



2017

**INTERNATIONAL CONFERENCE
ON INNOVATION IN EDUCATION,
SCIENCE AND CULTURE**

Grand Mercure Hotel
08 - 09/11/2017

BOOK OF PROGRAM



Organized by:
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Chair Foreword

The honorable,

- Professor Dr. Syawal Gultom, M.Pd, Rector of Universitas Negeri Medan
- Professor Dr. Jakrapong Kaewkhao, Director of the Center of Excellence in Glass Technology and Materials Science (CEGM), Nakhon Pathom Rajabhat University (NPRU), Thailand
- Rosemarie Daher Kowalski, Ph.D, Intercultural Studies, Research Metodology and Writing in Northwest University USA
- Professor Dr. Atty Cecilio D. Duka, Ed. D, Director Recoletos Law Center, San Sebastian College of Law – Manila
- Dr. Mati Horprathum (Researcher at The National Electronic and Computer Technology Center – NECTEC, Thailand)
- Vice Rectors
- Deans of Faculties of Education, Languages and Arts, Social Sciences, Natural Sciences and Mathematics, Engineering, Sports Sciences, and Economics
- Director of Postgraduate School of UNIMED
- Lecturers, researchers, students, all speakers and participants

Good Morning, *Salam Sejahtera*, Praise to Allah the Almighty for all His blessing, where today we are here to participate in 'The First International Conference on Innovation in Education, Science and Culture (ICIESC)' with the theme "Innovation Making Better Life".

Ladies and Gentlemen,

This conference presents a keynote speaker, 4 plenary speakers from Thailand, Philippine, United States of America (USA) and Indonesia. Besides speaker, around 220 researchers covering lecturers, teachers, participants and students have attended in this conference. The researchers come from Manado, Palu, Kendari, Malang, Surabaya, Bandung, Jakarta, Palembang, Jambi, Batam, Pekanbaru, Padang, Aceh, Medan and several from Malaysia, Philippine and Thailand.

I would like to express greatest thankful to all colleagues in the steering committee for cooperation in administering and arranging the conference. Hopefully this conference will be continued in the coming years with many more insight articles from inspiring research.

Regards.

Chairperson of ICIESC

Dr. Juniastel Rajagukguk, M.Si

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**Welcoming Speech of Chairman of Research Institute, State University of Medan
International Conference on Innovation in Education, Science and Culture (ICIESC)**

On behalf of the 1st International Conference on Innovation in Education, Science and Culture (ICIESC) committee, I wish to welcome all of the participants to the conference being held during November 8 – 9, 2017 at Grand Mercure Hotel, Medan Sumatera Utara, Indonesia.

Welcome the honorable guests speakers Professor Syawal Gultom, M.Pd, Professor Jakrapong Kaewkhao, Rosemarie Daher Kowalski, Ph.D, Professor Atty Cecilio D. Duka, Ed. D and Dr. Mati Horprathum. Welcome also delivered to Vice Rectors, Deans of Faculties of Education, Languages and Arts, Social Sciences, Natural Sciences and Mathematics, Engineering, Sports Sciences, and Economics, Director of Postgraduate School of UNIMED, other speakers, and participants from outside and inside Unimed.

This conference is one of the manifestations of the vision and mission of Research Institute (Lemlit) of Unimed, namely the dissemination and implementation of the results of research and studies related to the community. Therefore we strongly support the activities of this seminar which is also a series of academic activities of Unimed. Through this seminar, the participants will exchange information related to the latest research in the field of education, science-technology and culture which is expected to bring new ideas in solving various problems.

In accordance with the theme presented in this conference "Innovation Making Better Life" it is expected that LemlitUnimed can lead and strengthen the future research. The goal of innovation is to improve of research quality especially for education, science, technology and culture. Through innovation in education, science and culture, the human resources will be capable for solving global crises such as internationally political conflicts, climate change and loss of biocultural diversity.

Thank you for all committee to has well organized this conference. Thanks to all keynote speakers who have attended, presented and shared their ideas on education, science and culture. Thanks to all researchers, students and participants and hopefully this will be scientific discussion to develop the future innovation.

