 22 May 2008

Dear Sir,

We have the honor to transmit herewith the Report of the ASPAC On ASET held in Solo-Indonesia, from 19 to 22 of May, 2008.

Accept, Sir, the assurance of our highest consideration.

Prof. Dr. Ir. R.J. Widodo, M.Sc
MASDALI-Bandung

**WELCOMING MESSAGE FROM
THE CHAIRMAN OF THE NATIONAL STEERING COMMITTEE
FOR
THE ASIA PACIFIC CONFERENCE (ASPAC) On
ART, SCIENCE, ENGINEERING & TECHNOLOGY (ASET) 2008
Rohani Jahja Widodo**

**at
The Universitas Sebelas Maret, The Institut Seni Indonesia Surakarta
&
The Universitas Muhammadiyah Surakarta
in
Surakarta
May 19 – 22, 2008**

Ladies and Gentlemen,

As the Chairman of the NSC for the ASPAC on ASET 2008, I would like to warmly welcome the presence the Mayor of Kota Surakarta, Rector of the Universitas Sebelas Maret, the Rector of the Institut Seni Indonesia, the Rector of the Universitas Muhammadiyah Surakarta, the Rector of Universitas Negeri Yogyakarta, the Rector of Universitas Sanata Dharma Yogyakarta and the Rector of Universitas Negeri Surabaya.

The first ASPAC on ASET was held in 04-08 October 2004 in Bandung by MASDALI in collaboration with Indonesian Institute of Sciences, the Universitas Kristen Maranatha and the Universitas Katolik Parahyangan the proceeding with ISBN 979-3688-04-1..

I would like to express my sincere appreciation to:

- | | |
|--|-------------------------------------|
| 1. Kota Surakarta. | |
| 2. Universitas Sebelas Maret, | 11 Universitas Kritis Satya Wacana, |
| 3. Institut Seni Indonesia, | 12 Universitas Negeri Lampung, |
| 4. Universitas Muhammadiyah Surakarta, | 13. Universitas Negeri Yogyakarta, |
| 5. Universitas Sanata Dharma, | 14. Universitas Tarumanagara, |
| 6. Sekolah Tinggi Teknologi Nasional, | 15. Yayasan Kartika Eka Paksi |
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for their scientific and financial sponsors.

Ladies and Gentlemen

The theme of this conference is

**“IMPROVEMENT of COMPETANCE
of
the HUMAN RESOURCES
through**

EDUCATION, TRAINING, RESEARCH & DEVELOPMENT”

It is indeed a distinct privilege and an honor for me to be given this opportunity to chair this conference.

I would like to extend a hearty appreciation to all speakers, participants, and sponsors, because of your participation at ASPAC on ASET 2008 is a strong indication of your deep interest and concern to the problem we are facing at present in Asia Pacific Region :

The QUALITY of the HUMAN RESOURCES..

I would like to thank to the MASDALI (Indonesian Control Systems Society), which allow me to chair this conference. MASDALI is proud and honored to host this ASPAC on ASET 2008 in Surakarta city of Bengawan Solo and the first PON was held in 1952. There are many activities during the conference :

1. Plenary Sessions (Policy Papers),
2. Parallel Sessions (Technical Papers in the field of A.S.E.T),
3. Science & Technology Exhibition,
4. Scientific Meeting to explore the scientific collaborations, among Lectures, Trainers, Researchers and Developers in the Asia Pacific Region.
and
5. Scientific Tours.

In closing, I would like to express my gratitude to the participants especially those from overseas in taking the time attending this conference.

BILA ADA JARUM YANG PATAH JANGANLAH DISIMPAN DALAM PETI ;
BILA ADA KATA DAN LANGKAH YANG SALAH JANGANLAH DISIMPAN DALAM HATI.

Mohon maaf atas kekurangan dan kesalahan kami.

We wish you a rewarding and enjoyable stay in Surakarta, Indonesia.

Thank you,

Rohani Jahja Widodo

The Chairman of the NSC for ASPAC on ASET 2008

RECOMMENDATIONS

1. The forming Of ASPAS on ASSET (Asian Pacific Society On Art, Spiritual, Science, Engineering & Technology).
2. The inauguration of Indonesian Green Forum Communication
3. The declaration of Asia Pacific Green Council
4. ASPAC On ASSET 2009, will be held on May 2009 in UNY, coincide with the Dies Natalis of the UNY-Yogyakarta.
5. ASPAC On ASSET 2010, will be held in the UNESA SURABAYA.
6. The declaration of Awakening of Spiritual Awareness
7. The Declaration of Appropriate Technology Intention for anti global warming
8. 100 years Long-term Strategy (Strategy Besar/Raya)

Jakarta, 24 April 2008

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FENOMENA PENCARIAN JATI DIRI **Laksamana Handoko**

Kita masih ingat pada saat dibangku sekolah dijelaskan bahwa ilmu pengetahuan mempunyai ciri mampu memberikan penjelasan tentang peristiwa-peristiwa yang terjadi di muka bumi ini dan selanjutnya memberikan perkiraan-perkiraan apa yang akan terjadi selanjutnya.

Namun dihadapkan kepada peristiwa-peristiwa yang terjadi beberapa tahun akhir-akhir ini yang terkenal dengan tragedi nasioriai agaknya ilmu pengetahuan belum banyak memberikan andil dalam mengungkap apa yang sebenarnya terjadi sehingga oleh karena belum dapat diberikan analisa diagnosis secara cermat dan tepat yang sangat diperlukan untuk menyusun langkah-langkah terapis agar bangsa dan negara kita dapat melampaui tragedi nasional ini secara sukses.

Sementara proses analisa ini masih berjalan terus, pada bulan September 2001 terjadi peristiwa yang lebih mengejutkan lagi dengan diserangnya gedung kembar WTC dan Pentagon pada siang hari bolong dengan menggunakan pesawat terbang penumpang yang mengakibatkan korban sekitar 7000 orang beserta hancurnya dua gedung tersebut. Kemudian pada bulan Oktober Amerika dan sekutunya menggunakan mesin-mesin perangnya yang canggih menyerang Afghanistan yang dituduh melindungi biang keladi penyerangan WTC di bulan September tersebut.

Sebenarnya siapakah mereka-mereka itu.
Apa yang mereka pertentangkan
Bolehkah manusia menggunakan ilmu pengetahuan dan teknologi
untuk saling membunuh.
Bolehkah manusia menggunakan ilmu pengetahuan dan teknologi
untuk merusak lingkungannya.
Bagaimana seharusnya hubungan antara manusia dengan Sang
Pencipta, manusia dengan sesamanya dan manusia dengan alam

Memang pernah ada suatu prakiraan sekitar 50 tahun yang lalu, yaitu pada saat terjadi perkembangan ilmu pengetahuan dan teknologi yang sangat pesat, yang memperkirakan bahwa kemajuan perkembangan IPTEK akan menyebabkan mundurnya kehidupan spiritualitas manusia. Selanjutnya perkiraan itu meramalkan kemunduran kehidupan spiritualitas manusia ini akan mencapai titik nadir pada akhir abad ke - 20. Namun peneliti tentang kecenderungan strategis John Naisbitt dan Patricia Aburdene menemukan gejala bahwa hamperdisetiap kota besar Amerika Serikat dan Eropa ribuan orang secara intusias mencari wawasan dan pengalaman spiritual.

Gejala ini berkembang terus sehingga pada dekade 80-an sudah bisa dikatakan sebagai suatu gerakan yang kemudian dikenal dengan gerakan New Age.

Perkembangan cara pandang nilai - nilai kehidupan dari gerakan ini cukup pesat seiring dengan perkembangan teknologi komunikasi dan informasi. Pengikut gerakan New Age yakin bahwa dunia sekarang ini yang sedang mengalami krisis poiusi, peperangan, keterbatasan sumber daya dapat dirubah kedalam suatu "Jaman Baru " yang penuh dengan cinta, menyenangkan, damai, sejahtera, dan serasi.

Merubah dunia diawali dengan merubah diri kita sendiri.

Lalu bagaimana cara merubah diri sendiri ini mengingat bahwa sebagian besar umat manusia di bumi ini sedang mengalami krisis multi dimensional yang mengelilingi setiap aspek kehidupan: kesehatan, lingkungan, hubungan sosial, ekonomi, teknologi dan politik. Singkatnya krisis di bidang intelektual, moral dan spiritual. Mereka (pengikut gerakan New Age) menggunakan pisau analisa filsafat Perennial untuk mencoba keluar dari masalah krisis moral dan spiritual ini. Manusia mengalami krisis karena telah melanggartitrah asalnya sebagai manusia. Untuk itu manusia harus segera sadar sesadarnya menghidupkan kembali fitrah asasinya dalam kehidupan sehari- hari. Manusia harus kembali kepada jati dirinya. Sehingga tidak mengherankan apabila ada kecenderungan dari mereka untuk menoleh ke falsafah Timur {Turning East}.

Selain itu pengikut New Age sangat tertarik dengan spiritualitas baru yang lintas agama, karena menurut mereka hakekat sejati dari agama -agama tidaklah bernilai sectarian, tetapi universal tidak pula eksklusif tetapi inklusif serta tidak juga dogmatis tetapi bersifat eksperiensial. Hal ini menurut mereka hanya bisa diperoleh melalui

pengembaraan spiritual (Spiritual Adventure).

Spiritual Adventure ini selain sangat disukai dikalangan New Age, juga merupakan hal yang sangat menarik dari gerakan ini.

Pengalaman spiritual yang dialami oleh mereka yang menggunakan teknologi Channelling belakangan ini makin marak bahkan juga berkembang menjadi Trend Milenium - ///. Salah satu temuan mereka (Hipotetik) dari beberapa temuan yang disusun berdasarkan hasil Channelling menyatakan bahwa kondisi bumi saat ini sedang memasuki masa transisi untuk menuju kesadaran yang lebih tinggi. Selanjutnya lebih spesifik lagi diutarakan bahwa dewasa ini bumi dalam perubahan dari kondisi kesadaran berdasarkan pemikiran secara linier, pemikiran konkret terpusat pada urusan dunia, kepentingan ego, menuju kepada kondisi kesadaran dalam jiwa berdasar kasih sayang tak terbatas, pemikiran yang lebih banyak terpusat pada urusan Tuhan, urusan adi kodrati.

Proses iompatan kesadaran ini selanjutnya dikenal dengan istilah A Quantum Leap karena memang merupakan suatu Iompatan besar secara kualitatif maupun kuantitatif dibidang kesadaran manusia. Sering pun disebut sebagai The Awakening - The Ascension - The Great Leap in Conciousness - kebangkitan - kenaikan - Iompatan besar dalam kesadaran manusia.

Selanjutnya ditambahkan bahwa pada waktu - waktu ini energi kosmik yang dipancarkan ke bumi secara akumulatif meningkatkan vibrasi dalam atom hingga tingkat yang belum pernah terjadi sebelumnya. Tabir antara dimensi terangkat, berakibat terjadinya benturan - benturan paradigma, terjadi benturan - benturan nilai -nilai. Seolah-olah tidak ada lagi yang bisa dipegang. Hal ini tidak boleh terjadi berlarut - larut. Proses Iompatan ini harus ada percepatan.

Proses percepatan dan keberhasilan Iompatan kesadaran ini banyak tergantung dari respon manusia di bumi ini (termasuk manusia Indonesia). Hukum kosmik (untuk membuat keinginan menjadi kenyataan } mengalakan bahwa semakin banyak manusia yang berubah, bumipun akan ikut berubah. Jadi kiranya perlu ada keinginan bersama dan kemauan bersama untuk merubah kesadaran manusia ke tingkat yang lebih tinggi yang diawali dari pribadi - pribadi kita.

BEBERAPA PANDANGAN TENTANG PENCERAHAN

Pencerahan dalam Kisah Dewaruci

Inti sari dari kisah ini menggambarkan bagaimana Bima menemukan "air kehidupan" . Bima adalah saudara kedua dari lima kakak beradik Pandawa dalam cerita Mahabrata.

Alkisah setelah gagal menemukan "air kehidupan" di gua Candramuka di sebuah hutan yang jauh Bima kembali kepada Duma melaporkan perihalnya , kemudian Duma menyarankan Bima untuk mencari air kehidupan yang dimaksud di dalam Samudera. Bima sebenarnya sudah mulai curiga akan ketulusan "gurunya" namun ia tetap bertekad untuk mendapatkan air kehidupan tersebut. Peringatan saudara-saudaranya juga tidak digubris. Melalui perjalanan yang melelahkan sampailah Bima ketepi Samudera . Dengan persiapan secukupnya ia terjun dan menyelam kekedalaman Samudera yang bergelombang besar disana bertemulah ia dengan seekor naga raksasa Nembumawa yang secara beringas. langsung menyerang Bima . Dengan kesaktian yang dimiliki Bima , biansaiah sang naga dirobek-robek oleh Bima dengan kuku Pancanakanya. Berhasil mengatasi rintangan kemudian Bima merasa kelelahan , mengapung di permukaan dan membiarkan dirinya terombang-ambing oleh ombak kia.i kemari . Sesaat kemudian keadaan menjadi sunyi menjadi hening.

