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PREFACE

Srinakharinwirot University was established in 1949. In the initial stage of development, emphasis was placed on the teaching and training of students. In recent years, the University has adopted a major policy to achieve academic excellence in teaching, research, service to the communities and cultural preservation.

As research is regarded as one of our most important tasks, we do encourage our faculty staff to carry out research for the benefit of the country, in response to the Government's policy. We believe that research activities strengthen the teaching and training of postgraduate and doctoral students to meet the goal of making them highly capable persons.

To publicize information on our research activities, for the first time, the University has published this volume of research abstracts covering research projects undertaken between 1988 and 1993. The projects were supported by grants from the National Research Council of Thailand and the University.

It is anticipated that this book will be of great value of those who wish to become familiar with our past research trends and visualize our future research interests. It is hoped that a recognition of our researchers will also take place and that this recognition will bring us in closer contact with researchers in other centers of excellence.

I do thank the university researchers who made this compilation possible.



(Professor Dr.Pote Sapianchai)
President

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ทฤษฎีการพัฒนาตนเอง**

Pisit Sarawichitr

The purpose of this research was to construct a theory of self-development and inscribe it in a piece of stone, to analyse the components of the theory, to test the value and the effectiveness of the theory in real situations, and to indicate the appropriate aids in self-development. The participants consisted of eleven Graduates School Personnel of Srinakharinwirot University at Prasarnmit campus who worked during the first semester of the 1988 academic year. The group comprised one man and ten women. Their ages ranged from 23 to 56 years old and their formal education ranged from Grade Four to M.Ed. The research technique was the one-group-pretest-posttest with extensive observation, personal involvement and long distance participation. The instruments for data collection included a self-development form, a self survey, an improvement form, a self satisfaction form, a self development technique form and other processes such as observation, interview, conversation, and records through notebooks, photographs, cassette tapes, and video tapes. Descriptive techniques with appropriate simple statistics such as sum, average, and percentage were used to analyse the data. The construction of the self-development theory was completed and the inscription of the theory in a piece of stone was executed; the analysis of the components of the theory was also satisfactory; the test of self-development theory in real situations was successful.

The participants' negative attitudes and actions were changed to positive ones. They were happier, more satisfied with life and worked better, with a sense of purpose and vision of their future? The self-development teaching plans and aids were effective. The results confirmed the value and effectiveness of the theory of self-development.

Problems Related to Applications of Teaching Profession

ปัญหาการนำความรู้วิชาชีพครูไปปฏิบัติ

Chucheeep Onkokesoong

This investigation had two objectives; firstly to determine the problems of practising the teaching profession, and secondly, to propose guidelines to solve these problems. The investigator interviewed 69 fourth-year students out of the 201 undergraduate students who had completed their teaching practice and workshop. It was found that there were many problems in the practice of teaching. They were :-

1. Lack of knowledge and understanding of the teaching profession among the students.
2. Students were not able to transfer the knowledge of the teaching profession into practice.
3. Students could not remember the contents of the teaching profession courses.
4. Students did not get enough practice in teaching.
5. Students did not appreciate most of the courses offered but they were satisfied with the following courses: Introduction to Guidance, The General Methods of Teaching, The Instructional Media, The Educational Psychology, The Curriculum and The teaching of the Major Subjects.

Construction of Literary Mini-texts as Reading Development Medium at Elementary Level.

การสร้างหนังสือเรียนเล่มเล็กเชิงวรรณกรรมเพื่อเป็นสื่อพัฒนาการอ่านในระดับประถมศึกษา

Hathai Tonyong

The main purpose of this study was (1) to construct literary minitexts, to develop the reading ability of elementary level students by using the Concentrated Language Encounter Method, (2) to compare reading achievement between two groups of students learning through literary mini-texts versus larger texts, and (3) to study the differences in reading achievement and reading attitudes between sexes (boys and girls).

Using a simple random sampling technique, students were selected from 1,143 students in four elementary schools of Prathom Suksa III (Grade III) located in Bangkok and in suburban areas. The schools were Rajvinit School in Bangkok, Pracha - Uapathum School in Nonthaburi province, Wat Bangphlee Yai Klang School and Wat Bangphlee Yai Nai School in Samutprakarn province. The sample students in each school were randomly assigned into groups : experimental and control groups each with 30 students (15 boys and 15 girls). Both groups were taught by the Concentrated Language Encounter Method using literary minitexts for the experimental group and literary texts for the control group.

The pretest - posttest control group design was used in this study. The t - test statistics was used to investigate the significant differences between the mean test scores of the experimental and control groups. A Meta - analysis was also used to synthesize the effectiveness of the treatments between the experimental and control groups of the four schools.

The findings revealed that :

1. There was a high effectiveness in the experimental treatment of the reading achievement and attitudes towards reading with the average effect size of 1.09 (percentile at 36) and of 1.46 (percentile at 92.79) respectively.

2. Among the experimental groups in these school, it appeared that the group of Rajvinit school had the highest reading achievement scores and these were significantly different from the other three schools. This result is based on the pretest and posttest scores at the .05 level.

3. There was a significant difference between sexes in reading achievement and in attitudes towards reading in the experimental groups of every school at the .05 and the .01 levels respectively.

4. There was no significant difference between sexes in reading achievement and in attitudes toward reading in the control groups of all four schools.

A Followup Study For Job Placement and of Graduates form the Faculty of Nursing, Srinakharinwirot University.

**การศึกษาติดตามผลการมีงานทำและการปฏิบัติงานของบัณฑิต
พยาบาลศาสตรมหาวิทาลัยศรีนครินทรวิโรฒ**

Pongsri Kritlertnapa

The purpose of this study was to determine 1. The existing situation regarding employment opportunity and 2. the capability in duty performance of nursing graduates from Srinakharinwirot University as perceived by themselves, their supervisors and their co-workers. Thirty-three nursing graduates of Srinakharinwirot University, 33 supervisors and 31 co-workers were selected for of the study. The questionnaire was constructed, tested out, and used to collect data by researchers. The coefficient of reliability of the questionnaire was 0.92. Ninety seven questionnaires (98.98 percent) were completed and returned. Percentage, arithmetic mean and standard deviation of the data were analysed.

Based on the data analyses, the following conclusions could be drawn:

1. Status of the population. All of the nursing graduates who were female were admitted to Srinakharinwirot University through the entrance examination organized by the Ministry of University Affairs. Most of them opted to study in the Faculty of Nursing as their fifth or sixth choices. Those students who finished high school in the Eastern Region of Thailand and passed the entrance examination, organized by Srinakharinwirot University at Bangsaen, chose to study in the Faculty of Nursing as their first choice.

All of the supervisors were females. Most of them were between 40 and 49 years of age and had received a bachelor degree or a diploma. Their working experience was between 11 and 20 years.

Most of the co-workers were female and their ages were between 20 and 29 years. They had received a bachelor degree and their working experience was from 6 to 10 years.

2. Employment opportunity of the nursing graduates. It was found that eighteen and fifteen nursing graduates were employed in private and government hospitals respectively. Most of them were employed for between 1 and 35 days. They knew how and where to apply for job through faculty advisors and by themselves. For the year of their work, most of them did not change their job.

Most nursing graduates were employed as full-time nurses at hospitals. Their salaries ranged between 3950 and 8715 bahts per month. Nursing graduates working in the government hospital had the lowest salaries, and those who worked in the cosmetic clinics received the highest ones. Most nursing graduates were satisfied with their job.

In regard to the membership of the Nurses' Association of Thailand, most of the nursing graduates did not apply for membership. However, they intended to do so in the near future.

3. Capability in duty performance of the nursing graduates. With reference to the five aspects of duty performance of the nursing graduates, their supervisors and co-workers rated the aspects of characteristics and capability highly. The aspect of the nursing performance was rated at a moderately significant level, and the personality aspect was rated at the highest level.

The Development of Economics in Songkhla Province from World War II to 1987

พัฒนาการทางเศรษฐกิจของจังหวัดสงขลาหลังสงครามโลกครั้งที่สอง

Darunee Boonphiban

This research was aimed at studying the strategies and effects of economic development in Songkhla Province from World War II to B.E. 2530. The results of the study showed that in carrying out the economic development, the economic policies had been set up by the central government under the National Economic and Social Development Schemes. The policies were implemented through various ministries, departments, and local government offices. Local government organizations such as the Municipality of Songkhla, Haadyai, the Tambon Municipality of Sadao, and private sectors of Songkhla played active roles in carrying out the development. At the end of the Fourth National Economic and Social Development Plan, a new development strategy was adopted by the government to allow more participation among the provinces in proposing developmental targets. The result was that the economy of Songkhla has been steadily developed. Commerce and service sectors earn for the province the most income, followed by the agricultural and industrial sectors. The problems arising from the development include the ineffective exploitation of resources, lack of necessary infrastructures, shortage of capital and modern technology, and the insecurity of life and property of the people. All of these disadvantages should be rectified and redressed in order for the country to progress.

**Survey and Evaluation : A case study of role
and status of the Faculty of Social Science at
Srinakarinwirot University, Songkhla for
fourteen years**

**การสำรวจและประเมินภาระหน้าที่ของคณะสังคมศาสตร์
มหาวิทยาลัยศรีนครินทรวิโรฒ สงขลา ๑๔ ปี**

Panu Tamsuwan

The results of the research revealed new facts about the Faculty of Social Science of Srinakharinwirot University, Songkhla. These results can be summarized as follows :

1. The Faculty of Social Science has inherited and extended its function of educational provision from the then Faculty of Humanities and Social Science of the former College of Education, Songkhla, by providing courses formerly offered by the College of Education, particularly the bachelor degree programs in Education. Courses offered for these programs are mainly social studies, history, and geography.

2. Since 1977, the Faculty has expanded its programs by offering new undergraduate courses leading to a Bachelor of Arts degree in history. These courses are pure social science rather than the applied ones. Since the employment opportunities for graduates of this program are very limited, most graduates took up teaching. Accordingly, the original program was later modified to allow students to take more professional-oriented courses as electives.

3. For the past few years, the number of teachers recruited for public schools in general, has radically decreased. There has been a threat of unemployment for graduates in education; therefore very few students enrolled in the education programs, and as a result, certain major subjects, i.e. history and geography, had to be discontinued. The only remaining major course, social studies, is experiencing a declining enrollment, with ten students enrolled for the course annually. In response to this change, the Faculty of Social Science sees the need to offer more courses of its own discipline. An undergraduate program in economics will be started in the 1990 academic year, and later on, a program in geography. However, it appears that graduates of both pure and applied social science will inevitably face employment uncertainty. A possible solution to this problem is that more professionally related courses, elective or minor courses in business administration, English, educational technology, and others, should be an integrated part of the program.

4. The main task of the Faculty in the past focused on the provision of courses in social science education. At present, however, it is directed towards more courses in pure and applied social science. The direction the Faculty is heading for is not without difficulty. There is an urgent need to find solutions for the ensuing problems. First, the problem of inadequacy of personnel at various levels must be tackled. Second, there is a need for upgrading the present Social Science Faculty to its full status. Presently, the Faculty of Social Science, like other faculties of Srinakharinwirot University, Songkhla, does not enjoy a full faculty status, legally or in practice.

5. The overall impression in the past fourteen years is that the personnel of the Faculty have performed their tasks well and are ready to make progress for this institution in the long run.

**A Proposal for Staff Development Towards
the Promotion of the Teaching Efficiency
in Srinakharinwirot University at
att Bangkok**

**การเสนอโครงการพัฒนาบุคลากรเพื่อส่งเสริมประสิทธิภาพการสอนของ
มหาวิทยาลัยศรีนครินทรวิโรฒ วิทยาเขตบางเขน**

Somchai Chuchat

The purpose of the study was to investigate the administrators' and instructors' knowledge, need and methods of staff development, and to propose a staff development project for the promotion of the teaching efficiency of Srinakharinwirot University at Bangkok.

The samples of 28 administrators and 38 instructors comprised half of the instructors in each department selected, at random. The Survey Form was designed by the researcher. Data collection took place in September 1988. Frequency, percentage, parameter estimation, t-test, and One-Way ANOVA were implemented to analyse the data.

The major findings were as follows:

1. A Staff Development Unit should be set up at Srinakharinwirot University at Bangkok with a budget provided by the University, the Government, and foreign agency.
2. The Project should be a long range one and in accordance with the University Development Plan, and be continuous throughout the academic year.
3. Staff Development Activity should be arranged within the Campus for a one to two days.
4. Staff of the Staff Development Unit should have experiences in education, and should comprise members from various faculties.
5. According to the administrators' and instructors' opinion, the major problem for staff development at Bangkok is that many instructors do not recognize the importance of the improvement of teaching efficiency.

