



UNISEARCH JOURNAL

Volume 3 Number 3 September - December 2016

10101111010101
1010101

1010011011010111101
1010101



Educational research: transforming Thailand to a knowledge-based society

Thinking Through Practice:

Creative media as a Research methodology

The Dependence of People on Media
during Natural Disasters

Health and beauty of Thai adolescents:
obesity, whitening and
plastic surgery

Teachers' Academic Leadership

Reinforcement Strategies for
Educational Quality Improvement

of the Member Countries in the Association of
South East Asian Nations (ASEAN)

An Approach for Developing
the Toolkit for Assessing Disaster
Resilience in Thailand

ISSN 2465-3764



9 77246 53764 8

Academic services,
and special projects

Academic services,
research and development,
and consultancy

Human resource development
and event organization

offers academic and project management services tailored to clients' needs

“We strive to bring practical benefits to society”

Chula Unisearch, Chulalongkorn University

254 Chulalongkorn Research Building, 4th Floor, Phayathai Road, Pathumwan, Bangkok 10330

Tel : 0-2218-2880 Fax : 0-2218-2859 : www.unisearch.chula.ac.th

In today's rapidly changing world, advances in technology and communication have triggered global social change and created a world with a borderless society. We all need to learn, understand, anticipate and respond to these new technological possibilities and social dynamics, and to protect ourselves, our cultural integrity and national competitiveness. New research to improve the quality of education of Thai population is urgently needed. The goal of the government's policy on research and development, as defined in the National Education Plan Revised Version (B.E. 2552-2559, 2009-2016) states as follows:

"To promote research and development, create knowledge, innovation and intellectual property, develop knowledge management systems and create a research utilization system."

Educational institutions and research institutions need to focus more strongly on research to develop society and the country, in particular in identifying innovative solutions to address key challenges e.g. for the economy, society, environment, tourism and infrastructure.

In this changing social and technological context, education research and reform will be essential- quality education provides the foundation for social and development and national competitiveness. Thailand is fortunate in its rich knowledge base and diversity of indigenous knowledge across all regions of the country. Understanding and harnessing this local wisdom at community level will drive advances across many challenging areas, especially in natural resource management, tourism, community development and preservation of a diverse cultural heritage. Educational reform must prioritize these needs and address the importance of both indigenous and cognitive knowledge within the community context. This will contribute to the creation of a learning and knowledge society management to build strong and sustainable communities.

Inter-disciplinary approaches will increasingly form the core of applied research, bringing together a convergence of science and technology with social science approaches to create a shared and holistic understanding as well as contribute to practical, real-world solutions. The days of a reductionist, topic-by-topic approach to research and education are over, and it is now incumbent on the government and Thailand's educational institutions to lead the way in providing our youth with the tools needed to create a modern, integrated knowledge-based future for our country.

The Editorial Board

Vol. 3 No. 3 Sep. - Dec. 2016

Published by

Chula Unisearch, Chulalongkorn University

Advisory Board

- Prof. Kiat Ruxrungtham, M.D.
- Prof. Kua Wongboonsin, Ph.D.
- Prof. Mongkol Techakumphu, DVM.
- Assoc. Prof. Thavivongse Sriburi, Ph.D.
- Saowanee Wijitkosum, Ph.D.
- Supichai Tangjaitrong, Ph.D.
- Assoc. Prof. Suchana Chavanich, Ph.D.

Editorial Board

- Saowanee Wijitkosum, Ph.D.
- Wyn Ellis, Ph.D.
- Ms. Prapaporn Thapanaphong
- Ms. Buppachatt Mattayom
- Ms. Sirima Nintuam
- Ms. Preamsuda Jiwonok

Contact Enquiries

Chula Unisearch, Chulalongkorn University
254 Chulalongkorn Research Building,
4th floor, Phayathai Road, Pathumwan,
Bangkok 10330
Tel: 0-2218-2880
Fax: 0-2218-2859
www.unisearch.chula.ac.th

Disclaimer: "The Editorial Board disclaims any responsibility for the views and opinion expressed herein. The views and opinions expressed in this issue are entirely those of the individual authors."





3



8



14



29



44

3

Thinking Through Practice: Creative Media as a Research Methodology

8

Teachers' Academic Leadership Reinforcement Strategies for Educational Quality Improvement of the Member Countries in the Association of South East Asian Nations (ASEAN)

14

An Approach for Developing the Toolkit for Assessing Disaster Resilience in Thailand

21

The Dependence of People on Media during Natural Disasters

29

Health and beauty of Thai adolescents: obesity, whitening and plastic surgery

34

Interview

Assoc. Prof. Suchana Chavanich, Ph.D.

Restoration of Corals through Sexual Propagation... Bring Back Corals to the Sea of Thailand

40

Around us

Quality of Education for Thai Children

44

Project

Loei-Lao PDR ecotourism development cooperation project to link the two banks of the Mekong River

46

Activities News

34



Thinking Through Practice: Creative Media as a Research Methodology

Jirayudh Sinthuphan, Ph.D.
Faculty of Communication Arts, Chulalongkorn University



Introduction

The nation – which in modernity has been formalised as a nation-state – depends on ideologies and practices of clear-cut borders and requires the formation of identities and communities within defined borders and territory (Holton, 1998). Like the European Community, the ASEAN Community was conceptualised with the goal of deterritorialising national political boundaries and of encouraging greater cooperation among Southeast Asian nations. Yet, there is still a key contradiction in the position of the nation in our times. While culture and communication become increasingly deterritorialised and transnational, national political boundaries have also become increasingly reinforced. This condition creates a rupture between the politics of the nation and the human condition within nations and even more so for those human subjects who cross national boundaries, especially through migration and transcultural flow.

“Digital Storytelling and ASEAN Citizenship” is a practice - related research project that seeks to explore the role of digital storytelling and narrative arts in the deterritorialisation of national boundaries, and in establishing a transcultural connection between people of the Southeast Asian nations. The project has brought 30 participants from different communities in the region to work together and to think, through the process of media practice, about the issues of politics, cultures and identities of this emerging community.

Media Practice as Research

In recent years, “*practice*” has become an important element in research activities in international higher education, especially in the fields of Humanities and Social Sciences. The premise is that “*practice*” is not just a way of creating something, but it is also a way of thinking by doing through the body. There are two types of practice related research: practice-based and practice-led.

Practice-based Research is an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice. Claims of originality and contribution to knowledge may be demonstrated through creative outcomes in the form of designs, music, digital media, performances and exhibitions. Whilst the significance and context of the claims are described in words, a full understanding can only be obtained with direct reference to the outcomes.

Practice-led Research is concerned with the nature of practice and leads to new knowledge that has operational significance for that practice. In a doctoral thesis, the results of practice-led research may be fully described in text form without the inclusion of a creative work. The primary focus of the research is to advance knowledge about practice, or to advance knowledge within practice. Such research includes practice as an integral part of its method and often falls within the general area of action research.



Figure 1 Project participants study auditory arts in the Centre of Excellence in Digital Media, Chulalongkorn University

Source: Sinthuphan et al. (2015)

“Digital Storytelling and ASEAN Citizenship” is primarily a practice-led research that focuses on the theory and the process of transcultural media education. At the same time, its creative outcomes (such as digital designs, short films and documentaries) will also make it a practice-based research that seeks to promote transcultural connectedness among ASEAN citizens.

Cultivating Transculturalism

Transcultural connectedness or transculturalism is often defined as *“seeing oneself in the other”* (Cuccioletta, 2002), to which we might also add *“seeing the other in oneself”*. Although this concept has its roots in the field of diaspora studies, transcultural connectedness is not singularly the property of the diaspora and as such it also has wider implications, especially in transcultural media practice. Similar to a person’s identity, a piece of storytelling is shaped in a location and a space. Each space is attached to a shared thought and memory, as well as to a shared sense of belonging and longing. Transcultural media practice seeks to establish a link between two different sets of identities from two different spaces that are interconnected, but sometimes distinct and competing. Each identity depends on shared myths and memories, as well as upon a sense of belonging in an imagined community which has some continuity and relevance across time and space (Georgiou, 2010).

According to Fernando Ortiz who introduced the concept in the 1940s, transculturalism is a process of de-culturalisation with the past and re-inventing a new common culture based on



Figure 2 Contemporary ASEAN shadow puppet show based on traditional Minangkabau local storytelling

Source: Sinthuphan et al. (2015)

the meeting and the intermingling of the different peoples and cultures. Contrary to multiculturalism, which most experiences have shown re-enforces boundaries based on past cultural heritages, transculturalism is based on the breaking down of boundaries and on the recognition of the other, based on a culture of the mix. In other words, one's identity is not strictly one-dimensional (the self) but is now defined in terms of a mosaic of identities (the others).

Through the process of the AIMS workshop, participants are invited to reflect upon their own identities and to observe elements of themselves in fellow participants. They shared their stories, discussed their ideas, were confronted with contrasting perceptions and looked for the missing links between seemingly disparate world views, in order to re-imagine the pluralistic identities of a shared community.

Reaching a Wider Audience

What started as an experiment- an experiment in the methodology, in the concept and in the way that the project involves researchers across the Faculty of Communication Arts, *"Digital Storytelling and ASEAN Citizenship"* has a far-reaching impact, surpassing our expectations. Since the project's launch, we have been invited to give workshops in many ASEAN countries and to form a panel in up-coming international conferences.



Figure 3 Participants exchange stories and discuss ASEAN issues
Source: Sinthuphan et al. (2015)

Everywhere we went, we were greeted with enthusiastic participants and an excited audience, demonstrating that practice-related research in the Humanities and Social Sciences can also have a broader impact on society, as well as in academia. Above all, this research project has demonstrated the power of storytelling and the creative media in capturing the audience's imagination and in fostering a sense of belonging to the ASEAN community

Conclusion

A community, as Benedict Anderson (1991) has proposed, is imagined. It is psychologically constructed by those who share interests and mutual identification, rather than being simply bound by locality or face-to-face interaction. It is possible for people to maintain a sense of connectedness with those outside their geographical area. Such a sense of connectedness, as Walter Fisher illuminates, is forged and maintained through the use of stories. Fisher also recognizes that *"communities are co-constituted through communication transactions in which participants co-author a story that has coherence and fidelity for the life that one would lead"* (Fisher 1989).

In the light of these arguments, the future of the ASEAN Community exists equally in the stories its human subjects recount about their own community and themselves as it does in its administrative policies. Transcultural media practice such as *"Digital Storytelling and ASEAN Citizenship"* can provide an interconnected space for reflection, dialogue and a complex articulation of the 'Us' and the 'Others'. It is a way of thinking by doing - through the body and through the use of imagination. It is an interpretative tool to make sense of events and phenomena that would otherwise be disparate and apparently unconnected. In other words, transcultural media practice is a gateway to globality in one's own consciousness.

Acknowledgement

This article is part of the result of the research entitled: *"Digital Storytelling and ASEAN Citizenship"* funded by the Ratchadaphiseksomphot Endowment Fund (2013), Chulalongkorn University.

Reference

- Anderson, B. 1991. *Imagined communities: reflections on the origin and spread of nationalism*. London: Verso.
- Brah, A. 1996. *Cartographies of Diaspora*. London: Routledge.
- Cuccioletta, D. 2002. Multiculturalism or Transculturalism: Towards a Cosmopolitan Citizenship. *London Journal of Canadian Studies* 17: 1-11.
- Fisher, W. R. 1989. *Human Communication as Narration: Toward a Philosophy of Reason, Value, and Action*. Columbia: University of South Carolina Press.
- Georgiou, M. 2010. Identity, Space and the Media: thinking through diaspora. *Revue Européenne des Migrations Internationales* 26 (1): 17-35.
- Hinchman, L. P. and Hinchman, S. 1997. *Memory, Identity, Community: The Idea of Narrative in the Human Sciences*. Albany: State University of New York Press.
- Holton, R. J. 1998. *Globalization and the Nation State*. London: Macmillan.
- Mouw, R. and Griffioen, S. 1993. *Pluralisms and Horizons*. Grand Rapids, MI: Eerdm
- Sinthuphan, J. et al. 2015. *Digital Storytelling and ASEAN Citizenship*. Chulalongkorn University.

Teachers' Academic Leadership Reinforcement Strategies for Educational Quality Improvement of the Member Countries in the Association of South East Asian Nations (ASEAN)

Piyapong Sumettikoon, Ph.D. et al.

Department of Educational Policy, Management and Leadership,
Faculty of Education, Chulalongkorn University

Introduction

ASEAN is a regional organization comprised of Southeast Asian countries under the name of Association of Southeast Asian Nations. Its purpose is to cooperate among member countries in many aspects, such as peace, stability, economy, knowledge distribution and social, on the basis of equality and for the advantage of the member countries.

At a meeting on the educational cooperation among ASEAN member countries, it was agreed to find a way to collaborate on education by having activities and projects every year. However, this has been without any distinctive results due to different contexts in each member country, making the development rather slow and inefficient. An assessment and ranking of the quality of education in the 10 member ASEAN countries was performed by The Programme for International Student Assessment (PISA), with the five representative countries of Singapore, Indonesia, Thailand, Malaysia and Vietnam joining the Organisation for Economic Co-operation and Development (OECD). Malaysia and Vietnam joined PISA for the first time in 2012. From the assessment by PISA in 2012, only one or two ASEAN countries had a top ranked level of the world while the other countries, including Thailand, were revealed to have education problems. Even though these countries have tried to raise their educational standards by increasing the amount of budget spent on education development, the results have not shown any significant improvement compared to the immensely increased budget spent on education.