Pada saat itu sekonyong-konyong muncuilah sosok "manusia" dalam wujud yang kecil sangat mirip dengan Bima sendiri . Ia memperkenalkan diri sebagai Dewaruci yang merupakan penjelmaan Yang Maha Kuasa sendiri. Ia mempersilahkan Bima untuk memasuki batinNya melalui telinga kiri . Meskipun ragu-ragu anehnya Bima mentaatinya.

Sesaat kemudian ia menemukan dirinya dalam kekosongan tanpa batas dan kehilangan segala orientasi . Kemudian setelah beberapa saat ia melihat kembali matahari , daratan , gunung dan pantai . Lalu ia menyadari bahwa dalam tubuh kecil Dewaruci seluruh alam luar termuat secara terbalik (jagad walikan) Lalu ia melihat empat wama , tiga diantaranya yaitu kuning, merah dan hitam melambungkan nafsu-nafsu yang berbahaya yang harus di jauhi sedangkan wama keempat putih melambungkan ketenangan hati. Ia juga melihat boneka gading kecil yang melambungkan Pramana, prinsip ilahi yang berada didalam dirinya sendiri serta

memberi hidup .

Bima menyadari bahwa hakekatnya yang paling mendalam ialah manunggal dengan yang Ilahi.

Setelah melalui proses pencerahan Bima mencapai dimensi realitas hidup yang terdalam , ia menjadi penguasa atas seluruh bumi.

Seluruh alam semesta lerimpung olehnya , tidak ada yang lagi yang bisa dipelajari , " dalam kehidupannya ia telah mati " dan ia " hidup dalam kematiannya" . Dengan kesaktiannya yang tak tertandingi ia meninggalkan Dewaruci. Pencera/iasv - L Ha<ndoko-

Dalam ketenteraman batin ia pulang kepada kakak dan adik-adiknya. Kembafi melaksanakan tugas dan kewajibannya dengan motivasi baru. Kisah ini pula yang menjadi orientasi kelompok-kelompok Kejawan dalam memandang Pencerahan yaitu "Manunggaling Kawuia Gusti" Ada beberapa metode yang digunakan oleh paguyuban-paguyuban Kejawan, dengan warna dan corak sesuai dengan proses pencerahan yang diaiami oleh "guru mursyid"nya masing-masing.

Pencerahan dalam Zen Budhisme

Inti ajaran Budhisme adalah dicapainya pencerahan . Sebagaimana Sidharta menjadi Sang Budha.

Sehingga disini pencerahan diartikan sebagai proses terjadinya perubahan pengertian tentang hakikatnya yang terdalam (Sarori) dan perubahan tentang penglihatan hakekatnya sendiri (Kensho jserta pengalaman fruitif yang membahagiakan dan mengubah hidup seseorang .

Didalam proses pencerahan ini mereka sering mengaiami peibagai macam gejala paranormal , seperti halnya pengalaman makyo yang artinya dunia iblis. Pengalaman yorlki yaitu pengalaman dalam hal mengaiami kekuotan tenaga batin yang besar.

Penggunaan tenaga atau kekuatan-kekuatan tersebut yang tidak pada tempatnya akan menghalangi seseorang mencapai kensho

Jalan yang akan membawa atau membimbing manusia membentuk kembali keseluruhan did sebagai makhluk baru yang memandang hidup secara benar dan melaksanakannya disebut Delapan jalan utama , yang meliputi:

1. Mendapatkan dan memiliki pengetahuan yang benar
2. Memiliki kehendak yang benar
3. Menggunakan perkataan yang benar
4. Menampilkan perilaku yang baik
5. Menjalani penghidupan yang benar
6. Berupaya yang benar
7. Memiliki dan mengembangkan pikiran yang benar
8. Renungan yang benar menuju pencerahan rohani

Proses pencapaian pencerhan ini darl sisi lain dapat diakatakn sebagai perjalanan rohani atau pendakian rohani.

Sehingga dalam praktek sehari-hari delapan jalan utama ini selain sebagai jalan yang merupakan fungsi utamanya namun juga memiliki fungsi-tungsi lain, yaitu sebagai rambu-rambu untuk menjaga keselamatan pejalan rohani dan juga sekaligus sebagai tolak ukur dalam melaksanakan evaluasi perjalanan rohani itu sendiri.

Dengan demikian maka seseorang akan selalu mengikuti dan menyadari : dimanakah sekarang ini saya berada , kemanakah tujuan saya, dan bagcimana cara saya mencapai tujuan tersebut.

Pencerahan dalam spiritualitas Hindu

Kecenderungan yang menarik dalam perkembangan spiritual Hindu yaitu tampilnya kerinduan manusia untuk bersatu dengan Yang Abadi Yang Tak Berubah yang biasanya disebut dengan istilah Brahman.

Proses menyatunya manusia dengan Brahman yang mempunyai sifat pokok sat (ada), sit (kebijaksanaan) dan ananda (kebahagiaan) disebut pencerahan.

Proses ini dilewati melalui pelatihan jasmani dan rohani yang secara keseluruhan disebut yoga.

Kadangkala yoga digambarkan secara salah kaprah yaitu semacam kegiatan duduk dengan tenang kemudian mempelajari kaidah-kaidah mutiara dan filsafat. Sebenarnya kata-kata mutiara dan filsafat yang didapat dari membaca adalah ilmu pengetahuan yang bukan baru lagi (second hand Knowledge) yang bukan itu maksudnya yoga.

Selain itu yoga juga bukan berarti bahwa harus menghentikan kegiatan-kegiatan hidup sehari-hari, tetapi kehidupan sehari-hari tetap dijalankn ditambah satu kebiasaan baru yaitu yoga.

Pada dasarnya yang merupakan suatu system kegiatan / praktek yang menolong seseorang (pelakunya) untuk mengembangkan diri sebagai manusia. Meskipun pada awalnya yoga dapat dipelajari melalui pelatih atau petunjuk dalam buku instruksi - yang tentu saja banyak juga manfaatnya karena hal ini juga merupakan sharing pengalaman - tetapi tetap bagaimanapun juga seseorang dalam pelatihan yoga ini harus mencoba sendiri model-model meditasi dan yoga. Dengan seringnya pelatihan yoga ini dikerjakan maka akan banyaklah macam-macam model yang dialami.

Melalui yoga kesadaran manusia akan berkembang. Kemudian badan akan menjadi kuat tapi luwes / lentur (supple) dan pikiran akan menjadi lebih tenang dan jernih serta sadar akan pola hidupnya serta memiliki cakrawala pandang yang lebih luas sehingga dapat melihat permasalahan pada tempatnya termasuk disini adalah rambu-rambu yang akan memberi peringatan atau petunjuk dalam perjalanan kehidupan selanjutnya. Pelatihan ini mencapai puncaknya pada saat terjadi bersatunya diri dengan Brahman, atau bahkan merealisasi Brahman dalam dirinya, mengalami bahwa ia adalah sebenarnya Brahman sendiri. Inilah yang selanjutnya dikenal dengan istilah pencerahan.

Dalam kondisi demikian inilah biasanya diikuti dengan suatu pengalaman "advaita", nondualistik seperti pada Zen- Budhisme. Pengalaman ini sangat membahagiakan dan yang dapat merubah hidup seseorang secara mengesankan. Pengalaman inilah oleh kelompok pengikut New Age diistilahkan sebagai a glimpse of Paradise.

Pelatihan rohani berjalan terus dengan tekun, dengan disiplin yoga sehingga cepat atau lambat akan dirasakan dan disadari timbulnya kekuatan bathin tertentu yang diistilahkan dengan sidhi suatu kekuatan paranormal, suatu kesaktian, atau dalam istilah Jawa sering disebut dengan daya linuwih. Namun kekuatan ini kadang - kadang justru menjadi penghalang tercapainya tujuan yang hendak dicapai. Biasanya kekuatan ini hanya sebagai perbendaharaan yang selanjutnya tidak dikembangkan secara berlebihan bahkan seyogyannya tidak digunakan secara tidak semestinya.

Pencerahan melalui metoda Kuan Yin

Metoda ini dipilih mengingat adanya kekhasan yang menjadikan digandrungi oleh pencari kebenaran dari dunia Barat teristimewa pengikut gerakan New Age. Mereka sedang gandrung-gandrungnya menoleh ke Timur. Guru sejati dari metoda Kuan Yin dewasa ini adalah Supreme Master Ching Hai. Beliau menyatakan:

" Saya tidak tergolong penganut agama Budha atau Katolik. Saya

penganut ajaran Kebenaran, mengkhobatkan kebenaran. Anda boleh menyebutnya ajaran Budha, Katolik, Tao atau apapun yang anda sukanya sama I "

Tidak setiap orang bisa berlatih metoda Kuan Yin, meskipun setiap orang memiliki sifat ke-Budhaan dan bahwa setiap orang boleh berlatih rohani, namun kalusaatnya belum tiba belum tentu ia mau berlatih. Sehingga harus ada niat yang bersangkutan. Mungkin bisa digambarkan dalam kisah Dewaruci seperti niat yang dimiliki oleh Bima untuk mendapatka air kehidupan yang ia utarakan kepada gurunya.

Inisiasi metoda Kuan Yin bukan merupakan upacara untuk menjadi penganut agama baru. Didalam inisiasi ini diberikan petunjuk-petunjuk khusus mengenai meditasi pengamatan cahaya bathin dan suarc bathin serta guru Ching Hai memberikan transmisi rohani. Rasa keberadaan llahi yang pertama kali diberikan dalam keheningan (dalam pengikut New Age sering disebut sebagai pengalaman llahi). Dalam hal ini guru Ching Hai tidak perlu hadir secara fisik untuk membukakan "pintu" ini. Transmisi rohani merupakan bagian yang penting dari metoda ini. Sehingga sebenarnya teknik-teknik itu sendiri tidak banyak memberikan manfaat tanpa kemurahan hati Guru.

Adakalanya dalam tahap inisiasi ini seseorang mendengar suara bathin dan melihat cahaya bathin saat itu juga, maka bila hal ini terjadi sering dikatakan bahwa inisiasi ini merupakan "pencerahan seketika" atau "pencerahan segera". Peserta inisiasi bisa terdiri dari orang-orang penganut semua golongan agama maupun

semua latar belakang profesi.

Persyaratan yang harus dipenuhi oleh peserta inisiasi adalah menjadi vegetarian seumur hidup dan menaati lima pantangan yaitu :

1. Pantang membunuh
2. Pantang bedusta
3. Pantang mencuri
4. Pantang berzina
5. Pantang mabuk dan madat

Kemudian setiap hari melaksanakan pelatihan rohani dalam bentuk meditasi sekurang-kurangnya secara akumulatif selama dua setengah jam .

Setelah mengalami inisiasi ditambah dengan mematuhi persyaratan secara tekun maka tahap berikut bisa disebut sebagai pendakian rohani. Pada saat berhasil mencapai tingkat pertama/ dunia pertama (istilah ini digunakan untuk membantu memudahkan penangkapan pembaca) dan kerajaan Allah banyak dari peserta yang serta merta memiliki kemampuan-kemampuan yang lebih dari sebelumnya . Misalnya kemampuan penyembuh, melihat melampaui batasan ruang, mendengar dari jarak jauh, atau diluar frekuensi wajar. membaca pikiran orang secara tepat. Kadang-kadang juga kemampuan menulis, melukis, bahkan serin juga anugerah surga lainnya dalam bentuk karier, keuangan dan lain-lain.

Diharapkan setelah memiliki kemampuan-kemampuan ini tidak menjadikan seseorang terlena sehingga tidak berjuang untuk meneruskan pendakiannya .

Bila tahap ini dilalui dengan berhasil maka telah menunggu tingkat kedua/dunia kedua . Ditingkat ini akan banyak kemampuan dan kesaktian yang diperoleh dibandingkan di tingkat pertama . Kemampuan yang sangat menonjol adalah dalam berbicara dan berkotbah serta berdebat karena kecerdasan yang dimilikinya pada tingkatan yang tertinggi . Di India tingkatan ini disebut " Bodhi" . Termasuk dalam kemampuan ini adalah membaca " Akashic Record" sehingga akan bisa mengetahui kejadian-kejadian masa lampau, sekarang dan yang akan datang.

Ditingkat ini harus sudah mulai melunasi karma yang tersisa dari kehidupan yang lampau dan sekarang.

Tingkat ketiga atau dunia ketiga adalah tingkat tertinggi dari Tiga Dunia atau sering disebut sebagai Triioka. Dunia ketiga ini dapat dicapai setelah seseorang benar-benar bersih dari semua hutang dunia ini.

Dunia keempat. Dunia ini sungguh dunia yang luar biasa indahnya sehingga sulit digambarkan dengan kata-kata yang kita pakai sehari-hari. Namun sebagian daripadanya terdapat bagian yang sangat gelap. Bag: seseorang yang belum mencapai kebenaran sejati sangat mungkin akan terhalang disana. Guru sejati yang berpengalaman dapat membimbing mereka melalui tempat itu.

