



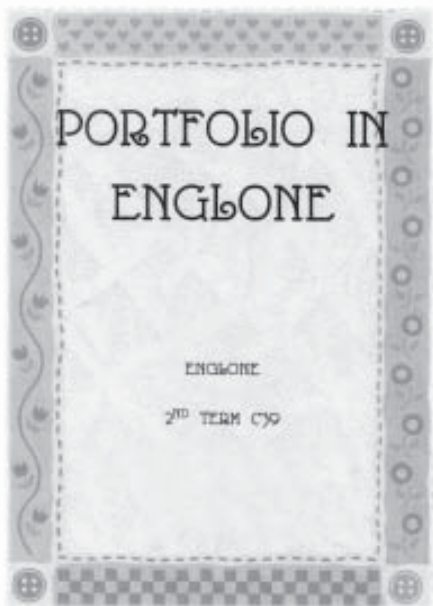
# THE URCO DIGEST

THE TRIMESTRAL PUBLICATION OF THE UNIVERSITY RESEARCH COORDINATION OFFICE  
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## EXPLORING THE ROLE OF SELF-REGULATORY PROMPTS IN ENHANCING THE METACOGNITIVE KNOWLEDGE OF FRESHMAN COMPOSITION STUDENTS



This study focuses on Freshman Composition students' retrospection in their journals to ascertain the role of a three-stage model of self-regulatory prompts in enhancing metacognitive knowledge. A total of 47 journals were collected from two intact classes comprising of 22 liberal arts and 25 engineering students. Qualitative and quantitative methods were employed to obtain a detailed description of the participants' metacognition. The findings suggest that giving students prompts that reflect a self-regulated cycle can increase their understanding of themselves as learners as well as their understanding of internal and external factors that spell their success or failure in class. Moreover, the results indicate that the prompts not only give students the experience of minding their own thinking but also make them aware of the depth and breath of their learning experience.



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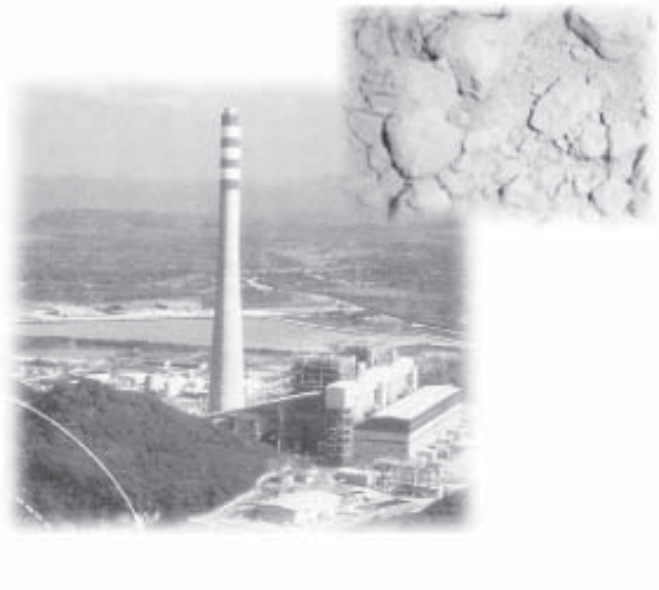
# COAL COMBUSTION WASTE FROM PAGBILAO COAL-FIRED THERMAL POWER PLANT AS PARTIAL/FULL REPLACEMENT OF FINE AGGREGATES IN CONCRETE MIXES

The cost of basic construction materials such as cement, ordinary sand, and gravel have steadily risen over the years. In time, the production of these materials will slow down as their sources get depleted gradually. Thus, industrialized countries have studied and introduced industrial waste as an alternative material. Tapping this undesirable and unused industrial waste can solve the country's environmental and solid waste disposal problems.

This research explores the use of bottom ash, an available by-product from any coal fired power plant, as a fine aggregate substitute in the mix design of concrete. The bottom ash used in this study specifically comes from the Pagbilao Power Station in Quezon Province.