Results of the study on the education quality development in the problematic countries showed that the pattern and methods of educational quality development mostly emphasized the physical development and adjusted management structure of the educational institutions. Moreover, these countries did not see the importance of educational human resource management, especially in the development of leadership skills in teachers. However, it has been accepted in the countries with a high ranked education assessment that this is a very important factor that leads to positive results in the quality of the education in these countries.

The above reasons lead to the study of strategies to strengthen the teacher's academic leadership in order to help develop the quality of education in ASEAN member countries. This will be of a substantial advantage to the development of the educational quality, which would in turn bring in economic, political and social stability in the Southeast Asian region in the future. The objectives of this research were to study the present and desirable future operating conditions in teachers' academic leadership that affect the educational quality development in ASEAN countries and to analyse and rank what is the most important aspect of the teacher's academic leadership that affects the development of high quality education. From this approach, strategies that would then strengthen the teachers' academic leadership can be proposed to help develop the quality of education in each of the ASEAN member countries.

Development of strategies to strengthen the teacher's academic leadership

1. Sample population and data collection

The research team selected people from two groups of people in the educational field in each of the 10 member ASEAN countries (Cambodia, Thailand, State of Brunei Darussalam, The union of Myanmar, the Philippines, Malaysia, Laos, Vietnam, Singapore and Indonesia). The two groups were (i) teachers or educational people (Group 1) and (ii) people who define the teachers' development policy or engage in the teachers' development (Group 2).

For Group 1, data was collected from 358 people who work in basic education schools using online questionnaires, while for Group 2 the data was collected from focus groups from each of the countries; where the data was obtained from groups of people who work with the respective Ministry of Education in each country and coordination of

educational institutes. These groups of people were different between each country, depending on the different limitations and organizational structure of each country.

2. Content used in the research

The research team assigned the scope and guideline of education related to the strategies to enhance the teachers' academic leadership for developing the quality of education in the member ASEAN countries by studying the conceptual framework on the related theories (Figure 1).

The research team organised the study process as follows:

1) Study the conceptual framework on the relationship between the teacher's academic leadership and the development of educational quality in ASEAN countries.

2) Study the present and desirable operating conditions in the future for the teacher's academic leadership for development of improved educational quality in ASEAN countries.

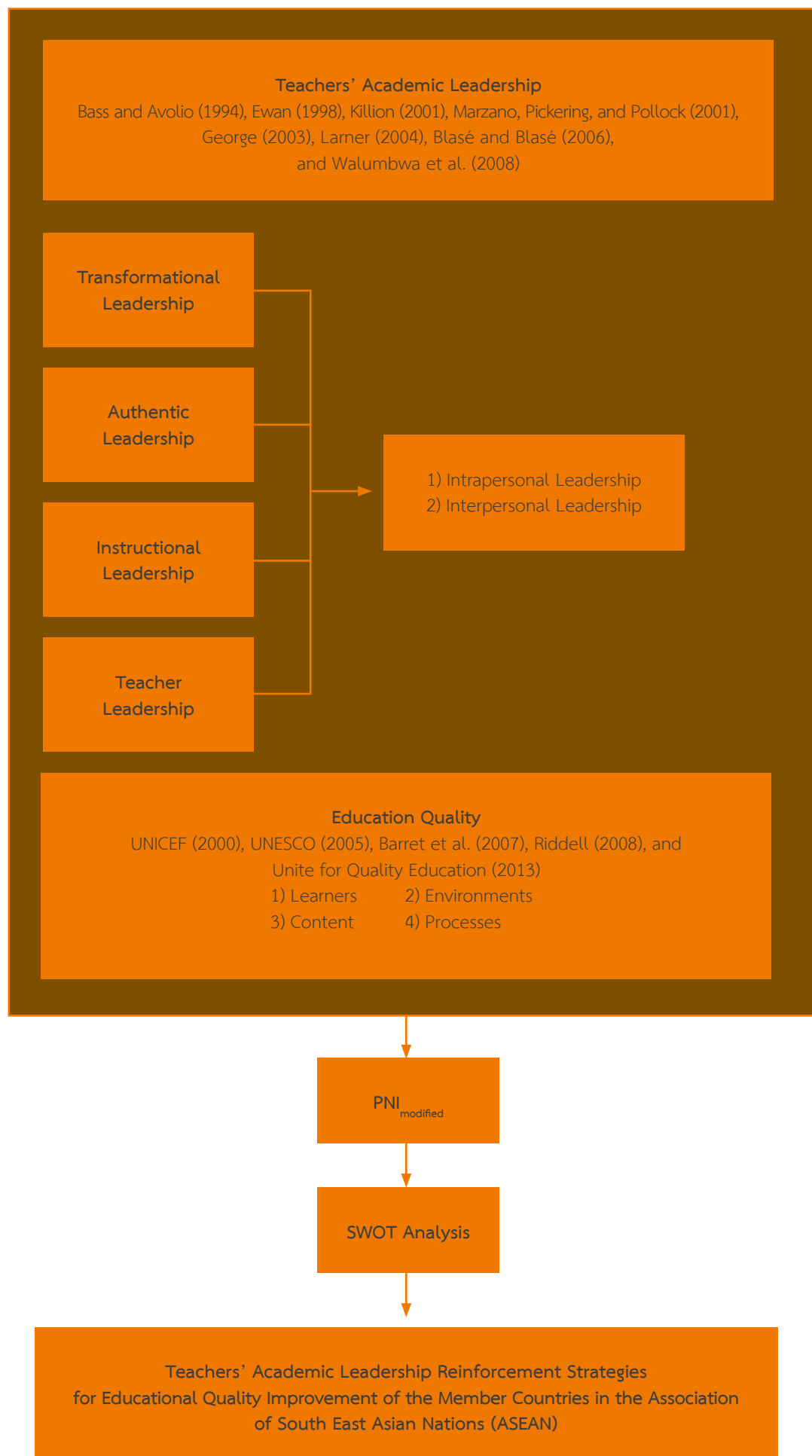


Figure 1 Conceptual framework of the research
Source: Sumettikoon, 2015

3) Rank the importance of each aspect of strengthening the teachers' academic leadership.

4) Analyse the greatest strength, weakness, opportunity and SWOT of the teachers' academic leadership.

5) Propose strategies to strengthen the teacher's academic leadership.

6) Investigate the suitability of each of the proposed strategies to strengthen the teacher's academic leadership.

7) Revise and propose new strategies to strengthen the teachers' academic leadership.

Results

1. Analysis of the present and the future desirable operating conditions of the teachers' academic leadership, in terms of the development of an improved quality of education in ASEAN countries, was as follows. The present overall image of the teachers' academic leadership in ASEAN countries is high (mean $\pm$ 1SD from a rating score of 0 to 5 of 3.51 ± 0.84). Likewise, the overall image of the desirable operating conditions of the teachers' academic leadership was high (mean $\pm$ 1SD from a rating score of 0 to 5 of 4.21 ± 1.00).

2. Ranking the important aspects required for strengthening the teachers' academic leadership. The results revealed that teachers need all the aspects, where the PNI_{Modified} score of each aspect ranged from 0.172–0.221. The most important aspects were the ideological nature (0.221), invention of organizational culture (0.209), individual importance (0.208), disciplinary and self motivation (0.190), realization and self-understanding (0.189) and attitude and inspiration on leading the class (0.172).

3. The strategies to strengthen the teachers' academic leadership so as to develop the quality of in ASEAN countries were divided into two groups: (i) collaboration strategies among ASEAN countries and (ii) selective process strategies that depend on

the suitability of each country. Each strategy was comprised of the main and sub-strategies with process guidelines.



3.1 Collaboration strategies among ASEAN countries

The first main strategy was comprised of four sub-strategies as follows.

1) Distribution of the different development strategies for enhancing the teachers' leadership in the Asian region (with 5 process guidelines).

2) Investment in human development that leads towards Asian development (with 4 process guidelines).

3) Development of the teachers' academic leadership on the basis of different religions and cultures (with 3 process guidelines).

4) Increasing the capability of teaching technology for the further development of the teachers' leadership (with 3 process guidelines).

The second main strategy was to develop the teachers' leadership using network technology and was comprised of two sub-strategies as follows.

1) Create a technology network strategy for developing a learning environment (with 2 process guidelines).



2) Create a technology network strategy for effective learning (with 2 process guidelines).

3.2 Development of strategies to strengthen the teachers academic leadership to develop educational quality of the member ASEAN countries. Suitable strategies were selected for each country, with the two main categories being as follows.

The first main strategy was to develop the teacher's leadership in knowledge management and education technology, and this was comprised of two sub-strategies as follows.

1) Determine the direction and strengthen the teacher's leadership for effective learning (with 3 process guidelines).

2) Strengthen well-informed teaching technology for teachers (with 3 process guidelines).

The second main strategy was to create learning communities to increase the education quality, and was comprised of four sub-strategies as follows.

1) Promote organizational culture on team work and set an example for teachers (with 7 process guidelines).

2) Create learning communities through academic societies (with 3 process guidelines).

3) Allocate budget for promoting team work in teachers (with 4 process guidelines).

4) Develop team work using religious activities (with 2 process guidelines).

Discussion

From the study, two interested aspects on the teachers' leadership development were revealed.

1. The strengths and weaknesses analysis of the teachers' leadership in ASEAN showed that all the individual variables on the teachers' leadership are strong but the leadership among individual teachers is weak. The overall image of ASEAN teachers is that each teacher has a high level of knowledge, skill and teacher spirit, but the environment or some other aspects of the different asian cultures leads to weaknesses in their relationships with other co-workers and so teamwork needs to be strengthened. This conforms to the results of previous studies that the quality of education depends on the work process among teachers that lead to organizational culture and exchange working process and so truly develops students in all aspects (Larner 2004; Blase & Blase 2006).

2. The focus group of the experts in strategic assessment revealed interesting aspects on the development strategy or action in ASEAN countries that need to be approved by the respective education leaders in the 10 member countries of ASEAN, and these have to go in the same direction to make the strategies work. The strategy depends for each variable on the difference between the present and the future desirable operating process. This gap should be small so that it can be pushed forward to form a real operating process that can easily be performed. However, this is opposite to the strategy concept that if the gap between the current and the desired operating process is great then it needs to be done first thing. Therefore, to adopt the research results and knowledge in a real and viable operating process, the context needs to



be studied and understood taking into account the basic context of the different religions, society and cultures. Thereafter, the pertinent aspects from the research can be used to solve the problems in an appropriate manner.

Suggestions

The research team had the following suggestions from the research process, which are divided into two parts.

1. Future work on this research

- 1) There should be research into the teachers' leadership in other variables or more specific aspects, using the results of this study to decide which variables should be studied.

- 2) Education research should be incorporated between government to government from each set of countries, since this would reduce problems in accessing the information and also reduce research limitations.

2. Suggestions on how to use the results

- 1) There could be difficulties in using the

result strategies at the same time in all 10 member ASEAN countries. Therefore, bilateral processes or co-operation to bring the countries to a state of readiness is another way that could lead to real development.

- 2) Effective strategies will happen only when they have been implemented systematically. However, this is difficult to operate. Therefore, the strategy should be used in a small section of ASEAN first and subsequently operated (with any required improvements) at a greater level so that the development can be continuous and distinct.

Acknowledgements

This article is part of the result of the research entitled: *“Teachers’ Academic Leadership Reinforcement Strategies for Educational Quality Improvement of the Member Countries in the Association of South East Asian Nations (ASEAN)”*, funded by the research clusters, Ratchadaphiseksomphot Endowment Fund, Chulalongkorn University.

References

- Barrett, A. et al. 2007. **Initiatives to improve the quality of teaching and learning: A review of recent literature**[Online]. Available from: www.ceppe.cl/images/stories/recursos/publicaciones/Enrique%20Hinojosa/Initiatives-to-improve-the-quality-of-teaching-and-learning.pdf[2015, June 8].
- Bass, B. M., and Avolio, B. J. 1994. **Improving organizational effectiveness through transformational leadership**. Thousand Oaks, CA: Sage Publications.
- Blase, J., and Blase, J. 2006. **Teachers bringing out the best in teachers: A guide to peer consultation for administrators and teachers**. Thousand Oaks, CA: Corwin Press.
- Ewen, R. B. 1998. **Personality, a Topical Approach: Theories, Research, Major Controversies, and Emerging Findings**. Mahwah, N. J.: L. Erlbaum Associates.
- George, B. 2003. **Authentic leadership: Rediscovering the secrets to creating lasting value**. San Francisco: Jossey-Bass.
- Killion, J. 2001. **What works in elementary schools: Results-based staff development**. Oxford, OH: National Staff Development Council.
- Larner, M. 2004. **Pathways: Charting a course for professional learning**. Portsmouth, NH: Heinemann.
- Marzano, R., Pickering, D., and Pollock, J. 2001. **Classroom instruction that works**. Alexandria, VA: ASCD.
- Piyapong Sumettikoon 2015. **Teachers’ Academic Leadership Reinforcement Strategies for Educational Quality Improvement of the Member Countries in the Association of South East Asian Nations (ASEAN)**. Chulalongkorn University.
- Riddell, A. 2008. **Factors influencing educational quality and effectiveness in developing countries: A review of research**. Eschborn, Germany: GTZ.
- UNESCO. 2005. **EFA global monitoring report 2005: Education for All, the quality imperative**. Paris: UNESCO.
- UNICEF. 2000. **Defining quality in education**[Online]. Available from: <http://www.unicef.org/education/files/QualityEducation.PDF>[2015, April 4].
- Unite for Quality Education. 2013. **The three pillars of quality education**[Online]. Available from: <http://www.unite4education.org/about/what-is-quality-education/the-three-pillars-of-quality-education/>[2015, April 4].
- Walumbwa, F. O., Avolio, B. J., Gardner, W. L., Wernsing, T. S., and Peterson, S. J. 2008. Authentic Leadership: Development and Validation of a Theory-Based Measure. **Journal of Management** 34 (1): 89-126.