Dunia ke-5. Disinilah "rumah" Guru sejati, semua guru sejati berasal dari sana. Melampaui dunia ke-5 berarti sudah banyak masuk kepada aspek Tuhan.

Pencerahan dalam pandangan Kristen

Dalam makalahnya yang berjudul Tinjauan Spritual - Gejala Paranormal dalam Perjalanan Rohani - Pastur Yohanes indrakusuma O. Carm, Memberikan pengertian tentang pencerahan berdasarkan pedoman yang diberikan Santo Yohanes Salib yang dikenal sebagai pembimbing rohani yang besar.

" Bila hal itu terjadi (melalui pengosongan diri) jiwa akan diterangi oleh Allah dan dirubah kedalam Allah. Dan Allah akan memberikan adanya yang adi kodrati sedemikian rupa kepadanya sehingga ia tampaknya seperti Allah sendiri dan akan memiliki segala sesuatu yang dimiliki Allah sendiri. Bila Allah memberikan karunia adi kodrati ini kepada jiwa, suatu persatuan yang demikian besarnya akan terjadi sehingga segala sesuatu yang ada pada Allah dan jiwa menjadi satu dalam satu transformasi partisipasi, dan " jiwa " itu sendiri tampaknya lebih Allah daripada jiwa. Sungguh ia benar-benar Allah karena partisipasi".

"Ia melihat dirinya ditingkat diatas segala pengertian kodrati kepada cahaya Illahi. Pengalam seperti ini dapat dibandingkan dengan keadaan seseorang yang sesudah tidur panjang membuka matanya dan melihat cahaya yang luar biasa yang tidak pernah diduganya sama sekali".

Dalam keadaan seperti itu, jiwa dibawa kepada suatu pengenalan Allah yang begitu mendalam dan mesra, menghasilkan suatu suka cita dan kebahagiaan yang begitu mendalam, yang tak terukiskan, yang ineffable. Budh pengalaman itu begitu kaya sehingga langsung menghapuskan semua kekurangan yang tidak bisa diatasi seumur hidup, betapun orang berusaha mati-matian untuk mengatasinya.

Perjalanan rohani atau ziarah rohani atau kadangkala disebut pelatihan rohani Kristen ini diawali dengan :

1. Inisiasi Kristen yang terdiri dari sakramen pembaptisan, sakramen krisma (penguatan) dan sakramen ekaristi.
2. Sakramen tobat

3. Sakramen perkawinan
4. Sakramen imam/ pentahbisan
5. Sakramen pengurapan orang sakit
6. Sakramentaii (doa-doa tertentu, jalan salib, pemberketan-pemberkatan khusus dan lain-lain).
7. Puasa dan pantang, meditasi, ziarah rohani , pelayananandan lain-lain.

Karismata yang dewasa ini muncul dan banyak dialami orang dalam proses pencerahan dapat digolongkan kedalam :

1. Sabda kebijaksanaan , karunia untuk mengerti situasi dengan tepat dan dapat bertindak dengan bijaksana atau memberikan nasihat yang bijaksana.
2. Sabda pengetahuan, untuk mengerti apa yang saat itu sedang dikerjakan Tuhan dan menyatakannya dengan tepat
3. Iman, karunia sesaat yang memberikan keyakinan yang pasti akan suatu hal. Inilah iman yang mampu memindahkan gunung.
4. Penyembuhan, karunia untuk menyembuhkan orang lain lewat iman, bukan dengan kekuatan sendiri atau tenaga da'iam melainkan semafa-mata lewat iman.
5. Mukjizat, karunia yang dapat berupa penyembuhan yang iugr blasa yang tidak dapat diterangkan secara kodrati. Selain itu juga dapat berupa lain seperti misalnya penggandaan roti, berjaian di atas air dan lain-lain.
6. Nubuat karunia untuk menangkap dan mengerti kehendak Allah serta menyampaikannya kepada jemaat atau kelompok tertentu.
7. Membeda-bedakan roh , karunia untuk secara intuitif mengenali roh apa yang menjiwai seseorang, diperlukan untuk menguji nubuat juga diperlukan dalam pelayanan doa , untuk mengerti dengan tepat kebutuhan seseorang.
8. Bahasa roh, karunia untuk berdoa dan berbicara dalarrV"bahasa" tertentu. Merupakan suatu bentuk doa yang ineffable, semacam kontemplasi awal.
9. Karunia tatsiran, karunia untuk menafsirkan bahasa roh itu bagi jemaat yang berkumpul.

Pencerahcm melalui pelajaran Makr'rfat.

Belakangan ini memasui milinium III, Metafisika Study Club mengembangkan metode perenungan dan pelatihan Makrifat. Kegiatan ini dilaksonakan lebih intensif pada 5 tahun akhir-akhir ini. Secara singkat pelajaran Makrifat yang dimaksud adalah sebagai berikut:

Makrifat adalah ilmu pengetahuan yang tertinggi dalam agama Islam yang diajarkan oleh Nabi Muhammad SAW.

Di Jawa Ilmu Makrifat disebarluaskan oleh Sunan Bonang dan Sunan Giri yang memperoleh pelajaran dari Maulana Ishak yaitu ayah Sunan Giri dan Syeh Hamzah Fansuni yang menjabat Penasehat Spiritual Kerajaan Pasai di Panto? Barat Sumatera.

Murid-murid Sunan Bonang dan Sunan Giri antara lain adalah Sunan Kalijaga, Sunan Kudus dan para wali lainnya serta raja-raja Jawa dan kerabatkenalan yang terdekat.

Raja-raja Jawa dan kerabat keraton yang menggunakan gelar Ki Ageng (K.A.) adalah guru-guru mursyid atau guru Makrifat.

Penyebaran ilmu Makrifat sejak zaman wali hingga sekarang disampaikan secara rahasia dan tertutup serta terbatas hanya kepada orang-orang teipilih dengan metode lisan.

Pada zaman penjajahan mengajarkan ilmu Makrifat dilarang, karena para pahlawan yang memberontak kepada Belasnda pada umumnya memfliki ilmu Makrifat.

Kini beberapa guru Mursyid berusaha menginformasikan dan mengajarkan ilmu Makrifat secara terbuka sesuai perkembangan zaman, dengan tujuan agar sebanyak mungkin manusia memperoleh pencerahan untuk meningkatkan kesadaran spiritual.

Adapun pengertian Makrifat menurut Imam Ghozali adalah sebagai berikut:

Makrifat artinya pengenalan kepada Allah SWT, berdasarkan penyaksian.

Jadi Makrifat artinya monyaksikan Allah SWT secara langsung, secara nyata tanpa perantara.

Pasulullah Nabi Muahmmad SAW bersabda:

"Awaludini Ma'rifatullah ta'ala", artinya awal mula beragama adalah mengenal / menyaksikan Allah SWT.

Contoh: Nabi Muhammad SAW setelah ma'rifatullah memperoleh wahyu pertama (di gua Hira untuk Iqro' dengan perantara malaikat Jibril sedangkan perintah melaksanakan sembahyang lima waktu baru diperoleh pada saat Isro' dan Mi'raj.

Sedangkan syarat-syarat untuk Makrifat adalah: 1. Memiliki keinginan yang tulus dari hati sanubari untuk menemui Tuhan tanpa paksa-ikutan atau sekedar ingin tahu.

2. Menyakini bahwa menemui Tuhan merupakan suatu kewajiban dan menyadari segala sanksi-sanksinya bagi mereka yang tidak mengharapkan pertemuan dengan Tuhan.
3. Mencari seorang pembimbing /pemandu/guru mursyid yang dapat memberikan kunci Ilmu Makrifat untuk dapat menemui Tuhan atau memasuki rumah Allah SWT/Baitullah/Kerajaan Allah.

Selanjutnya proses pencerahan ini secara singkat dapat digambarkan sebagai berikut:

- Engkau harus melihat tanpa mata.
- Engkau harus mendengar tanpa telinga.
- Engkau harus bekerja dan berbicara tanpa menggunakan lidah
- Engkau bahkan harus mati selagi hidup, dan sesudah itu barulah hidup dapat mendengar sabda Tuhan dan bertemu dengan Dia.

Karunia yang diperoleh sesudah Makrifat adalah:

1. Meningkatnya pengenalan jati diri.
2. Meningkatnya pengenalan Tuhan.
3. Meningkatnya Taqwa.
4. Mencintai Tuhan dan ciptaan-Nya.
5. Sadar akan tugasnya sebagai khalifah untuk Mamayu Hayuning Bawono
6. Istiqomah
7. Lebih mensyukuri nikmat Tuhan

DISKUSI

Latar Belakang

1. Ilmu pengetahuan dan teknologi tidak mampu menjelaskan dan mengatasi secara tuntas tragedi nasional maupun internasional.
2. krisis multi dimensional disebabkan karena manusia ingkar akan fitrahnya
FENOMENA BUMI DALAM HAUS AKAN TRANSISI KEHIDUPAN (AL QUANTUM SPIRITUALITAS LEAP) PENINGKATAN KESADARAN MANUSIA AKAN JATI DIRINYA
3. Merubah kesadaran manusia ketingkat yang lebih tinggi dapat dilakukan melalui proses pencerahan.
Pengertian
4. Beberapa pandangan tentang pencerahan :
 - a. Kisah Dewaruci / pandangn Kejawan, manunggaling Bima Dewaruci manunggaling Kawuia Gusti.
 - b. Pandangan Zen Budhisme, Sdharata menjadi Budha.
 - c. Spiritualitas Hindu, menyatunya manusia dengan Brahman.
 - d. Metode Kuan Yiaberadanya Hani dalam diri manusia.
 - e. Pandangan Kristen, menyatunya Allah dalam diri manusia.
 - f. Ilmu Ma'rifat.
5. Pengertian umum . Berdasarkan pandangan - pandangan tersebut diatas dapat dirumuskan pengertian umumnya ialah sebagai berikut:

Pencerahan adalah bagian kegiatan dalam perjalanan rohani seseorang yang merupakan hadirnya Allah kedalam diri manusia sehingga jiwa diterangi oleh Allah dan dirubah ke dalam Allah. Dalam keadaan seperti itu, jiwa dibawa kepada suatu pengenalan Allah yang begitu mendalam dan mesra, menghasilkan suatu sukacita dan kebahagiaan yang begitu mendalam yang tak terlukiskan (inefable).

Buah pengalaman itu begitu kaya sehingga langsung menghapuskan semua kekurangan yang tidak bisa diatasi seumur hidup, betapapun orang berusaha mati-matian untuk mengatasinya.

METODA

PKMAHAMAN MENDALAM -JATI DIRI -HUB MAN : DON ALLAH DGN MAN DON ALAM -
PANGGILAN -KURNIA PANTANG RAMBU PUASA JALAN UTAMA MKDITASI

- ◆ NIAT
- ◆ WELAS ASIH
- ◆ PENGETAHUAN

KURNIA YANG DIPEROLEH (metoda Kuan Yin)

DUNIA-V 11 RUMAH " GURU SEJATI
DUNIA-IV ◆ DUNIA INI SANGAT INDAH
◆ BISA MENGHALANGI
DUNIA - III TINGKAT TERTINGGI DARI TRILOKA
DUNIA-II KEMAMPUAN BERBICARA, DISKUSI, KECERDASAN TINGGI, AKASHIC
RECORD ◆ BODHI
DUNIA-I PENYEMBUHAN, MELIHAT DAN MENDENGAR MELAMPAUI BATAS
WAJAR , MEMBACA PIKIRAN ORANG . MELUKIS DAN MENULIS
i

KARUNIA YANG DIPEROLEH (pandangan Kristen)

1. Sabda kebijaksanaan
2. Sabda pengetahuan
3. Iman
4. Penyembuhan
5. Mukjizat
6. Nubuat
7. Membeda-bedakan roh
8. Bahasa roh
9. Karunia tafsiran bahasa roh

KARUNIA YANG DIPEROLEH (Dalam ilmu Makrifat)

1. Meningkatnya pengenalan jati diri.
2. Meningkatnya pengenalan Tuhan.
3. Meningkatnya Taqwa.
4. Mencintai Tuhan dan ciptaan-Nya.
5. Sadar akan tugasnya sebagai khalifah untuk Mamayu Hayuning Bowono
6. Istiqomah
7. Lebih mensyukuri nikmat Tuhan

IMPROVING THE QUALITY OF HUMAN RESOURCES FOR DEVELOPMENT

Murari Suvedi, Professor
Michigan State University

Mr. Chairman, Honorable Minister, Governor, distinguished guests, and colleagues from industry, government, and academe.

I am truly honored to stand before all of you to deliver the keynote address for this grand event today -- the Second Asia Pacific Conference on Art, Science, Engineering and Technology. I would like to extend sincere thanks to the Organizing Committee for allowing me to express my thoughts to the distinguished participants in attendance from the government, industry, and the academe.