**An Evaluation of SWU Diploma in TOEFL
Program : a joint project between
Srinakharinwirot University and the British
Government under the Columbo Plan**

**การประเมินโครงการหลักสูตรประกาศนียบัตรบัณฑิตการสอน
ภาษาอังกฤษในฐานะภาษาต่างประเทศภายใต้ความร่วมมือระหว่าง
มหาวิทยาลัยศรีนครินทรวิโรฒกับรัฐบาลอังกฤษ**

Samang Hiranburana

The purpose of this research is (a) to conduct a formative evaluation of the courses offered in the Srinakharinwirot University Diploma in TOEFL Programme, a joint project between the Thai and the British Government under the Columbo Plan, so that modifications

and adjustments could be made before their summative evaluation, (b) to assess the efficiency of the programme through an evaluation of its graduates' qualities in terms of their increased English proficiency, teaching skills, teaching attitudes, the resultant improvement in language skills and learning attitudes among the students in the practical teaching schools,

and finally (c) the multiplying effects that the Diploma graduates are generating in their own school and provinces. The research also puts on records the expenditure involved in setting up an integrated post graduate one year programme.

Adjustments of the six compulsory courses were made in terms of course content and teaching/learning activities among 15 participants and 6 tutors after their first running in 1987. A summative evaluation was conducted by the 1988 diploma participants, using the 5 scale ranking questionnaire, and all the courses were rated very good by the 12 participants for their contents, learning activities, teachers, and the methods of evaluation. It was decided by the department that continual assessment and modification constitutes a crucial component of running the programme.

Assessment of the programme efficiency was conducted in many ways. Firstly, the participants in 1987 were found to have their English proficiency increased by one band (using the British Council Mini-Platform Test just by using English as the teaching-learning medium in the course for 6 months. Secondly, there seemed to be a laudable correspondence between the participants' self assessment and the tutors' assessment of their teaching ability and teaching techniques. Assessment of any improvements in the practical teaching of school students after 12 weeks of teaching was found to be negative in terms of improvement in the language skills but highly positive for the attitudes towards learning English. A follow-up study of the 1987 graduates reveals a high correlation between the head-masters' opinions and the graduates' opinions on their attitude and performance of their work in the schools (50% ranked these as "very good" and 40% as "good"). To the department's concern, diploma graduates who had been trained to be just good teachers are being required by the schools to conduct not just the school internal supervision programme, but also are being invited to be trainers or speakers for short as well as intensive training programmes in the provinces and

regions.

Over the years, it was found that for heavy equipment B.10,789 came from the British Government while the Thai Government contributed B.111,415. For general expenditure, the Thai government contributed B.422,967 (staff salary not included) while an unknown sum came from the British Government. Additional expenditure was incurred by 3 short-term training sessions held in Britain, - a contribution from the British Government.

Characterization of Common Antigens in Paragonimus siamensis and P. heterotremus

ศึกษาคุณสมบัติของแอนติเจนร่วมในพยาธิใบไม้ปอด 2 ชนิด

Pansin Katutat

The common antigenic determinant in adult Paragonimus siamensis and P.heterotremus was studied by immunizing rats with adult P.siamensis and P.heterotremus crude extracts. The 94, 87 and 77 kilodalton protein bands were recognized from the reaction between the P.siamensis antigens and rat serum antibodies immunized with P.heterotremus, while for the P.heterotremus antigens, the 56 and 22 kilodalton protein bands reacted with the rat serum antibodies immunized with P.siamensis

A Study on Culture of Some Macro-Red Algae in the Eastern Coast

**การศึกษาการเลี้ยงสาหร่ายทะเลสีแดงขนาดใหญ่บางชนิดบริเวณ
ชายฝั่งทะเลภาคตะวันออก**

Punnee Pedyod,

A survey was made on the distribution of red macro - algae along the eastern coast of the Gulf of Thailand between September 1987 and August 1988. Forty-two species were collected and identified. All species were found during winter. The species were Centroceras clavulatum, C. minutum, Ceramium byssoideum and Gracilaria sp. The red macro-algae was found in abundance at Laem Taen, Smae San, Hard Phadaeng, Ban Pae, Aow Lane and Khung Wimarn, with the number of species as 16, 16, 15, 15, 15 and 12 respectively.

Ecological study of the culture revealed that the red macroalgae grew well at a temperature between 30 and 32 C, where the light penetration depth was from 0.6 to 1.4 meters, the salinity of water was 30 ppm, pH 7, the wave condition was moderate and the stalk holding materials were rocks, gravels, sand, seashell and seaweed.

The red algae used for the culture was *Gracilaria verrucosa*. Two types of culture - beds were prepared namely net and monoline types. Spores and thallus were used in the culturing method. The nets and monolines in three different types of floating, sinking and interception with the ground were set up. The experiment was carried out in an open system. The data were analysed by using the two - way ANOVA and the results were as follows:

No spores were found on the nets and monolines. By using thallus for cultivation, it was observed that the highest yield was obtained from the sunk net while the lowest yield was found on the floated net. It was very interesting to find that the product of *Gracilaria verrucosa* was higher in the net than in the monoline method.

Karyotypes of Two Cyprinid Fishes, *Catlocarpio siamensis* (Boulenger) and *Probarbus jullieni* (Sauvage).

คาริโอไทป์ของปลากะหันและปลาอีสกไทย

Wichian Magtoon,

Thawat Donsakul,

The purpose of this experiment was to study the karyotype of two cyprinid fishes, *Catlocarpio siamensis*, Boulenger and *Probarbus jullieni*, Sauvage. Two specimens of *C. siamensis*, in standard length 22.5 - 23.5 cm. and five specimens of *P. jullieni*, 6.8 - 7.5 cm. in length were used. An observation of the mitotic metaphase chromosome prepared from gill and kidney tissue by the Uwa and Ojima's method was made. The Levan et. al's method of chromosome classification was employed. The findings of the experiment were as follows :

1. The diploid chromosome number of *C. siamensis* is 96. The karyotype comprises 9 pairs of metacentrics, 27 pairs of submetacentrics, 3 pairs of subtelocentrics and 9 pairs of acrocentric chromosomes. The arm number is 168.

2. The diploid chromosome number of *P. jullieni* is 96. The karyotype comprises 11 pairs of metacentrics, 7 pairs of acrocentric chromosome. The arm number is 132.

Two Stage Anaerobic Fermentation of Tomato Solid Waste

การหมักกากมะเขือเทศแบบบับอากาศสองขั้นตอน

Yuwadee Nakapadungrat

This research was carried out to study the biogas production by a two-stage anaerobic fermentation of tomato solid waste. The experiments were performed at an ambient temperature. In the acidogenic stage, the tomato solid waste suspension at the concentrations of 10 and 20 g per litre was fermented for a three - day hydraulic retention time. The filtered liquor contained organic contents at an average of 1,753.79 and 2,816.99 mg COD per litre, with pH values of 4.30 and 4.22 respectively. The percentage of the solid waste destruction was 20.23 and 12.74 of the total solid or 19.61 and 12.15% of the volatile solid respectively.

The experiments in the methanogenic stage were carried out to study the effect of organic loading rates on the gas production rate (V_g/V_r), the efficiency of the gas production (V_g/COD_a and V_g/COD_d), the amount of volatile fatty acid (VFA), alkalinity and pH of the effluent, the methane content of the combined gases between carbondioxide and methane and finally the organic destruction. It was found that when the organic loading rates increased, the rates of the gas production rates increased, V_g/COD_a decreased, the amount of volatile fatty acid increased, pH of the effluent and the organic destruction decreased. It was noticed that when the organic loading rate was more than 1.7 g COD/litre/day, the alkalinity of the effluent varied and pH values became constant. An increase in organic loading rate had little if any effect on V_g/COD_d and also the methane content, within the ranges 88.02 to 93.58% in the combined gases of carbondioxide and methane.

In addition, the effect of hydraulic retention time on gas production rate was investigated. It was shown that when the fermented liquor containing 1.5 g COD/litre was fed into a methane reactor and the hydraulic retention times were decreased from 10 to 5 and 2 days, the gas production rate increased from 0.06 to 0.13 and 0.27 litre/litre, pH of the effluent decreased from 7.05 to 6.98 and 6.64, respectively. The decrease in hydraulic retention time did not affect either the gas production rate or the organic destruction.

However, the system in a methane reactor could tolerate the fermentation of one day hydraulic retention time with the organic loading rate of 4.2 g COD/litre/day. The maximum gas production was obtained at the rate of 0.81 litre/litre. The effluent had a pH value of 6.04, the alkalinity content of 864.3 mg/litre and the volatile fatty acid content of 557 mg/litre. The organic destruction was 39.21%

Synthesis of Research Results on Child Rearing Practices in Thailand using Meta Analysis Procedure

**การสังเคราะห์งานวิจัยที่เกี่ยวข้องกับการอบรมเลี้ยงดูเด็ก
ในประเทศไทย**

Dusadee Yoelao

A meta - analysis procedure was used to analyse research results on child rearing practices in five universities of Bangkok and the Behavioral Science Research Institute. Studies were based on the following criteria : 1) they must be statistically analysed and provide statistics such as t, Z, F, X^2 or r, 2) the instruments used in the study must be highly reliable ($r_y > .60$).

Using the procedure described by Rosenthal and Hedges, the effect size indicators were computed and transformed into the standardized effect size. The homogeneity of the variance of the standardized effect size was tested and ANOVA and regression analysis was used to study the variation in the effect size indicators.

The results were as follows :

1. The effect size of child rearing practices ranged from small to medium sizes.
2. The positive child rearing practices had positive effect on personality, social character and intellectual development.
3. The highly controlled method of child rearing practices had positive effect on personality and social character, by contrast the permissive or unreasoning type of child rearing had negative effect on personality and social character.
4. Type of research project, type of child-rearing practice, sample size and education level of subjects in each study accounted for the 12% variance in effect sizes.

Gonad Inhibiting Hormone Activity During Ovarian Maturation in Giant Freshwater Prawn, *Macrobrachium rosenbergii*

การแสดงผลของฮอร์โมนที่ยับยั้งการเจริญของรังไข่ในช่วงพัฒนาการของรังไข่ ระยะต่าง ๆ ในกุ้งก้ามกราม

Werawan Sithigorngul

Eyestalk extracts taken from two different stages of giant freshwater prawn (*Macrobrachium rosenbergii*), one with developing ovary and the other with undeveloped ovary after spawning, were injected into eyestalkless female prawns four days after spawning. Each prawn received six injections with a dose of 1 or 2 eyestalks/injection at 24 hr interval. The extracts from both stages showed similar inhibitory effect on

ovarian development in dose-response fashion. Thus there seems to be no difference in the level of the inhibitory factors in the eyestalks of the two stages differing in ovarian development.

**SEM Study on the Ocular
Microvascularization of the Common
Tree Shrew (*Tupaia glis*)**

**การศึกษาลักษณะโครงท่อนหลอดเลือดภายในตาของกระแต (*Tupaia glis*) ด้วย
กล้องจุลทรรศน์อิเล็กตรอนแบบสแกน**

Wattana Srisukonth,

Since the scanning electron microscopy (SEM) of vascular corroding cast provide excellent three-dimensional angioarchitecture, this technique was applied to study the ocular microcirculation in the common tree shrew (*Tupaia glis*). Casts were prepared by filling the ocular vessels of 6 animals by an intra-cardiac injection with Batson's no.17 plastic and corroded in 40% KOH at room temperature. The ocular vascular casts were gently washed in distilled water, air - dried, coated with gold and examined under SEM at 20 kV. It was found that the eye ball was supplied by anterior and posterior ciliary arteries which are branches of the ophthalmic artery (OA). The anterior ciliary arteries (ACAs) supplied the iris. The long posterior ciliary arteries (LPCAs) supplied the major portion of anterior segment, ciliary body and constituted a major arterial circle, while the short posterior ciliary arteries (SPCAs) supplied the posterior segment and gave branches to form the Zinn-Haller arterial circle within the lamina cribrosa of the sclera. The presence of the central retinal artery and 2 to 4 LPCAs in the eye of a common tree shrew are similar to what has been observed in man.

**A Study of Teaching Efficiency as Evaluated
by Undergraduate Students of
Srinakharinwirot University at Bangkok**

**การศึกษาประสิทธิภาพการสอนตามการประเมินของนิสิต
มหาวิทยาลัยศรีนครินทรวิโรฒ บางเขน**

Suwatana Buavaraporn

The purpose of the study was to investigate the teaching efficiency of instructors as evaluated by undergraduate students, and to compare students' view on teaching efficiency according to the number of years of study, faculties, majors, grade point average, and professional experience in teaching.

The sample group comprised undergraduate students of Srinakharinwirot University at Bangkok, who were studying in the second semester of the 1988 academic year. Thirty percent of the total number of students were randomly selected (probability proportional to size) to respond to the Teaching Evaluation Form constructed by the Staff Development Unit of Chulalongkorn University. The parameter estimation and one-way analysis of variance were used to analyze the data.