An Approach for Developing the Toolkit for Assessing Disaster Resilience in Thailand

Prof. Pornchai Sithisarankul, MD, MPH, DrPH.¹

Kingkan Jongsukklai²

Montakarn Chimmamee, Ph.D.²

¹ Department of Preventive and Social Medicine,
Faculty of Medicine, Chulalongkorn University

² Social Research Institute, Chulalongkorn University

Introduction

The past decade has seen an increased frequency of major natural disasters that caused critical widespread damage in Thailand and elsewhere in the world. The increasing costs of human and financial resources for relief and post-event restoration present increasingly important challenges for every country in the world.

The World Disaster Report 2014 prepared by the International Federation of the Red Cross and Red Crescent Societies (IFRC, 2014) collates disaster data from all over the world. The report revealed that globally, disasters resulted in 1,059,072 casualties over the 2004–2014 period, of whom 690,118 deaths (or 65%) occurred in Asia. Damage from disasters reached US\$ 1.669 trillion globally, and US\$759.6 billion in Asia. Overall, disasters affected almost 2 billion people around the world, 1.6 billion of whom were in Asia. In all, there were 3,867 incidents

classed as natural disasters, 1,752 of which were flood-related, accounting for almost half of the world's disaster incidents.

As a result of the World Conference on Disaster Risk Reduction 2015 held in Sendai, Japan, the Sendai Framework for Disaster Risk Reduction 2015–2030 was put into effect; the plan will last for 15 years. In summary, the Framework aims to reduce risks from disasters, especially casualties, way of life and health, as well as loss of property. The goal is to prevent new risks and reduce existing risks from economic structure, law, health, culture, education, environment, technology, politics, and institutional measures with integration. This will also narrow the disparity in protective actions and emergency responses, minimize risks and vulnerabilities, and increase response capabilities (Department of Disaster Prevention and Mitigation, 2015).

In the past, in management of natural disasters, most of the time vulnerability was considered largely as a matter of engineering strength. However, the focus has recently shifted to place greater emphasis on social and environmental processes (Cadona et al., 2012). That is to say, vulnerability refers to people or a community suffering poverty and lacking a social support network. Most such communities are unaware of the importance of risk and vulnerability assessment in order to prepare for disasters. This makes them unable to learn to manage disasters from the past incidents as there is no transfer of knowledge and distribution of resources, no planning to prevent the disaster and reduce the risk or impact from potential future events.

Thailand has suffered many critical calamities, most notably from flooding, especially the *“Great Flood of 2011”*, which was Thailand’s most severe in 70 years. The flood affected an area of 150 million rais in Bangkok and 64 provinces around the country, including agricultural, residential and industrial land. The 2011 flood caused 1,026 deaths and impacted

the lives of 16,224,302 people. Total damage was estimated at 1.44 trillion Baht (Department of Disaster Prevention and Mitigation, 2015). The World Bank ranked this flood as the 4th most critical in the world (World Bank, 2012).

The lesson from that flood taught us that Thailand was unprepared for the potential disaster; each affected area had different resilience ability, and there was still a gap in terms of disaster education. Therefore, there is a need to develop a toolkit to assess community resilience that will help enhance community-level awareness of, and interest in, preparation to increase local-level disaster resilience. With this tool, residents can better understand and identify opportunities to take community-level actions to enhance preparedness and plan appropriate response and restoration measures. Such knowledge and understanding will significantly reduce risk, vulnerability, and potential disaster impacts on the community. Last but not least, the toolkit will increase the preparedness and adaptability using their skills, social factors, and available resources to face disaster impact and urgent incidents.



Definition of disaster resilience

Many organizations have defined disaster resilience at many levels, including personal and community/social levels (United Nations Development Programme, 2014). Some examples are as follows:

- Overview level: EU (2012) defined disaster resilience as the ability of individuals, households, communities, countries, or regions to manage, adapt, and restore rapidly from stress and shock.

- Individual level: Master, Best, and Gramezy (1990) defined disaster resilience as the ability to adapt to challenges and threats, while Butler, Morland, and Leskin (2007) defined disaster resilience in terms of adaptability to abnormal or extenuating circumstances such as recovery from an illness and the ability to resume normal work after facing challenges.

- Community/ social level: According to Comfort (1999), disaster resilience is the ability to resist critical natural disasters without external support and without significant damage, loss, or reduction in productivity or quality of life. The Subcommittee on Disaster Reduction (SDR) (2005) referred to disaster resilience as the ability or potential of a community or society to adapt to disaster (resistance or changes) to achieve or maintain the structure or functionality of the community system at an acceptable level; at the level that the community system can manage to increase protection and improve risk reduction measures in the future. The Committee on Increasing National Resilience to Hazards and Disasters (2012) defined disaster resilience as the ability to get prepared and plan to absorb, restore speedily, and adapt to unexpected situations.

In Thailand, such definitions are not widely referred to among Thai scholars. Chuengsatiansup, et al. (2014) studied community resilience and

defined it as the power to restore; the ability of the system of community or society to manage, resist, and survive crises or threats as well as its ability to restore speedily and effectively the community's structure and fundamental functionality.

These definitions of academics and relevant organizations point to overall concurrence that disaster resilience means the ability to adapt to challenges, threats, and abnormal circumstances in a timely manner, and the community's ability to manage risks in order to minimize critical losses through preventive and restorative action, as well as to introduce measures to mitigate future risks.

Developing a toolkit for assessing community resilience: principles and concept

The researchers have reviewed the literature relating to the theory and model for a toolkit to assess disaster resilience, and conducted content analysis to summarize the concept and model to develop the toolkit for use in Thailand. The International Federation of the Red Cross and the Red Crescent Society (2014) stated that the following elements are required in order to achieve security and resilience:

1. Ability and potential to classify and identify strengths and weakness of the community and response according to level of urgency.
2. Ability to effectively use knowledge and experience of the community.
3. Strengths and lowered risk from disaster shall focus on the ability to assess the risks and level of preparedness, especially the effectiveness of the resources to minimize damage.
4. Ability to share experience and good practice; the more the better.

5. Understanding law and relevant policies will reinforce the strengths on the implementation about humanity and support development.

6. Ability to perform community work; the more the performance is improved, the more resilience is improved.

7. Network and allies; the more the better.

8. Working mechanism and technical support that are mutually aligned and supportive will enhance the restoration process.

9. Creating the opportunity to practice to become consistent.

10. Sufficient budget and human resource to support sustainably.

11. Capability to reduce the disaster risk.

12. Pro-active strategy.

13. Strong coordination between local communities and agencies from local and central government.

Community resilience

The review of literature and research from other countries revealed a number of studies on disaster resilience focusing on diverse disciplines, spanning sociology, policy operation, policy determination, engineering, geography, and urban planning. Each discipline carries a nuanced interpretation of disaster resilience. The determination of disaster resilience indicators is also a challenge among researchers and practitioners.

A search of relevant extant data from the global academic literature during the period 2003-2014 was conducted using the following key words: “community resilience”, “disaster-resilient community”, “resiliency indicators”, “resilience index”, “disaster-resilience index”, “flood resilience”, and “resilience capacity”. The results reveal a wide range

of models for assessing disaster resilience, variously using region, nation, city, and community as the unit of analysis.



Among these models, the following were selected that align with the objectives of this study:

1. *Community/Climate Disaster Resilience Index (CDRI)* by Shaw and IEDM Team (2009) which consists of five elements or dimensions of assessment, including physical, social, economic, institutional, and natural, for which survey and secondary data were used.

2. *The Baseline Resilience Indicators for Communities (BRIC)* by Singh-Peterson et al. (2014) which consists of five elements or dimensions of assessment, including economic, institutional, infrastructure, community, and social, for which fundamental and secondary data were used.

Both models are suitable for applying as the framework for developing the toolkit and resilience assessment model in the specific context of community in Thailand for at least two reasons. Firstly, the elements or dimensions of assessment in both models cover and align with the context of the area to be assessed. Secondly, the variables or indicators of both models can facilitate data

collection to satisfy either approach. To be specific, CDRI is an assessment model that directly addresses disasters, while BRIC is an analysis framework that creates indicators from available data, which mainly comprises basic variables. However, although both models have the same five elements or dimensions of assessment, they differ in detail for each assessment dimension.

However, at the first stage, considering the dimensions of disaster resilience and the variables prescribed by the two models, together with the

experience and lessons of disaster management in Thailand, the researchers found that CDRI and BRIC still could not fully cover all variables that should be included in the context of Thailand. To fill this gap, some new variables derived from the literature review of Thai research were introduced and classified by the elements or assessment dimensions that suit the context of Thailand, in order to be able to fully assess and reflect the actual disaster resilience of a community with more realism.

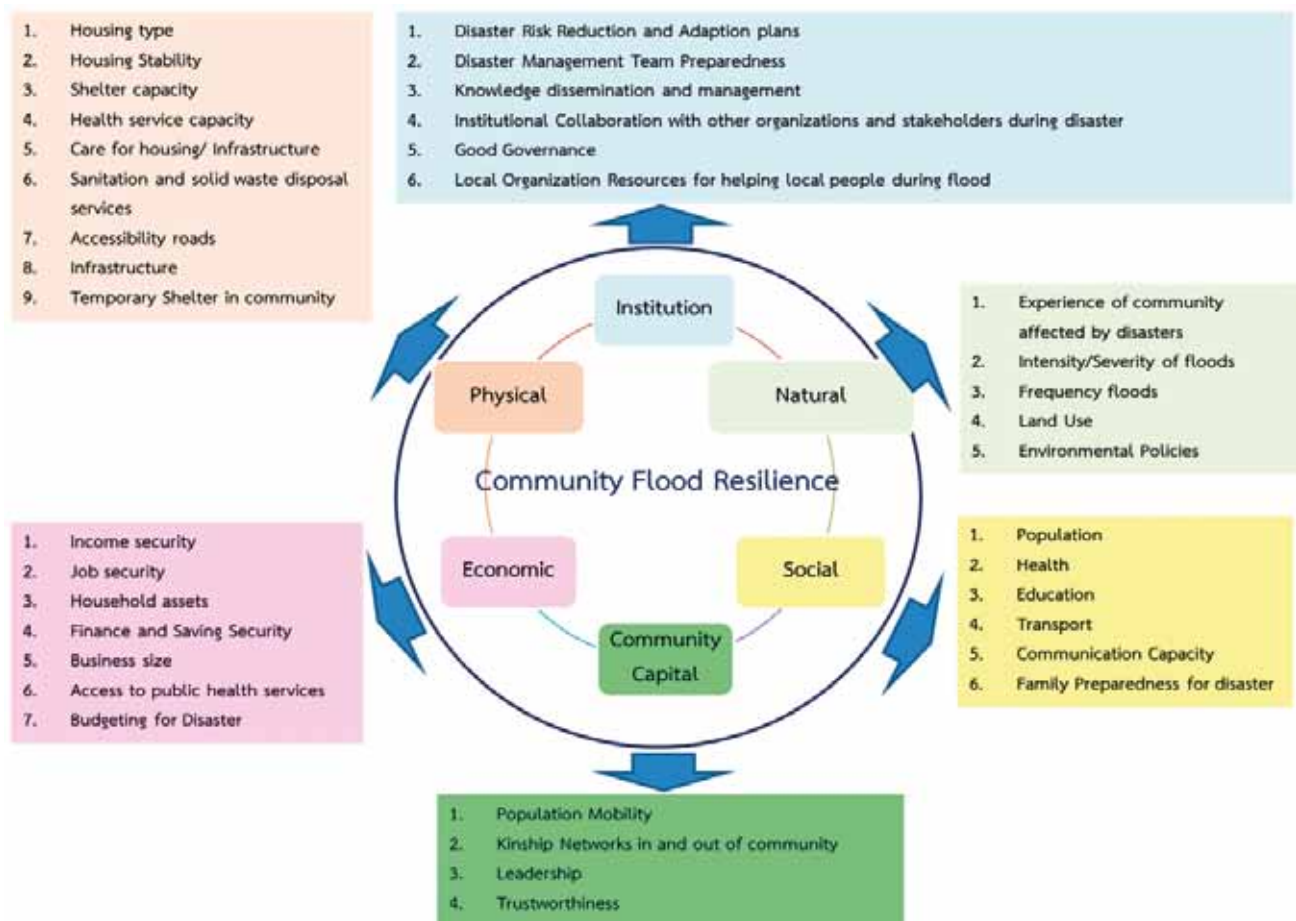


Figure 1 Fundamental element for assessing community resilience

Source: Sithisarankul, Jongsukklai, and Chimamee (2015)

Fundamental elements or dimensions for assessing community resilience in the context of Thailand

An assessment tool or model was designed and entitled as Community Flood Resilience Assessment (CFRA) to apply to the context of Thailand. The CFRA tool comprises assessments in 6 dimensions; natural with 5 indicators, physical with 9 indicators, institutional with 6 indicators, economic with 7 indicators, social with 6 indicators, and community capital with 4 indicators (37 indicators in total) as shown in Figure 1.

Regarding the fundamental elements or dimensions that can be assessed to evaluate community resilience in the context of Thailand, the researchers adopted the following concepts for each dimension:

Dimension 1: Natural refers to the capacity of the community environment such as green zone, risky zone of the city, as well as effective waste management system, which can serve as significant indicators of the community's ability to cope with future disasters.