Born and raised in a small farm in the mountain region of Nepal, I have been a student of agricultural sciences for more than 35 years. I have studied and worked on both sides of the world: the developed world and the developing world. So, in some ways, I feel that I am destined to speak today about my perspectives on the challenges facing our society and my vision for improving the quality of human resources for sustainable development.

I will divide my talk into four distinct areas. First, I will share with you some facts about our world, its population and the challenges we face to maintain our quality of life. Second, I will highlight the changes taking place in our society as a result of the adoption of technologies in our daily lives. Third, I will discuss the need for quality of human resources for sustainable development in the 21st century. Specifically, I will focus on challenges facing the system of higher education. Finally, I will outline strategies for educating the new generation and how we should proceed toward human capacity development in the 21st century.

Our World

In 1900, the world population was about 1.6 billion people. By 2000 there were more than 6 billion people. The population is growing by 360,470 persons every day, 15,020 every hour, 250 every minute, or 4.2 every second. According to the United States Census Bureau, the world population is expected to reach 9 billion in another 50 years. This means that, although the population has begun to stabilize, we need to prepare to feed, house and provide care for an additional 3 billion people.

A new trend has emerged in the distribution of world population. About half of the world's population will be urban in 2008 (People and Planet, 2008). Cities and urban areas are gaining some 60 million people every year and urban population of the developing world is growing rapidly.

Of course, progress has been made to feed and cloth the growing population. Extreme poverty has been receding, though hunger still persists in many parts of the world. However, I draw your attention to the following questions: Can we supply food to our growing population at affordable prices? How can we ensure a regular food supply in light of the worldwide rise in energy costs? What has been done to reduce inequality and unemployment? What are the consequences of rapid population growth in housing, water and energy supplies? What are its consequences to our schools, universities, healthcare facilities, businesses and industries? How will it impact on our lakes, rivers, forests or fishing areas? What are the consequences of rapid urban population growth of residential housing and factories into previously prime rice-growing land?

Science, Technology and Society

Scientific discoveries and advances have influenced almost every aspect of our lives. The wave of change has been very significant in the past 40-50 years. To illustrate some examples-- many of us in this room were not born in a hospital. We did not receive the immunizations and vaccinations our children receive today. Many of us attended elementary school where only one teacher taught the entire school under a tree or a one-room school house. We were mostly boys attending school; our sisters stayed home working on the farm or helping our parents at home. We walked to our school crossing rivers and swamps under the hot

sun or the rain. We had no radio, television, computer or the cell phone. Today, we are raising our children in an environment which is much different from that of our time. The way of life has changed so much that our own children have a hard time believing us. They frequently ask, “Oh, really?”

Our society has experienced tremendous change in the past 50 years. Through adoption of scientific discoveries and technologies, we have increased food production, processing and distribution. We have built new polytechnics and universities; modernized our health care systems, built infrastructures such as roads, bridges, waterways and airports; established communication networks in radio, television and the Internet; and we have opened up and expanded trade and commerce with other nations. New democracies following a new governance system have emerged. As a result, today we live in a highly interconnected and interdependent world.

There has been an explosion of new knowledge. Artists, scientists, engineers and educators are working tirelessly to generate new knowledge and develop new technologies. Educational leaders, development planners and policy makers, entrepreneurs of businesses and industries, and decision makers serving our governments – all are constantly developing or adapting policies and programs so we can harness the benefits from the evolving knowledge and technology.

Change has been the buzzword in every aspect of life—new software, new medicine, new construction material, new textbook, new food product, new fashion, new music and so on. Political leaders, social workers, educational administrators, healthcare professionals, business entrepreneurs, policy makers, scientists and engineers—all are seeking change. We are at the cross-roads of change. It is important to note, here, that it is our human resource which is the driving force for all the change we are experiencing today and will continue to face tomorrow.

Human resource is shaped by our educational system. The quality of our educational system needs to improve so that our human resources can sustain the progress we have made, and lead into the new era of development. I believe this is essentially the theme of this conference, so let me outline few strategies for the improvement of the quality of human resources.

Improving the Quality of Human Resources: Challenges and Opportunities

Human resource is the basic and most important factors in a nation’s development. In an era of globalization, a high quality human resource is mandatory for every nation. The quality of human resource of a nation will determine their competitiveness in the world economy. The well-equipped and skilled human resources will contribute to the individual, organizational and national development through improved performance (Osman-Gani and Tan, 1998). A nation’s development is not sustainable unless it is supported by a well-trained workforce of her own people.

Several terminologies have been used to describe human resource development, e.g., manpower development, workforce development, people development, training and skills development, human capital development and capacity building. National planning commissions or national development boards are given the responsibilities to develop policies and formulate plans for human resources development. Governments have made major investments in establishing schools, polytechnics vocational training centers, colleges and universities. Businesses and industries have established trade schools and workforce development or training centers. Private entrepreneurs have made investments in establishing schools, technical colleges and universities. Despite such massive investments, the quality of human resources in many countries is poor and we see a need to strengthen our educational system.

Mr. Chairman, Ladies and Gentlemen,

Let me now focus on the challenges and opportunities facing the quality of human resources development in the Asia Pacific Region. Despite achievements in literacy rates in the past 40-50 years, our educational system is facing a serious crisis. Let me summarize that crisis.

Our students: Our student population is increasing. Our schools have not been able to keep up with the growing student enrollment pressure. Classrooms are crowded, playgrounds have shrunk, and student-teacher ratio has gone up.

We have increased the overall educational participation, but we need to address the high school drop-out rate. For example, in Indonesia, about 15% of the students drop out at the elementary school level; 63% enroll in secondary school; and 17% enroll in the tertiary level (EdStats, 2007). This indicates that a small proportion of the population complete college degree and only few continue to advanced graduate or professional education.

What are the implications of these statistics for national development plans? How can the development planners and policy makers use this information to shape up our educational system? How can we be competitive in the global economy and job market? What kind of jobs should be created for those who did not complete high school?

We see a need for massive reform in our educational system. First, we need reform in our basic education delivery system—popularly known as K-12 education. The goal should be to equip students with basic reading, writing, math and social skills. Social skills include dealing with citizenship and pride in nationalism, preserving our arts and culture, and serving as stewards of our landscape. This education should be made accessible to all people.

Second, we need to strengthen and enhance our technical and vocational training in order to develop employable skills of our labor force. Vocational training enables working adults to acquire employable skills. It also helps re-skill our labor force to fill in job vacancies requiring new skills. Technical and vocational training is essential for workforce development and address the problem of unemployment or under-employment.

Third, our businesses and industries, in order to stay competitive, need to modernize their operation and management. The changes taking place in technology means that job skills and requirements are changing. As a result, they need to constantly upgrade the skills of their employees. They need to initiate worker training and retraining schemes at our production facilities, factories and industries to upgrade them with skills needed for use of new technology. This is an area in which I see a need for new linkages between the businesses or industries and polytechnics or universities. National governments should develop policies to promote collaboration.

Fourth and the most important, we need reform in our higher education system in order to equip our graduates with scientific knowledge and skills needed to discover new technologies, adapt policies to disseminate these technologies to benefit humankind and guide change in harmony with our societal values. The higher education system is the engine driving manpower development. It is higher education that trains our school teachers, civil servants, engineers, doctors, lawyers, businessmen, and many other types of service providers. The quality of human resources of a nation depends on the quality of higher education—its faculty, curricula, research, and outreach programs.

Challenges and Opportunities to Reform Higher Education

Mr. President, let me spell out few challenges facing our higher education system and opportunities to reform or address these challenges:

1) **Student enrollment pressure:** Our colleges and universities are facing tremendous pressure for student enrollment. As colleges and universities have limited resource, i.e., classrooms, laboratories, faculty and staff support, some colleges have imposed a system such as an entrance examination to admit students. Unfortunately, this system can hurt a student who comes from a remote rural village simply because he or she may be unable to compete with suburban school graduates in entrance examinations in which math, science and probably English skills are tested. This may lead to a weaker human resource base required for sustainable rural development.

Two alternatives are available to address to the enrollment pressure: we may choose to build more colleges and universities; or we increase the enrollment capacities at existing universities. Many nations tend to choose the first option of building new colleges or universities using various forms of public-private partnership models.

2) Our curriculum: Traditionally, we adopted the Western curricula at our colleges and universities which were either discipline-based or professional majors. Disciplinary majors have included areas such as sociology, civil engineering, animal science, horticulture, etc., which have had established national journals and a professional society. Professional majors tended to focus on vocational orientation, with the bulk of graduates entering the world of work following graduation (Bawden, 1996). Examples include business management, telecommunication and food marketing. This distinction is important in designing our general curricula. What type of work will our graduates be doing upon graduation? To give one example, how many semester credits of math, calculus, statistics or chemistry should we require for graduation? Should we be preparing students to enter graduate school or prepare them for employment? Obviously, this has implications for resource requirements—the number and types of faculty hires, and the size of laboratories and farms/experiment stations to maintain.

We know that curriculum development is a dynamic process and that we should be continually updating curricula as new knowledge becomes available. Accordingly, we need to upgrade our textbooks, lab equipment, chemicals and manuals, and computer hardware and software. We also need to invest in faculty development programs to keep our faculty members current in their fields. Our buildings are aging, our labs are rusted, and our faculty members lack vigor without funds to support their development or exchange programs.

3) The pedagogy: We have witnessed major structural changes in the content and style of instructional delivery, from hierarchical, test-based, instructor-driven, passive-knowledge-transfer types of instruction to present-day learner-centered, online instruction.

This transition in the style of teaching and learning has changed from encouraging rote memorization of fact and principles to hands-on learning. Educators have recognized that students lack proper understanding of social value and culture and do not know how to communicate effectively with clientele or customers, marketers, and policy-makers. They also lack ethics, interpersonal skills, entrepreneurial skills, teamwork skills, and leadership skills. In order to address these issues, we have revised our curricula and graduation requirements. We encourage students to be problem solvers through immersion into the world of work through internships. I feel that the higher education system in the developing world should consider similar pedagogical innovation in college teaching and learning.

4) Internationalization of curriculum: With tremendous growth and interdependence of trade taking place among nations, we have to add a new dimension to our undergraduate curriculum—the international dimension for sustainable development. We need to create opportunities for our students to learn what other nations are doing in order to keep their industry competitive in the world market. To be competitive, they need to see what technology and services are utilized by others, and what is required for successful business operations. They need to understand the importance of global markets and to find ways to cooperate and collaborate to improve the systems of production, processing and marketing. At Michigan State University, we strongly encourage and support students to study abroad, and we are in the top 10 for both study abroad participation and international student enrollment among U.S. public universities.

The goal of this conference, in essence, is to enhance collaboration and cooperation. I feel that this conference should help forge linkages and partnerships between our universities, governmental and non-governmental organizations. We must develop partnerships to support internationalizing the student experience, collaborating in research and outreach programs, and sharing knowledge and instructional techniques.

5) Leadership for change: Despite changes taking place worldwide in course content and style, at most colleges and universities in developing countries, pedagogy remains unchanged. We tend to put the blame for no change or such slow change on poor communications infrastructure— e.g., lack of access to the

Internet— or on lack of funding. In reality, our colleges and universities care less about how well their faculty members teach the student than about how many grant dollars they bring to the university. In light of this, the system of faculty recruitment, tenure and promotion needs a critical review and the adoption of corrective measures to promote a holistic, student-centered and problem-solving-oriented pedagogy. This requires leadership with commitment to teaching as a profession, leadership from within the teaching profession and leadership that garner support from a wide array of stakeholders.

6) Role and linkage within society: Historically, colleges and universities were engaged in teaching and research. Public service or outreach was not a common function. Today, most universities perform three primary functions: teaching, research and outreach. This is also true for some universities in many developing countries. For example, while signing the basic law of higher education when establishing Bogor Agricultural University, the president of Indonesia mentioned “Tridharma”—instruction, research and community service— as its core philosophy (IPB: Bogor Agricultural University).

It is high time to redefine the roles and expectations of our system of higher education. What should be the roles and functions of our colleges and universities? Should we demand them to fulfill all three functions, i.e., teaching, research and outreach? Should we expect universities to partner with businesses and industries to offer in-service training, refresher courses, or workshops to upgrade our labor force? Should an internship or apprenticeship be a part of graduation requirement? Should universities depend solely on government funds? Should we change our organization from “publicly supported” to “publicly assisted” institutions and start charging fees for service? I feel that the higher education should be responsive to our societal needs—preserving our culture, promoting our values, solving our day-to-day problems, and maintaining human dignity.

7) Keeping college affordable: Last, but not least, our common challenge is to expand college access to low-income and tribal population. For a variety of reasons, too many qualified students fail to pursue a postsecondary education simply because they cannot afford it. Female students do not have equal social support and access to post secondary education. It is our role as educational leaders and policy-makers to find ways to keep quality college education affordable and accessible by all citizens.

Distinguished participants,

Let me reiterate the key points of my presentation. I see a clear need for change in our educational system for quality human resource development.