The major findings were as follows :

1. According to the students' number of years of study, faculties, and majors, there were significant differences between their mean scores at .01 level of significance confidence.

2. According to the students' grade point average and professional experiences in teaching, there were no significant differences between their mean scores.

3. Every item of the Teaching Evaluation Form was favorably rated by most students.

Factors related to Adjustment of Adolescent Students

องค์ประกอบที่สัมพันธ์กับการปรับตัวของนักเรียนวัยรุ่น

Oraphin Choochom,

The objectives of this study were divided into three categories. Firstly, it aimed to compare school adolescents according to their family and bio - social backgrounds. Secondly, it aimed to investigate the relationships existing between child - rearing practices, self-concepts and home environments with the adjustment of school adolescents. Thirdly, it aimed to study important factors which influence the adjustment ability of school adolescences.

The sample group comprised 534 Mathayom Suksa I students of the academic year 1989 from secondary schools in the Bangkok Metropolitan area. The tests used for collecting the data were composed of a student's background questionnaire, a self concept assessment questionnaire, an adjustment assessment questionnaire, a home environment questionnaire, child - rearing practice questionnaire.

Data were analysed by using the one - way analysis of variance, Pearson's Product Moment Correlation Coefficient and Stepwise Multiple Regression Analysis.

The results of the study are as follows :

1. The comparison of school adolescent according to the family and bio - social backgrounds yields the following results

1.1 There was a difference between the family and bio - social background of school adolescents in terms of their ability in adjustment. The school adolescents from a high economic background could adjust themselves better than those from a low economic background. However when comparing the school adolescents from a middle economic background to the school adolescents from a high family economic background, there was no difference. By the same token the school adolescents with a low family economic background had no difficulty in their adjustment compared to the school adolescents from a middle family economic background.

1.2 School adolescents from an extended family could adjust themselves better than those from a nuclear family.

1.3 There was no significant difference in adjustment among school adolescents in relation to sexes, ages, birth orders, family sizes, father and mother's levels of education, or occupations of father and mother.

2. The study of the relationships among child - rearing practices, self - concepts, home environments and adjustment of school adolescents revealed the following results.

2.1 School adolescents with love - oriented and reasoning child - rearing practices showed positive relationship with self adjustment.

2.2 Self - concepts and home - environments were positively correlated with the ability to adjust by school adolescents.

3. The self concepts were the most important influential factor in predicting the adjustment of school adolescents. The prediction accuracy could reach as high as 42.29%. When supported by the second important factor which was home environment, the prediction could be 50.37% accurate.

Synthesis of ^{10}B -EGF for Medical Applications

การผลิตโปรตีนที่มี ^{10}B เป็นองค์ประกอบเพื่อบำบัดโรคมะเร็ง

Saisanom Tampitag

Attempts have been made to seek the best method to cure different types of cancer. A neutron capture therapy is on the new frontier. Attractive compounds including the cell seeking proteins are being boronated and introduced into the tumor in order to cure the malignant tissues by the neutron capture therapy. The epidermal growth factor was purified for boronation from submaxillary glands of male swiss webster for boronation.

Blood Lead level in Bangkok Metropolitan Bus Drivers

ระดับตะกั่วในเลือดในคนขับรถประจำทาง ชสมท.

Wanchai Bupanhaeran

A descriptive epidemiological study was conducted to determine the blood lead level of Bangkok Metropolitan bus drivers. One district bus route, Number 9, was selected by a random sampling technique from the total of 10 district bus routes. From the No. 9 district bus route, a total of 35 bus drivers were selected for biography taking, physical examination and blood lead level testing. The result showed that the average blood lead level of these bus drivers was $11.8 \pm 43 \text{ ug}/100 \text{ ml}$. Headache, malaise, and loss of concentration were found to bear no relationship to blood lead level. There was also no correlation between the duration of work as bus drivers and the blood lead level ($r = 0.12$).

**Epidemiological Studies During The
19th Srinakharinwirot Games, Pisanulok
Thailand, August 21 - 26, 1989**

**การศึกษาภาวะทางระบาดวิทยาในกีฬามหาวิทยาลัยศรีนครินทรวิโรฒ
ครั้งที่ 19 วิทยาเขตพิษณุโลก 21 - 26 สิงหาคม 2532**

Kritikorn Patumwong

This epidemiological study on sporting injuries was conducted during the 19th Srinakharinwirot Games, using data collected from the special prescriptions given by doctors and nurses at medical care centers. The study was performed during August 21 - 26, 1989. There were 171 episodes of injuries during the Srinakharinwirot games in which 102 occurred in males and 69 in females. The majority of the patients (31.3%) were in the 21 year old age group. The Physical Education campus had the highest rate of (35.5%) and The Maharakam campus had the lowest (6.7%). Among those who were injured, 81.3% were athletes, 62.5% of the cases notified during the game. The highest incidence rate occurred among football players this being 24.6%. Most injuries during the competition were a result of arthritis icular sprain and dislocation. Most of the injured persons were basketball, football and volleyball players, in that order. The high peak of injury occurred during 10.00 - 12.00 A.M. and 6.00 - 8.00 P.M. The cost of treatment was around 15.20 baht per episode.

A Study on Chemical Constituents of Impatiens balsamina Linn. and Their Antimicrobial Activities.

การศึกษาสารประกอบทางเคมีจากดอกเทียนบ้านและฤทธิ์ในการต้านจุลินทรีย์

Sumalee Loengsakul

The sensitivity test of dermatophytic micro-organisms to hexane, chloroform and methanol extracts which were prepared from the purple, garden balsam (Impatiens balsamina Linn.) flowers by a continuous extraction showed that the hexane and chloroform extracts were more effective than a methanol extract.. The former could inhibit the growth of seven to eight tested species of microorganisms. Separation of hexane and chloroform extracts by a column chroma-tography was performed. The most active fraction from both extracts was obtained in the form of golden needle crystals. The structure of purified golden needle crystals was elucidated to be 2 - methoxy - 1, 4 - naphthoquinone by the spectrum analysis method. The minimal inhibitory concentrations of the compound to Trichophyton mentagophytes, T. rubrum, Epidermophyton floccosum, Microsporum gypseum, Canadida albicans, Staphylococcus aureus ATCC 25923, and -hemolytic Streptococcus group A are 15.6, 1.95, 15.6, 31.25, 31.25, 31.25 and 125 microgram per milliliter, respectively, but Pseudomonas aeruginosa ATCC 27853 was found to be a resistant strain to the extracts tested.

A Study of Ferns in the Songkhla Area

การสำรวจเฟิร์นในบริเวณจังหวัดสงขลา

Kitima Mekomol

The purpose of this project was to study the fern specimens in the Songkhla area from December 1988 to November 1989. The ferns were classified into 23 families, 45 genera and 85 species. One species is new. Descriptions of each species were recorded in details and photographed, and a key for identifying the genera and species of these ferns was constructed.

**A Chromosome Study of Mastacembelid Fish,
Mastacembelus favus and Mastacembelus
erythraea in Thailand**

**การศึกษาโครโมโซมของปลากระทิงและปลากระทิงไฟ
ที่พบในประเทศไทย**

Thawat Donsakul,

The main purpose was to study the chromosome of Mastacembelus favus and M. erythrotaenia. Twenty specimens of each species of M. favus and M. erythrotaenia, from 180.0 to 355.5 mm in length and 180.0 to 345.2 mm in length, respectively; were studied. A method of chromosome preparation of Ida and Kyo (1980), Denton (1973) and Uwa and Ojima (1981) was adopted. The chromosome classification as recommended by Levan et al. (1964) was used. The results were as follows:

1) The diploid chromosome number of M. favus was 48. The karyotype comprises 5 pairs of metacentric, 2 pairs of submetacentric, and 15 pairs of acrocentric chromosomes. The arm number was 62.

2) The diploid chromosome number of M. erythrotaenia was 48. The karyotype comprises 6 pairs of metacentric, 1 pair of submetacentric and 17 pairs of acrocentric chromosomes. The arm number was 62.

There were no reports on the number and karyotype of these fish. We concluded that M. favus and M. erythrotaenia were identical to that reported in Rhynchobella aculeata (Kaur and Srivastava, 1966). These cytogenetic data are useful in the cytotaxonomy of fish.

Effects of N:P Proportion and Frequency of Nutrient Pulses on Growth of *Polycavernosa changii* in Closed Farm Systems.

การเพาะเลี้ยงโดยให้อัตราส่วนและช่วงความถี่การให้ N:P ระดับต่าง ๆ ในสาหร่าย *Polycavernosa changii* ในระบบฟาร์มปิด เพื่อพัฒนาการเพาะเลี้ยง ในระดับอุตสาหกรรมต่อไป

Somsak Sansuk

An experiment, in situ cage cultures, was performed to investigate the effects of N:P proportion and frequency of nutrient pulses on the growth of *Polycavernosa changii* in closed farm systems. The experiment was carried out in Ao Yang, and Ao Yai subdistricts, Trad province from July, 1989 to October, 1989. After 120 days, the growth rate and yield of *P.changii*, with eight nutrient proportions and three levels of pulse frequencies were obtained. Both the proportion and frequency of nutrient pulses affected the growth of *P.changii* thus indicating that the nutrient limitation occurred during the study. The highest productivity was found when N and P were used in the ratio 4:1, and the frequency of nutrient pulses was once a week. The prerequisite observation gave the assumption that the growth of *P.changii* was directly dependent on environmental factors.

Construction of an Instrument to Identify Underachiever Students.

การสร้างแบบทดสอบเด็กที่มีผลสัมฤทธิ์ทางการเรียนต่ำกว่าความสามารถที่แท้จริง

Sriya Niyomthum

The purpose of this study was to construct a reliable instrument to identify students having the characteristics of underachievers. This instrument was adapted from the Rimm's Achievement Identification Measure (AIM). The AIM is a parent report inventory which is both reliable and valid, and can identify underachievers and their underlying problems. The five tests on 1) Competition 2) Responsibility 3) Control 4) Achievement Communication, and 5) Respect are used.

The study samples were 514 elementary school students in the Bangkok Metropolis. They were randomly selected by using the stratified random sampling method. The procedure in constructing this instrument consisted of two testings. After the item was revised, the reliability, validity and normalized percentage were defined.

This study revealed that the reliability of the AIM was .93. The validity of the AIM as calculated by the known group technique and t-test technique was different at the significance level of .01. Besides, it was found that the related validity as calculated by using the correlation conducted by their teachers and parents appeared to be from .51 to .61 and it was significantly different at the confidence level of .01.

The Construction of an Instrument to Identify Behaviorally Disordered Children

การสร้างเครื่องมือเพื่อคัดแยกเด็กที่มีปัญหาทางพฤติกรรม

Padoong Arayawinyoo

The major purpose of this research was to construct an instrument to identify the behaviorally disordered children, aged 6 - 12 years. The norms would also be established to be used as criteria in decision making. The instrument was made for teachers to use conveniently, yet still possessing acceptable validity and reliability as a standardized technical device.

The instrument was used to measure 3 major areas of student behavior; Classroom Behavior, Personal Behavior and Peer Relations. These areas were subdivided into 11 headings; Interest in Lessons, Organization, Responsibility, Attention, Body Behavior, Emotion and Social Behavior, Activity Participation, Relations with Teachers, Social Acceptance, Peer Cooperation and Social Adjustment.. The instrument consisted of 50 items which would be answered by classroom teachers who had thoroughly familiarized themselves with the children to be rated.

The sample consisted of 4406 school children whose ages ranged from 6 to 12 years, systematically selected from 33 primary schools from different parts of the country. These schools were under the Office of National Primary Education Commission, the Ministry of Education.

The Alpha Coefficient which indicated the reliability of the instrument was established at 98. The Known-Group Technique was applied to ascertain the validity. The statistics employed to determine the difference yielded the significance beyond 0.1 The percentile ranks were established as norm reference. Other forms of descriptive statistics, e.g. mean and standard deviation, were also made available for further comparison and consideration. Also included were the test administration, scoring and interpretation of the data.

การศึกษาหาอัลคาลอยด์ในใบทองหลางต่าง

Sunan Chainakul

Alkaloids were isolated from the leaves of *E.variegata* L. and the total alkaloids were characterized by gas chromatography (GC) and gas chromatography/mass spectrometry (GC/MS). Hydroxyl groups of alkaloids were derivatized as their trimethylsilyls (TMS) derivatives by GC and GC/MS and the individual alkaloids present were characterized by comparing their GC retention times and mass spectral fragmentation patterns with the data reported in the literature. The alkaloids found were crysonine, crysopine, crysodine and crysovine.