Finally, I hope that all academicians and stakeholders of LemlitUnimed hand-in-hand to excel our institution to be a world class university.

Best wishes for all of us
Chairman of Lemlit Unimed

Prof. Motlan, M.Sc.,P.hD

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RECTOR WELCOMING SPEECH

International Conference on Innovation in Education, Science and Culture (ICIESC)

The honorable,

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- *Vice Rectors*
- *Deans of Faculties of Education, Languages and Arts, Social Sciences, Natural Sciences and Mathematics, Engineering, Sports Sciences, and Economics*
- *Director of Postgraduate School of UNIMED*
- *Lecturers, researchers, students, all speakers and participants*

AssalamualaikumWrWb

Good Morning, Praise to Allah the Almighty for all His blessing, where today, we could all gather here in order to attend 'The International Conference on Innovation in Education, Science and Culture (ICIESC) with theme is "Innovation Making Better Life".

Ladies and Gentlemen,

Organizing international conference at State University of Medan (Unimed) will be constantly developed because by presenting several conferences covering all disciplines we will get a lot of inspiring inputs and new knowledge or current trending scientific topics in this world. Through this conference we will continue to promote research in field of education, science, technology and culture at Unimed. Innovatioin in some fields especially in learnig process are continuously improved.

The expectation is that all of lecturers and researchers will innovate in education, science, technology and culture that Unimed proposes the Institute of Research (Lemlit) can be encouraging educators and researcher for improving quantity and quality of research.

Let us awaken scientific attitude and skills in promoting Unimed to be a world class university and well-known which persists to be developed and excelled.

Wassalamualaikum Wr. Wb.
Rector of Unimed

Prof. Dr. Syawal Gultom, M.Pd.



Committee of ICIESC

Advisors

Prof. Dr. Syawal Gultom, M.Pd (Rector of Unimed)

Prof. Drs. Motlan, M.Sc.,P.hD (Chairman of Research Institute of Unimed)

Dr. Martina Restuati, M.Si (Secretary of Research Institute of Unimed)

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Professor Snezhana Abarzhi (Australia)

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Consumption	Rosmina Purba Rizki Fadhillah
Receptions	Rahma Diana Asmawati

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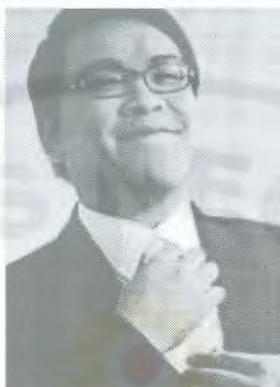
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[PS-1]

Luminescence Material from Glass Doped Ln³⁺ and Their Applications



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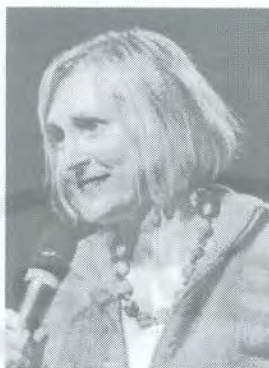
Glasses are source of material have properties like low cost, easy to prepare, high transparency at room temperature, hardness along with sufficient strength, excellent electrical resistance, absence of the grain boundaries and continuously variable composition for the optical applications. Glasses doped with Lanthanide ions (Ln³⁺) can be well developed as luminescence materials because of high emission efficiencies, corresponding to 4f-4f and 4f-5d electronic transitions in the Ln³⁺. The 4f-4f transition gives an especially sharp fluorescence patterns from the ultraviolet to the infrared region, because of shielding effects of the outer 5s and 5p orbitals on the 4f electrons. In this review, up and down conversion luminescence properties of the glasses doped with several lanthanide ions, i.e., Ce³⁺, Nd³⁺, Sm³⁺, Eu³⁺, Dy³⁺, Er³⁺ and Tb³⁺ have been explain. Moreover, the current status of their potential applications of Ln³⁺ doped glasses are also given.

Keywords Glass; Lanthanide; Luminescence

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[PS-2]

Connected and Collaborative: 3 Trends in Education



Rosemarie Daher Kowalski

Intercultural Studies, Research Metodology and Writing in Northwest University USA

Abstract - As students and faculty members become more and more connected online, collaboration can enhance educational research, classroom communication, and learning partnerships within the institution and beyond. How can educational experiences and a university classroom reflect this interactive reality? Here are three innovative trends worth noting.