- We need to improve the quality of our school level education and make sure it is accessible and affordable by all people.
- We need to strengthen and enhance our technical and vocational training in order to develop employable skills of our labor force.
- We need initiate worker training and retraining schemes at our production facilities, factories and industries to upgrade them with skills needed for use of new technology.
- We need to establish linkages between businesses or industries and polytechnics or universities. These linkages should serve as freeways opening up communication and team work between researchers and industry leaders.
- We need reform in our higher education system in order to equip our graduates with scientific knowledge and skills needed to discover new technologies, adapt policies to disseminate these technologies to benefit the humankind and guide change in harmony with our societal values.
- We need to internationalize our curriculum through faculty and student exchanges, study abroad programs and international research collaboration.
- Internships have proven to be a very effective way to offer hands-on and employment-focused learning experience (National Research Council, 1996). It is high time for colleges and universities to partner with government and industry to offer practical education for the new generation.
- Forging or building partnerships with other colleges and universities within the region and internationally helps make better use of our resources. There is no need to re-invent the wheel—we can learn and share from one another’s experience.

National policy is critical to achieve quality human resource development. We need educational leaders and planners with open minds, vision and commitment to develop comprehensive policies for human resources development. We need manpower that can make appropriate use of new technology at the individual, community, watershed and national levels. We need strong cooperation and support from our government as well as our businesses and industries. We need collaboration with our partners nationally and internationally. We need to change the way we do things. Change is essential and we can do it.

Thank you.

References

- American Council on Education. 2006.
<http://www.acenet.edu/AM/Template.cfm?Section=Home&CONTENTID=18299&TEMPLATE=/CM/ContentDisplay.cfm>, 4/29/08.
- Bawden, R. 1996. A Learning Approach to Sustainable Agriculture and Rural Development: Reflections from Hawkesbury.
<http://www.fao.org/sd/EXdirect/EXan0010.htm> , 4/29/08.
- Bogor Agricultural University. 2006. <http://www.ipb.ac.id/pi/2.html>, 4/29/08.
- Cohen, J.E. 2005. Human Population Grows Up. Scientific American (Special Issue) Vol. 293, No. 3, pp. 48-55.
- EdStats-Country Profile. 2008. <http://siteresources.worldbank.org/EXTEDSTATS/Resources/3232763-1171296190619/3445877-1172014191219/IDN.PDF> , 4/29/08
- Fields, A. M., E. Hoiberg, and M. Othman. 2003. Changes in Colleges of Agriculture at Land-Grant Institutions. NACTA Journal Vol. 47, No. 4, pp. 7-15.
- Gasperini, L. 2001. World Food Summit Five Years Later: The Challenge of Feeding and Educating All. http://www.fao.org/sd/2001/KN1005a_en.htm
- Michigan State University. <http://www.msu.edu/rankings-and-recognitions/index.html>, 4/29/08.
- Osman-Gani, Aahad M. and Wee-Liang-Tang. 1998. Human resource development: the key to sustainable growth and competitiveness of Singapore. Human Resource Development International, Vol 1, Issue 4.
- People and Planet.net. <http://www.peopleandplanet.net/doc.php?id=199§ion=2> 4/29/08
- Suvedi, Murari. 2007. "Higher Education in Food, Agriculture and the Environment in the 21st Century," in The 6th International Student Summit on Food, Agriculture and Environment in the 21st Century. Tokyo: Tokyo University of Agriculture Press.
- U.S. Census Bureau. 2008. <http://www.census.gov/ipc/www/idb/>, 4/29/08.

DEVELOPMENT OF SYLLABUS AND TEACHING OF POST-GRADUATE ENGINEERING DESIGN COURSE BASED ON TOTAL DESIGN APPROACH IN A MALAYSIAN UNIVERSITY

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ABSTRACT

In this paper, the development of syllabus and teaching postgraduate engineering design course based on total design approach is presented. The involvement of the author in designing the Engineering Design and Innovation course at postgraduate level is discussed. The experience in teaching the course to postgraduate students (Master of Science and Ph.D.) in a Malaysian university is shared. The teaching is based on total design model where design core activities such as market investigation, product design specification, conceptual design and detail design are taken into consideration. In carrying out the design task, various engineering design methods like value engineering, morphological chart, brainstorming, gallery method and Pugh concept selection technique were employed by the students. The total design of an automatic egg cooker carried out by two groups of postgraduate students are taken as case study.

KEY WORDS : Total design, Engineering design, Malaysian university, Postgraduate syllabus, Postgraduate teaching

INTRODUCTION

It is the vision of Malaysian government for Malaysian engineers to be technically competent and well-respected professionals that are spearheading technology and wealth creation in Malaysia (Megat Johari et al., 2002). To achieve this vision, it is envisaged that an engineering design and innovation syllabus at postgraduate level emphasizing on innovation and creativity to be developed. The Engineering Design and Innovation course was recently developed based on total design approach coined by Pugh (1991). Total design (see Figure 1) is the systematic activity necessary, from identification of the market and user need, to the selling of the successful product to satisfy that need (Pugh, 1991). In total design, the design core activities consist of market investigation (including user need and problem definition), product design specification, conceptual design, detail design, manufacture and sales are performed. According Dieter (2000), there is another stage to be performed between conceptual design and detail design, which is called embodiment design. He stated that it is the stage where the design concept is invested with physical form, the example of which is like 'putting meat on the bones'. In all the activities, design concept is considered the most important activity. It is a means of identifying viable solutions from which the optimum design can be decided (Ertas and Jones, 1996). In conceptual design stage, designers use creativity and imagination to develop solutions to achieve the design objectives while satisfying the constraints (Hyman, 1998). Various design methodologies were proposed to be used in each stage of total design such as morphological chart, value analysis, quality function deployment, function analysis, requirement tree, gallery method and Pugh concept selection method and details of these methodologies can be found in established text books like Cross (1994), Ulrich and Eppinger (2004), and Wright (1998).

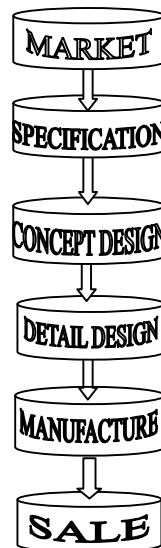


Figure 1: Fundamental design model (Pugh, 1991)

DEVELOPMENT OF SYLLABUS

In developing the syllabus for this total design course for Master of Science and PhD students in the Department of Mechanical and Manufacturing Engineering, Universiti Putra Malaysia, emphasis is placed on carrying out design activities at each stage of the total design core. For instance, during conceptual design stage, various activities such as morphological chart, function analysis, objectives tree, failure mode and effect analysis, quality function deployment and many others have been proposed for the students to carry out by conducting group discussion on a specific engineering product. The understanding of engineering design process, total design versus partial design, design information gathering, creativity, design tools (computer based and procedure based) and concurrent engineering are emphasized. Concurrent engineering is considered important in product design because it facilitates manufacturing consideration, which the ultimate aim in product development. Concurrent engineering is a product development methodology with the goals of maximizing quality, reducing lead time and lowering the costs (Prasad, 1996). In fact, concurrent engineering fits very well within total design environment (Sapuan and Gayretli, 1996). Specialized course on concurrent engineering was earlier developed and taught (Sapuan, et al. (2002) and Sapuan et al. (2003)). In addition, methods of information gathering and information retrieval are taught during market investigation stage (Sapuan, 1998). Issue of design, patent and copy right impingement is also given due consideration.

TEACHING APPROACH

When the course was introduced in December 2005 to the Master of Science and PhD students, the syllabus and the teaching approach were well appreciated by the students. A group of seven Master of Science and PhD students attended the class. Since four the students came from overseas, the course was taught fully in English.

Course assessment

The course assessment comprises individual and group minor assignments, a major group design project and a final examination. In the first assignment, students were given 4 essay type questions on theory of design for manufacture and ten marks are allocated for this individual assignment. In the second assignment, students were divided into two groups and they worked to solve a creativity exercise of an engineering product. This ten mark exercise was an initial attempt to assess the ability of the students to work in a team.

Major design project

In the major project, the students were divided into two groups to design an automatic egg cooker. The students have to submit a group report and present an individually assessed presentation based on their group work performed for five weeks. During market investigation stage, students carried out interview to

the users, gathering information from internet, trade literature, books, journal and conference papers, reports, standards and patents. They also carried out competitors' analysis.

After sufficient information was gathered, the product design specification (PDS) was prepared. It formed as the design guides and it is a dynamic document. An example of PDS developed by the students (Group 1) is given below.

1. Performance

- 1.1. Can cook 10 eggs for boil eggs
- 1.2. Can cook 5 eggs for poach
- 1.3. Can cook the eggs hard, medium and soft
- 1.4. Automatically shut off when the eggs are ready to prevent overcooking
- 1.5. Heat resistance based
- 1.6. Only 400 watts (good for energy saving)

2. Ergonomics

- 2.1. Indicator light on/off
- 2.2. Audible tone alarm
- 2.3. Portable (can be moved from place to another)
- 2.4. Comfortable to hold
- 2.5. Aesthetically pleasing
- 2.6. Water level indicator

The following stage is conceptual design. Each member of the teams has to come up with his solution to be put forward during brain storming session. Group 1 employed the morphological chart to solve the problem while Group 2 used gallery method. Figure 2 shows a concept developed by a member of Group 2. The concepts developed were finally selected using Pugh concept evaluation technique (See Figure 3).

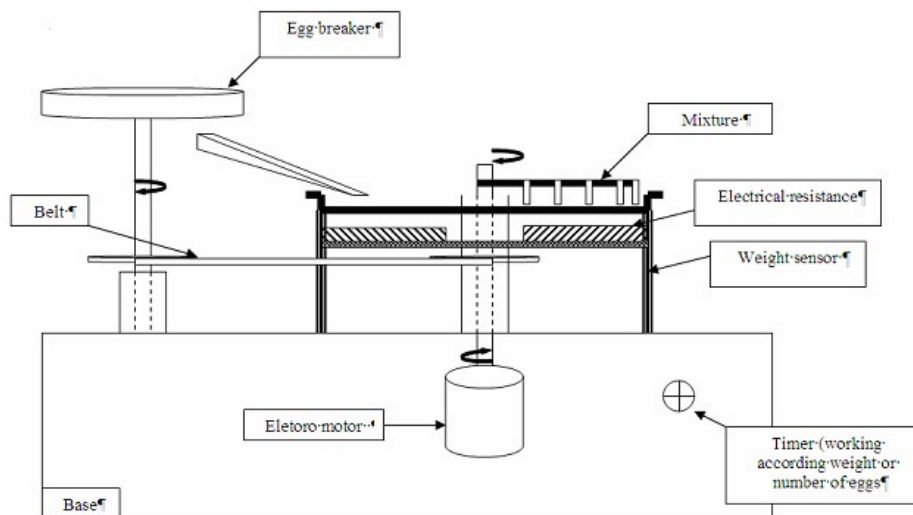


Figure 2: A concept of automatic egg cooker

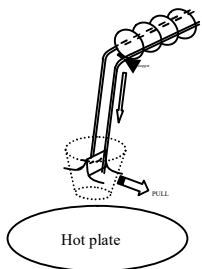
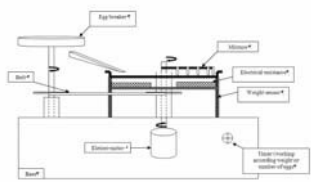


Criteria		Concept 1	Concept 2	Concept 3	Concept 4	
						
1	Safety	s	s	s	s	
	Low risk to user	s	s	s	+	
	2	Market competitiveness	-	-	s	s
		Environmental friendliness	s	s	s	s
		Low cost	+	-	s	-
		Portability	+	+	+	+
	3	Aesthetics	-	s	s	+
		Performance	+	+	+	+
		Cleanliness	-	s	s	+
		Egg-breaking mechanism	s	-	+	s
		Robustness	-	+	s	s
		Reliability	+	+	+	+
	4	Quality	s	s	s	s
		Ergonomics	s	s	-	s
Ease of use		s	s	s	+	
	Size and weight	+	s	s	-	
	$\Sigma+$	5	4	4	7	
	$\Sigma-$	4	3	1	2	
	ΣT	1	1	3	5	

Figure 3: The concepts evaluated using Pugh concept evaluation method

The next step was to perform embodiment design. The selected concept was refined further in terms of material selection, cost analysis and its functional aspect. An example of embodiment design is shown in Figure 4.