To study and develop a method of boron concentration analysis by thermal neutron absorption technique

ศึกษาและพัฒนาการวิเคราะห์ที่หาปริมาณธาตุบอรัอนโดยเทคนิคการดูดกลืนนิวตรอนเทอร์มิ

Jitpranee Weerapong

A thermal neutron howitzer was constructed and a gamma spectrometer together with a NaI (TI) detector, was connected to a multichannel analyzer. The flux monitors made of indium foils were used for a determination of the thermal neutron flux at the center of the sample cell. The flux was 4.44×10^4 neutron/cm². To analyse the borax concentration in the samples we used the principle of neutron absorption technique. The calibration curves with the peak areas were plotted against the borax concentration. The results of the seven meat ball and six fish ball samples showed that the borax concentrations were in the order of 200 ppm.

Determination of the Hemolymph Glucose Level in Macrobrachium rosenbergii

การตรวจหาระดับกลูโคสในเลือดของกุ้งก้ามกราม

Santi Ruangmaneevaitool

A crustacean hyperglyceric hormone bioassay was developed for hormone purification study. The sampled blood sugar level from the eyestalk-intact prawns, after spawning, was found to be highly variable. In contrast, the blood sugar level in the eyestalkless prawns was low with a very minor fluctuation. Injection of the crude eyestalk extract (2 eyestalks/prawn) induced a rapid increase in blood sugar level to a maximum within an hour after injection and then gradually declined to the level close to that of the control animals around 6 hours after injection. Increase in blood sugar level depends on the amount of the injected crude extract in a dose-response fashion.

A Chromosome Study on Three Species of Notopterid Fishes, *Notopterus notopterus*, *N. chitala* and *N. blanci*, from Thailand

**การศึกษาโครโมโซมของปลาสาคร ปลาทราย และปลาดองลาย
ที่พบในประเทศไทย**

Thawat Donsakul

The main purpose of this experiment was to study the chromosome and karyotype of *Notopterus notopterus*, *N. chitala* and *N. blanci* from Thailand. Twenty specimens of each species of *N. notopterus*, *N. chitala* and *N. blanci* 25.0 to 27.5 cm, 17.4 to 18.5 cm. and 23.5 to 26.7 cm. in standard length were studied. The method of chromosome preparation was modified from that of Ida and Kyo (1980), Denton (1973) and Uwa and Ojima (1981). The classification of chromosomes was the method recommended by Levan et.al. (1964). The results were as follows:

1. The diploid chromosome number of *N. notopterus* is 42. The karyotype comprises of 21 pairs of acrocentric chromosomes. The arm number is 42.

2. The diploid chromosome number of *N. chitala* is 42. The karyotype comprises 1 pair of subtelocentric and 20 pairs of acrocentric chromosomes. The arm number is 42.

3. The diploid chromosome number of *N. blanci* is 42. The karyotype comprises of 21 pairs of acrocentric chromosomes. The arm number is 42.

It was found that *N. chitala* was closely related to *N. blanci* and *N. notopterus*. These cytogenetic data are useful for the cytotaxonomy of fishes.

Self-control Ability in Thai Children as Related to Educational Curriculum, Training Skills, and Psychological Components for Effective Citizenship

ความสามารถในการควบคุมตนเองของเด็กไทยในแง่ของความสัมพันธ์ระหว่างองค์ประกอบทางการศึกษาการฝึกทักษะและการพัฒนาจิตลักษณะ เพื่อการสร้างพลเมืองที่มีประสิทธิภาพ

Chancha Suwannathat

The purposes of this study were:

- 1) To examine the relatedness of the contents in school textbooks to the development of self-control.**
- 2) To investigate the relationships between family's and school's socialization and children's self-control.**
- 3) To examine the interrelatedness among children's psychological characteristics in 6 dimensions (self-restraint, inhibition, self-confidence, tolerance and forgiveness, emotional-social maturity, future orientation) and the relationships between these psychological traits and children's self-control ability.**

As for the main findings, it can be concluded that the family and school socialization are significantly related to the children's development of self-control ability. There are also significant inter-relatedness among the 6 dimensions of children's psychological characteristics in self-control. There are also high concordance between children's perceived socialization of their parents and the parents' own report of their actual training for children's self-control. In addition, it is noted that mothers play a more significant role in self-control development for their children than fathers and teachers. These mothers are found to use a more traditional way of training for self-control by using an external control rather than an internal one. And it is also noted that some teachers try to use Buddhist principles in controlling themselves.

As for the relations between bio-social variables and different dimensions in self-control ability of children, it is noteworthy that school children in the sampling who have lower family income obtain higher scores in all psychological traits concerning self-control ability when compared with children who have high and middle family income. In addition, the school children in grade 8 also obtain higher scores than those in grade 5 in some psychological traits in self-control ability (dimensions 2 and

3). With regards to curriculum content analysis, it is found that there are an inadequate number of elements in the reading content which can lead to self-control development in schoolchildren. In addition, the elements which are found related to self-control are only confined to the Physical aspect of control rather than the verbal and spiritual aspects.

**การทดลองใช้ ไอ อี พี (IEP) สำหรับเด็กที่มีความต้องการพิเศษ
ในประเทศไทย**

Padoong Arayawinyoo

The purpose of this investigation was twofold: to experiment on applying the Individualized Education Plan for special needs school children in Thailand, and to compare the academic achievement of the special needs children with and without the application of the IEP's. The sample consisted of 32 first graders from a school in Bangkok, of which 16 were hearing impaired and 16 mentally retarded (EMR and TMR) children. These children were classified into 2 experimental, and 2 control groups consisting of 8 children. The experimental groups were exposed to the IEP's while the control group to the national curriculum prescribed by the Ministry of Education. After the IEP's, the experimental groups also followed the national curriculum. The experiment lasted one semester (4 months). Seventeen instruments were utilized to collect the data, 16 consisted of the academic achievement test while the last one was a questionnaire. The statistics employed in the analysis of the data included descriptive statistics, Man-Whitney U-Test and Wilcoxon T-Test for Dependent Samples. The research yielded the following findings;

1. The academic achievement of the special needs children with the IEP's were significantly ($p < .01$) higher than those without the IEP's.
2. With the introduction of the IEP's, no special needs children failed while those without IEP failed in the final examination.
3. The teachers of the special needs children agreed that the IEP's should be specially introduced into Thai Special Education System.
4. One alternative to the IEP was empirically possible. That was the construction of an IEP out of the national curriculum prescribed by the Ministry of Education. Some of the behavioral objectives suitable for a specific special needs child should be taken from those specified in the national curriculum and these objectives would constitute the IEP for each child.

It was recommended that the Individualized Education Plan should be urgently introduced to Thai Education System instead of following the national curriculum mapped out for normal children. More importantly, the current practice of academic evaluation which was appropriate for normal children should be abolished and a new evaluation system should be designed for the special needs children in schools.

การศึกษาผลของอัตราปุ๋ยยูเรีย 46 เปอร์เซ็นต์ ที่มีต่อการเจริญเติบโตของสาหร่าย *Polycavernosa changii* ในแปลงทดลองระบบฟาร์มปิดซึ่งน้ำทะเลมีความเค็ม 10 - 20 ส่วนในพัน

Somsak Sansuk

An experiment using in situ cage culture was used to investigate the effects of 46% of fertilizer urea on the growth of *Polycavernosa changii* in closed farm system. Two groups of *P. changii* have been experimented upon using the same ratio of fertilizer by two different treatments. In one of them the fertilizer was sowed in the farm, and in the other, the algae was soaked in the fertilizer solution. The experiment was carried out at Ao Yang, Ao Yai subdistrict, Muang district, Trad province from August to October 1990. After the period of 11 weeks, the ration of fertilizer of 6 levels was treated once a week, and the growth rate and yeild of *P. changii* that was soaked in 6 concentration levels of nutrient was obtained. The value of the fertilizer was 0.5 gram per cubic meter after 70 days. For the other that was treated by sowing the fertilizer in the experimental farm in 6 concentration levels, the growth rate and yeild of *P.changii* was also obtained but it showed the tendency of a good growth rate where the value of fertilizer was 0.7 gram per cubic meter after 63 days. The prerequisite observation gave the assumption that the growth of *P.changii* directly depended on experimental factors.

Maternal and Child Health Practice of Working Mothers in Industry in the Eastern Seaboard Developing Area

การปฏิบัติด้านอนามัยแม่และเด็กของมารดาที่ประกอบอาชีพในโรงงานอุตสาหกรรม เขตพัฒนาชายฝั่งทะเลตะวันออก

Miss Wannee Banthurng

The purpose of this study was to determine the existing situations of maternal and child health practices during pregnancy, intrapartum, postpartum, family planning, and neonatal care undertaken by the mothers who had their last living children aging from 6 months to 6 years and were working in industrial plants in the Eastern Seaboard Development Area. A group of 202 mothers were selected to participate in the study. The instrument used to collect data was a structured interview. The mathematical percentage, arithmetic mean, standard deviation, and frequency were employed to analyze the data.

Based on the analysis of the data, the following conclusions could be drawn :

1. It was found that approximately 97.0 per cent of the mothers attended antenatal care clinic and most of them ensured they had sufficient rest and sleep, bathed regularly, took care of themselves when having complications had, and adequate nutrition. Coconut juice is the most popular food for the mothers during pregnancy. 75.6 per cent of mothers worked six days a week. 43.7 per cent of mothers transferred themselves to low-risk tasks. 68.0 per cent of mothers did not take leave of absence before delivery. It was found that 99.0 per cent of mothers' deliveries were conducted by health personnel and trained laymen. The remainder were delivered by their husbands and relatives using non-sterile sharpened bamboos to cut the umbilical cord. It was found that 67.3 per cent of the mothers after delivery laid near fire-places. Most of them bathed, took care of episiotomy wounds and themselves when having complications. 34.5 per cent of the mothers who had leave of absence took time off longer than that allowed in regulations and 46.0 per cent did not have a postpartum follow-up.

2. It was found that most mothers would like to have only two children. 74.8 per cent of the mothers used a birth control method. The most popular method was taking contraceptive pills which could be purchased at local drug stores.

3. It was found that 6.7 per cent of the mothers practised breast feeding and more than 9.0 per cent of the children had been immunized. Most mothers had knowledge of nutrition, child bathing, feed-bottle cleaning, and taking care of sick children. 20.3 per cent of the mothers left children at their relatives' houses. Most mothers left their children at day-care centers or nurseries and brought their children home after work.

Problems and Needs for Staff Development of Instructors Srinakharinwirot University

Bangsaen.

**ปัญหาและความต้องการพัฒนาคณาจารย์ของคณาจารย์
มหาวิทยาลัยศรีนครินทรวิโรฒ บางแสน**

Boonjai Srisatidnarakul

The purpose of this research was to survey the problems and needs for staff development, as well as the opinions in relation to the staff development of Srinakharinwirot University Bangsaen. The data were obtained from 97 instructors in the Faculty of Physical Education, Faculty of Humanities, Faculty of Sciences, Faculty of Education, Faculty of Social Science and Faculty of Nursing. The research instruments were devised by the researcher.

The data were collected during July 16, - September 14, 1990. The statistics used for the data analysis were percentage, t-test and f-test.

The research findings were as follows :

1. On average, all aspects of staff development problems were moderately needed and could be ranked in the following order: Research, academic society services, cultural conservation, textbooks and article writing, academic advisor and teaching.

2. On average, the needs of staff development were at the medium level and could be ranked from high to low as:- research, textbooks and article writing, academic society services, teaching, cultural conservation and academic advisor.

3. The instructors with different marital status, subjected faculty and educational qualification had a statistically significant difference in teaching problems. In addition, the instructors with different educational qualifications had a statistically significant difference in academic society services problems.

4. The instructors with marital status had a statistically significant difference in teaching needs.

5. Most instructors agreed that Srinakharinwirot University should set up a staff development unit under the responsibility of the Vice President for Academic Affairs. It should also be run by a joint committee selected from instructors of each faculty. The staff development activities can be short-term seminars or workshops, organized during the university vacation and within the university area. In regard to the problems and the obstacles in staff development, they are ranked from the most difficult to the least difficult as :- having no clear policies in staff development activities, lack of personnel resources with the ability and expertise in managing the staff development ,and finally, lack of a staff development unit..

Study on Comparison in Landsat Image Interpretation with TM. and MSS. Data for Land use Mapping in Sukhothai Province .

การศึกษาเปรียบเทียบผลการแปลภาพถ่ายดาวเทียมซัทมาทีเอ็ม. และเอ็มเอสเอส ด้านการทำแผนที่การใช้ที่ดินจังหวัดสุโขทัย

Phirom Onseng

The main purpose of this study was to compare the Landsat image interpretation between the TM. and the MSS. data for landuse mapping in Sukhothai province. The study materials were Landsat TM. data, B & W paper print of band 3 and 4 in the scale according to the landuse map. These multitemporal images were acquired on Dec. 5, 1989 and Apr. 6, 1988. The Landsat MSS. data, B & W paper print of band 5 and 7 in the same scale of TM. data, recorded in Feb. 15, 1987 and Mar. 19, 1987, and positive color composite films at a scale of 1 : 1,000,000 were acquired on Feb, 15, 1987. The image interpretation was done visually to identify and classify the details and survey the ground, and to correct the final maps.