Dimension 2: Physical refers to management of the community's physical infrastructure (roads, electricity, running water, land utilization, and waste management). Adequate infrastructure in these areas will help reduce the impact of a disaster, at the same time increasing the community's ability to mount a rapid and effective disaster response.

Dimension 3: Institutional refers to the role of institutions in planning and managing resources. These are key to building effective resilience within the community.

Dimension 4: Economic refers to the stability and diversity of the community's economic base- an indicator of the community's overall security during and after disaster events.

Dimension 5: Social refers to basic social and people characteristics that distinguish resilience both inside the community itself and among communities. Some examples include vulnerable citizens (children, senior citizens, the disabled, psychiatric patients, migrant workers). This may also concern the experience of community's management in times of disaster such as education and awareness of environment and disaster, utilization of communication channels to receive news and information about disaster, and preparedness to enhance community resilience.

Dimension 6: Community Capital refers to community disaster management by using "community capital". Even though external support from outside the community is vital to effective disaster management, management using community capital, including the relationships among individuals, neighbors and community members will facilitate problem solving. It also transforms the approach to disaster management and empowers communities by moving from an expectation for help to be provided externally, towards a self-help mentality. There are 4 aspects of community capital to be considered; 1) relationship with the community, 2) affiliation with the area, 3) participation of local residents, and 4) building mutual trust.

Epilogue

Based on a review of the global academic literature on the topic of disaster resilience and resilience assessment models, as well as the experience and lesson of management in times of disaster in Thailand, six fundamental elements or dimensions of resilience assessment in the context of Thailand were synthesized. To align with the principle for developing a resilience assessment toolkit that fits the Thai context, the researchers

applied the principles of Johnstone (Johnstone, 1981, cited in Jangsiripornpakorn, 1998), including 1) expert judgment; 2) measurement of effort required; and 3) collection of empirical data. In this study, confirmatory factor analysis was used to test the Community Resilience Assessment Model (CRA) that the researchers developed; whether the results agree with the empirical data and how the model is suitable for assessing resilience in the context of Thailand.

Acknowledgement

This article is a part of the research project entitled: *“Urban Community Resilience Development in Thailand”*, funded by Ratchadaphiseksomphot Endowment Fund (2013), Chulalongkorn University.

References

- Butler, L. D., Morland, L. A., and Leskin, G. A. 2007. Psychological resilience in the face of terrorism. In B. Bongar, L. Brown, L. Beutler, J. Breckenridge, and P. Zimbardo (Eds.), *Psychology of terrorism*, pp. 400-417. New York, NY: Oxford University Press.
- Cadona, et al. 2012. *Managing The Risks Of Extreme Events And Disasters To Advance Climate Change Adaptation (Special Report of the Intergovernmental Panel on Climate Change)*[Online]. Available from: https://www.ipcc.ch/pdf/special-reports/srex/SREX_Full_Report.pdf[2014, November 20].
- Chuengsatiansup, K., sumonmarn Sangha, S., Netiparatanakul, P., and Suputramongkol, S. 2015. *Community Disaster Tools*. 1st edition. Nontaburi: Suksala.
- Comfort L. K. 1999. *Shared Risk: Complex Systems in Seismic Policy*. Amsterdam and Oxford: Pergamon. 322 pp.
- Committee on Increasing National Resilience to Hazards and Disasters. 2012. *Disaster Resilience: A National Imperative*. Washington, D.C.: THE NATIONAL ACADEMIES PRESS.
- EU, 2012. *The EU approach to resilience - Learning from food security crises*[Online]. Available from: http://ec.europa.eu/echo/files/policies/resilience/com_2012_586_resilience_en.pdf[2014, November 20].
- International Federation of Red Cross and Red Crescent Societies. 2014. *World Disaster Report: Focus on culture and risk*[Online]. Available from: www.ifrc.org/Global/Case%20studies/Disasters/cs-framework-community-en.pdf[2014, October 20].
- Johnstone, J. N., 1981. Indicators of education systems. London: Unesco, cited in Jangsiripornpakorn, A. 1998. *A development of socio-economic status indicators of public secondary school students' families in Bangkok Metropolis*. Doctor of Philosophy, Faculty of Education, Chulalongkorn University.
- Masten, A. S., Best, K. M., and Garnezy, N. 1990. Resilience and development: Contributions from the study of children who overcome adversity. *Development and Psychopathology* 2: 425-444.
- National Committee of Disaster Prevention and Mitigation. 2015. *National Disaster Prevention and Mitigation Plan 2015*. Department of Disaster Prevention and Mitigation, Ministry of Interior, Thailand.
- Shaw, R., and IEDM Team. 2009. *Climate Disaster Resilience: Focus On Coastal Urban Cities In Asia*[Online]. Available from: http://www.unisdr.org/files/12505_CLIMATEDISASTERRESILIENCEEN.pdf[2014, October 10].
- Singh-Peterson, L., Salmon, P., Goode, N., and Gallina, J. 2014. Translation and evaluation of the baseline resilience Indicators for Communities on the sunshine coast, Queensland Australia. *International Journal of Disaster Risk Reduction* 10: 116-126.
- Sithisarakul, P., Jongsukklai, K., and Chimmamee, M. 2015. *“Urban Community Resilience Development in Thailand”*. Chulalongkorn University.
- Subcommittee on Disaster Reduction (SDR). 2005. *Grand Challenges for Disaster Reduction*. Washington, D.C.
- United Nations Development Programme. 2014. *Disaster Resilience Measurements-stocktaking of ongoing efforts in developing systems for measuring resilience*[Online]. Available from: www.preventionweb.net/files/37916_disasterresiliencemeasurementsundpt.pdf[2014, October 10].
- United States Environmental Protection Agency (EPA). 2014. *Planning for Flood Recovery and Long-Term Resilience in Vermont: Smart Growth Approaches for Disaster resilient Community*. Washington, DC: Office of Sustainable Communities, United States Environmental Protection Agency.
- World Bank. 2012. *Thailand Economic Monitor December 2012*. Bangkok: World Bank Office, Bangkok.

The Dependence of People on Media during Natural Disasters

Asst. Prof. Phnom Kleechaya, Ph.D.
Faculty of Communication Arts Public Relations, Chulalongkorn University

Introduction

Over the past ten years, Thailand has experienced severe natural disasters as never before. The tsunami of 2004 caused the loss of 1000s of lives of local people and foreign tourists along the Andaman coast of southern Thailand. A great flood in 2011 severely affected agriculture, industry, urban areas, including Bangkok, and other residential areas. It damaged and destroyed homes and had a serious impact on the economy of Thailand. 3,900,000 households in sixty-one provinces amounting to 19% of the nation's households, were affected by flooding from July to December 2011 (National Bureau of statistics, 2012).

Such natural disasters uncovered problems of media management and the communication of facts to the public concerning preparedness for disasters, including migration and protection of life and property. Confidence in disaster management was affected nationwide as illustrated by a news report that *"The results of vague news causes 7 industrial states to stop production. Overseas manufacturers such as Toyota, Honda and Nikon prevented at least 600,000 people from working."* (Supawan, 2011) Industry and the economy were damaged.

Mass media is a critical factor in the event of natural disasters. Hirschburg, Dillman, and Ball-Rokeach (1986) explained that the occurrence of natural disasters contributes to public ambiguity. People feel confused and uncertain about how the disaster affects the safety of their lives, property and families. In these circumstances, people seek an alternative to normalcy. It is well known that during natural disasters, people rely on news from mass media more than usual in order to judge what is the appropriated action to help themselves, their families, friends and acquaintances for survival and to prevent loss of valuable property.

The purpose of this study is to describe people's information seeking, to assess the type and role of the media and to evaluate the effects of media exposure on individuals. The research refers to the floods in Thailand in order to describe the dependence on the media during natural disasters in general. Understanding the basis for planning of the management of the communication system will help minimize loss of life and property in the event of natural disasters.

Methods

From January to March 2014 a survey distributed a questionnaire to collect data and made a one-shot case study in the provinces that experienced severe flooding in 2011. 200 people from Chiang Mai in the north and Phra Nakhon Si Ayutthaya in the central region, were sampled randomly for a total of 400 people. In Bangkok and the nearby area a specific demographic group in the flood zone and one from a non- flood zone were also randomly sampled with a total of 413 people. So a grand total of 813 people were surveyed. This research applied descriptive statistical analysis consisting of frequencies, percentages, means and standard deviations. Variables included personal status, cognition of flooding, TV channel media exposure to the flood, demand of news content, flood news reporting of many media and their impact on individuals. Inferential statistics by stepwise multiple regression analysis was used to determine whether or not the relationship between the independent variables affected the dependent variables as well as to determine the influence of the independent variables on the dependent variables. The level of statistical significance is 0.05.

Theory and media dependency model

The scope of this study was based on the Media Dependency Model which represents the impacts on the individual of the media. This theory emphasize on the relationship between producer and receiver of information. The producer will control the content and the receiver will use information in learning society and living a daily life which provoke effect of mass media in several dimension of dependency relation. The model emerged in middle of 1970 based on the concept of understanding the effects of media

on individual or group of people that have to understand role of mass media in society. The role of mass media in reporting is significantly important to understand the process of learning reality and behavior of individual that need to receive updated and efficiency information from data collection, arrangement, and news reporting of mass media system. Therefore, mass media system of controlling information resources effect on perception, emotion and behavior of receiver resulting from connection between social system and individual. (Ball-Rokeach and Jung, 2009). Rubin and Windahl (1986) add more to the idea that the “*media dependency*” is based on the connection between 3 main factors as follows; 1) The relationship between society and mass media which resulting in media access and information reporting that individual needs from media. 2) The relationship between mass media and audience that determine how to choose media form that reflected from mass media system in reporting information that suitable to audience or not. 3) The relationship between society and audience that society system are normally set information needs of audience and society has influenced information needs and motivation of media use as in confused situation that can reduce confusion among audience.

Moreover, Ball-Rokeach and Jung (2009) suggested that dependence on media starts from individual to the individual communication connection system and expands to interdependent activities of society and the media. From this, Merskin (1999) has emphasized that mass media dependency come from 5 micro and macro factors as below:

1. Form of media. How independent is the media of politics and the economic and other systems of society.

2. The society situations refers to how individuals and situation are expressed.

3. Quality of mass media report refers to the quality of the media in news reporting.

4. Interpersonal network refers to the communication network affects the expectations and incentives for the use of the mass media.

5. Individual factors refers to the aims and motivation on using or accessing mass media.

Individual access to media during a natural disaster

A natural disaster is an event that occurs unexpectedly and causes damage to both life and property. An analysis of the idea of dependency on mass media takes into consideration that the audience under conditions of natural disasters feels uncertain about the situation and seeks news differently from under normal conditions. Rubin and Windahl (1986) explained that a natural disaster causes ambiguity in the audience, which tries to reduce the ambiguity by seeking information from the media and ultimately relies on news. The reduction of ambiguity depends on what data are reported, that is, the adequacy of the information the audience receives from the media. The primary sources people use are, radio, television and personal communication (Hirschburg, Dillman, and Ball-Rokeach, 1986). Gordon (2009) studied the dependence on the media during the storm disaster of Hurricane Katrina, and found that in addition to television, radio, the internet and interpersonal communication were sources of news. Moreover, Velev, and Zlateva (n.d.) reported that under disaster situations use of online communication with family and friends is an effective resource because it is in real time and is promptly

accessible. The internet is a source immediately after evacuation (Spence, Lachlan, and Griffin, 2007).

Media dependency is based on the amount of influence the media has on the audience. The consequences are on 3 levels: (DeFleur and Ball-Rokeach, 1982) 1) Cognition as a result of the news. The presentation of news will increase either clarity or ambiguity. The attention the audience pays to a particular subject and how much is learned about both the content and the ideas presented by the media. 2) Affection that result from emotions such as desensitization, fear and anxiety, and hate or love. 3) Behavioral refers to the nature of the association with the media, whether it's activation or deactivation.

From the above it can be concluded that audience access to media during natural disasters should eliminate any ambiguity and promote safety. The channels to access media are mass media and the Internet and increased communication with relatives and neighbors. Because the overall nature of the situation is linked to the severity of the natural disaster, the use of the social media, the need for public information and the amount of media exposure are all related to each other during the chaos of the disaster. It is incumbent on the media to reduce frustration within the public and assist in the reduction of damage from natural disasters. These aspects describe the nature of the dependency of the audience on the media in the event of a natural disaster.

Result

The results confirm that several issues explain the dependence on the media in disasters:

1. Cognitive factor The sample group learned that the disaster caused damage to life, property and

the community. The media most used was television. Mobile phones, family, friends, neighbors and Facebook were also broadly used.

2. The demand for news and information about the flood The most require information that samples need are as following;

1) Concerns about returning home to safe drinking water, potential epidemics, electrical hazards, poisonous animals, safe cleanup practices, contamination, and chemical residues.

2) The assistance and disaster relief by government agencies, local authorities and charities to help victims solve the basic problem of flooding had to be addressed.

3) Immediate necessities were food, drinking water, clothing, shelter, medicines and toilets.

In addition, the sample identified the most requirement of media news reporting are as follows;

1) Report which areas were flooded, which areas might be flooded in the near future, how to prepare for flooding, safe evacuation routes, the time predicted when the flood would reach their homes, how long the flood might last at their homes, and emergency nursing and health care.