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[PS-3]

Unity in Diversity in Education: The Philippine Experience



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Unity

It is the state of being one; oneness. A whole or totality as combining all its parts into one. The absence of diversity; unvaried or uniform character. (dictionary.com)

Diversity

The concept of diversity encompasses acceptance and respect. It means understanding that each individual is unique, and recognizing our individual differences. It is the exploration of these differences in a safe, positive, and nurturing environment. It is about understanding each other and moving beyond simple tolerance to embracing and celebrating the rich dimensions of diversity contained within each individual. These can be along the dimensions of race, ethnicity, gender, sexual orientation, socio-economic status, age, physical abilities, religious beliefs, political beliefs, or other ideologies.

Scope of what constitutes diversity

According to Dr. James Banks, African American professor in the University of Washington, diversity may be seen in the following: social class, ethnicity, race, language, abilities and disabilities, religion, sexual orientation and gender among others.

Etymology of Unity in Diversity

Unity in diversity was adopted as the official motto of the European Union in 2000, referring to the uniqueness of each of the nations belonging to the EU as well as to the intention of all the nations belonging to the organization to forge a common identity. Very soon after its adoption, the motto was changed to "United in diversity." Each member of the EU expresses the motto in its own language.

Principles that would help create unity in diversity in the schools.

The following are some of the principles laid down in a study published in 2001 by the University of Washington College of Education:

1. *Professional development programs should help teachers understand the complex characteristics of ethnic groups within the society and the ways in which race, ethnicity, language, and social class interact to influence student behavior.*

Since the Philippines with more than 1000 islands, has a diverse ethnic groupings and cultural traits, these differences are taken into account in the teacher training as well as professional development programs of educators. There are more than 175 ethnolinguistic groups in the Philippines. These ethnolinguistic groups include the Ivatan, Ilocano, Pangasinense, Kapampangan, Tagalog, Bicolano, Cebuano, Ilongo, Waray, Surigaonon, Zamboangueno, Subanon, Masbateno, Maranao, etc.

Professional Development Programs should help educators to: (1) uncover and identify their personal attitudes toward racial, ethnic, language, and cultural groups; (2) acquire knowledge about the histories and cultures of the diverse racial, ethnic, cultural, and language groups within the nation and within their schools; (3) become acquainted with the diverse perspectives that exist within different ethnic and cultural communities; (4) understand the ways in which institutionalized knowledge within schools, universities, and popular culture can perpetuate stereotypes about racial and ethnic groups; (5) acquire the knowledge and skills needed to develop and implement an equity pedagogy, as instruction that provides all students with an equal opportunity to attain academic and social success in school.

2. Schools should ensure that all students have equitable opportunities to learn and to meet high standards.

Based on this idea the schools have duties in the areas of: (1) teacher quality; (2) a safe and orderly learning environment; (3) time actively engaged in learning; (4) student-teacher ratio; (5) rigor of the curriculum; (6) grouping practices (7) sophistication and currency of learning resources and information technology; and (8) access to extra-curricular activities.

3. The curriculum should help students understand that knowledge is socially constructed and reflects researchers' personal experiences as well as the social, political, and economic contexts in which they live and work.

In the curriculum and teaching units and in textbooks, students often study historical events, concepts, and issues only or primarily from the points of view of the victors. The perspectives of the vanquished are frequently silenced, ignored, or marginalized.

The Philippines has reviewed and revised its curriculum to help its students become globally competitive. Among these measures are the following laws: Batas Pambansa Blg 232 – Education Act of 1982; Republic Act No. 10157 - Kindergarten Education Act; Republic Act No. 10533 - The Enhanced Basic Education Act of 2013.

4. Schools should provide all students with opportunities to participate in extra- and co-curricular activities that develop knowledge, skills, and attitudes that increase academic achievement and foster positive interracial relationships.