The results of the study showed that the categories of 9 types of landuse on Landsat TM. data could be identified and classified more clearly and more precisely than that of the Landsat MSS. data. The major basic image characteristics used were tone, texture, pattern and location and association. In some the landuse types, they appeared as line and geometric boundaries while in MSS. data, they were fuzzy.

The land use maps specially from the Landsat TM. data base can be used as a planimetric map, and as a tool for studying the spatial distribution, differentiation, and interaction between and within the land use types. However, the same scale of Landsat data and landuse map will reduce the error of reduction or enlargement. Unfortunately, many of the map details could not be shown in the map. Besides, several small areas were grouped into the large one by the generalization of the map making.

Spread of Infectious Agents : Salmonella and Shigella by Cockroaches

การแพร่กระจายของเชื้อ Salmonella และ Shigella จากแมลงสาบ

Nantana Arunlerk

The purpose of this experiment was to analyse Salmonella and Shigella obtained from two areas, namely : Nongmon market in Bangsaen and Amphur Muang market (Talad Subsin) in Chonburi Province. One hundred and eighty samples were taken from each source making during February 1990 to January 1991. Salmonella was found only during August - October 1990 in 23 samples. There were 7 serovars; Salmonella derby, S. amsterdam, S. weltevreden, S. virchow, S. saintpaul, S. I 1,3,19:-:-and S. orion. Sensitivity tests were performed with 6 drugs. It was found that Salmonella was susceptible to ampicillin, chloramphenicol, kanamycin and penicillin except S. derby which was susceptible to ampicillin, kanamycin and penicillin but resistant to chloramphenicol, streptomycin and tetracycline. Nevertheless we never found Shigella.

Computer Study of Chaos

การศึกษาปรากฏการณ์เคออสด้วยคอมพิวเตอร์

Nasan Polpok

Chaotic phenomena are studied using a torsion pendulum as a model. It was found that the usual behavior of a torsion pendulum is harmonic but under appropriate conditions, the torsion pendulum behaves chaotically. In this study, a damping parameter was used as the changing condition. Phase space and Poincare map were served as tools for determining if motion is chaotic or harmonic. Phasespace of a harmonic motion will be one or two closed loop(s). Poincare map of such a motion will be one or two point(s) in the space of velocity and displacement. The trajectory in the phase space of a chaotic motion, on the other hand, never repeats the previous one. The line trajectory, however, is limited in a certain region of the space spanned by velocity and displacement. Poincare map of a chaotic motion will be distributed by hundreds of points (the number of point depends on the period of time of studying). The shape of the distribution depends on the selected phase of the external driving force.

**A Chromosome Study on Three Species
of Notopterid Fishes, Potopterus notopterus,
N. chitata and N. blanci, from Thailand**

**การศึกษาโครโมโซมของปลาสามชนิด ปลาทราย และปลาทองทราย
ที่พบในประเทศไทย**

Thawat Donsakul

The main purpose of this experiment was to study the chromosome and karyotype of Notopterus notopterus, N. chitata and N. blanci from Thailand. Twenty specimens of each species of N. notopterus, N. chitata and N. blanci 25.0 to 27.5 cm, 17.4 to 18.5 cm. and 23.5 to 26.7 cm. in standard length were studied respectively. Method of chromosome preparation was modified from Ida and Kyo (1980), Denton (1973) and Uwa and Ojima (1981). Classification of chromosomes was followed the method recommended by Levan et.al.(1964). The results of this experiment were as follows:

1. The diploid chromosome number of N. notopterus is 42. The karyotype comprises of 21 pairs of acrocentric chromosomes. The arm number is 42.

2. The diploid chrommosome number of N. chitata is 42. The karyotype comprises 1 pair of subtalocentric and 20 pairs of acrocentric chromosomes. The arm number is 42.

3. The diploid chromosome number of N. blanci is 42. The karyotype comprises of 21 pairs of acrocentric chromosomes. The arm number is 42.

Funr this result it might be concluded that N. chitata were closely related to N. blanci and N. notopterus. These cytogenetic data are beneficial for the cytotaxonomy of fishes.

**Morphology and Karyology of Cyprinid Fishes,
Tor soro , Puntius orphoides and P.stoliczkanus
in Pai River, Mae Hong son, Northern,
Thailand.**

**สัณฐานวิทยาและคาริโอไทป์ของปลาพลวงหิน ปลาแก้มช้ำ และปลาปลา
ในแม่น้ำปาย จังหวัดแม่ฮ่องสอน ภาคเหนือ ของประเทศไทย**

Wichian Magtoon

The purpose of this experiment was to study the morphology and karyotypes of three cyprinid fishes, Tor soro, Puntius orphoides and P. stoliczkanus. Ten specimens of Tor soro, P.orphoides and P. stoliczkanus were used in this study. Mitotic Metaphase chromosome preparation was the modified method of Uwa and Ojima (1981). The chromosome Classification scheme followed that of Levan et al., (1964). The results of this experiment are as follows: 1) Three species, Tor soro, Puntius orphoides and P.stoliczkanus have morphological differences among them. 2) The diploid chromosome number of Tor soro is 100. The karyotype comprises 9 pairs of metacentric, 7 pairs of submetacentric, 3 pairs of subtelocentric and 31 pairs of acrocentric chromosomes. The arm number is 132. 3) The diploid chromosome number of Puntius orphoides is 50. The karyotype comprises 7 pairs of metacentric, 8 pairs of submetacentric, 2 pairs of subtelocentric and 8 pairs of acrocentric chromosomes. The arm number is 74. 4) The diploid chromosome number of Puntius stoliczkanus is 50. The karyotype comprises 11 pairs of metacentric, 11 pairs of submetacentric, 2 pairs of subtelocentric, and 1 pair of acrocentric chromosomes. The arm number is 94.

A Survey of Parasites in Commercial Fishes from the Eastern Coast of Thailand

**การสำรวจพยาธิในปลาเศรษฐกิจบริเวณชายฝั่งทะเล
ภาคตะวันออกของไทย**

Supunnee Leethochavalit

In the exploration of commercial fisheries of the eastern coast of Thailand at the port of Kao Sam Muke, Port of Ang Sila, Port of Bang Sarei in Chonburi Province, port of Ban Phe Amphur Muang in Rayong Province, port of Chantaburi Amphur Muang in Chantaburi Province and port of Trad Amphur Muang in Trad Province from during April 1986 to February 1987 and from October 1987 to January 1992, 2370 fishes of 105 species were found to be attacked by 104 species of parasites from the total number of 6609 and 128 species collected. The parasites in the gill filament, mouth cavity, alimentary tract, liver, abdominal cavity, mesentery and egg etc. were examined.

46 species of the parasites found were ectoparasite and 58 of them were endoparasite, 38 species were copepod in the family Anthosomatidae, Bomolochidae, Caligidae, Dichelesthidae, Euryphoridae, Lerecopodidae, Pandaridae and Trebiidae 8, 3, 12, 7, 1, 3, 1 and 1 species, respectively. Two species were unknown copepod. The isopod was found only in one species, each in family Gnathiidae and Aegidae. Trematodes were found in both Monogenea and Digenea. Six species of them were in Monogene group, which were Axinidae, Dactylogyridae, Diplectanidae, Microcotylidae and family Tetraonchidae 1, 2, 1, 1 and 1 species respectively. In the Digene group, 34 species were in the family Acanthocolpidae, Acanthostomidae, Allocreadiidae, Bucccephalidae, Cryptogonimidae, Fellodistomidae, Haploporidae, Hemiuroidae, Monorchidae and family Gorgoderidae 2, 1, 8, 3, 2, 2, 1, 9, 1 and 1 species, respectively together with 4 species of unknown trematodes. 15 species of the nematodes were found. They were in family Camallanidae, Cuicullanidae, Heterocheilidae, Gnathostomatidae and family Trichnridae 2, 3, 6, 1 and 1 species, respectively and 2 were unknown species. The Acanthocepharan were found in six species. They were in the family Echinorhynchus, Micracanthorhynchidae, Neoechinorhynchidae, Quadrigyidae and family Rhadinorhynchidae 1, 1, 1, 1 and 2 species, respectively. The Cestode was found in 3 species. Two of them were in family Bothriocephalidae and Tentaculariidae.

Of all the parasites examined, *Spirocamallanus* sp. was the most abundant one found in the port of Kao Sam Muke and Ang Sila. But at the port of Bang Sarei, port of Ban Phe port of Chantaburi and port of Trad, the *Contracaecum* larva type A was found most often.

**A Study on Coastal Water Quality in the
Swimming Zones at Bangsaen, Pattaya and
Jomtien Beaches in Chonburi Province
in 1991**

**การศึกษาคุณภาพน้ำในเขตว่ายน้ำชายหาดบางแสน หาดพัทยา
และหาดจอมเทียน จังหวัดชลบุรี ปี 2534**

Waewtaa Thongra-ar

Coastal water quality in the swimming zones at Bangsaen, Pattaya and Jomtien beaches were studied from January to December 1991. It was found that the water charaetrns of each beach was as follows : Bangsaen beach, temperature 27.0-32.0 C, salinity 17.0-36.0 %,pH 7.92-8.36, dissolved oxygen 5.5-8.8 mg./l, BOD 0.4-7.4 mg./l, total coliform bacteria 13-18,000 MPN/100 ml and faecal coliform bacteria 8-2,400 MPN/100 ml. For Pattaya beach it was found that the temperature was 28.0-32.0 C, salinity 27.0-35.0 %, pH 7.70-8.45, dissolved oxygen 4.6-12.5 mg/1, BOD 0.3-8.0 mg./1, tttotal coliform bacteria 21-240,000 MPN/100 ml and faecal coliform bacteria 2-130,000 MPN/100 ml. Jomtien beach found that the temperature was 28.0-32.0 C, salinity 30.0-36.0 %., pH 7.75-8.39, dissolved oxygen 6.1-8.9 mg./1, BOD 0-8.3 mg/1 total coliform bacteria <2-2,800 MPN/100 ml and faecal coliform bacteria <2-2,400 MPN/100 ml.

Based on the coastal water quality standard for swimming that the total coliform bacteria should not be more than 1,000 MPN/100 ml, the results indicated that the water quality of the three beaches was very poor for swimming except at South Pattaya when water was degraded almost throughout the year. In comparing of the water qualities for swimming it was found that Jomtein beach water is the best, followed by Bangsaen beach with water in Pattaya beach being the worst. Moreover, the results indicated that the water quality of the three beaches in the year 1991 were more degraded than those in the year 1989 and 1990.

A Chromosome Study on Three Species of Silurid Fishes, *Ptyopterus cryptopterus*, *K. bleekeri* and *Ompok bimaculatus*, of Thailand

การศึกษาโครโมโซมของปลาเนื้ออ่อน ปลาแดง และปลาชะโอนของไทย

Thawat Donsakul

The main purpose of this experiment was to study the chromosome and karyotype of *Ptyopterus cryptopterus*, *K. bleekeri* and *Ompok bimaculatus* of Thailand. Fifteen specimens of each species of fishes, 10.1 to 10.5 cm, 10.6 to 13.8 cm, and 17.8 to 21.5 cm in standard length were studied. The method of chromosome preparation of Ida and Kyo (1980), Denton (1973) and Uwa and Ojima (1981) was modified. The classification of chromosome followed the method recommended by Levan et al.(1964). The findings of this experiment were as follows:

1) The diploid chromosome number of *K.cryptopterus* is 92. The karyotype comprises 4 pairs of metacentric, 5 pairs of subtelocentric and 37 pairs of acrocentric chromosomes. The arm number is 100.

2) The diploid chromosome number of *K.bleekeri* is 64. The karyotype comprises 10 pairs of metacentric, 3 pairs of submetacentric, 1 pair of subtelocentric and 18 pairs of acrocentric chromosomes. The arm number is 90.

3) The diploid chromosome number of *O. bimaculatus* is 50. The karyotype comprises 17 pairs of metacentric, 1 pair of submetacentric, 1 pair of subtelocentric and 6 pairs of acrocentric chromosomes. The arm number is 86.

The findings of this experiment revealed that the chromosome number and pattern of karyotype of the 3 fishes are different..