2) The restoration remedies to be addressed include future flood prevention programs; compensation for injury, deaths and property damage; the revenue lost over the flood time by restoring employment; providing consolation from the loss of life and property; how to go back to normal daily life. Moreover, mass media are the sources for obtaining donations to help the victims of floods. They should publish the amounts and distribution of donations, establish funds designated to help victims, and seek volunteers.

3. Reporting of flood news from mass media. The sampled audience rate them: TV is the most

valuable and most accessible medium during floods. Newspaper, radio, family, friends, mobile and the internet are the accessed frequently. The internet was rated for presenting news, the negative impact data was considered to be only moderately effective. The local media was rated on the moderate level.

4. The impact of floods on individuals. Three levels were considered: Awareness of the flood situation, feeling fear and anxiety, and response to the flood,

1) Cognition; The sampling group considers flood to be the most serious natural disaster that threatens their life and property. The researcher found the sampling group received a high level of correct flood information from the media in order to react to the flood situation safely.

2) Affection; The sampling group had fear and anxiety on a moderate level but fear of loss of life and property on a high level. On a moderate level they worried that they would not be able to sustain life during and after the flood.

3) Behavioral response; The sampling group were alerted on a high level to pack belongings, reserve drinking water and food, and prepare to evacuate. However, some sampling groups were desensitized from listening to the flood news and didn't follow the instructions to ensure their safety from flooding.

Relationship of factors related to media dependency during natural disaster

Stepwise multiple regression analysis was used to determine the relationship between the independent variables such as the ability of the media to provide news about the flood and the severity of the flooding and the effects on the

dependent variable such as the impact of flooding on the individual. The results were analyzed at the confidence level of 0.05. The test results conclude that the opinions about the media role in reporting flooding news ($\beta = 0.333$) and the flood situation ($\beta = 0.269$) had the main impact on the individual. It was concluded and confirmed that the individual relies on the media and the role of the media and various channels offering flood news is important. How each factor affects people can be summarized:

1. The impact on individual's cognition

There are 3 factors of direct variation: 1) The opinion of the role of the mass media in reporting news of flooding ($\beta = 0.238$) 2) The demand for flood news ($\beta = 0.215$) and 3) Flooding situation ($\beta = 0.181$) and inverse variation is the frequency of exposure to various channels and news about flooding ($\beta = -0.095$).

2. The personal feelings of fear and anxiety

There are 3 factors of direct variation: 1) The flood situation ($\beta = 0.243$) 2) The opinion of the role of mass media in reporting flooding news ($\beta = 0.180$) and 3) The frequency of exposure to various channels and news about flooding ($\beta = 0.079$).

3. The impact on the individual's behavior.

There are 3 factors of direct variation: 1) The opinion of the role of mass media in reporting flooding news ($\beta = 0.216$) 2) The Flooding situation ($\beta = 0.088$) and 3) The frequency of exposure to various channels and news about flooding ($\beta = 0.080$).

As summarized above, the individual's dependency on mass media comes from 2 main factors: 1) The situation of the flood and 2) The role of the mass media in reporting flooding news. The dependency on mass media increases once the flood is at a high level and therefore the mass media presents news at a high level. The frequency of exposure of individuals makes awareness of the

dangers slightly lower but it increases anxiety even though individuals are more alert.

Conclusion

The results of the study explains that dependence on the media was at the highest level when the public perceives that the flood was a natural disaster and a serious threat to their lives, property and the community. Individuals seek news about the readiness to return to their homes, about assistance, disaster relief, and access to the necessities of life. Such the information is necessary so that motivated individuals can work toward getting the required information. TV is the highest level of use of mass media because it is most broadly accessible and can respond to the need most readily. Other less effective media are family and friends, mobile phones, and facebook.

Flooding is a severe natural disaster and a threat to life and property. Victims rely on mass media to provide accurate information allowing them to judge what is best for their lives. Although the people are afraid, the anxiety is reduced when they are informed about how to stockpile food and drinking water, and how to evacuate. However some audiences are deactivated and desensitized by the media and do not follow the recommended precautions. (Figure 1)

Suggestion

The researcher found that the results indicated that under floods, people rely on the media for their own safety. They depend on many sources for information such as mass media, individual media and new media. There should be a system to alleviate flooding responding to the seriousness of the flood, the responsibility of mass media and the level of people's interest in media. The content of this research

offer the following suggestions that support the development of information systems and flood mitigation:

1. Content of News The content that people want varies according to the situation:

1) Before and during the flood. News content should focus on two issues:

- Assistance and disaster relief. Relief is provided by both government agencies, especially local authorities, and charity.
- Food, drinking water, medicines and temporary toilets, temporary shelter and clothing are essential.

Before and during the flood situation, media should give more information about the area flooded, the predicted time that the flood will arrive their homes, the level of water in flooded areas, safe routes for evacuation, disease prevention and primary health care. Media should provide information about the donations for victim relief and transparency in handling donations of property and money, the establishment of funds to help victims, and ways to volunteer to help victims because the public wants information about how to help.

2) After the flood when the water level is reduced to normal. News content should focus on

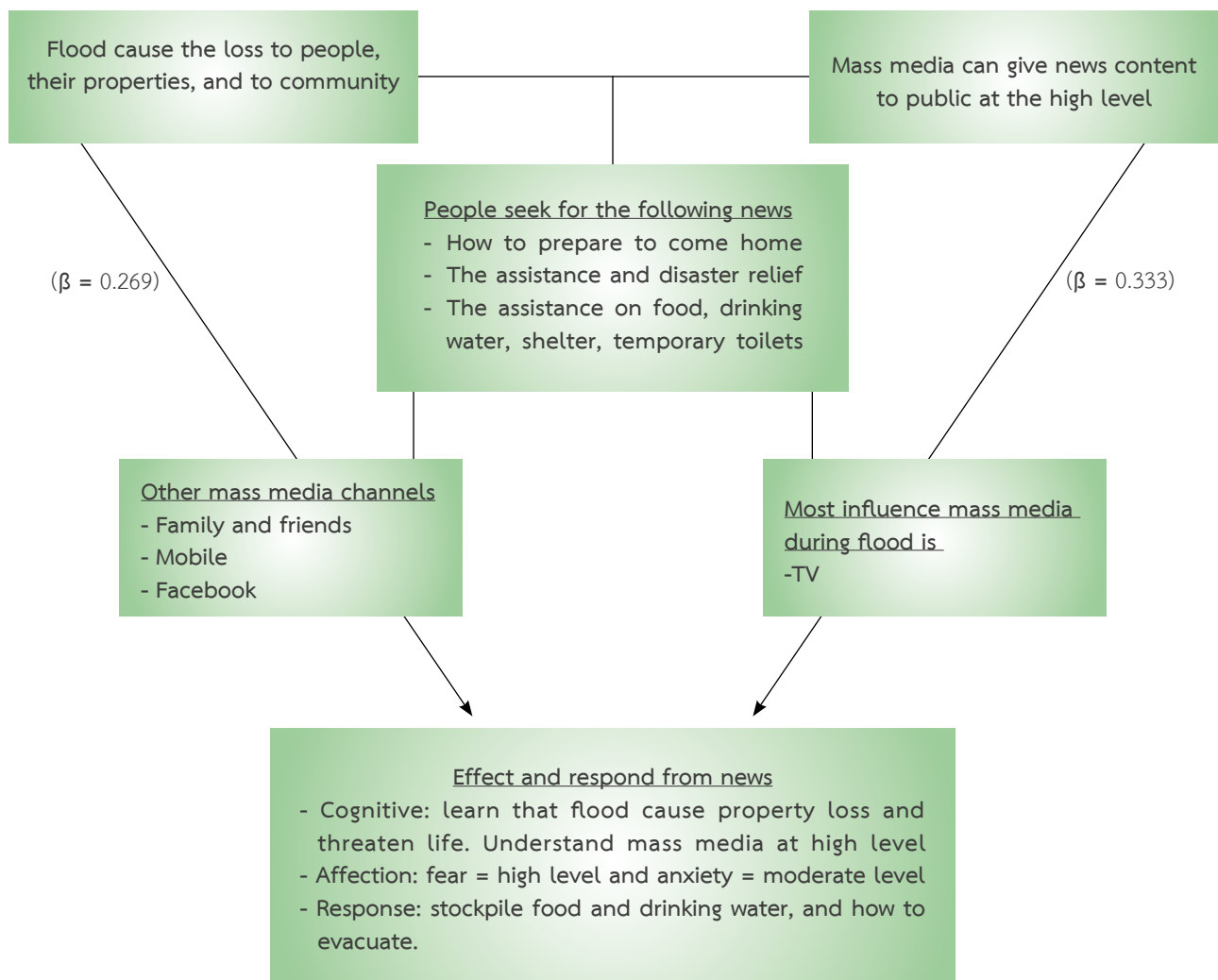


Figure 1 Conclusion of The Dependency of people on the media during Natural Disasters.

Source: Kleechaya (2015)

how to prepare to come home with clarity about the safety of drinking water, prevention of epidemics, electrical hazards, poisonous animals, safe cleaning methods, the danger of contamination, and chemical residues. The mass media should provide information about prevent flooding in the future. The remedy for compensation due to injury, deaths and property damage should also be addressed. Ways to offset the revenue lost and restoration of jobs are important considerations. Consolation from the loss of life and property should be provided.

2. Media and public access channels Priority should be given to the mass media such as television and communication between individuals through the family and friends, mobile phones, and social media such as Facebook.

Also it should be noted that the public is dependent on the performance of the media. TV should be the main source to provide warnings to

help people to be safe from the dangers of flooding. The news reporting should focus on the victim relief from various agencies. Food, drinking water, medicines, temporary toilets, temporary shelter and clothing can best be provided by using a communication network between the individual, the family, friends, relatives and neighbors, mobile phones and social media such as Facebook. The media should urge people to follow the instructions to ensure their safety and also to give solace to help people feel more comfortable.

Acknowledgment

This article is part of the research project entitled: *“Thai People’s Media Dependency during Nature Disaster”* funded by indepth strategy research project, the Ratchadaphiseksomphot Endowment Fund, Chulalongkorn University.

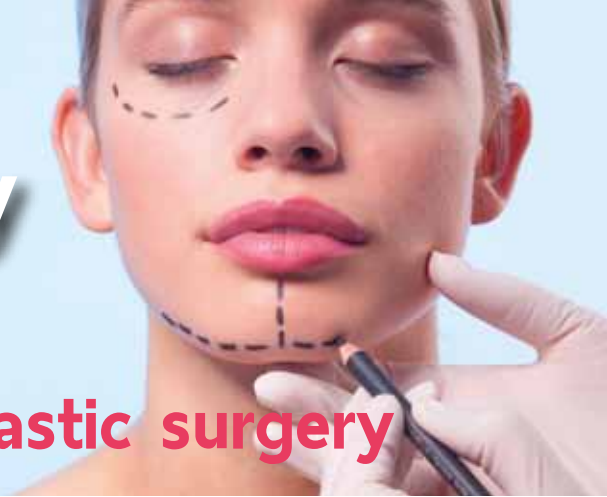
References

- Ball-Rokeach, S. J., and Jung, J.-Y. 2009. The Evolution of Media System Dependency Theory. In R. L. Nadi and M. R. Oliver (eds.), **The SAGE handbook of Media Processes and Effects**, pp. 531-544. Los Angeles: SAGE
- DeFleur, M. L., and Ball-Rokeach, S. 1982. **Theories of mass communication**. 4th ed. New York: David McKay Company.
- Gordon, J. 2009. **Media Dependency Theory and a Tale of Two Hurricanes: Crisis Communication in Southeast Louisiana for Hurricanes Katrina and Gustav**[Online]. Available from: <http://research.allacademic.com>[2013, March 30].
- Hirschburg, P. L., Dillman, D. A., and Ball-Rokeach, S. J. 1986. Media System Dependency Theory: Responses to the Eruption of Mount St. Helens. In S. J. Ball-Rokeach and M. G. Cantor (eds.), **Media Audience, and Social Structure**, pp. 117-126. Beverly Hills: Sage.
- Kleechaya, P. 2017. **Thai People’s Media Dependency during Flood Disaster**. research project in research cluster on climate change and disaster management and has been supported by Ratchadaphiseksomphot Endowment Fund 2013 of Chulalongkorn University.
- Merskin, D. 1999. Media Dependency Theory: Origins and Directions. In D. David and K. Viswanath (eds.), **Mass Media, Social Control, and Social Change: A Macrosocial Perspective**, pp. 77-98. Ames, Iowa: Iowa State University Press.
- National Bureau of statistics. 2012. **Report on Impact of Flood on households, July-December 2011**. Statistical Forecasting Bureau, National Statistical Office.
- Rubin, A. M., and Windahl, S. 1986. The uses and dependency model of mass communication. **Critical Studies in Mass Communication** 3 (2): 184-199.
- Spence, P. R., Lachlan, K. A., and Griffin, D. R. 2007. Crisis Communication, Race, and Natural Disasters. **Journal of Black Studies** 37 (4): 539-554.
- Supawan. 2011. **Bangkok braces for more flooding**[Online]. Available from: <http://www.oknation.net/blog/print.php?id=758604>[2014, March 17].
- Velev, D., and Zlateva, P. n.d. **Use of Social Media in Natural Disaster Management**[Online]. Available from: <http://www.ipedr.com/vol39/009-ICITE2012-B00019.pdf>[2013, March 30].