The ash was subjected to several tests to determine its composition and properties. Afterwards, the ash was used in several mix designs to find out the best design mix that could reach the targeted comprehensive strength of 20.7 MPa and the corresponding tensile stress capacity. The manner of substitution of the sand by the ash was made from 0% up to 100% ash, in intervals of 20%. Furthermore, these trends were integrated into four different water-cement ratios: 0.69, 0.61, 0.54, and 0.47. The results of the experiments indicated that

a 60-40% bottom ash-sand proportion with water-cement ratio of 0.69 passed the desired strength and cost analysis. The utilization of coal bottom ash in concrete will lower the cost of fresh concrete production in Quezon Province.



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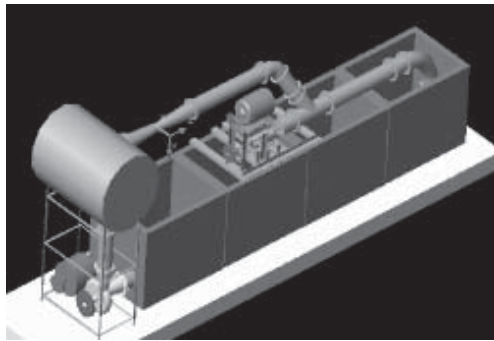


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# COMPUTER-AIDED DESIGN OF A LOW HEAD AXIAL-FLOW PUMP



*Axial Pump Test Setup*



*Axial Pump Impeller*

Axial pumps find many applications such as in irrigation, prawn farming, etc. when high volume and low head pumps are required. Without knowledge of the design and construction of axial pumps, end-users make do with off-the-shelf centrifugal pumps that consumes a lot of power when applied to low head and high volume. The design of an axial pump is still theoretically not understood in the pump manufacturing industry. The available references do not provide a simple and straightforward design procedure of axial pumps. Thus, the objective of this study is to clarify the theoretical formula and provide a relatively simple and new procedure of designing welded axial-flow pumps.

Since the manual computation of formulas and the use of tables and charts in the design of pumps are time-consuming, the study presents an axial pump design software that will compute for the

necessary specifications of a pump for a given design criteria. This leads to the fast design process, and even enables non-pump experts to design an axial pump. The software takes into account the practical aspects of fabricating the axial pump. With the theoretical values computed, the nearest standard available parts are suggested. Standard pipe sizes are used in fabricating the axial pump hub and the casing resulting in material cost savings and reduced fabrication time. Moreover, the spacings in between the diameters of the impeller jig fabrication are created at an interval of 25 mm (approximately 1 inch) to ease of technician's work in the fabrication process.

With the development of the new axial pump design procedure and software, the values generated from the software can be compared against experimental axial pump characteristic graphs. The comparison of computer results with actual values will validate the effectiveness of the design procedure.



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# PSYCHOPATHOLOGY AMONG FILIPINOS: CULTURE-BOUND DIAGNOSIS, THERAPEUTIC PRACTICES, AND PREVENTION MEASURES FOR MENTAL ILLNESS



Mental illness narratives were derived from tales told in story-sharing sessions about how Filipinos suffer for their sanity. There are 118 narratives constructed from the transcripts. This ethnographic study employed the *Sikolohiyang Pilipino* approach of *panunuluyan*, the process by which the researcher participates in the life of community. Participants in the *kuwentuhan* sessions were sampled purposively from natural clusters of people living either in the coastal, upland, or lowland communities in both urban and rural areas. Data in the form of stories were generated through the *Sikolohiyang Pilipino* method of *kuwentuhan*, a process of sharing of stories and telling tales about the phenomenon of mental illness in the community. These stories were gathered from the four major ethnic language groups: Ilocano, Tagalog, Bicol, and Cebuano. Transcripts and tales were qualitatively analyzed and interpreted through the meaning-making process to describe psychopathology in Philippine culture. Individuals involved in the *kuwentuhan* validated the meaning

derived by the ethnographer through the process of feedback to the community. The participants confirmed the truthfulness and trustworthiness of interpretations of the tales and stories from the narratives as well as the strands of data from the field notes.