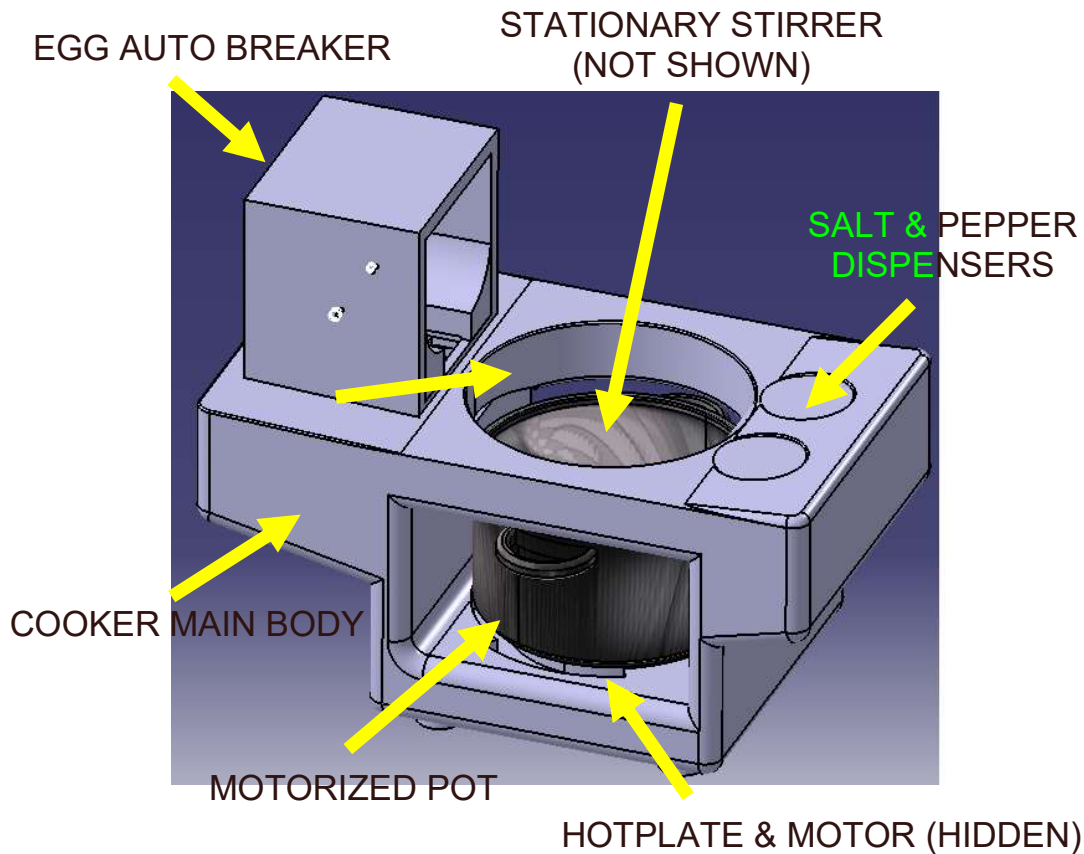


Figure 4: The scrambled egg cooking machine fully assembled

Final examination

Final examination was conducted for two hours and it was an open book and open note examination. Since this was the first course of its kind taught in the department at postgraduate level, the main problem faced by the students was to answer fully the questions within the prescribed time. However, the results turned out to be very good. It was the students' expectation that they answers they gave should be very detail but the lecturer's expectation was that nothing of in depth answers needed. An example of examination question is given below:

Question 2

a. Generate five design concepts for a ladder used for painting the wall. Evaluate the concept using Pugh concept selection method. 6 marks

b. Develop a concept for the equipment which enables the bicycle riders to drink their tea from a plastic cup while both hands are holding the bicycle handle. 4 marks

CONCLUSIONS

The students can cope and even appreciate the use of total design approach in carrying out product design and this new experience is totally different to them from the design course undertaken at undergraduate

levels where the emphasis is mainly on design calculations and design of machine elements. No doubt, both approaches have their own purposes and strengths but this new approach has opened a new perspective in teaching approach for the engineering design subject.

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REFERENCES

Cross, N., 1994, *Engineering Design Methods, Strategies for Product Design*, Second Edition, John Wiley & Sons, Chichester.

Dieter, G.E., 2000, *Engineering Design, a Material and Processing Approach*, Third Edition, McGraw-Hill, Boston.

Ertas, A., and J.C., Jones, 1996, *The Engineering Design Process*, Second Edition, John Wiley & Sons, Inc., New York.

Hyman, B., 1998, *Fundamentals of Engineering Design*, Prentice Hall, Upper Saddle River, New Jersey.

Megat Johari, M.M. N., A.A., Abang Abdullah, M.R., Osman, S.M., Sapuan, N., Mariun, S., Jaafar, H., Omar, A.H., Ghazali and M.Y., Rosnah, 2002, "A New Engineering Education Model for Malaysia", *International Journal of Engineering Education*, Vol. 18, pp. 8-16.

Prasad, B., 1996, *Concurrent Engineering Fundamentals, Integrated Product and Process Organization, Volume I*, Prentice Hall PTR, Upper Saddle River, New Jersey.

Pugh, S., 1991, *Total Design*, Addison Wesley Publishing Company, Wokingham, England.

Sapuan, S.M., 1998, "Computerized Information Retrieval System for the Postgraduate Research Degree in Mechanical Engineering Design", *AESEAP Journal of Engineering Education*, Vol. 28, pp. 27-36.

Sapuan, S.M., and A., Gayretli, 1996, "The Improvement of the Link and Integration Between the Simultaneous Engineering Philosophy and the Total Design Studies", *AESEAP Journal of Engineering Education*, Vol. 26, pp. 52-61.

Sapuan, S.M., Y. Nukman and A.R. Salwa Hanim, 2002, "On Teaching Undergraduate Concurrent Engineering Course in a Malaysian University", *Proceedings of the Engineering Education, Training and Policy Conference, Second World Engineering Congress 2002*, Kuching, Sarawak, Malaysia, 22-25 July 2002, pp. 130-133.

Sapuan, S.M., Y., Nukman and A.R.S., Hanim, 2003, "Concurrent Engineering Teaching and Research in Malaysian Universities", *Sudan Engineering Society Journal*, Vol. 49, pp. 19-26.

Ulrich, K.T. and S.D., Eppinger, 2004, *Product Design and Development*, Third Edition, McGraw-Hill, Boston.

Wright, I.C., 1998, *Design Methods in Engineering and Product Design*, McGraw-Hill, London.

CHALLENGE IN EDUCATION

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Saat ini banyak sekali sekolah-sekolah yang ingin membuat suatu manajemen pendidikan berbasis WEB tetapi secara umum menghadapi kendala sebagai berikut :

1. Kekurangan Sumber Daya Manusia terutama IT
2. Kekurangan Sumber Dana
3. Kekurangan Informasi Tentang Teknologi
4. Kekurangan Sarana dan Prasarana
5. Kekurangan Fasilitas Telekomunikasi

Secara umum Manajemen Pendidikan berbasis WEB; dikembangkan oleh perusahaan profesional yang bergerak di bidang jasa pemograman. Jika dikembangkan secara sendiri-sendiri, biasa hasilnya tidak maksimal dan biayanya akan mahal sekali.

Beberapa program serupa sudah dikembangkan oleh Universitas ataupun perusahaan IT professional, tetapi kebanyakan program-program serupa biasanya mencapai angka diatas US 50.000 suatu angka yang bisa dipakai untuk membangun puluhan kelas di Indonesia.

Pemilihan untuk pemakaian open source memang bisa menjadi suatu alternatif, tetapi begitu menghadapi kendala secara teknis, maka tidak ada perusahaan yang bisa support secara gratis. Selain itu tentu saja diperlukan suatu tenaga yang betul-betul trampil untuk setup sistem secara keseluruhan

Dengan kenyataan seperti itu Bliss International; memberanikan diri mendirikan satu divisi baru yang berusaha mencari solusi untuk pendidikan murah mulai dari back-end sampai front-end.

SOCO adalah suatu sistem manajemen pembelajaran dengan memanfaatkan internet yang diberikan secara gratis kepada sekolah-sekolah yang di anggap paling siap untuk menyelenggarakan pembelajaran secara on-line.

SOCO Meningkatkan Kualitas Pendidikan

Pendidikan tradisional pada umumnya sangat dipengaruhi oleh kemampuan seorang guru menerangkan suatu pengetahuan, memstimulasi motivasi anak untuk belajar. Guru menjadi sumber pengetahuan dan murid berusaha mengikuti apa yang di ajarkan oleh seorang guru. Soco menawarkan suatu pembelajaran yang berbeda; dimana guru dan murid bersama-sama mencari pengetahuan itu secara interaktif, dan menyusunnya secara bersama (*glossary and wiki feature*)

Fungsi yang ada pada Soco; diharapkan memberikan semangat eksplorasi yang tinggi terhadap ilmu pengetahuan, dan menyusunnya secara sistematik untuk kepentingan diri sendiri maupun untuk masyarakat lain jika mereka memang mau membaginya. Guru tidak lagi menjadi satu-satunya sumber pengetahuan, tetapi lebih kepada pedampingan kepada murid-murid sehingga bisa mencari kebenaran ilmu pengetahuan secara bersama-sama.

Anak-anak didik yang terbiasa menulis (*metoda posting*) pada usia dini; akan lebih deskriptif dalam mengungkapkan pikiran-pikirannya, dan cenderung lebih analitis baik dalam menerima hal-hal baru maupun menerangkan buah karyanya. Dengan kemampuan ini anak-anak bisa menjadikan dirinya sendiri sebagai "*source of knowledge*" dan bisa memperkaya dirinya sendiri dengan pengetahuan-pengetahuan yang ia inginkan (*self learning*). Dengan kemampuan seperti itu tugas guru menjadi lebih mudah, yaitu mempertajam dan mempertajam motivasi untuk terus menerus belajar.

SOCO No Time and No Class Limit

Sebagaimana "*system on-line learning*" memberikan ruang belajar yang lebih luas dan tanpa ada batasan waktu seperti pada kelas tradisional yang dibatasi oleh kelas dan jam belajar. Anak-anak dan mahasiswa bisa belajar kapan saja dia mau, dengan mengakses SOCO, pekerjaan rumah, forum ilmiah, buku-buku, pengumpulan tugas semua itu tersedia selama 24 jam. Tentu saja dosen dan seorang guru bisa memberikan batas akhir pengumpulan suatu tugas. Tetapi materi-materi maupun tugas yang ada tetap di tersedia tanpa ada batasan ruang dan waktu seperti pada kelas tradisional.

SOCO Learning is Fun

Ketika anak-anak melihat hasil pekerjaan mereka, entah itu menggambar, programming, buah pikiran di publikasikan di web. Mereka akan senang, dan merasa tertantang untuk membuat sesuatu lain yang lebih “cool”, mereka akan mencoba hal-hal baru, kreasi-kreasi baru. Pada banyak kasus anak-anak semakin senang ketika terjadi kompetisi atau pihak luar (sekolah lain) ikut mengomentari atau memberikan penilaian. SOCO bahkan memungkinkan Podcast dimana komentar-komentar bisa direkam dan didengar oleh yang bersangkutan. Meskipun untuk saat-saat awal mungkin ini belum akan diluncurkan.

Saat ini fungsi yang paling di senangi anak-anak adalah “chat” jadi meskipun dalam satu ruangan anak-anak saling berdiskusi hanya dengan memainkan jari-jarinya di tuts keyboard.

Banyak sekali mata pelajaran yang sangat sulit untuk dideskripsikan dengan kata-kata maupun ilustrasi di papan tulis. Soco memungkinkan dosen atau guru memasukkan animasi,

gambar-gambar untuk menjelaskan suatu mata kuliah. Jadi ketika mau melukiskan reaksi momen, lebih mudah menampilkan gif file bola dengan massa yang berbeda bertumbukan dari pada memakai dua belah tangan di tumbukan untuk kemudian menjauh. Soal-soal matematika yang sulit bahkan bisa ditampilkan dalam bentuk game yang sangat menarik

Jadi belajar menjadi lebih menyenangkan; bukan ?

SOCO Penyetaraan Kualitas Pendidikan Desa dan Kota; Timur dan Barat

Keterbatasan jumlah dan kualitas guru sangat berpengaruh sekali terhadap kualitas pendidikan terutama sekali pada pendidikan tradisional dimana guru menjadi sumber ilmu pengetahuan. Tidak dapat diingkari bahwa pendidikan sekolah di kota besar lebih baik daripada di kota kecil, apalagi di desa. Pendidikan di Indonesia Timur lebih tertinggal di banding dengan Indonesia Barat. Sekolah-sekolah di Jawa umumnya lebih baik daripada di Ujung Barat Indonesia. Kenyataan seperti ini, membuat masyarakat yang peduli akan pendidikan berpindah dari dari Timur Ke barat; dari kota kecil ke kota besar dari Ujung Barat ke Pulau Jawa. Hal ini menyebabkan beban yang berlebihan dikota dan menyebabkan pembangunan pendidikan di daerah-daerah menjadi lebih tertinggal karena tidak mencapai skala ekonomi yang menguntungkan untuk dikembangkan. Dan orang-orang yang sadar akan pendidikan dan mau membayar untuk pendidikan ternyata pindah ke kota besar. SOCO menawarkan materi pendidikan yang sama dari ujung barat sampai ujung Timur dan pendidik yang sama kualifikasinya untuk semua kalangan.