A Study of an Appropriate Model of an Economical Stove Used in the Palm-Sugar Domestic Industry in Amphur Singhanakorn, Songkhla

**รูปแบบเตาเศรษฐกิจที่เหมาะสมต่อการพัฒนาอุตสาหกรรมขนาดย่อม
ของตาลโตนด อำเภอสิงหนคร จังหวัดสงขลา**

Praman Tepsongkroh

The purpose of this research was to study the factors affecting palm-sugar production, using a stove in domestic palm-sugar industry and the appropriate model of the stove used in palm-sugar domestic industry. The data were collected by through interviews and observation of the palm-sugar makers in Amphur Singhanakorn, Songkhla. The data was statistically analysed

The results of this study were :

1. In general the influential factors of palm-sugar making were different : the life time of the sugar-palm trees, the numbers of sugar-palm trees from which sugar is obtained per day, the amount of sugar palm juice per day, an amount of firewood used, the need for growing firewood plants, an amount of time spent in making sugar. Whereas, the numbers of labourers and the amount of enthusiasm in sugar making were not different. Yet all factors and procedures in sugar making were still of substandard production methods.

2. Types and percentages of stoves used by the farmers were :

- 2.1 the traditional one-pan stove without a ventilation controller (82.1 %)
- 2.2 the adapted one-pan stove with a ventilation controller (10.8 %)
- 2.3 the adapted two-pan stove with a ventilation controller (7.1 %)

3. The most appropriate and effective model of stove which was appropriate for palm sugar making was an adapted one pan stove with a ventilation controller.

Some Ecological Factors Affecting the Growth of Giant Tiger Prawn, *Penaeus monodon* Fabricius (Biological Factors)

ปัจจัยทางนิเวศวิทยาที่มีผลต่อการเจริญเติบโตของกุ้งกุลาดำ, *Penaeus monodon* (ปัจจัยทางชีวภาพ)

Voravit Cheevaporn

A monitoring study on phytoplankton and zooplankton communities and production of Giant tiger prawn, was carried out from 4 January to 2 May 1991. The pond was of 3.8 rai (6,080 square meter) in area with intensive management. The results showed that the blue-green algae and diatom were the major components of phytoplankton while copepod and decapod larva are zooplankton.

The stocking density was 50 prawns/square meter. After the rearing periods, the final prawn size was 25 grams with a yield of 1,368 Kg./Rai. The survival rate and Food Conversion Ratio were 62.4% and 1.474 respectively. The result indicated that the rearing is a success.

From statistical analysis, the results indicated that phytoplankton do not show any significant relationship with the shrimp growth. But zooplankton shows significant negative relationships. To improve the efficiency of rearing, the density of zooplankton should be considered.

Taxonomic Study of Some Marine Shrimps found along the East Coast of Thailand

การศึกษาอนุกรมวิธานของกุ้งทะเลบางชนิดที่พบบริเวณชายฝั่งตะวันออกเฉียงใต้ของประเทศไทย

Nongnuch Lelapiyanart

Taxonomic study of marine shrimps collected from the morning and fishing-ports of four provinces (Chonburi, Rayong, Chantaburi and Trad) along the coast of Thailand was carried out from March 1990 to February 1991. 30 species of 7 genera of family Penaeidae were

Penaeus (Marsupenaeus) japonicus, P.(Melicertus) latisulcatus, P.(Penaeus) semisulcatus, P. (P.) monodon, P.(Funneropenaeus) merguensis, P. (F.) silasi, Metapenaeus intermedius, M.brevicornis, M.ensis, M.conjunctus, M.affinis, M.moyebi, Parapenaeus longipes, Parapenaeopsis tenella, P.hungerfordi, P.maillepedo, P.cornuta, Metapenaeopsis stridulans, M.palmensis, M.barbata, M.toloensis, M.lamellata, Atyppopenaeus stenodactylus, Trachypenaeus malaianus, T.pescadorensis, T.sedili, T.curvirostris, Sicyonia lancifera andommaneyii

An Analysis of Achievement Test Using Logistic Models

การวิเคราะห์แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนด้วยโมเดลโลจิสติก

Pachongjit Intasuwan

This study had three main objectives. First, to demonstrate the procedures of item analysis, using logistic models, to interpret the results. Second, to compare the results of the logistic and classical models. Third, to examine the agreement and the contradiction between the results from the logistic and the classical models.

The data used in this study were obtained from 1502 Prathom Suksa VI students in response to the 60-item mathematics achievement test. The testing, a regular school examination, took place at the end of the second semester of the academic year 1986. These students were from schools in the Bangkapi area of Bangkok.

The preliminary analyses indicated that the test scores were unidimensional. Under the three parameter logistic model -- 3PL model, the parameter estimation results were as follows: difficulty estimates ranged from -3.7490 to 3.9110, discrimination estimates ranged from .1471 to 2.000, and the lower asymptote or guessing estimates ranged from .0418 to .3966. Item no. 14 caused the incomplete run, therefore it was excluded from the estimation. Four items had discrimination estimates less than .3000, these were items nos. 15, 30, 41, and 60.

Under the Rasch model -- 1PL model, the difficulty parameter estimates of 59 items were between -2.68 and 1.90. The fit analysis showed that four items did not fit the model. They were items nos. 30, 34, 45, and 60.

All sixty items were included in the item analysis under the classical model. The easiness parameter estimates -- proportionately correct, ranged from .1853 to .9401. Three items had easiness indices above .9000, these were items nos. 1, 3, and 17. The discrimination estimates -- point biserial correlation between items i and total test excluding items i , ranged from -.0891 to .4170. Items no. 14 had the lowest discrimination, and it was negative. Five items had discrimination indices lower than .10, these were items nos. 14, 30, 34, 58, and 60.

Further analyses were done to examine whether or not the choices chosen by the examinees, among 4 alternatives for each item, were in accordance with the examiner's expectations. The results showed that from 18 out of 60 items, only one alternative was found inappropriate for each item, and the alternatives from another 3 items had the same problem.

Ranks of item difficulties estimated from the three different models were in high agreement, especially between the 1PL model and the classical model.

The 3PL model rejected fewer number of items than the 1PL model. Even though the classical model gave results that depended upon the group ability, it gave useful information for the alternative improvement. Therefore, at this stage of the test development, the classical model should be used in tandem with the logistic model. For the final test forms, the item parameters should be estimated using the logistic model.

Benthos and Some Environmental Parameters at Pattaya to Laem Chabang Port

**สัตว์ทะเลหน้าดินและสภาวะแวดล้อมบางประการบริเวณพัทธยาถึง
ท่าเทียบเรือแหลมฉบัง**

Somtavil Jaritkuon

The density, biomass and distribution of benthic macrofauna in the eastern coast of the Gulf of Thailand were investigated. The study areas were those from Laem Chabang to Pattaya. Samples were collected six times from during October 1989 to August 1990. Environmental factors such as salinity, temperature etc. were measured. Total organic content, grain size and type of sediments were determined.

The results showed that benthic macrofauna were found in 11 groups. The relative density of the dominant groups were polychaetes (77.50%), crustaceans (13.16%), molluscs (2.25%), echinoderm (1.80%), and others (5.29%). The average density and biomass of benthic macrofauna were 127.06 individuals/m² and 10.09 g/m², respectively. Some correlation coefficients of benthic macrofauna and environmental factors were found to be significant.. The diversity and similarity of indices of benthic macrofauna among different stations were considered.

A Collection of Pure Cultures of Zoo-plankton from the East Coast

การรวบรวมและปลูกถ่ายสัตว์บริสุทธิ์จากชายฝั่งทะเลภาคตะวันออก

Jitra Teeramaetee

Pure cultures of zooplankton from the East coast were collected during the month of October 1990 to December 1991. Some zooplankton by cultures and isolated of pure cultures was in the following range :

copepod A ; eggs had 2 lobes and could produce eggs from 40 to 200 eggs by a female copepod A in 1 to 5 crops in a life time. The maximum age of copepod A is 7 to 15 days.

cladocera A ; each female cladocera A produced nauplius in 1 to 4 crops by the average of 3 to 11 nauplius. The maximum age of cladocera A is 5 to 9 days.

Growth of copepod A and cladocera A were the best if they were in *Chaetoceros calcitrans* with yeast. On the average, 94.3 nauplius and 14 nauplius were totally produced by a female in a life time. Mass cultures in 10 litres and 200 litres in medium ; copepod A could not be increased but cladocera A could be increased to 10 litres.

**Effects of Temperature and Salinity on
Protease Production of Vibrio anguillarum
ผลของอุณหภูมิและความเค็มต่อการสร้างเอนไซม์ Protease ของ
Vibrio anguillarum**

Nantana Arunlerk

The purpose of this study was to investigate the effects of environmental factors : NaCl concentration and temperature to the protease production of Vibrio anguillarum. V. anguillarum were collected from seawater, fishes and molluscs from the coast of Chonburi province during April-May 1990. Cultures were incubated in Py medium. The turbidities were read spectrophotometrically at the wavelength of 430 nm. The protease activities were performed by using azocasein. An analysis of the growth conditions of V. anguillarum showed that the optima conditions were as follows : 5% NaCl concentration and temperature 25 C. Nevertheless the protease production rate was relatively low. This may be due to environmental strains not being the sole causative agent in vibriosis.

**Genetic Diversity Among Populations of
Fresh - Water Crabs in Thailand
การศึกษาความหลากหลายทางพันธุกรรมของปูน้ำจืดในประเทศไทย**

Nongluk Sakulyanonwitaya

Eight metabolic enzymes (ADH, ALDOX, G-6 PD, ME, PGM, HBDH, ODH, SOD) of Somanniathelphusa dugasti collected from Nakornrachshima, Chaiyaphume, Khonkean and Udonthani, were studied by the method of Starch-gel electrophoresis. Genetic variations among crabs from the four localities was inferred from the variation of the enzymes. It was found that the average proportion of the observed heterozygosity was 0.203, which was slightly high. The calculated genetic identity ranged from 0.884 - 0.997 which were considerably high and the genetic distances among the four populations were rather low, ranging from 0.003 - 0.129. The calculated D and I values among the four populations revealed that S.dugasti from Nakornrachshima found to be the most varied group.

The Influence of Lines in Visual Art upon Undergraduates' Perception

**ความรู้สึกของนิสิตระดับปริญญาตรีที่มีต่อเส้นแบบต่าง ๆ
ในงานทัศนศิลป์**

Winai Somdee

The purposes of this study were to investigate the under-graduates' perceptions of various forms of lines in visual art and to analyze the relationship between those perceptions and their major subjects.

The sample was undergraduate students of twelve different majors of Srinakharinwirot University, Prasarnmit Campus in the academic years 1991-1992. Students from each major were selected by means of a simple-random sampling and the total number was 212.

The research instrument used was a questionnaire which consisted of a set of 29 visual art items. Each of them had five alternatives, one of which was open-ended. The statistics applied in analyzing the data were frequency, percentage and chi-square (χ^2)

The findings were as follows:

1. The undergraduates' perceptions of lines in visual art include

1.1 Straight lines were found to convey the feelings of grace, stability earnestness and peace.

1.2 Curvy lines were found to convey the feelings of gentleness, smoothness, comfort, continuity and blend.

1.3 Wavy lines were found to convey the feelings of argumentation, severity, confusion and puzzlement.

1.4 Inclined lines were found to convey the feelings of movement, instability and uncertainty.

2. The difference between the perceptions of the under-graduates of various forms of lines and their majors were statistically significant at .01 and .05 levels.

Suggestopedic Method of Teaching for Higher Education Student

การสอนแบบขึ้นนะสำหรับนักศึกษาระดับอุดมศึกษา

Varin Rusmeprome

The purposes of this study is to implement Suggestopedic Method of Teaching in a classroom setting to determine whether it can provide a significant effect on the Foundation of Educational Technology Subject learning efficiency and long term memory of higher education students.

The sample consisted of 40 students selected from the number of graduate students who took the foundation courses and enrolled in the Educational Technology Department by simple random sampling. The sample were divided equally into an experimental group and a control group. The experimental group was instructed by the Suggestopedic method and the control group was instructed by a conventional method. All subjects were pretested with a multiple-choice learning efficiency test. The instruction consisted of eight-50 minutes periods, held twice a week for each group.

The groups were posttested after the instruction. Four weeks later, both the experimental and the control groups were administered the same test.

The t-test was used to test the statistical significance of differences.

Results of this study indicated that the suggestopedic group's learning efficiency and the long term memory scores showed statistically significant gains above those of a control group who received conventional instruction over a four-week 4 period. It was concluded that suggestopedia is an approach that facilitates the knowledge acquisition naturally with emphasis on the relaxing, calm and comfortable environment which should be implemented in higher education learning and teaching.

The Surveying Of Microbiological Water Quality at Samila Beach, Songkhla

**การสำรวจคุณภาพน้ำทะเลทางจุลชีววิทยาบริเวณชายหาดสมิหลา
จังหวัดสงขลา**

Nukul Intarasangkha

The investigation of water quality at Samila Beach, Songkhla province was conducted for 6 months from March to August 1991 by collecting seawater monthly from 5 sites along the beach.

The samples were analysed for total coliform and fecal coliform bacteria and for some chemical and physical properties.