Results reveal the people's mental illness metaphor, its cultural meaning, and its implication to the study of cultural psychopathology. A conceptual framework on Filipino psychopathology is presented showing the spiritual and social aspects of mental illness and wellness in Philippine culture as well as the concepts of *loob*, *bait*, and *sarili*. Cosmic beliefs heavily influence the causal explanations about madness. The spiritual worldview of the Filipino affects his concept of the nature of illness, both physical and mental. A culture-based psychodiagnosis of mental illness centers on the characterological aspect of making assessment. Traditional therapies for mental illness and prescriptions for prevention are based on Filipino folk beliefs on the causes of madness.



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# UPLAND TINGGUIAN WOMEN: THEIR PROPOSED ROLES IN THE PEACE-MAKING PROCESS AND DEVELOPMENT IN THE CORDILLERA REGION (ABRA)



This study identifies the different causes of armed conflicts in the upper part of the Cordillera, particularly in Abra where Tingguian municipalities have been the sites of armed encounters between the NPA, CPLA and the military in the past and at present. It describes the indigenous mechanisms that Tingguian women employ in resolving conflict and in coping during the period of armed encounters. Furthermore, it delineates the roles of the Tingguian women in the peace-making process and in community development.

Through a descriptive and exploratory method, the study used fieldwork, face-to-face interviews, and limited participant observation for data-gathering. Ten women from the four municipalities were selected as respondents. The data were subjected to simple frequency count and qualitative data analysis especially by noting down similarities and differences.

Tingguian women unanimously agree that poverty, abuse of the environment, and failure of the government in delivering basic services are the main reasons why there is war and underdevelopment in their communities. As part of the population, these women do their share and use their power to improve the peace and order situation and pursue development in their areas. In times of encounters, they do various tasks including nursing and treating the wounded, burying the dead, and initiating dialogues between the warring parties. To cope during troubled times, they keep silent, befriend the military, and spearhead the reconciliation process. However, their roles are not duly recognized since culturally speaking, policy formulation and decision-making are the domains of the men. Thus, the research contends that peace and development in the Tingguian communities are attainable if the roles of the women are openly acknowledged and encouraged.



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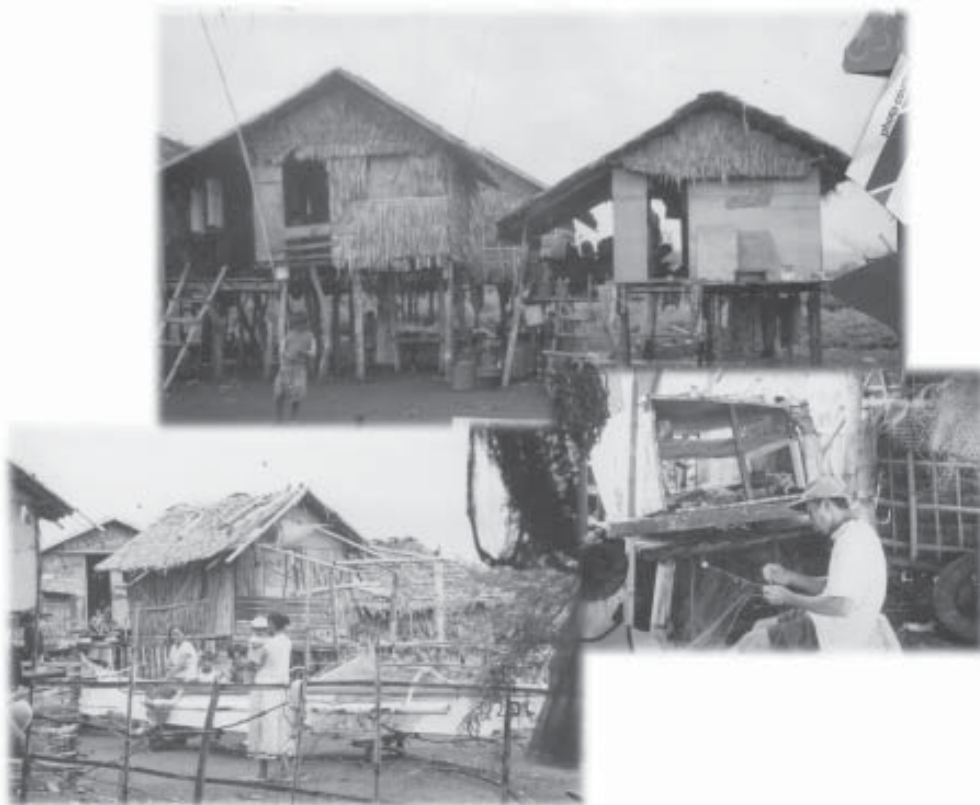
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# ETHNIC TRANSFORMATION OF A BAJAU COMMUNITY IN BATANGAS CITY