Yayasan-yayasan yang selama ini kesulitan menemukan pengajar yang kualitasnya sama baik dengan sekolah2 mereka di kota kini bisa membagi materi sekolah mereka di Kota dengan sekolah mereka di tempat yang terpencil. Seorang professor bisa mengajar di ujung Merauke dan menerima tugas-tugas murid-muridnya tanpa ada penundaan waktu. Dengan pembangunan pendidikan yang merata diharapkan beban kota-kota besar akan lebih berkurang dan biaya pendidikan secara umum akan menjadi lebih murah. Terimakasih untuk jaringan telekomunikasi yang sudah sampai dipelosok pelosok Tanah air.

SOCO Educate the Educator

Tahap pertama dari sosialisasi SOCO adalah mengedukasi Guru dan Dosen, sampai saat ini diperkirakan ada sekitar 450 orang guru yang harus di training untuk bisa secara aktif menggunakan SOCO. Karena adanya ketidak sinambungan *proficiency* teknologi terutama untuk guru-guru tradisional yang sudah mengajar puluhan tahun. Maka pertama-tama yang diberikan adalah motivasi training, training merupakan training tatap muka. Untuk selanjutnya guru-guru di encourage untuk ikut on-line SOCO training, dengan segala kemampuan SOCO.

Secara umum ada tiga kelas training; yaitu basic; intermediate dan advanced. Guru-guru yang sudah menyelesaikan tingkat basic saja, sudah langsung bisa praktek dan menggunakan SOCO dalam kegiatan mengajar di sekolah. Guru-guru lain yang lebih bersemangat bisa meneruskan sampai tingkat advanced dan menggunakan SOCO secara optimal. Semua pertanyaan bisa dipostkan ke Forum; guru yang sudah berhasil bisa menerangkan kepada guru lain; tidak melulu harus di jawab oleh SOCO (*Learning Society Concept*)

Pada Training tingkat akhir guru diharapkan sudah mampu menggunakan SCORM; suatu standar yang diikuti oleh dunia pendidikan internasional dalam membuat e-learning berbasis WEB. Standar ini diinisiasi oleh *Advanced Distribution Learning* dan dipakai oleh Kementrian Pertahanan Amerika Serikat.

Kemampuan SOCO dalam mentraining guru-guru sampai saat ini diperkirakan menjadi 10.000 tergantung kepada kecepatan *bandwidth*nya. Lamanya training sangat tergantung pada learning curve dari Guru-guru yang bersangkutan. Secara umum dalam beberapa puluh jam latihan seorang guru yang bisa menguasai tingkat basic. Untuk kebutuhan ini sekolah2 memerlukan koneksi internet dengan up-stream yang lumayan besar. Jika Telkom bisa menyediakan sambungan SSL tentu akan mempercepat proses training tersebut.

Proses Training akan diberikan secara gratis secara berkelompok per sekolah; setiap sekolah yang ikut akan diberikan semacam kelas-kelas percobaan dimana mereka bisa mencoba meng upload bahan bahan kuliah; tugas-tugas, diskusi, memulai forum dan fungsi-fungsi yang ada pada SOCO.

SOCO Build the Learning Society

Guru guru yang sudah di training adalah cikal bakal “*The Learning Society/ Masyarakat Belajar*”, secara prinsip guru-guru tersebut diharapkan akan terus menerus memperbaharui ide-ide tentang pengetahuan yang ia ajarkan sesuai dengan pertumbuhan ilmu pengetahuan itu sendiri dalam suatu komunitas internasional. Dengan *proficiency* menggunakan SOCO; guru tersebut diharapkan tidak canggung lagi untuk bergabung pada institusi atau komunitas suatu cabang ilmu pengetahuan dan terus menerus mengupdate dirinya sendiri dengan hal-hal baru. Semangat tersebut diharapkan di teruskan kepada anak-anak didiknya.

Anak-anak yang belajar dengan sistem SOCO merupakan masyarakat belajar masa depan dengan cara pandang masa depan. Anak tidak lagi terkungkung dalam stigma “gini lho; kata guru saya.....” tetapi mereka akan selalu berusaha menjawab persoalan baru mereka dengan jawaban-jawaban terkini. Anak-anak dan guru yang sudah merasakan manfaat dari SOCO; di harapkan bergabung dalam SOCO *Volunteer Lecturer* yang menularkan semangat belajar yang sama kepada anak-anak tidak mampu.

SOCO secara terus menerus akan meng update kemampuannya berdasarkan prinsip-prinsip paedagogik yang benar terutama menemukan cara yang lebih efisien dalam mendelievery pendidikan untuk anak anak kurang mampu.

SOCO Solution for Free Education (Education for the Poor)

Sampai saat ini, dimuka planet bumi Manajemen Pendidikan On-Line hanya berhasil dikelola oleh institusi-institusi pendidikan. Belum pernah ada di bumi ini *On-Line Education* Manajemen System yang dikelola secara terbuka dan di peruntukkan untuk masyarakat tidak mampu. Telkom dan SOCO bisa mencoba membuat catatan baru untuk dunia pendidikan dengan mulai mencoba men “*delivery*” pendidikan secara terbuka terutama kepada masyarakat tidak mampu. Usaha ini tentu tidak bisa di lakukan secara sendiri-sendiri, tetapi dengan *Educator* yang sudah terlatih, *the Learning Society* dan Pemerintah, diharapkan cita-cita ini bisa terwujud.

Secara teoritis seorang anak yang sudah terlatih dengan sistem pendidikan on-line bisa menjadi pendamping untuk anak-anak tidak mampu pada tingkatan yang lebih rendah. Secara teknologi jika *delivery* pendidikan untuk sekolah mampu sama saja dengan *delivery* materi untuk masyarakat tidak mampu.

Meskipun demikian tentu ada kiat kiat baru dalam pemberian tugas dan cara-cara yang lebih atraktif dalam mengajak anak putus sekolah untuk belajar secara mandiri. Diperlukan peran besar pemerintah untuk menyediakan akses2 internet secara gratis bagi masyarakat tidak mampu. Akses-akses ini bisa dikelola oleh LSM yang sudah menyelenggarakan pendidikan untuk masyarakat tidak mampu, maupun bantuan PT POS, maupun staff kelurahan atau organisasi pendidikan lainnya yang bisa menuntun dan mendampingi anak-anak dalam proses belajar.

Soco secara teknologi memungkinkan public registration. Satu sistem sampai saat ini mampu menampung sampai dengan 100.000 siswa, pada tahun mendatang diharapkan satu sistem bahkan bisa melayani sampai dengan 200.000 siswa sekaligus.

Materi2 bisa di upload oleh *Registered Teacher* pada berbagai tingkatan. Soal-soal latihan bisa ditampung pada Bank Soal dan digenerate sesuai dengan keperluan. Penilaian ulangan atau ujian bisa langsung diberikan oleh sistem; sehingga tidak perlu *resource* untuk memeriksa soal. Murid-murid yang mendapat test yang bagus bisa mengambil ujian kesetaraan Paket A,B, C sesuai dengan program pemerintah.

Dan semua itu bisa disajikan secara gratis, masyarakat atau pemerintah yang mau berpartisipasi cukup menyedia internet akses.

Quality in Human Resources

Adalah betul bahwa conference ini meletakkan pemberdayaan pada sumber daya manusia; bukan pada ekspolarasi sumber daya alam. Pendidikan di Indonesia lebih banyak menitik beratkan pada edukasi orang yang sebanyak-banyaknya daripada sebaik-baiknya, sehingga jangan heran jika yang terjadi adalah banyaknya pengganggur yang dihasilkan oleh pendidikan.

Pendidikan Indonesia juga menjadi bahan study negara lain kenapa sebagian besar lulusan Indonesia tidak mampu mencapai suatu kemampuan daya saing dasar seperti datang tepat waktu, hidup bersih dan higienies. Lulusan lulusan seperti tidak mempunyai daya saing sama sekali baik secara horizontal dibanding dengan

(kelompok negara2 berkembang) atau vertikal (kelompok negara-negara maju). Ketidak mampuan basic survival skill menyebabkan mereka tidak mampu bersaing untuk mendapatkan kualitas hidup yang baik, sehingga untuk mendapatkannya seringkali dilakukan dengan cara cara yang tidak baik dengan merugikan rakyat dan negara, serta menimbulkan ketidakadilan pada masyarakat.

Ada banyak sekali tantangan bagi pendidikan Indonesia; sebagian besar orang berkecukupan dengan menjawab tantangan tersebut, dan sebetulnya tantangan itu tidak pernah selesai. Adakah diantara kita yang mampu memanfaatkan segala kekurangan dan tantangan tersebut menjadi suatu keuntungan atau daya saing.

Mari kita cerdaskan bangsa ini dengan pendidikan yang lebih cepat dan berkualitas.

FINDING ANSWERS FROM DOCUMENTS BASED ON ANNOTATION STATISTICAL ANALYSIS AND RESOURCES IN INTERNET

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Abstracts

A Question Answering System is a system that returns answers in response to questions posed in natural language. Candidate answers from documents are found using a statistical technique and linguistic knowledge such as named entity and part of speech taggers. We also use information available on the Internet to validate answers found in the documents. Our result shows that we can find 29.77% correct answers.

Keywords: question answering, named entity, query expansion

1. INTRODUCTION

Web can be seen as very large of universal repository of human knowledge which has allowed unprecedented sharing of ideas and information in a scale never seen before. Despite so much success, the Web has introduced new problems to find useful information. Then search engine has been developed to help people. Search engine is a tool for finding the documents in a collection that are good matches to user queries. It provides list of documents which is needed to examine in determining whether they are relevant to query or not. Sometimes user does not have enough time to read documents one by one. So we need a system which is able to retrieve explicit answer rather than list of documents. For example, 'What is the capital city of Indonesia?' then it returns 'Jakarta' as the answer.

Question Answering (QA) System is a system that returns answers themselves, rather than documents containing answers, in response to a question posed in natural language. QA research attempts to deal with a wide range of question types such as: factoid, list, and definition. A factoid question is a fact-based, short answer question such as 'Who is the president of Indonesia in 2008?' A list question asks for different instances of a particular kind of information to be returned, such as 'List the names of lakes in Indonesia'. Answering such questions requires a system to assemble an answer from information located in multiple documents. A definition question asks for interesting information about a particular person or thing such as 'Who is Julius Caesar?' Definition questions also require systems to locate information in multiple documents.

Generally, most current QA systems search for answers in three major stages, namely question classifier, documents retrieval and answer extraction. A question classifier determines the question type in order to locate the type of answer. Question type is determined by question word

found in the question and also other attributes of question like annotation [13]. For example, 'Who is the president of Indonesia?' 'Who' is a question word for asking person and the word 'President' annotated by <JobTitle> indicates that the answer type is <Person>.

Based on the keywords yielded by analyzing the question, the documents retrieval locates documents most probably to contain the answer. Then answer extraction module extracts answer candidates that match the expected answer type.

Many QA Systems use several NLP tools to assign annotation in documents collection such as named-entity (NE) tagger, part of speech (POS) tagger, semantic roles tagger, grammatical relations tagger as clues to locate the answer.

Named entity (NE) defines some informative words, such as personal names, locations, organization names, time and number expressions as information units in text [4,11]. Li and Croft has applied named-entity annotation in locating answers in their Chinese Question Answering [10]. They used BBN's Identifinder System and found all candidate answers according to the question type. For example, if the question type is LOCATION, then each location marked by Identifinder is an answer candidate. Then the average distance between an answer candidate and the location of each matching word of question was calculated. The answer candidate that has the smallest average distance was picked as the final answer.

Part of speech (POS) tagging is the process of marking up the words in a text as corresponding to a particular part of speech. Words are identified as nouns, verbs, adjectives, adverbs, etc [15]. Many POS tag systems have been introduced, such as London-Lund Corpus (197 tags), Lancaster UCREL (165 tags), LOB Corpus (135 tags), Brown Corpus (87 tags), PENN POS (48 tags) [14]. For example, 'The/DT

TreeTagger/NP is/VBZ easy/JJ to/TO use/VB. DT is determiner, NP is proper noun singular, VBZ is present tense verb, JJ is adjectives, TO is literal to and VB is base form verb. Quantum, a French to English Cross Language Question Answering System used POS tags to determine the expected type of the answer to a particular question [16]. Combination of POS tags and noun-phrase tags formulated the regular expression patterns to determine the answer extraction function.

Semantic roles are used to represent the semantic functions and relationships of the constituents of a sentence, such as agent, patient, beneficiary, etc [9]. Unlike parsing, semantic role labeling uses predicate-argument structures, which represent the core meaning of sentence [11]. For example, *'John gave Mary a bouquet of roses'*. Predicate *'gave'* has arguments *'John'*, *'Mary'* and *'a bouquet of roses'*. It can be represented as *gave(John/agent, a bouquet of roses/theme, Mary/recipient)*. *'John'* is an agent since he is a causer or initiator of events, *'a bouquet of rose'* has role as theme since it undergoes a change of location and recipient goes to *'Mary'* as she receives something. Semantic roles labeling has been applied in QA System [18]. In this QA System, Pradhan et. al parsed both question and documents for marking thematic or semantic roles. Then they used the semantic labels to formulate the answer type patterns and applied in answer extraction stage.