Health and beauty of Thai adolescents:

obesity, whitening and plastic surgery



Asst. Prof. Khemika Yamarat, Ph.D. et al.
College of Public Health, Chulalongkorn University

Introduction

Adolescents are at a physical, psychological and social transitional stage to becoming adults, and need acceptance from people around them. Beauty is one of the main adolescent pursuits, and its perception affects their physical and mental wellbeing, including their family and the economy and society of the country. Beauty issues that affect the image appearance of adolescents, and are related to self confidence and self esteem, include the body weight. This is especially the case in teenage girls. Body weight is an important factor related to the self satisfaction of one's own shape and effect global self-esteem. A low self confidence effects the social adaptation of the person and leads to social problems (Crocker and Luhtanen, 2003).

Adolescents who are interested in their own bodies and appearance spend most of their time looking after themselves, in terms of how to dress up and buying clothes or beauty products. Interest in these aspects is related to the social and country development, especially in societies where individual beauty is a priority. Media, especially printed materials and the internet and TV (including soap and/or movies) influence the members of the society, including adolescents, to have their body appearance conform to the normal values expected by that society (Dohnt and Tiggermann, 2006). However, there are always concerns about the danger of using beauty products and plastic surgery.

This research aimed to survey Thai adolescents' opinions and experience on health and beauty issues to understand the situation for planning and prevention of problems from health and beauty aspects in Thai adolescents.

Guidelines to study the health and beauty in Thai adolescents

This study involved descriptive research by surveying the target group, male and female teenagers in high schools and universities in Bangkok and provincial regions (central, north, south and northeastern Thailand), by randomly selecting two provinces to represent each part. There were hence eight provinces in total in the survey: Phetchaburi, Suphan Buri, Nan, Chiang Mai, Nong Bua Lam Phu, Sakon Nakhon, Satun and Pattani. Then for each province, two places of education, one each at high school and university level, were selected from the city district of each province to survey and the data was collected using questionnaires. The questionnaire was designed to cover all the aspects related to aesthetics, including skin whitening and plastic surgery, using drugs, products for health and cosmetics, and including taking, applying and injecting chemicals.

Results of health and beauty in Thai adolescents

Aesthetic value in adolescents' viewpoint

From this study, most adolescents (95.5%), both male and female, were concerned about their personality and then their body shape (90.2%), face (88.4%) and complexion (87.9%) (Figure 1).

In their opinion, the face could be improved but their personality skills are also important, not only their appearance.

Body weight and height of Thai adolescents

The adolescent target group surveyed was comprised of 2,859 participants with an age range from 12–25 years old, of which 658 were male teenagers (23%) and 2,201 were female teenagers (77%). For domicile

location, 710 participants (24.8%) lived in Bangkok, the capital of Thailand, and 2,149 participants lived in the provincial regions. Both the average body weight and height (Figures 2 and 3) fall within the standard of the ministry of public health for their age (Department of Health, Ministry of Public Health, 1999). However, each target group believed that they were overweight because from an aesthetic value, being thin is popular. Therefore, overall they were not satisfied with their appearance or body weight. In general, adolescents wanted to decrease their body weight and increase their height. For example, female adolescents (average weight of 51.3 kg) wanted

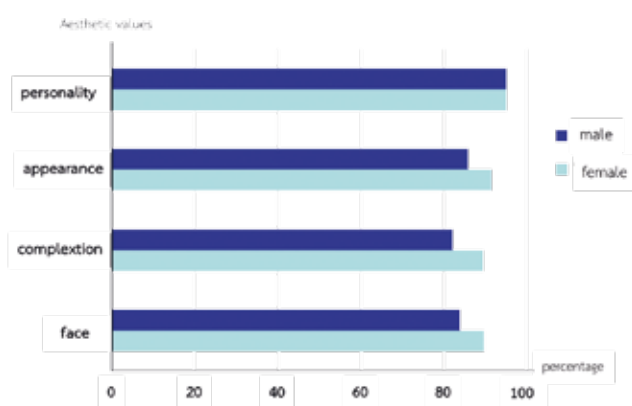


Figure 1 Aesthetic values in male and female adolescents' viewpoint
Source: Yamarat et al. (2015)

to reduce their weight by an average of 4.3 kg (to 47.0 kg) and to increase their height (average of 159.2 cm) by an average of 5.9 cm (to 165.1 cm). The male adolescents likewise wanted to decrease their weight (average of 59.5 kg), but by slightly less at an average of 1.9 kg (to 57.6 kg) and to increase their height (average of 167.5 cm), but by a larger amount at an average of 6.6 cm (to 174.1 cm). More than half of these target groups wanted to reduce their weight by different methods. Female teenagers used a restricted nutritional diet (79.2%) more than exercise (67.1%), whereas male teenagers preferred to do exercise (79.1%) more than a restricted nutritional diet (58.7%). Moreover, the study showed that female teenagers in senior high school and undergrad students tended to use drugs and supplementary food and/or products to help reduce their weight more than junior high school students in both the groups that live in Bangkok and the provincial regions. Although both male and female teenagers used drug and/or supplementary food products (9.4%), a higher proportion of females used such than males (9.4% and 3.2%, respectively).

Adolescent attitudes towards the use of beauty products and plastic surgery for aesthetics

The questionnaire included questions about the adolescents' attitudes towards aesthetics. The results showed that the use of beauty products and plastic surgery for aesthetics was widely accepted, with a score of 4.1/5, while concern for the safety of beauty products and plastic surgery also received a high score of 4.4/5. The notion that if one got the expected results from surgery then it was not wasted received a score of 3.2/5. In contrast, that the use of beauty products and plastic surgery for aesthetics is not fashionable, or is not the right thing to do and is an unnatural appearance, both received a lower score of 2.9/5 each. However, that people who have plastic surgery do not lack in self-confidence per se or do it because they want to be able to socialise with other people both received a score of 2.9/5. Moreover, most of the participants think that using beauty products and plastic surgery for aesthetics is nothing to be ashamed of nor does it have to be kept secret (score of 2.3/5). These attitude scores reflect that the views of these adolescents are against the beliefs of previous Thai society, but in agreement with current Thai adolescents' characteristics in the modern world, with acceptance and adoption of modern technologies and belief in themselves. Therefore, it can be said that Thai adolescents tend to support the use of beauty products and plastic surgery, at least of a high quality and safe service.

Sources of knowledge, beauty products and plastic surgery for aesthetic purposes

When the participants were asked about how they searched for knowledge to help them decide what beauty and health products to buy (Figure 4), they mainly used the internet as an information source (28.9%), followed by advice from friends (17.2%) and television (16.6%). For information on plastic surgery for aesthetics, 25.2% of the participants used the internet as the knowledge source, but only 18.3% pay attention to personal media, such as medical doctors, pharmacologists or specialists, and 16.5% and 12.3% got their information from friends and members of the family, respectively. From the survey, adolescents tended to use the internet as their main source of media, which is a high risk source due to unvetted propaganda (Khemika Yamarat et al. 2015). The government has ordered the

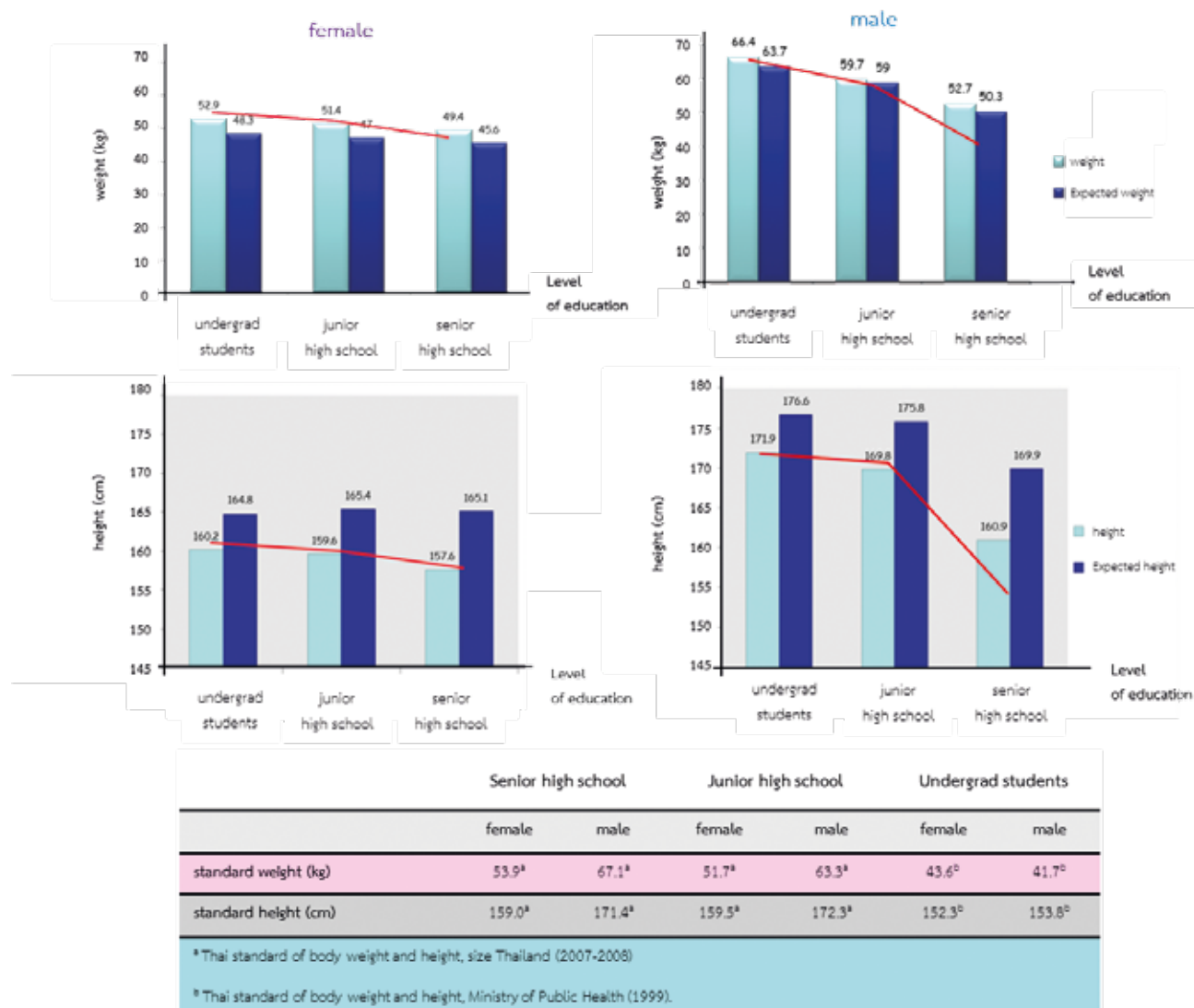


Figure 2 Body weight and height of Thai adolescents at present and what they expected

Source: Yamarat et al. (2015)

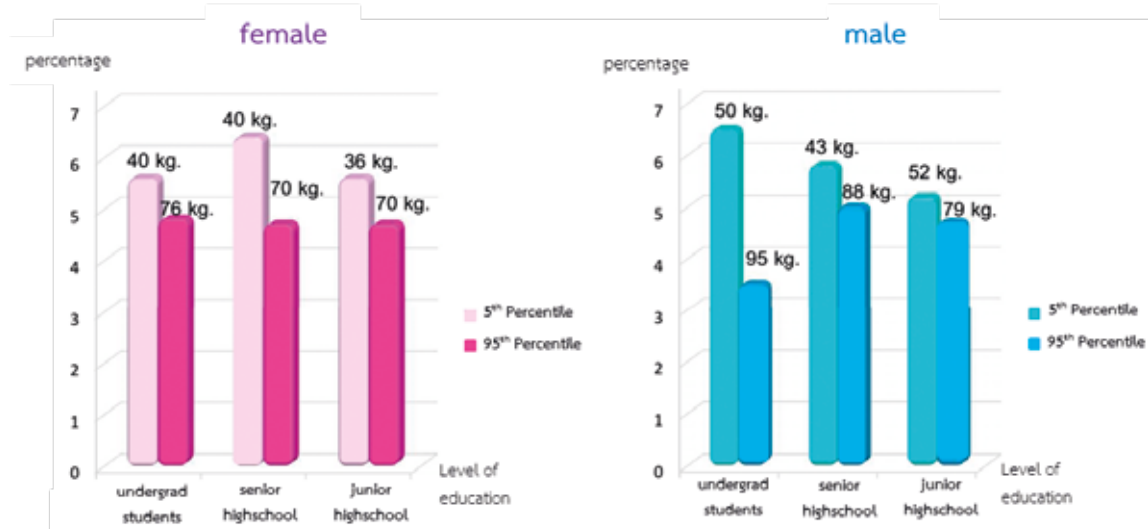


Figure 3 Body weight at 5th percentile and 95th percentile of male and female Thai adolescents

Source: Yamarat et al. (2015)

related government sectors to control these advertisements. Nevertheless, adolescents seek the information from members of their family and medical personel, which are the more trustable sources, to a lower level than other sources. It could be because

internet and television media are easy access sources, convenient, personal and less expensive, while trustable medical personel are difficult to access and, more importantly, come at a high expense.