This is a baseline study that provides basic socio-demographic information on 104 Bajau families from Mindanao who have been living in Barangay Malitam, Batangas City for more than ten years. It shows that many of the cultural practices of the Bajaus in Batangas have remained traditional particularly in the domains of courtship, family, marriage, child-rearing, religion and settlement pattern. However, changes have been observed in some of their cultural practices specifically in the area of education and the means or source of

livelihood. The research utilized key-informant interview and observation. The key informants include selected Bajau leaders, a missionary pastor, teachers, and the City Social Welfare Office staff. Available reports from the City Social Welfare and Development of Batangas were also reviewed. The study hopes to generate additional data for future research focusing on policy formulation and program intervention for the improvement of the lives of the Bajaus in Batangas.



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# ANG ISTRUKTURA AT MGA PAGBABAGO SA YAMANG-TAO NG HUKBONG PAGGAWA NG MGA INDUSTRIYA SA FILIPINAS: IMPLIKASYON SA PRODUKTIBIDAD AT PAGKAKOMPETITIBO

Malawak ang papel na ginagampanan ng yamang-tao bilang mahalagang sangkap sa proseso ng produksyon. Ang papel na ito ay naging daan upang siyasatin ang produktibidad ng mga sangkap na maaaring magpaliwanag sa bilis ng paglaking ekonomiko. Maging ang pagiging kompetitibo ng mga bansa ay itinuturo sa pagkakaiba sa antas ng yamang-tao nito. Maraming pag-aaral ang nagpapatunay sa importansyang ginagampanan ng yamang-tao sa pagpapasulong ng isang bansa. Ang problemang konseptwal at empirikal ay kung papaano susukatin ang yamang ito. Maraming alternatibong pamamaraan ang ginagamit sa pagsukat nito.

Ang pangunahing problema ng pananaliksik ay tukuyin kung may makabuluhang pagbabago sa istruktura ng yamang-tao sa hukbong paggawa sa iba't ibang industriya sa Filipinas sa paglipas ng panahon. Ang ikalawang problema ng pananaliksik ay tukuyin kung may epekto ang mga pagbabago ng yamang-tao sa produktibidad ng mga industriya at pagiging kompetitibo ng mga ito.

Ang *production function* o relasyon ng nabuong produkto at ginagamit na produktibong sangkap ay maaaring ihayag sa sumusunod na ekweysyon:

$$Q_{it} = f(A_{it}, L_{it}, K_{it})$$

Ang  $Q_{it}$  ay ang nabuong produkto ng ika- $i$  na kompanya sa taong  $t$ , ang  $L_{it}$  ay ang paggawang sangkap ng ika- $i$  na kompanya sa taong  $t$ ,  $K_{it}$  ay ang istak ng kapital ng ika- $i$  kompanya sa taong  $t$ , at ang  $A_{it}$  ay ang sangkap ng kaalaman o ang pagiging epektibo ng paggawa ng ika- $i$  na kompanya sa taong  $t$ . Ipinagpapalagay ng modelo ng produksyon na ang mga kundisyong positibo ang karagdagang produktibidad ng mga sangkap  $f'(\square) > 0$ , at negatibo naman ang bilis ng pagbabago ng karagdagang produktibidad ng mga sangkap,  $f''(\square) < 0$  ay nangyayari.