Grammatical relation informs subject and object of sentence [9]. It indicates the relationship between verb with subject and object. For example, *'A dog bit John'*. Dog bears subject relation and John bears object relation. Grammatical relation knowledge has been used in QA such as in [1]. This QA did not use NE like many others QA for finding answers. The answer finding approach was centered on the main verb of the question. It relied on analyzing grammatical relations between the verb and the other parts of the question and answer.

As we described before, many approaches have been proposed in finding answers from documents collection. In this research we propose to use text annotation statistical analysis on passage (part of documents) and collect additional resources from Web for our Question Answering System.

The rest of paper is organized as follows: In section 2, all modules of our QA are described in details. In section 3 we explain the experiment, section 4 and 5 we respectively present the analysis and conclude the paper with discussion of future directions.

2. FINDING ANSWER PROCESS

Our QA consists of four modules, namely question processing module, information retrieval module, passage processing module and answer extraction module.

2.1 Question Processing Module

There are four processes are applied on each question:

- Named entity and part of speech are marked up.
- The expected answer type is identified.
- Stop words are removed.
- Query expansion is performed by finding the verb synonym of question.
- Stemming is applied.

We employ GATE [6], an open source linguistic tools for text engineering, for assigning NE and POS tags. GATE has been in development at the University of Sheffield since 1995. It recognizes NE for date, person, job title, location, money, organization, and percent. We also developed our own NE tagger to recognize measure, element, anthem, planet, currency, religion, event, sport, music, airport, movie, bomb and object. We built the NE tagger based on list of facts that were collected from Web, like Wikipedia [19], CIA Facts [3]. The GATE POS tagger [8] is modified version of the Brill tagger [2], which produces a part of speech tag as an annotation on each word or symbol, such as VBD for past verb, NN for singular noun, etc.

We identify the answer type based on question word, NE and POS tag information. For example, *'which + organization/NN'* points to organization as answer type, *'who + <PERSON>'* expects job title as answer type. We define some answer types like location, organization, person, date, job title, money, definition, measure, music, object, etc.

We also remove stop words from question to formulate query. A stop word is a word which is usually ignored, e.g., *'a'*, *'an'*, *'the'*, etc since they lack significance to the determination of sentence meaning [7]. For example, a question *'Which country did Iraq invade in 1990?'* results query *'country did Iraq invade 1990'*.

A candidate answer text can express the same semantic structure of the question with a different verb that is the same meaning as the verb in the question. Therefore, we find the synonym of the verb to perform query expansion. Query expansion is a process of reformulating a seed query to improve retrieval performance [20]. Verb is identified by looking part of speech of word. We use WordNet, English lexical data base developed by George A. Miller from Princeton University [21] to find the verb synonym. For example, query *'country did Iraq invade 1990'* has *'invade'* as verb. From WordNet we get *'attack'* as its synonym. Query expansion results *'country did Iraq invade 1990 attack'*.

Stemming is then applied on query to remove words affixes and get base form of words as a result, using Porter Algorithm [17]. For example, query *'country did Iraq invade 1990*

attack' gives result 'countri did Iraq invad 1990 attack'.

2.2 Information Retrieval Module

In this module, query from previous step is run through an information retrieval system to retrieve a list of relevant documents from documents collection. We use Lemur [12] information retrieval system to index and retrieve the documents. Lemur is a toolkit designed to facilitate research in language modeling and information retrieval.

Query is also sent to Google (<http://www.google.com>) to collect Wikipedia pages since it contain less noise. Information from Wikipedia is used to validate the candidate answer from corpus later in answer extraction module.

2.3 Passage Processing Module

The contents of the top 10 relevant documents are split into passages. Each passage contains seven sentences which first sentence is taken from last sentence of previous passage. This technique is to overcome the occurrence of pronouns like 'it', 'she', 'they', etc. The passages are then tagged using GATE.

2.4 Answer Extraction Module

Scores are calculated for each passage in order to select candidate answer with the best score. The score on passage follows these rules:

- a. Assign 1 to a passage if expected named entity is present and 0 if not. Only passage contains appropriate named entity tag will be taken to the next stage.
- b. Add 1 for each occurrence of query matching words.
- c. Add 1 if query matching words occur more than half in one sentence of passage.

We extract the candidate answers from passages according to the expected answer type. For example, if the answer type is LOCATION, then we proceed to score the candidate answers follow these rules:

- a. Calculate the total distance between an answer candidate and the location of each query matching word in current and previous sentences. We divide then the total distance by the quadrate of number of matching words. See Tabel 1.

Table 1 Average Total Distance Formula in Sentence

$Dk(ans) = \frac{\left(\sum_{keyC}^n \ p(keyC) - p(ans)\ + \sum_{keyB}^m \ p(keyB) - p(ans)\ \right)}{(n + m)^2}$
<p>Dk(ans) = average total distance in sentence keyC = matching keyword in current sentence keyB = matching keyword in previous sentence p(keyC) = position of matching keyword in current sentence p(keyB) = position of matching keyword in previous sentence p(ans) = position of candidate answer n = number of matching words in current sentence m = number of matching words in previous sentence</p>

Table 2 shows the example of calculating the average total distance.

Table 2 Example of Calculating the Average Total Distance

<p>Question: Which country did Iraq invade in 1990? Query: countri did Iraq invad 1990 attack Answer Type: location Stemmed Passage: The <Organization>United Nations</Organization> trade embargo wa impos on <Location> Iraq </Location> in <Date>August, 1990</Date>, after <Location>Iraq</Location> invad <Location> Kuwait</Location>. :: Total distance is the sum of distance between Kuwait to Iraq and invad. The average total</p>
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- b. If passage contains the same candidate answers more than one, then sum all of the average total distances and divide by the quadrate of number of the same candidate answers. See Tabel 3.

Table 3 Temporary Scoring Formula of Candidate Answer in One Passage

$Dp(ans) = \frac{\sum_{i=1}^k Dk(i)}{k^2}$
<p>Dp(ans) = temporary score of candidate answer in one passage Dk(i) = average total distance in sentence k = number of the same candidate answers</p>

- c. Divide the temporary candidate answer score by passage score to compute the final score of candidate answer in one passage. See Table 4.

Table 4 Final Scoring Formula of Candidate Answer in One Passage

$$Sk(\text{ans}) = \frac{Dp(\text{ans})}{skp^2}$$

Sk(ans) = final score of candidate answer in one passage
Dp(ans) = temporary score of candidate answer in one passage
skp = passage score

After scoring of answer candidates on each passage are done, we select the final answer by applying these following rules on each answer candidate:

- a. Sum the final scores of all the same candidate answers from each passage and divide by quadrate of number of passages contains them. See Table 5.

Table 5 Final Scoring Formula of Candidate Answer From All Passages

$$Sk_{\text{tot}}(\text{ans}) = \frac{\sum_{k=1}^i Sk(k)}{i^2}$$

Sk_{tot}(ans) = final score of candidate answer from all passages
i = number of passages contains the same candidate answers
Sk(k) = final score of candidate answer in one passage

- b. We also validate the answer candidate to fact tables contain facts about capital cities, countries, cities, continents, measure units, time formats and abbreviations. We then divide the score by 100 if the answer candidate exists in fact table.
- c. Finally, the score of each candidate is ranked in ascending order. The candidate answer that has the smallest score will be the answer to a question.

As our QA needs to return the document to support the answer, we choose the passage with the smallest score that contains returned answer.

3. EXPERIMENT

In this work, we used the collection from Cross-Language Evaluation Forum CLEF [5] that contains English documents from the *Glasgow*

Herald and the *Los Angeles Times*. There are 200 questions (queries) and their answers created by CLEF which contain of factoid, definition, temporally restricted and list questions. We use Lemur information retrieval system [12] to index and retrieve documents.

To evaluate the result of our experiment, we use CLEF standard judgments:

- incorrect** : the answer string does not contain a right answer or the answer is not responsive
- unsupported** : the answer string contains a right answer but the document returned does not support that answer
- inexact** : the answer string contains a right answer and the documents supports that answer, but the string contains more than just the answer or is missing bits of the answer
- right** : the answer string consists of exactly the right answer and that answer is supported by the document returned

4. Results

Based on our experiment, there are 36 correct answers are found (Tabel 6). There are 4 inexact answers, 35 unsupported answers, and 53 wrong answers.

Table 6 Evaluation of the QA Results

Answers	Evaluation
right	39 (29.77%)
inexact	4 (3.05%)
unsupported	35 (26.72%)
incorrect	53 (40.46%)

Based on the result of the information retrieval system, there are 131 relevant documents (65.5%) found in the top 10 documents that contain the correct answers. However, our results (see Table 6) can only identify 39 correct answers (based on correct document supports) and 35 unsupported answers (the answers are correct but they are found in wrong documents). In other words, we would be able to get 74 correct answers (56.49%) out of 131 correct answers or around 37% from all questions.

We have identified several problems that cause problems in finding correct answers:

- The linguistic tool, GATE, has assigned wrong named entity tags to the candidate answers.
- The answer types have been identified incorrectly.
- The answer candidates contained question words that caused the distance score became zero.
- Anaphora resolution problem.

- e. The supported documents are selected based on their scores only, and not considered other features like of query word frequencies in the passages.

Our technique was not able to answer definition question type since it has no appropriate named-entity tag.

5. SUMMARY

Our work in the question-answering topic has shown that named entity tagger could help finding correct answers in the documents. However correct answers can only be found if it has correct named entity tagger. Using information from sources available on the internet can also help verify the answers found in documents. In the future, we plan to use deeper linguistic knowledge like syntactic and semantic analysis to get better result.

References

- [1] Buchholz, S. Using Grammatical Relations, Answer Frequencies and the World Wide Web for TREC Question Answering. The 10th Text Retrieval Conferences, pages 502-509, 2002. <http://trec.nist.gov/pubs/trec10/papers/TilburgILK.ps.gz> (diakses Januari 2007)
- [2] Cunningham, Hamish et al. "Developing Language Processing Components with GATE Version 3 (a User Guide)." University of Sheffield. 2006.
- [3] CIA. <https://cia.gov/cia/publications/factbook/> (diakses Januari 2007)
- [4] Chincor, Nancy et al. "1999 Named Entity Task Definition." Version 1.4. The MITRE Corporation and SAIC. 1999.
- [5] CLEF. 2006. <http://www.clef-campaign.org>; Internet (diakses Januari 2007).
- [6] GATE. 2006. A General Architectural for Text Engineering [online]. <http://gate.ac.uk> (diakses Januari 2007).
- [7] Generic Information Retrieval System. 2001. http://www-nlp.nist.gov/related_projects/tipster/gen_ir.htm (diakses Januari 2007).
- [8] Hepple, M. "Independence and commitment: Assumptions for rapid training and execution of rule-based POS taggers." In Proceedings of the 38th Annual Meeting of the Association for Computational Linguistics (ACL-2000), Hong Kong, October 2000.
- [9] Kroeger, Paul R. "Analyzing Syntax." Cambridge University Press. 2004.
- [10] Li, Xiaoyan; Croft, W. Bruce. "Evaluating Question-Answering Techniques in Chinese". In NIST Special Publication: The 10th Text Retrieval Conference (TREC-10). 2001.
- [11] Lee, Cheng-Wei et al. "Perspective on Chinese Question Answering Systems". http://www.iis.sinica.edu.tw/IASL/webpdf/paper-2005-Perspectives_on_Chinese_Question_Answering_Systems.pdf (diakses Januari 2007)
- [12] Lemur. 2006. <http://www.lemurproject.org/lemur/overview.php> (diakses Januari 2007).
- [13] Manning, C.D and Schutze, H. "Foundations of Statistical Natural Language Processing". The MIT Press, Boston. 1999.
- [14] Mohanty, R.K. "Parts-of-Speech Tagging". Presentation Slide of Computational Linguistic Class. Summer School of Asian Language Processing, Pakistan. 2006.
- [15] Part-of-Speech Tagging Guidelines for the Penn Treebank Project. <http://www.cis.upenn.edu/~treebank/> (diakses Januari 2007)
- [16] Plamondon, Luc; Foster, George. "Quantum, a French/English Cross-language Question Answering System". In Proceedings of CLEF 2003, Trondheim, Norway. 2003.
- [17] Porter Stemming Algorithm. <http://www.tartarus.org/~martin/PorterStemmer/> (diakses Januari 2007)
- [18] Pradhan, S.S; Krugler, V.; Ward, W.; Jurafsky, D.; Martin, J.H. "Using Semantic Representations in Question Answering". <http://www.cs.colorado.edu/~martin/Papers/cuaq-icon-2002.pdf> (diakses Januari 2007)
- [19] Wikipedia. 2006. <http://en.wikipedia.org> (diakses Januari 2007).

- [20] Wikipedia-Query Expansion.
http://en.wikipedia.org/wiki/Query_expansion
(diakses Januari 2007)
- [21] WordNet. 2006.
<http://wordnet.princeton.edu/> (diakses Januari 2007).