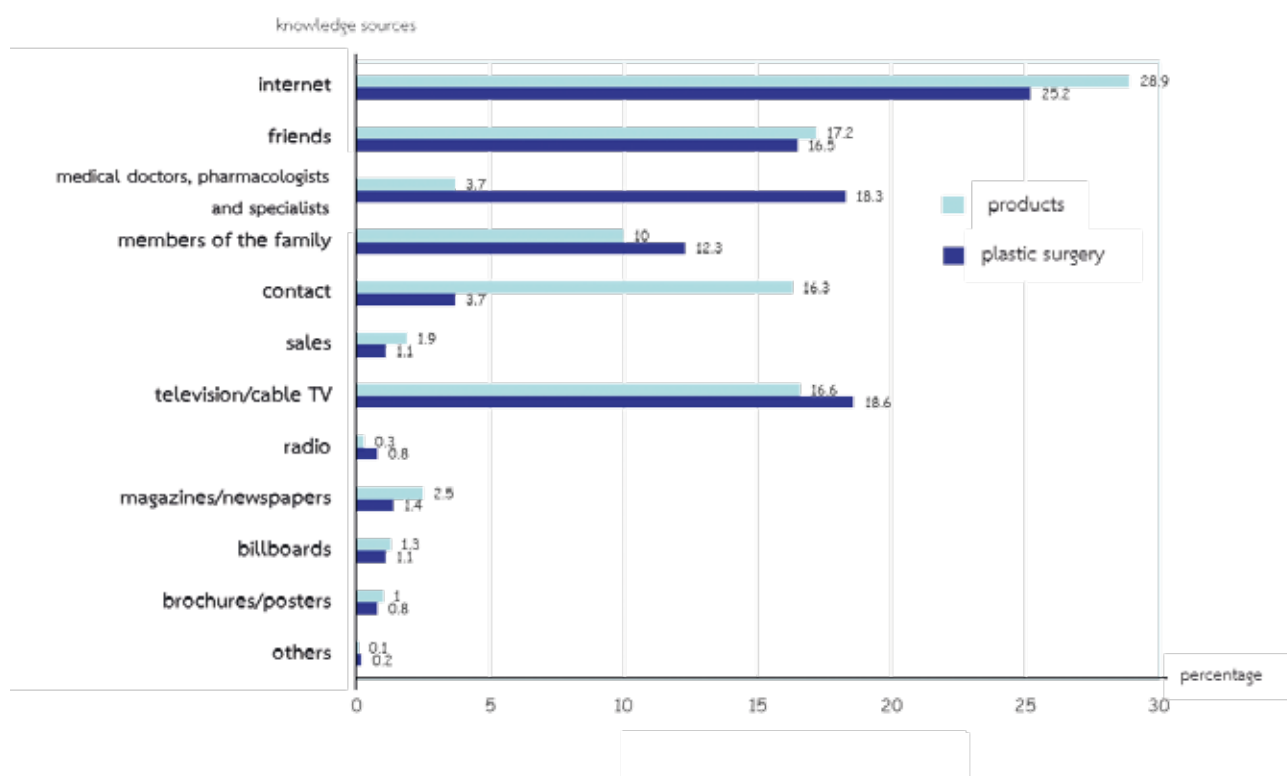


Figure 4 Knowledge sources that influence the participants' decision on buying beauty products and plastic surgery.
Source: Yamarat et al. (2015)

Using health and beauty products, and experience with plastic surgery, for aesthetic purposes

From the survey about the use of health and beauty products for losing weight, skin whitening and aesthetic purposes by taking supplementary drugs, cosmetics, etc., most adolescents (60.1%) used health and beauty products. Of those that do, 71.6% used them for aesthetics, 65% for skin care, 62.1% for wrinkle treatment and 29.8% for skin whitening. With respect to the risk of use of health and beauty products, 3.4% of the adolescents injected beauty products for skin whitening and 7.8% used supplementary foods for losing weight, of which, 14.7% bought weight-loss drugs from the internet, despite the fact that these pills need a prescription from a medical doctor. Also, from the study, 4.7% of the participants used health and beauty products that contain illegal chemicals, such as steroids, sibutramine or mercury and 5.6% of them bought these products from illegal sources.

The adolescents' experiences on plastic surgery for aesthetics, which include surgery, injection and other operatives for aesthetics like laser, heat and radio wave treatment, botox and filler injection and fine thread lifting, are summarized in Figure 5. From the survey,

most of the adolescents (96.3%) have never had surgery. Only 3.7% of the participants have used plastic surgery for aesthetic purposes, which were classified as follows: rhinoplasty (41.0%), hair removal or wrinkle treatment by laser treatment (23.8%), eyelid surgery (13.3%), botox (13.3%), liposuction (8.6%), breast augmentation (7.6%), facial structure adjustment (6.7%) and chin augmentation (5.7%). Moreover, the participants did other aesthetic activities, such as dermabrasion, thin lips surgery,

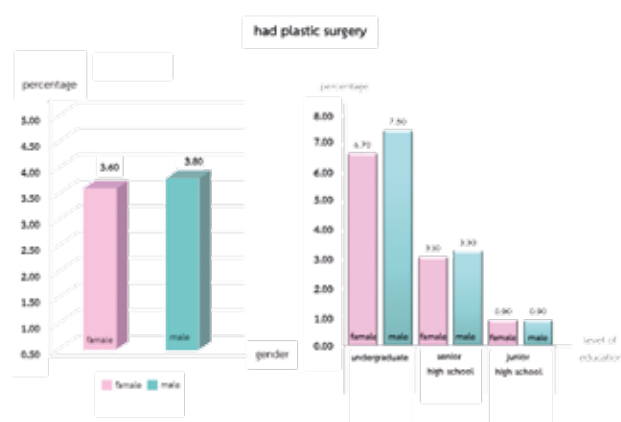


Figure 5 Percentage of adolescents who had plastic surgery for aesthetics, classified according to sex and educational level
Source: Yamarat et al. (2015)

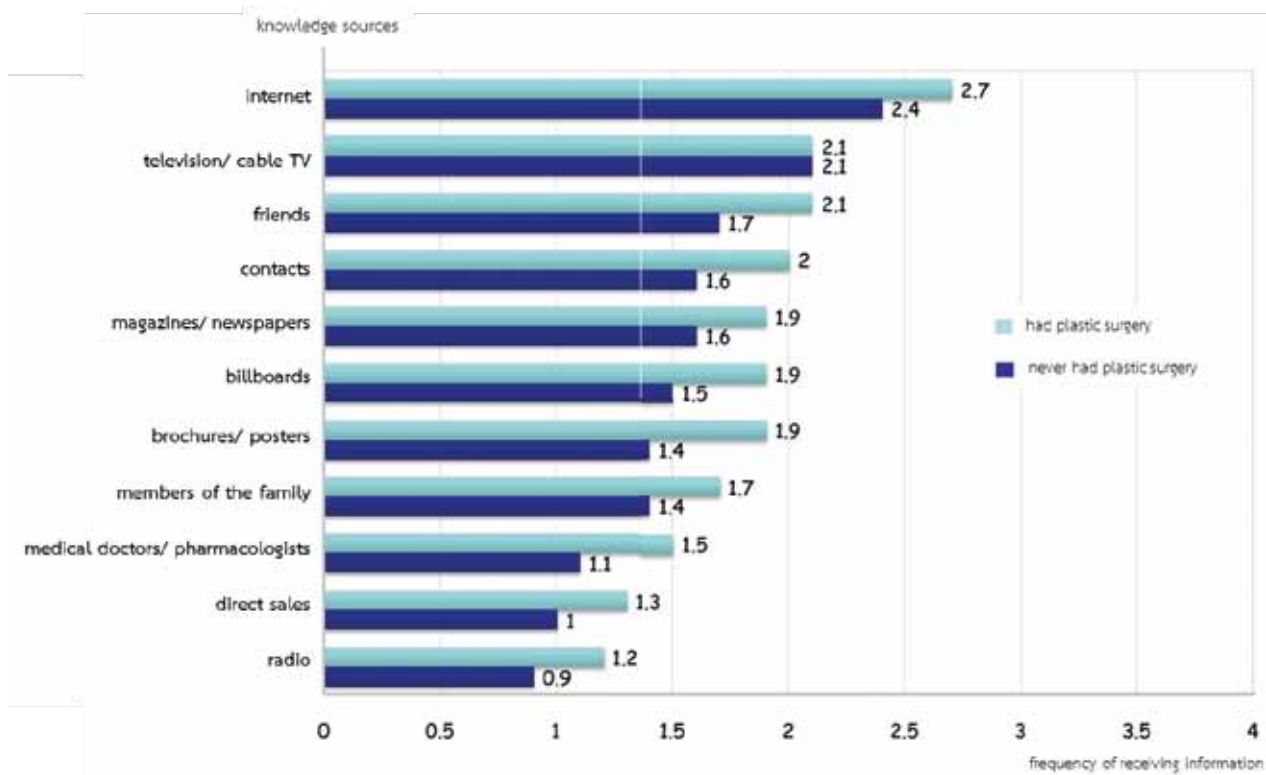


Figure 6 Average score of information sources adolescents received about plastic surgery for aesthetics in the past six months. (0 = never and 4 = everyday)

Source: Yamarat et al. (2015)

reduction of large earlobes, fine thread lifting and so on. Female adolescents in university and senior high school level have undergone rhinoplasty and laser treatment for wrinkle and hair removal at a greater proportion than the other groups. For female adolescents at university level, 46.9% have had plastic surgery, of which 24.5% had rhinoplasty and 24.5% had laser treatment for wrinkle and hair removal. For the female participants in the senior high school level the proportions were broadly similar with 52.0% having had rhinoplasty and 24% having used laser treatment for wrinkle and hair removal.

The most interesting issue is that nearly a quarter of this group of participants had rhinoplasty without telling their parents (24.3%). However, most of them (66.3%) still consulted medical doctors or specialists, and also checked that the medical doctors and medical service places were reliable (70.5%).

Problems from using health and beauty products and plastic surgery for aesthetic purposes

With respect to using health and beauty products, such as lotions, skincare, skin whitening and weight-loss

drugs, in the adolescents, more than half (55.7%) had no problems with their treatment. Most of the problems reported were an allergic rash and irritated skin (27.8%), blackened skin (16.2%), dermatitis, red and swollen skin, dry skin and acne (8.5%) and stretch marks (4.3%).

With respect to the use of plastic surgery for aesthetic purposes, more than 68.6% of the participants had no problems. The participants who reported problems can be grouped according to the type of operation, such as in cases that injected chemicals for skin whitening, botox, filler and so on. The problems found included being allergic to the chemicals (4.8%), mistakes during the injection (3.8%), such as belary-eyed, swollen or bruised, or other complications from injection (6.7%), the need for re-injection to improve the first one (4.8%) or to maintain the shape (10.5%). Problems with plastic surgery, fine thread lifting, laser, eyelid surgery, rhinoplasty, chin and breast augmentation were more or less the same, and include reinjection to adjust or maintain the designed shape, and complications from injections, such as shock, passout and infection at the lesions. Interestingly, 105 adolescents (80 females, 25 males) who had plastic surgery, had it done by someone

without a medical license or permit (22.9%), and this was not significantly different between males and females (41.7% and 58.3%, respectively). There were 11 females and males without a license who had performed skin whitening, botox and filler injections (21%). Thus, adolescents who received information from government sectors, such as the Food and Drug Administration Thailand, still had a risk from using health and beauty products (bought weight-loss drugs without a prescription, or bought the products from illegal places), and also had a risk in undergoing plastic surgery for aesthetic purposes (injection of chemicals or surgery performed by persons without a license). This is not different from those adolescents who had not received any information (Figure 6). Figure 5 shows the average score of knowledge sources adolescents received about plastic surgery for aesthetic purposes in the past six months. This clearly points out that the information about health and beauty from the government sectors does not reach the adolescents.

Conclusion

This study surveyed the current situation of problems about health and beauty. The survey included the attitudes and information sources about health and beauty in adolescents, including their experience problems to integrate this knowledge for awareness and prevent health and beauty problems in the adolescents. The results are in agreement with other studies, both in Thailand (Poijlertaroon, 2003) and abroad (Hawkins et al., 2004) that adolescents without obesity problems use weight-loss drugs for aesthetic purposes more than health purposes because they are not satisfied with their appearance. This was influenced by “ideal” images of

beauty in the media that preferred skinny, thin and flared skin. Accordingly, some adolescents are not satisfied with their appearances and this can lead to a health risk.

From the survey of the adolescents’ attitudes, adolescents were seemingly aware of safety in health and beauty and agreed on the expertise of the medical personnel. They also believed that these products could cause negative effects to their body, such as stretch marks and dark facial skin. If the adolescents paid high attention to these three aspects it would be more likely that they would be safe in using health and beauty products. However, some of the adolescents still used health and beauty products in the wrong way, leading to problems. Therefore, they should know how to look after themselves and become more selective and immune to the media influences on body satisfaction and self esteem.

The purpose of this research was to adjust the strategy about health and beauty in adolescents by developing roles from “protection” to “protectors”, whereby the adolescents look after each other systematically. By using the internet and television media as tools to develop their capacity to understand and critically judge the media, they can know about health and consumer protection policies, and so they can protect themselves.

Acknowledgements

This article is part of the result of the research entitled: “*Health and Beauty of Thai adolescents: Current Situation and Proactive Strategies*” funded by research clusters: social development, Chulalongkorn University.