Ang *production function* ayon sa modelo ni Solow ay maaaring ding gamitin sa ating pagsusuri. Tulad ng isang *production function* ayon sa Cobb-Douglas na modelo, ang relasyon ng nabuong produkto at mga produktibong sangkap ay ipinakikita sa ekweysyon (1)

$$Q_{it} = f(A_{it}, L_{it}, K_{it}) \quad (1)$$

Ang mga depinisyon ng mga varyabol sa ekweysyon (1) ay katulad din ng mga nabanggit sa unahan maliban sa varyabol na  $A_{it}$ . Ang  $A_{it}$  ay ang kabuuang istak ng yamang-tao ng ika- $i$  na kompanya sa taong  $t$ . Kung hahatiin ang mga varyabol sa ekweysyon (1) ng varyabol  $L_{it}$ , ang *production function* ay nauuwi sa pagpapaliwanag kung papaano nagbabago ang produktibidad ng



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paggawa. Ang production function ayon kay Solow ay ipinakikita sa ekweysyon (2):

$$q_{it} = f(a_{it}, k_{it}) \quad (2)$$

Ang  $q_{it}$  ay ang nabuong produkto ng bawat paggawa ng ika- $i$  na kompanya sa taong  $t$ . Ito rin ay matatawag natin bilang produktibidad ng paggawa ng ika- $i$  na kompanya sa taong  $t$ . Ang  $a_{it}$  ay ang indeks ng yamang-tao ng ika- $i$  na industriya sa taong  $t$ . Ito ay sinusukat bilang avereyds na taong tinapos na pag-aaral ng isang ordinaryong manggagawa sa bawat kompanya. Ang  $k_{it}$  ay ang ratio ng kapital sa paggawa o ang istak ng kapital sa bawat paggawa sa ika- $i$  na kompanya sa taong  $t$ . Ipinagpapalagay din ng modelo na ang  $f'(\dots) > 0$  at ang  $f''(\dots) < 0$  ay nasusunod.

Ang modelong nabanggit ay maaaring sukatin sa pamamagitan ng ekweysyon (3):

$$\ln q_{it} = \beta_0 + \beta_1 \ln a_{it} + \beta_2 \ln k_{it} + v_{it} \quad (3)$$

$\ln q_{it}$  = ang natural logarithm ng nabuong produkto bawat manggagawa  
 $\ln a_{it}$  = ang natural logarithm ng indeks ng yamang-tao sa ika- $i$  industriya sa taong  $t$   
 $\ln k_{it}$  = ang natural logarithm ng ratio ng kapital sa paggawa ng ika- $i$  na industriya sa taong  $t$   
 $v_{it}$  = mga ingay  
 $\beta_0, \beta_1, \beta_2$  = mga koepisyenteng susukatin.

Ang mga datos ay hango sa ulat ng ika-apat na kwarter ng Labor Force Survey ng National Statistics Office (NSO) mula noong 1988 hanggang 1998. Kinuha mula sa mga taunang survey na ito ang antas ng edukasyon at iba pang katangian (edad at kasarian) ng mga manggagawa sa iba't ibang pangunahing industriya sa buong bansa at iba't ibang rehiyon ayon sa noong 1988 at 1998.

Sa pagtatantiya ng ekwesyon ng produktibidad ng mga industriya, kakailanganin ang datos sa produksyon o output, istak ng kapital, at paggawa. Ang produksyon ng mga pangunahing industriya sa bansa ay ibinatay sa idinagdag na halaga (*value added*) mula sa mga ulat ng National Statistics Office. Ito ay sinukat ayon sa presyo noong 1985 upang makuha ang tunay na pagbabago sa paglipas ng panahon. Ang ginamit ay ang *GDP deflator* na nakabatay sa 1985.