There is significant research that supports the proposition that participation in co-curricular and extracurricular activities, and school-sponsored social activities contributes to academic performance, reduces high school drop-out rates and discipline problems, and enhances interpersonal skills among students from different ethnic backgrounds.

5. Students should learn about stereotyping and other related biases that have negative effects on racial and ethnic relations. Making crosscutting group memberships salient can reduce prejudice because it is hard to dislike people with whom you share important aspects of your identity. These are aspects of identity (religion, age, sex) that people share with some of the members of their own racial or ethnic group but not with other members.

The Philippine constitution respects freedom of religion. Article III, Section 5 of the said Constitution provides: No law shall be made respecting an establishment of religion, or prohibiting the

free exercise thereof. The free exercise and enjoyment of religious profession and worship, without discrimination or preference, shall forever be allowed. No religious test shall be required for the exercise of civil or political rights. Moreover, Under Article XIV, Section 5(3): At the option expressed in writing by the parents or guardians, religion shall be allowed to be taught to their children or wards in public elementary and high schools within the regular class hours by instructors designated or approved by the religious authorities of the religion to which the children or wards belong, without additional cost to the Government. Article XIV, Section 3(3).

The diversity of religions in the Philippines is as follows based on statistics: Catholic - 80.58%; Islam - 5.57%; Evangelicals (PCEC) - 2.68%; Iglesia Ni Cristo - 2.45%

6. Students should learn about the values shared by virtually all cultural groups (e.g., justice, equality, freedom, peace, compassion, and charity).

Teaching students about the values that virtually all groups share, such as those described in the UN Universal Bill of Rights can provide a basis for perceived similarity that can promote favorable intergroup relations. The following are the basic human rights that should be taught to children: Basic Human Rights, Right to Equality, Freedom from Discrimination, Right to Life, Liberty, Personal Security, and Freedom from Slavery, Freedom from Torture and Degrading Treatment, Right to Recognition as a Person before the Law

Human Rights in the Philippines

Under Section 17, Article XIV of the 1987 Constitution there is hereby created an independent office called the Commission on Human Rights. The teaching of human rights is included in the school curricula, in textbooks, and other reading materials and in the qualifying examinations on government service is also provided by Executive Order 27 issued on July 4, 1986.

7. Teachers should help students acquire the social skills needed to interact effectively with students from other racial, ethnic, cultural, and language groups.

Being the target of stereotyping, prejudice, and discrimination is a painful experience. People react in a variety of ways, many of them potentially damaging. For instance, people respond with anger, rage, and violence, they reciprocate the prejudice and discrimination, or they can accept the stereotypes as potentially applicable to them.

8. Schools should provide opportunities for students from different racial, ethnic, cultural, and language groups to interact socially under conditions designed to reduce fear and anxiety.

Xenophobia – the intense or irrational dislike or fear of people from other countries.

9. A school's organizational strategies should ensure that decision-making is widely shared and that members of the school community learn collaborative skills and dispositions in order to create a caring environment for students.

Safe and Caring School

According to the National School Climate Center, Columbia University, a safe and caring school environment is one in which students feel positively connected to others, respected, that their work is meaningful, and that they are good at what they do.

10. Teachers should use multiple culturally sensitive techniques to assess complex cognitive and social skills.

Diversity in the Classroom. A multicultural classroom is one in which both the students and the teacher are accepting of all races, cultures, and religions. This acceptance is evidenced by the books that are read, the activities that are completed, and the lessons that are taught.

The Madrasah Program in the Philippines

Madrasah is an Arabic word which means school. Madrasah education is a system of education which emphasizes on Arabic literacy, Islamic values (universal moral values based on Islam), and the Islamic religion. The Madrasah education program was formulated to meet the needs of Muslim Filipino children. According to DepEd Order 51, signed in 2004, all public and private schools in Muslim communities are encouraged to implement the curriculum madrasah.