The results of the study showed that the water quality from site I (in front of the lotus pond) to sites IV (in front of Songkhla Navy Base Club) is suitable for swimming but at site V (near Kao San village) water is polluted, coliform and fecal coliform bacteria concentration are high especially during March and April, the value is 170-920 MPN/100 ml. It should be noted that, there is a lot of waste water from Kao San Village which may affect the water quality not only of its own site but also that of the near site (site IV).

The chemical and physical qualities of sea water at Samila beach are normal. Dissolved oxygen concentration ranged from 5.4-8.7 mg./l, pH values values ranged from 7.5-7.9, salinity values ranged from 28-34.5 ppt and water temperature ranged from 31.5-39 C.

Working Status of Master's Degree Graduates in Education Measurement from Srinakharinwirot University

**สถานภาพการทำงานของมหาบัณฑิตสาขาการวัดผลการศึกษา
มหาวิทยาลัยศรีนครินทรวิโรฒ**

Sor Wasna Pravalpruk

The first graduate program in Educational Measurement of Thailand was offered by Srinakharinwirot University in the year 1966. The purpose of this program was to train and prepare educational measurement for personnel for the country. Most graduates have worked in the area of measurement, evaluation, and research.

The working status of the graduates was to be surveyed and the curriculum to be evaluated. Ninety-six graduates was used as a sample of the population.

Most graduates worked as instructors, administrators and resource persons in the field of measurement, evaluation research and statistics. Their responsibilities were :

- 1. To construct both teacher - made tests and standardized tests.**
- 2. To be resource persons in measurement and evaluation.**
- 3. To teach courses in measurement and evaluation.**
- 4. To be program evaluators.**
- 5. To be school registrars.**

Their opinions on the curriculum were as follows:

- 1. The main purpose of the curriculum was to construct measuring tools.**
- 2. The curriculum was congruent to the needs of measurement personnels.**
- 3. The curriculum was comprised of measurement, statistics and research designs.**
- 4. The content of curriculum was up-to-date.**
- 5. Studying load during each semester was appropriate, although there were limited number of selected courses.**
- 6. Assignments of classes were rather heavy and the quality of reports was questionable.**
- 7. Honesty and professional ethics were always emphasized.**
- 8. Evaluation of learning outcomes and grading system were appropriate and fair.**
- 9. The roles of advisory thesis committee were appropriate.**

The objectives of the curriculum as rated by the graduates according to its importance were as follows :

- 1. To construct and develop measuring tools in Behavioral Sciences.**
- 2. To perform instruction of education measurement, evaluation statistics and research design.**
- 3. To realized the ethics and responsibilities of evaluators.**
- 4. To perform further study in educational measurement.**

The qualification of graduates was rated to be the most needed characteristic, and It was the characteristics of this curriculum.

An Culture Analysis of the southern Jataka Literary Works

วิเคราะห์วัฒนธรรมจากวรรณกรรมภาคใต้ประเภทชาดก

Suebpong Thammachat

The research analysed the cultural aspects of the Southern Thailand's Jataka literary works and attempted to highlight the continuation of such aspects from the past to the present. All of the literary works analyzed were written before the reign of King Rama VI. Most of the cultural aspects have been handed down to the present-day people, although some of the aspects have been modified to suit the changing ways of life, and some have been lost through negligence.

The cultural aspects taken into account in the analysis are traditions, beliefs, values, ethics, arts, household items, dress modes, and nutrition habits. All of these cultural aspects contribute to the well-being of the Southern Thailand's society in the past and are the accepted basic principles which will pave way for the future cultural development of the society.

Effects of Rate of Urea 46 percent on The Growth of *Polycavernosa changii* in Closed Farm System Where Salinity of Sea Water 30 - 35 partperthousand

การเพาะเลี้ยงสาหร่าย *Polycavernosa changii*

**ในระบบฟาร์มปิดโดยใช้ปุ๋ยยูเรีย 46% ในอัตราและความถี่ระดับต่างเพื่อ
พัฒนาการเพาะเลี้ยงในระดับอุตสาหกรรมต่อไป**

Somsak Sansuk

An experiment, using in situ cage culture, was used to investigate the effects of fertilizer urea on the growth of *Polycavernosa changii* in closed farm system at Ao Yang in Ao Yai district, Amphur Muang, Trad Province from November 24th 1990 to February 9th 1991. The ration of fertilizer urea at 6 different concentrations were 1.3, 1.5, 1.7, 1.9, 2.1 and 2.3 gram per cubic meter where the salinity of sea water was 30-35 ppt. Two groups of *P. changii* were experimented with the same fertilization. One, *P. changii* in the solution of fertilizer at six different levels was soaked once a week. The growth rate and yield of *P. changii* of this group were obtained with statistically significant differences where the value of fertilizer nutrient was 1.9 gram per cubic meter after the period of 11 weeks. The other was treated by sinking the fertilizer in the porous polyethylene bag in the in situ cage culture in the experimental farm with 6 levels

of fertilizer once a week. The growth rate and yield of P. changii were also obtained with statistically nonsignificant difference, but it showed the tendency of rather good growth rate where the value of fertilizer was 1.9 gram per cubic meter after 63 days. The prerequisite observation gave the suggestion that the growth rate of P. changii was directly-dependent on experimental factors.

Chemical Constituents of Polyalthia cerasoides (Roxb.) Benth. ex Bedd.

สารประกอบเคมีในพญารากดำ Chemical Constituents of Polyalthia
cerasoides (Roxb.) Benth. ex Bedd.

Suparak Pratyasittikul

Chemical constituents from the stem bark of Polyalthia cerasoides (Roxb.) Benth. ex Bedd. were investigated. The isolation and structural elucidation were determined by using chromatographic and spectroscopic methods respectively. It is found that the stigmas terolis the only compound present on crude hexane extracts. The two pure compounds were found in crude methanol extracts, they are tetrahydrofuran-2, 3, 4, 5-tetrol, MP 132 C and 1, 2, 4-trihydroxy-3, 5-dioxycyclopentene-4-acetic acid, MP 216-218 C.

Extraction of Antibacterial Substances from Azadirachta indica A. Juss var Siamensis Valenton leaf.

การสกัดสารที่มีประสิทธิภาพในการยับยั้งการเจริญเติบโตของ
แบคทีเรียจากใบสะเดาบ้าน

Jinda Tambanjong

The antibacterial activity study of extracted solutions from Azadirachta indica A. Juss var Siamensis Valenton leaf with hexane, chloroform and methanol against B-Streptococcus gr. A, Pseudomonas aeruginosa and Staphylococcus aureus showed that the extracted solutions could not inhibit the growth of Pseudomonas aeruginosa but inhibited the growth of the B-Streptococcus gr. A and Staphylococcus aureus. The chloroform extract had a higher antibacterial activity than the others.

By using the column chromatography technique, with silica gel as an adsorbent and a mixture of chloroform : toluene : methanol = 4 : 20 : 1 as a solvent, five fractions were separated from the chloroform extracted solution. Fraction two and five, the

sticky green and brown liquids, could inhibit the growth of B-Steptococcus gr. A and Staphylococcus aureus. The minimum inhibition dose of fraction two and five for B-Steptococcus gr. A were 31.25 and 31.25 ug/disc, for Staphylococcus aureus were 125 and 31.25 ug/disc respectively.

Motor Fitness Development of Srinakharinwirot University Students

**พัฒนาการทางสมรรถภาพกลไกของนิสิต
มหาวิทยาลัยศรีนครินทรวิโรฒ ประสานมิตร**

Tawate Piriwapoen

The purposes of this study were to compare the motor ability development of Srinakharinwirot University students. The population sample comprised of 230 male and 420 female students. The Barrow's motor ability test consisting of the standing broad jump, medicine ball put and zigzag run was used to collect data. One-way ANOVA and t-test were used to analyze the data. The findings were :

1. Motor ability of standing broad jump, medicine ball put, zigzag run, and the total motorability of male and female students majoring in Physical Education, Recreation and others were significantly different..

2. The motor ability's development showed that

2.1 Male students in Physical Education had no development in every test.

2.2 Male students in Recreation had development in zigzag run and the total motor ability at .05 level confidence.

2.3 Male students in other majors had development in zigzag run at .05 level confidence.

2.4 Female students in Physical Education had development in medicine ball put at .05 significance level.

2.5 Female students in Recreation had development in medicine ball put at .05 Significance level.

2.6 Female students in other majors had development in zigzag run and total motor ability at .05 level significance.

**Attitudes of Library's Users and Staff
Towards the New Library Building of
Srinakharinwirot University Prasarnmit**

**ความคิดเห็นของผู้ใช้และบุคลากรห้องสมุดต่อ
อาคารสมเด็จพระเทพรัตนราชสุดาฯ มหาวิทยาลัยศรีนครินทรวิโรฒ
ประสานมิตร**

Anchalee Amnajtham

The main purpose of this study was to determine the levels of satisfaction in Akarn Somdej Pratheparattanarachasuda, Srinakharinwirot University Library's among users and staff in using the library building with regard to its arrangement, lighting, temperature, furniture, equipment and facilities.

The data were gathered through two sets of questionnaires, one of which was randomly distributed among 1,200 library users and the other to all 75 members of the library staff. The percentage, means and standard deviation were used to analyse the data.

The results indicated that:

1. Most users are highly satisfied with the library building and its facilities.
2. Users indicated that the audio service and drinking water service require improvement.
3. The library staff are moderately satisfied with the library building. They expressed satisfaction with such facilities as the meeting halls, seminar rooms, lifts, stairs, channels of communication, working areas and lighting.
4. The areas in which the level of satisfaction is low are the working area of the Serials Division, the library equipment in the Reference Service Division, the fire prevention system and the cleanliness of the building deck.

The results of this study point the way to appropriate library physical rearrangements to facilitate and maximize both library uses and functions.

A Survey and Development of Women Artisans in Southern Thai Rural Areas

การสำรวจและพัฒนาร่างฝีมือสตรีในชนบทภาคใต้

Pinyo Tunpitayakupt

Most of the women artisans in southern Thai rural areas were 45 year old housewives. Their main careers were farming and plantation work. They were presumed to do supplementary work like handicraft, pottery, wickerwork, weaving, sculpturing and the like. They used local raw materials such as reeds, sugar palm leaves, cloth, bamboos, clay, coconut shells and other indigenous plants like Ka-po, Kloom, and Li-pao

Most of the raw materials used in the craft work were traditionally obtained from nature in the neighbourhood. As these materials became scarce because of a large amount of consumption, the cost was relatively high. The per capita income of women artisans in these rural areas was between 1000 and 1500 baht per month. Such income was uncertain and dependent on orders placed by traders.

The products were made in various forms and styles; householdware, furniture and ornaments. Since the direction of production had been changed to serve commercial purposes and the cost of living had increased drastically, the format copying was introduced in the production procedures. Moreover, many senior artisans were retired. These caused the loss of masterpiece works which identified local and cultured uniqueness. The art of craftsmanship, however, could still be seen in the works of artisans who worked for the projects under Her Majesty The Queen's patronage.

The prominent obstacles or constraints of female artisans in southern Thai rural areas were the lack of knowledge in marketing and the increase in the cost of raw materials. Furthermore young women in the villages unfortunately showed less interest in this handiwork, though there were a lot of support given by several government organizations like the Centre for Industrial Promotions, Non-Formal Education Centre, Provincial and District Agricultural Promotion Units, and The Office of Community Development.

Mangosteen Peel Affects on Cell Viability

Wannapa Settheetham

Cytogenic effects of boiled water extract of mangosteen peel were investigated in human lymphoblast (K4) and lymphoma (P3HR-1) cell lines. Reduction of cell viability and inhibition of cell growth were shown a dose-response relationship to the dose of mangosteen peel within a range of 0.2 - 1.0 mg/ml. The DNA fragmentation and chromosome aberration were not different from the untreated control. In addition, it was not found to be an inducer of the production of virus capsid antigen (VCA), determined by Epstein-Barr virus (EBV). This preliminary result suggests that the water extract of mangosteen peel decreases the number of viable cells, however, this effect does not result from nucleus activation and chromosome damage. The water soluble compound in mangosteen peel may play a role in RNA or protein synthesis systems to reduce the survival.

**A Chromosome Study on Four Species
of Mastacembelid Fishes, *Macragnathus
siamensis*, *M.circumcinctus*, *M.aculeatus*
and *Mastacembelus armatus*, in Thailand.**

**การศึกษาโครโมโซมของปลาทลจุด ปลาทลภูเขา ปลาทล
และปลากระทิงดำ ที่พบในประเทศไทย**

Thawat Donskul

The main purpose of this experiment was to study the chromosome and karyotype of *Macragnathus siamensis*, *M.circumcinctus*, *M.aculeatus* and *Mastacembelus armatus*, in Thailand. Fifteen specimens of each species of fishes, 15.3 to 19.7 cm, 11.2 to 14.5 cm, 11.7 to 17.3 cm, and 22.5 to 30.0 cm. in standard length were studied. The method of chromosome preparation of Ida and Kyo (1980) and Uwa and Ojima (1981) was modified. Classification of chromosome follows the method recommended by Levan et. al. (1964). The findings of this experiment were as follows:

1) The diploid chromosome number of *M.siamensis* is 48. The karyotype comprises 4 pairs of metacentric, 1 pair of subtelocentric and 19 pairs of acrocentric chromosomes. The arm number is 56.