Ang halaga ng istak ng kapital ay batay sa pangangapital ng mga industriya simula pa noong 1975 hanggang sa kasalukuyan mula sa *Annual Survey of Establishments*. Ang datos ay sinukat sa presyo noong 1985 upang makuha ang tunay na pagbabago sa istak ng kapital sa paglipas ng panahon. Ang ginamit na deflator ay ang GDP deflator para sa pangangapital.

Sa paglalarawan ng istruktura ng antas ng edukasyon ng hukbong paggawa, nakita natin ang antas ng natapos na pag-aaral ng mga manggagawa ayon sa edad, kasarian, at uri ng industriya.

Masasabi nating bata pa rin ang edad ng mga miyembro ng hukbong paggawa. Ang pinakamalaking bahagi ng hukbong paggawa ay nasa edad 25-34 taon, kahit bumaba na ang proporsyong nito sa paglipas ng mga taon. Samantala, ang pinakamababang bahagi ay nasa categoryang 55-64 ang edad. Ang malaking bahagi rin ng mga manggagawang may mabababang antas ng edukasyon ay matatagpuan sa mga categorya ng pinakabata at pinakamatandang miyembro ng hukbong paggawa. Karamihan sa mga manggagawang tapos sa kolehiyo ay nasa edad 25-34 taon. Samantala, ang pinakamalaking bahagi ng mga manggagawang walang natapos na pag-aaral ay nasa edad 55-64 taon.

Nagbabago rin ang indeks ng yamang-tao batay sa edad. Ang edad 20-24 taon ay nagtala ng pinakamataas na indeks na umabot sa 9.25 taon at ang edad 55-64 ang nagtala naman ng pinakamababang indeks na 6.2 taon noong 1998.



Kahit marami ang absolutong bilang ng mga lalaki kung ihahambing sa mga babaeng miyembro ng hukbong paggawa, tumataas naman ang absolutong bilang at proporsyon ng kababaihang pumapasok sa hukbong paggawa sa paglipas ng mga taon. Mas maraming kababaihan ang tapos sa kolehiyo kung ihahambing sa bilang ng kalalakihan. Bunga nito, higit na mataas ang antas ng indeks ng yamang-*tao* ng mga kababaihan kung ihahambing sa mga kalalakihan.

Kung titingnan ang istruktura ng antas ng edukasyon ng mga manggagawa ayon sa industriya, lumalabas na pagkakaiba ang mga ito sa pagitan ng mga produktibong sektor ng ekonomiya. Malaking bahagi ng mga manggagawa sa agrikultura ay di tapos sa elementarya. Samantala, ang pinakamalaking bahagi ng mga manggagawa sa sektor industriyal ay tapos sa *hayskul* tulad ng pagmamamamunaktura at tapos naman sa kolehiyo sa elektrisidad, gas at tubig. Sa sektor ng mga serbisyo, ang pinakamalaking proporsyon ng mga manggagawa ay tapos sa *hayskul* na lumilitaw sa mga industriya ng kalakalan at transportasyon samantalang tapos naman sa kolehiyo ang lumalabas sa mga industriya ng pananalapi at serbisyon pangkomunidad.



Ang indeks ng yamang-*tao* sa mga industriya ay naitala noong 1998 sa antas na 8.2 taon o lagpas lamang ng ikalawang taon sa *hayskul*. Ito ay tumaas lamang ng 8.4 porsiyento sa loob ng 11 taon. Ang agrikultura ang nagtala ng pinakamababang indeks na umabot lamang 6.06 taon o tapos ng elementarya noong 1998 kahit tumaas na ito mula sa naitala noong 1988. Samantala, ang industriya ng pananalapi ang nagtala ng pinakamataas indeks na umabot sa 11.96 taon noong 1998 ngunit bumaba na ito mula sa naitalang indeks noong 1988. Hindi iisang direksyon ang dinaanan ng indeks ng yamang-*tao* ng mga industriya. Kasama sa mga industriyang nagtala ng pagtaas sa indeks sa loob ng 11 taon ay pagmamamunaktura, pagmimina, konstruksyon, kalakalan at transportasyon, samantalang bumaba naman ang indeks sa elektrisidad, gas at tubig.