Books Authored by Atty. Duka

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2. *Labor Laws and Social Legislations: A Barrister's Companion* (Rex Bookstore, 2016)
3. *Constitutional Law: A Barrister's Companion* (Rex Bookstore, 2010)
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5. *The Struggle for Freedom: A Textbook in Philippine History* (Rex Bookstore, 2008)
6. *The Law and the Teaching Profession in the Philippines* (C and E Publishing, 2008)
7. *Philosophy of Education* (Rex Bookstore, Inc., 2006, 1999)
8. *Reviewer for the Civil Service Examination* (Manila Review Institute, Inc., 2015, 2001)
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13. *Introduction to Sociology* (Anvil Publishing), 2014



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[PS-4]

Research and Development of Thin Film and Nanostructure at NECTEC, Thailand



Mati Horprathum

Abstract - Thin films and nanostructured coatings have attracted enormous attention for the development of optical coatings, sensors, optoelectronic devices, photocatalysis and solar cells. In this work, we present the overviews of the fabrication techniques based on physical vapor deposition, i.e., magnetron sputtering, electron beam evaporation, and the optical spectroscopic characterizations, i.e., spectroscopic ellipsometry, spectrophotometry, which have been developed at Optical Thin-Film Technology Laboratory, NECTEC, Thailand. We would further discuss our accomplished work, which have been realized through the synergy of theories and experimentations, and utilizes the technologies toward local industrial manufacturers. In addition, we will also discuss the potentials of the fabrications to improve towards recent applications i.e. self-cleaning glasses, omnidirectional anti-reflection coatings, transparent conductive oxides, surface enhanced Raman scattering (SERS) substrates, ultra-sensitive nanostructural gas sensors, birefringence nanostructure thin films, high surface area photocatalytic nanostructures and their future developments.

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[ABS-30]

Shuttle Tool: Designing The Bleep Test Tool As A Digital Aerobic Endurance Test System

Imran Akhmad

State University of Medan
Corresponding Author:

Abstract - This research is a research about the design of a tool called shuttle tools as a counter bleep test counters to measure aerobic resistance based on microcontroller and its application as a digital tool that uses motion sensors to calculate feedback. This study aims to find out: the level of needs of product needs of Shuttle tools and designing bleep test based on digital system. The method in this research is a survey of 30 samples randomly simple. The instrument used is a closed and open questioner. The study concludes that: (1) 64% of respondents stated that the doubt in the count of bleep test, (2) 45% stated that the count of the manual count is less objective, (3) 75% of respondents stated that the existing device shows difficult to obtain, and (4) 80% of respondents stated that the importance of tools to help bleep test-based digital systems.

Keywords: Shuttle Tools, microcontroller, Bleep test, aerobic



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Shuttle Tool: Designing The Bleep Test Too As A Digital Aerobic Endurance Test System

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Keywords: Shuttle Tools, microcontroller, Bleep test, aerobic

INTRODUCTION

All sports that are dominant physical activity desperately need aerobic endurance (DTA). DTA is often interpreted with Maximum Oxygen Volume (VO₂ Max) which means that the ability of the lungs to store oxygen as much as possible. DTAs are required during matches for the duration of the game to remain powered while the training can accomplish the task of training that is given optimally. Endurance depends on several factors such as speed, muscle strength, technical ability to perform movement efficiently, the ability to use physiological functions of the body economically psychological status when performing activities [1]. This becomes the basis of the importance of knowing the aerobic capacity of an athlete to establish the ability of one's heart and lungs. One instrument that is quite popular to use is bleep test [2], [3], [4]. Bleep test is a test instrument for measuring athletic aerobic capacity and is performed back and forth with a distance of 20 meters using a 20 meter rhythm [5], [6].

There are some weaknesses in manual test bleep namely; the use of difficult tools such as the provision of sound systems, tape recorders, manual counting counts and various other administration test equipment. The impact of the weakness is often a miscalculation and it is difficult to determine the accuracy of feedback and ultimately affect the results of aerobic endurance tests.

Various studies have been conducted to improve the efficiency and effectiveness of bleep test with computer utilization as a tool [7] developing computer bleep test software. The study developed the recording of the results one by one, the bleep test time indicator shown to be shown to the teste for the tester to bleep test with the maximum. Number indicator to match the tester. The results still have weaknesses;

(1) the technical count is still manual calculation, (2) has not utilized the motion sensors and (3) the use of tape recorder tool. The software is good enough but needs to be crafted to produce tools that can minimize weaknesses. Besides that it has also been developed bleep test software team that is the 20-meter bleep test team that is released by United Kingdom or the United Kingdom and Bleep test that can be used in I phone in realease in UK.