2) The diploid chromosome number of *M.circumcinctus* is 48. The karyotype comprises 7 pairs of metacentric, 1 pair of submetacentric and 16 pairs of acrocentric chromosomes. The arm number is 64.

3) The diploid chromosome number of *M.aculeatus* is 48. The karyotype comprises 7 pairs of metacentric, 1 pair of submetacentric and 15 pairs of acrocentric chromosomes. The arm number is 62.

4) The diploid chromosome number of *Mastacembelus armatus* is 48. The karyotype comprises 6 pairs of metacentric, 1 pair of submetacentric, 2 pairs of subtelocentric and 15 pairs of acrocentric chromosomes. The arm number is 62.

The findings revealed that 4 fishes have the same chromosome number ($2n=48$) but different patterns of karyotypes. This study is useful for cytotaxonomy of fishes.

**An Investigation on the Effect of
Community and Industrial Expansion
on Water Quality in Songkhla Province**
การศึกษาผลกระทบของการขยายชุมชน และโรงงานอุตสาหกรรม
ต่อสภาพแวดล้อม ทางน้ำในจังหวัดสงขลา

Nugul Intrasungkha

By collecting water samples from ten study sites at the mouth of Songkhla lagoon, monthly for 12 months in 1992 and monitoring the water qualities in terms of chemical, physical and biological standard. The results of the study revealed that the water quality in this area is prone to be polluted in summer in some study sites. The DO value ranged from 0-4 mg./l. and BOD value ranged from 0.1-19.15 mg./l. Total coliform and faecal coliform bacteria ranged from 2->160,000 MPN/100 ml. Another studied results were as follow; ammonia 0-6.31 mg./l, nitrite 0-0.027 mg./l, nitrate 0.004-0.221 mg./l, phosphate 0-0.79 mg./l pH 7.1-8.1, salinity 1-35 ppt, transparency 30-168 cm., suspended solid 4-377 mg/1 and temperature 26-34 C. The water from Ta Sa-arn to Municipal fishing bay is quite polluted by fishing activities, so the public should be made aware and some means to control or prevent the water pollution should be set up.

Elimination of Iron Oxides from the Underground Water for Safe Consumption by Physical Means

การกำจัดสนิมเหล็กออกจากน้ำเพื่อการอุปโภคโดยวิธีทางฟิสิกส์

Cho Saleechan

We have constructed an apparatus for ridding drinking water of iron oxides by the physical mean of air addition. Our apparatus consisted of an air pump, air chamber and a sieving tank. Four water samples were collected from (1) Crotaram Temple (2) Crotaram School, both of Ampur Bangbor, Samutprakarn province (3) Prongkunpetch School and (4) Prngkunpetch village, both of Ampur Nongbuarahew, Chaiyaphum province.

We measured the iron content of each water sample with a Speedtronic-21 instrument (at wavelength 515 mu) before passing it through the air chamber. After the time intervals of 1, 2, 3...12 minutes, it was found that the iron content of each water sample after passing through the sieving tank was different. Water that contained most iron had 392.00 mg. of iron/litre, and water that contained least iron had 24.23 mg. of iron/litre. The amount of oxides decreased substantially after passing air through the water sample during the first minute and thereafter the iron content slowly decreased. The time intervals needed for air addition until the amount of the iron content was below the standard set by the Department of Mineral Resources (0.5 mg./litre) are as follows:

- Crotaram School 9 minutes
- Crotaram Temple 5 minutes
- Prongkunpetch School 11 minutes
- Prongkunpetch Village 3 minutes

This method of iron oxides eradication from water can be used in the water systems of villages where the amount of iron content is above the safety standard for drinking.

Evaluation of the Master Programme Curriculum in Physical Education and Health Education in B.E. 2527

**การประเมินผลหลักสูตรการศึกษาตามบัณฑิต วิชาเอกพลศึกษาและ
สุขศึกษาพุทธศักราช 2527**

Pornsuk Hunnirun

The purpose of this study was to evaluate the B.E. 2527 Master Programme Curriculum in Physical Education and Health Education of Srinakharinwirot University. The population of this study was graduate students and people who graduated with Master Degree in Physical Education from B.E. 2517 to 2531 and in Health Education from B.E. 2525 to 2531. The sample of this study composed of 9 graduate students in Physical Education, 25 graduate students in Health Education, 88 graduates with Master Degree in Physical Education from B.E. 2517 to 2531 and 58 graduates with Master Degree in Health Education from B.E. 2525 to 2531. The researchers constructed a rating scale and opened - end questionnaires to evaluate the Master Programme Curriculum in Physical Education and Health Education. The questionnaire had the following aspects : 1) philosophy and objectives, 2) organization of sequence and content of subject matters, 3) learning experiences, 4) measurement and evaluation and 5) educational environment. The validity and reliability of this questionnaire was 0.786. A number of questionnaires was sent directly to graduate students and collected by researchers and the rest was sent to graduates with Master Degree in Physical Education and Health Education by mail. Data collected from questionnaires were analysed by calculating mean, standard deviation, t-test, one-way Analysis of variance and Newman-Keules Method.

Findings :

1. There were no significant difference between the opinion of graduate students in Physical Education and those who graduated with Master Degree in Physical Education in the areas of the organization of sequence and content of subject matters, the learning experiences, but the measurement and evaluation aspect of the determination of proposed thesis, educational environment and scholarship funds were significantly different.

2. There were no significant differences between the opinions of graduated students in Health Education and those graduated with Master Degree in Health Education in the areas of the measurement and evaluation, the organization of sequence and content of subject matters but the organization of sequence and content of subject matters and the learning experiences aspect about major and elective subjects were significant different.

The Construction of an Instrument to Identify Learning Disabilities

การสร้างเครื่องมือเพื่อคัดแยกเด็กที่มีปัญหาในการเรียนรู้

Padoong Arayawinyoo

The major purpose of this study was to construct an instrument to identify the learning disabilities, of children aged 6 - 12 years. The norms would be established, and used as criteria in decision making. The instruments were made less complex so that teachers could use it, but the device would still possess the acceptable validity and reliability as a standardized technical instrument.

This survey device was used to measure 5 major areas of student performance and behaviour : Language, Math, Time and Direction, Motor and Behavior. These areas were subdivided into 25 headings : Vocabulary, Following Instruction, Story Telling, Reading, Writing, Counting, Math Concept, Numerical Memory, Left-Right Orientation, Walking/Running, Jumping, Balancing, Finger Dexterity, Unusual Movement, Cooperation, Attention Span, Orderliness, Interpersonal Adjustment, Acceptance by Peers and Responsibility. The instrument consisted of 50 items to be answered by the classroom teachers who had been thoroughly familiarized themselves with the children to be rated.

The sample consisted of 3658 Primary schoolchildren whose ages ranged from 6-12 years, systematically selected from 35 Primary schools in different regions of the country. The schools were under the supervision of the Office of the National Primary Education Commission, the Ministry of Education.

The Alpha Coefficient which indicated the reliability of the instrument was established at .99. The Known-Group Technique was employed to ascertain the Validity. The t-test was utilized to determine the difference yielded. The percentile ranks were created as normreference. Other forms of descriptive statistics, e.g. mean, standard deviations, were also made available for further comparison and consideration. Also included were the test administration, scoring and interpretation of the data.

Approch to Improve Morality by Using a "Guess Who" Technique in Elementary School in Bangkok.

**การประยุกต์ใช้ทคโนโลยี "ใครเอ่ย" เพื่อสร้างเสริมจริยธรรมของนักเรียน
ระดับประถมศึกษา ในเขตกรุงเทพมหานคร**

Yuwadee Tienkaprasit

The purpose of this study was to adapt the peer-rating technique called "Guess Who" to be used in a classroom situation as a tool to reinforce moral behaviours emphasized in four aspects : self-discipline, social cooperation, responsibility and kindness.

The samples used in this experiment were 107 elementary students in the academic year 1992 of Samakom Satriethai School, Petchburi Road, Phayathai Bangkok. The samples were in three regular classrooms were divided into three groups: one control group, experimental group I, and experimental group II.

Research tools were checklists of moral behaviors and personal data blanks which were used as pre-test and post-test self reports of the samples, and the "Guess Who" questionnaire which is used as peer rating feedback of moral behaviors in the 4 aspects mentioned above. The "Guess Who" questionnaire is used monthly for five times in the experimental group I and the experimental group II. In accordance with the "Guess Who" questionnaire the students in the experimental group II who gained high negative rating scores by peers are assigned to have a group counseling for improvement.

Comparing the moral behaviour scores between groups by the t-test and F-test, the experimental group I was statistically significantly different after the experiment in self-discipline, responsibility and kindness more than the control group and the experimental group II. The only aspect of moral behavior that the experimental group II has shown to be statistically different when compared to the control group is self-discipline.

The moral behaviour in the control group was not statistically significantly different when compared between the score of the pre-test and post-test, except social cooperation. The result of the experimental group I and II was statistically significantly different in three aspects : self discipline, social cooperation and kindness, but there is no statistically significantly difference in responsibility aspect.

When compared to the increased scores on moral behaviour of boys and girls, high and low academic achievement, and in the three groups, there was no difference.

A summary of the results from this study on the application of "Guess Who" technique to reinforce moral behavior in the elementary school students showed that "Guess Who" technique could reinforce the students in the classrooms to react with more accepted behaviour. It can be also used without limitation on students sex and academic achievement variables.

**Buddhist Parents' Characteristics as
Correlates of Child-Rearing Practices :
Behavioral Science Approach.**

**ลักษณะทางพุทธศาสนาและพฤติกรรมศาสตร์ของบิดามารดาที่
เกี่ยวข้องกับ การอบรม เลี้ยงดูบุตร**

Ngamta Vanindananda

The aim of present study was to investigate the antecedents of the Buddhist child-rearing practices. There were three main objectives. Firstly, to examine whether parents with higher level of the Buddhist characteristics could carry out the Buddhist child-rearing practices better than their counterparts. Secondly, to explore the direction and degrees of the relationship among the parents' Buddhist characteristics, the behavioural science characteristics and the Buddhist child-rearing practices. Finally, to compare the directions and degrees of the above relationship between the father and the mother of various types.

It was found that the amount of the Buddhist participation and the three aspects of the Buddhist characteristics were effectively related to the Buddhist child-rearing practices. The relevant recommendations were to promote the Buddhist participation and the Buddhist characteristics of parents. Child-rearing campaign should be directed at the father to make him realize his important role in Buddhist socialization.

Mental Health of Children in Eastern Seaboard

**การศึกษาผลของการจัดการชั้นเรียนที่มีต่อผลสัมฤทธิ์
ทางการเรียนวิชาวิทยาศาสตร์ระดับชั้นมัธยมศึกษาตอนต้น
โดยการสังเคราะห์งานวิจัย ปีการศึกษา 2518-2534**

Somchit Savathanaphaibul

The purpose of this study was to synthesize knowledge on the effects of classroom management on the scientific achievement of the lower secondary education in the 1985-1991 academic year through the meta-analysis and content analysis techniques. The population consisted of 112 experimental subjects selected according to the following criteria:

1) Classroom management and comparative studies on the scientific achievement and teacher manual instruction.

2) Classroom management studies in the school system.

3) Sufficient data for meta-analysis. The major findings were as follows:

1. Quantitative Research

1.1 There were 26.82% of studies on systematic instruction, 3.35% on student personality and thinking styles, 54.17% on media instruction and 44.79% on Mathayom Suksa 2 studies.

1.2 The results on classroom management were as follows: student personality, individual differences, classroom environment, facilitating learning, systematic approach, activities facilitating student achievement, classroom disciplines, group dynamic, and thinking styles. Each type of these studies was more efficient in scientific achievement than the teacher manual instruction.

1.3 The results of classroom management on systematic instruction which emphasized instructional activities, media instruction, student roles, teacher roles, knowledge and fundamental knowledge investigation were more efficient in scientific achievement than teacher manual instruction.

1.4 There was no significant differences among eight types of classroom management of scientific achievement.

1.5 There was no difference between scientific achievement and classroom management through system approach classified according to instructional activities, media instruction, student roles, and teacher roles.

2. For content analysis, there were classroom management with regard to personality and individual differences using activities which emphasized student roles, teacher roles and media instruction.

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