Batay sa espesipikasyon ng *production function* ayon sa modelong Solow, lumilitaw na mahalaga ang papel ng edukasyon sa pagpapataas ng produktibidad ng mga industriya. Ang nasukat na koepisyente ng elastisidad ng produktibidad ng paggawa sa indeks ng yamang-*tao* ay napakataas at lumalagpas sa 100%. Subalit dahil sa napakabagal na pagtaas ng indeks ng yamang-*tao* sa iba't ibang industriya sa loob ng mahigit sa isang dekada, ang napakataas na potensyal na epekto ng edukasyon sa pagpapataas ng produktibidad ng mga industriya ay hindi maipatupad.

Makabuluhan din ang epekto ng pangangapital sa pagpapataas ng produktibidad ng mga industriya. Ayon sa nasukat na koepisyente, kahit na maaaring maghalinhinan ang kapital at paggawa sa pagbabago ng produktibidad ng mga kompanya, kinakailangang mas mabilis ang pagtaas ng pagbabago sa kapital kaysa pagbabago sa paggawa upang makuha ang makabuluhang pagbabago sa produktibidad ng paggawa sa mga industriya. Nagpapahiwatig na kailangang-kailangan ang dagdag na pangangapital sa mga industriya upang mapataas ang produktibidad.

Ang resulta ng ating pagsusuri ay sumasang-ayon sa mga pag-aaral empirikal sa ibang bansa na naghahayag na kinakailangan ang mas matinding pagpapalawak ng yamang-*tao* kaysa sa pagpapalawak ng istak ng kapital at paggawa upang mapabilis ang pag-unlad ng ekonomiya.

Sa harap ng globalisasyon at pagbubukas ng ating ekonomiya sa malayang kalakalang internasyonal, ang pagiging kompetitibo ng ating mga industriya ay nakasalalay sa mataas na antas ng edukasyon ng ating mga manggagawa. Tunay na nagpapataas ng produktibidad ang sangkap na ito sa proseso ng produksyon. Dahil dito, kakailanganin ang mabilis na pangangapital sa yamang-*tao* upang tumaas at tumingkad ang pagiging kompetitibo ng ating mga industriya nang malasap natin ang mga benepisyo ng globalisasyon.

# MULTISPECTRAL AEROSOL OPTICAL DEPTH MEASUREMENT IN MANILA (14°33.978'N; 120°59.523'E) USING THE MIDDLETON SP02 SUNPHOTOMETER

A multispectral aerosol optical depth (AOD) measurement at four discrete wavelengths (368, 500, 675, and 862 nm) was carried out at De La Salle University, Manila, Philippines (14°33.978'N; 120°59.523'E) using a Middleton SP02 sunphotometer along with the sun-tracking and data acquisition system specifically developed for this study. The calibration experiments utilizing the Langley method were done at the campus of DLSU in Canlubang, Philippines (14°15.735'N; 121°2.609'E) for three Saturdays. Cloud screening was also performed on some of the data to obtain the AOD. A total of 10 morning and 23 afternoon sessions were

considered for the mean AOD calculation. The AODs for all the four wavelengths during the four successive clear days considered for April were higher in the morning compared to those in the afternoon. The daily mean AOD for March-April 2004 also showed the same trend. During this two-month period, the mean AOD in the morning for 368, 500, 675, and 862 nm ranged from 0.43 to 1.49, 0.30 to 1.06, 0.21 to 0.67, and 0.19 to 0.46, respectively. In the afternoon, the mean AOD for 368, 500, 675, and 862 nm ranged from 0.40 to 1.14, 0.20 to 0.80, 0.13 to 0.51, and 0.10 to 0.34, respectively.



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