This is the underlying need to develop a tool bleep test that is named shuttle tools. This study aims to produce bleep test tool by utilizing motion sensor infrared computerized system based on microcontroller. Shuttle tool is a tool to calculate inverse bleep test by utilizing infrared beam as motion sensor which connected to microcontroller and direct entry to computer software application system to display bleep test result end.

METHOD

This research was conducted in Physical Laboratory of Faculty of Sport Science Unimed in September 2017. The sample of this research is 30 people with purposive random sampling technique. Research and Development research methods (R & D) of Borg and Gall model [8] is a research method used to produce a particular product and test the effectiveness of the product. The steps of this study can be explained in the picture below flowchart.

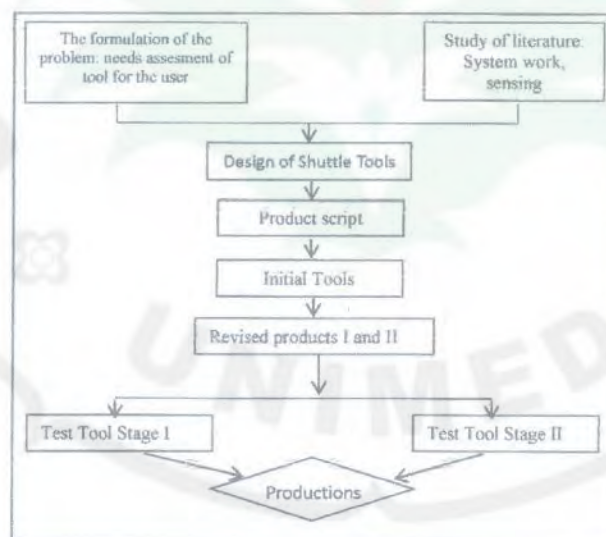


Figure 1. Diagram of the research flow

The instrument of this research use: using closed and open questionnaire. Closed questionnaires are used to determine the level of effectiveness and efficiency of the product. Open Questionnaire is used to know the weakness and non-conformity of tools to the needs of the product and is used during Focus Group Discussion (FGD). The data analysis techniques used in this research are: (1) Needs analysis using percentage technique to see the level of product requirement, (2) To measure the effectiveness and efficiency of the product use as a validity test with FGD technique by 5 experts namely test and measurement experts, sports coaching experts and IT experts. (3) to see the effectiveness and efficiency of the model used phase 1 trial for 10 people and group 2 trial as many as 20 people using questionnaire.

RESULT AND DISCUS

From the analysis of needs that have been done to 35 respondents consisting of administrators, coaches and athletes from some branch manager of sport, so that 89% of respondents said that they have done the measurement of local muscle endurance and 11% never did. Then 56% of the respondents said they had done local muscle tests using digital equipment and 44% did not. Furthermore, respondents say 100% of respondents need digital equipment to develop local muscle endurance. Then 59% of respondents answered the measurement using digital tools have better accuracy than manual and 41% disagree. Furthermore 92% of respondents said that if there is a digital tool to measure the muscle endurance of local respondents desiring to use it and 8% do not want to use it. The results of needs analysis can be illustrated in the diagram below:

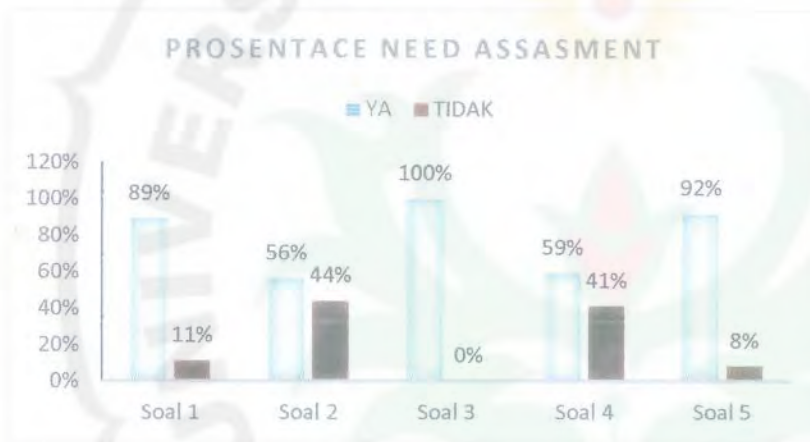


Figure 2. Prosentage of Need Assesment

The initial product design of the shuttle tool is able to work to guide the bleep test execution mechanism. The working system of the tool begins with the availability of a 20 m trajectory with 1.5 m trajectory width. To record the tray is used infrared motion sensor to guide the limit of feedback 0 - 20 m mounted on the upright pole. To record the repercussion mounted microcontroller-based recorder in the right / left waist according to the position of the infrared sensor. Recorded sensor results are recorded will be stored in the microcontroller connected computer network.

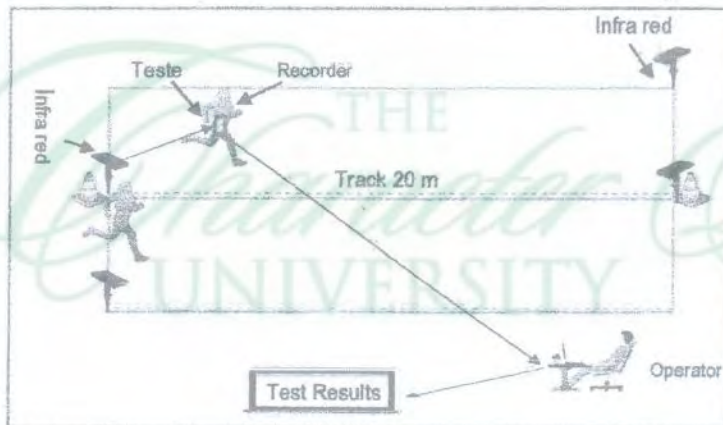


Figure 3. A set of shuttle tool works

When the runner starts running from the first point when getting a vibration alert and sound from the recorder that has been installed in the body. The sign will be on for 5 seconds when the button on the recorder is pressed. At this moment the runner is already entering the Bleep Test level 1. 1. After arriving at the second point the teste starts running again to the first point when the alert shakes and turns on. By the time the teste is at the Bleep Test level 1.2. To go on, the teste starts running from every point to another point should wait for the vibration alert and sound on the recorder. If the teste has not arrived at the next point and the sign is on, it indicates that the runner failed, and will light the sign that the teste failed. When 3 times fails sequentially then the alarm will sound an omen to terminate the test. When the alarm sounds will be connected to the mococontroller which is then automatically recorded on a PC or laptop computer and the test results appear Vo2 Max test. The result of 3 expert validation shows that the design of shuttle tools is categorized well and can be continued.



Figure 3, Expert Justment Result

DISCUSSION

The design of the bleep test tool "shuttle tools" is a digital system tool that helps the tester make measurements on the athlete. Utilization of digital devices in measuring the performance of one's motion is very effective and shows a high level of objectivity [9]. The initial startup of the shuttle tool can be used as a tool to measure the bleep test with a good level of objectivity. Shuttle tool works by utilizing infrared beam as a tool of digital motion sensor and connected to microcontroller which then connected to PC. The calculation results will be analyzed with the application and the count will be seen on the display. The numbers appearing on the display will be translated by app and show the category of bleep test results. Shuttle tools have the advantage of not having to use large hardware and can be done alone with equipment that is easy and cheap. It is believed that the shuttle tool is the best solution for sports actors who want to know the level of aerobic endurance or VO2Max.

Conclusion

This paper describes the design of bleep test tool based on microcontroller by utilizing infrared body motion sensor. The initial draft describes the mechanism of the shuttle tool's work from the beginning to the end of the test. The result of initial draft design as follows; the catch of the infrared sensor is connected to the microcontroller and

subsequently channeled to the PC automatically. Countdown count results will be seen on the display, especially connected with the recorder and automatically. The whole thing will be integrated which shows the result and level of each teste and shows the category VO2 Max.

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