References

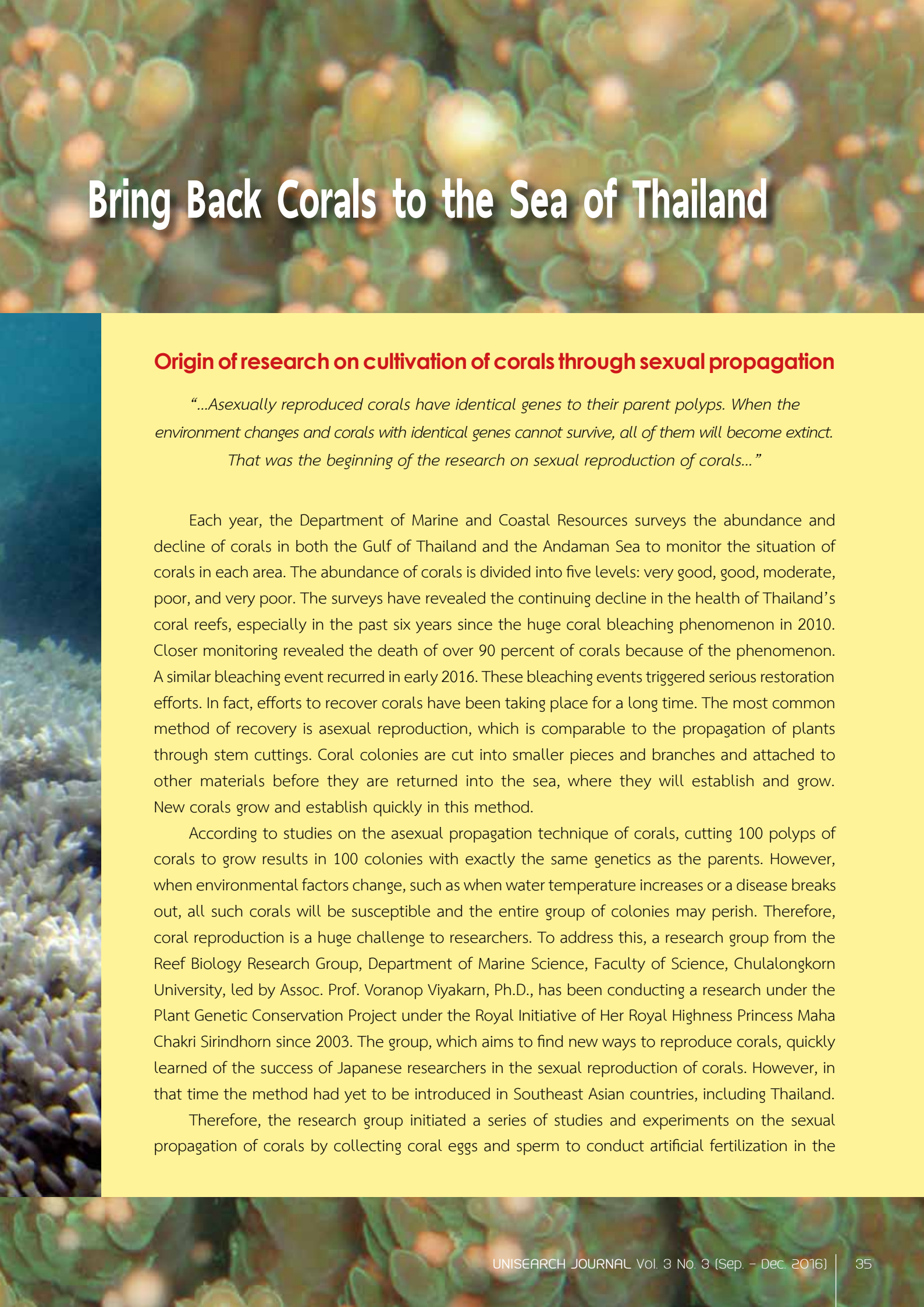
- Crocker, J., and Luhtanen, R. K. 2003. Level of Self-Esteem and Contingencies of Self-Worth: Unique Effects on Academic, Social, and Financial Problems in College Students. *Personality and Social Psychology Bulletin* 29 (6): 701-712.
- Department of Health, Ministry of Public Health. 1999. **Standard weight, height and indicator of nutritional status reference for Thai**[Online]. Available from: <http://nutrition.anamai.moph.go.th/temp/main/view.php?group=5&id=448>[2014, April 22].
- Dohnt, H., and Tiggemann, M. 2006. The Contribution of Peer and Media Influences to the Development of Body Satisfaction and Self-Esteem in Young Girls: A Prospective Study. *Developmental Psychology* 42 (5): 929-936.
- Food and Drug Administration Thailand, Ministry of Public Health. 2014. **FDA warn skin problems caused by a skin whitening product**[Online]. Available from: [http://khaosod.co.th/view_newsonline.php?newsid=TVRNNE9EazNOREUyTVE9PQ==&subcatid=\[2014, October 13\].](http://khaosod.co.th/view_newsonline.php?newsid=TVRNNE9EazNOREUyTVE9PQ==&subcatid=[2014, October 13].)
- Hawkins, N., Richards, P. S., Granley, H. M., and Stein, D. M. 2004. The Image of exposure to the thin-ideal media image on woman. *Journal of Eating Disorders* 12: 35-50.
- Pojlertaroon, A. 2003. **Behavior and reasons behind anti-obesity drug usage among non-obese female adolescents in Bangkok**. Master’s Thesis, Department of Social and Administrative Pharmacy, Faculty of Pharmaceutical Sciences, Chulalongkorn University.
- Yamarat, K. et al. 2015. **Project Report on Beauty Health of Thai Adolescents: Current Situation and Proactive Strategies**. Financial Support from Social Development Cluster, Chulalongkorn University.

Assoc. Prof. Suchana Chavanich, Ph.D. Restoration of Corals through Sexual Propagation...

Assoc. Prof. Suchana Chavanich, Ph.D., a scientist specializing in reef biology, shares her knowledge and experience from the extensive research aimed at restoring coral reefs through sexual reproduction.



The situation of the corals in the seas of Thailand is nothing less than a crisis, with the corals in steep decline. Natural events, such as storms, monsoons, or even tsunamis, together with human activities, such as anchoring near reefs, inshore fisheries, and irresponsible tourism, are the primary causes of this decline. Marine tourism has become very popular with the continuous increase of the number of tourists each year. However, tourists frequently damage the corals by intentionally breaking them or unintentionally kicking them while snorkeling or scuba diving. These activities worsen the situation of corals in Thailand day by day.

The background of the page is a vibrant underwater scene featuring various types of coral reefs. The corals are in shades of green, orange, and brown, with some showing signs of bleaching. A large, semi-transparent yellow rectangular box is positioned in the center of the page, containing the main title and several paragraphs of text. The title 'Bring Back Corals to the Sea of Thailand' is written in a large, bold, white font at the top of this box. Below the title, there is a sub-header in red, followed by a quote in italics, and then three paragraphs of text in a standard black font. The bottom of the page features a dark blue horizontal bar with white text for the journal information and page number.

Bring Back Corals to the Sea of Thailand

Origin of research on cultivation of corals through sexual propagation

“...Asexually reproduced corals have identical genes to their parent polyps. When the environment changes and corals with identical genes cannot survive, all of them will become extinct. That was the beginning of the research on sexual reproduction of corals...”

Each year, the Department of Marine and Coastal Resources surveys the abundance and decline of corals in both the Gulf of Thailand and the Andaman Sea to monitor the situation of corals in each area. The abundance of corals is divided into five levels: very good, good, moderate, poor, and very poor. The surveys have revealed the continuing decline in the health of Thailand’s coral reefs, especially in the past six years since the huge coral bleaching phenomenon in 2010. Closer monitoring revealed the death of over 90 percent of corals because of the phenomenon. A similar bleaching event recurred in early 2016. These bleaching events triggered serious restoration efforts. In fact, efforts to recover corals have been taking place for a long time. The most common method of recovery is asexual reproduction, which is comparable to the propagation of plants through stem cuttings. Coral colonies are cut into smaller pieces and branches and attached to other materials before they are returned into the sea, where they will establish and grow. New corals grow and establish quickly in this method.

According to studies on the asexual propagation technique of corals, cutting 100 polyps of corals to grow results in 100 colonies with exactly the same genetics as the parents. However, when environmental factors change, such as when water temperature increases or a disease breaks out, all such corals will be susceptible and the entire group of colonies may perish. Therefore, coral reproduction is a huge challenge to researchers. To address this, a research group from the Reef Biology Research Group, Department of Marine Science, Faculty of Science, Chulalongkorn University, led by Assoc. Prof. Voranop Viyakarn, Ph.D., has been conducting a research under the Plant Genetic Conservation Project under the Royal Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn since 2003. The group, which aims to find new ways to reproduce corals, quickly learned of the success of Japanese researchers in the sexual reproduction of corals. However, in that time the method had yet to be introduced in Southeast Asian countries, including Thailand.

Therefore, the research group initiated a series of studies and experiments on the sexual propagation of corals by collecting coral eggs and sperm to conduct artificial fertilization in the

nursery. At the beginning, the studies were conducted together with Japanese researchers. Subsequently, the parameters were varied to suit the environment and other specific factors in Thailand. One of the differences is that corals in Japan usually produce eggs and sperms during the

full moon. After the eggs and sperms are collected, they require only one month in the nursery before they are released into the natural sea. In contrast, the egg and sperm production season of Thai coral populations is unpredictable, making collection more challenging. Moreover, the early experiments resulted in the zero survival of the juvenile corals released into the natural sea after being in the nursery for one month, as practiced in Japan. The researchers later discovered that environmental differences were responsible for the phenomenon. In Japan, the only environmental threat to corals are algae. In Thailand, algae are not a problem. However, Thai corals are threatened by mollusks, sponges, and fouling organisms. When young corals are released into the sea, these creatures attach to

them, making coral growth impossible. With continuous research effort, the researchers found that they need to keep the corals in the nursery for at least two years before release. Researchers needed to find a way to improve the nursery technique, which is not required in Japanese conditions.

Sexual reproduction of corals

*“...Sexually reproduced corals have more genetic diversity.
They are stronger and have more chance to survive...”*

Humans can facilitate the sexual propagation of corals in two ways: direct and indirect sexual reproductions. The indirect method involves the simple drowning of used tires, cement blocks, tires or bricks into the sea and waiting for coral larvae to settle on substrates naturally. Coral survival rate of this method depends on the environment and prevailing currents. Scientists found that the survival rate of this method is only 0.001%. Direct reproduction is accomplished by collecting eggs and sperms for artificial fertilization in a hatchery. The larvae are then kept in the hatchery for a certain period before being planted in the sea. The survival rate of the juvenile corals may be 50% higher than that of naturally reproduced corals.

Studies showed that corals in different locations release eggs at different times. Mostly, corals release their eggs and sperms once a year, usually at night. The corals at Samae San Island usually release eggs from January to March. The release of eggs from different branches occurs at different

times, one after the other, gradually. For example, one branches may release its eggs one night and another the following night. This characteristic contributes to the laborious egg collection process. The researchers need to dive into the water from 6.00–10.00 p.m. every night from January to March to collect sufficient eggs for use in the nursery. The fertilized eggs float in water for one week. Subsequently, the researchers need to place tiles in the water for the larvae to settle. The juvenile corals are kept in the hatchery for at least two years before being released into the open water.

Corals have a chemical cue. A colony sends a chemical signal to other colonies when it releases eggs and sperm, stimulating them to follow suit. By nature, a colony releases both eggs and sperms simultaneously, which will not fertilize from the same parents. Therefore, if a colony releases eggs and sperms without signaling others to do so, little or no fertilization occurs, and the released eggs eventually die. The periodical release of eggs and sperm may be caused by the weak chemical signaling within the colony, which could be caused by environmental factors. The research team is currently exploring these factors.

Although sexually reproduced corals grow more slowly compared to those that are asexually reproduced, the former are stronger because they have more genetic diversity. As a result, the colonies are more stable and resilient to environmental changes.

However, the technique of sexual propagation of corals requires expertise in coral reef biology, special care, and higher costs compared to asexual reproduction methods. The average cost of the sexual propagation method of corals per colony is 3,000 baht compared to the asexual counterpart of only 30 baht.

Bring corals to their natural habitat

“...now we can do mass production of coral larvae and these juvenile corals can become parents in the future. It is the complete cycle of sexual propagation of corals...”

This first successful research on the sexual propagation of corals in Thailand was conducted under the Plant Genetic Conservation Project under the Royal Initiative of Her Royal Highness Princess Maha Chakri Sirindhorn in collaboration with the Naval Special Warfare Command, the Royal Thai Navy, and the Reef Biology Research Group from Department of Marine Science, Faculty of Science, Chulalongkorn University. The research group can now produce 3,000–4,000 coral tiles, each of which hosts 3–5 corals, making it possible to return about 10,000–20,000 corals to their natural habitat annually to restore Thailand’s reefs. Currently, corals are being reproduced using the sexual propagation method in the sea of



Samae San Island, Chon Buri Province and Royal Navy Base of Thap Lamu, Phang-nga Province. In addition, knowledge has been transferred to the Department of Marine and Coastal Resources for application in other areas, such as in Rayong Province.

However, returning the juvenile corals to their original habitats from where the eggs were collected is important. If they are released in areas not native to the species, unpredictable changes may occur to the ecosystem. For instance, if non-native corals, which may be more

competitive, are released into the home of native corals, the latter may die out because of the higher competition.

Having conducted a detailed research and repeated experiments on coral reproduction in the nursery, the researchers are confident that corals grown in the hatchery for two years are mature and can produce eggs and sperms after growing naturally in the sea for another three years. With this, Thailand has become the first successful country in Southeast Asia in full cycle mass propagation of corals, while other countries, such as the Philippines, Indonesia, and Malaysia, have only succeeded on an experimental basis or small production volumes.



Future research goal

“...to develop juvenile corals to be stronger and more resistant to diseases, global warming, and the constantly changing environment...”

By monitoring the coral bleaching situation, researchers found that the sexually reproduced corals released into the sea of Samae San Island survived bleaching and matured to become parents themselves. The next research goal is to develop stronger juvenile corals that can resist diseases, global warming, and the constantly changing marine environment. Researchers are now trying to assess the environmental resistance of sexual reproduced corals and determine ways to improve their strength and survival. They are also experimenting on ways to stimulate coral growth. Juvenile corals reach a size of only 2 cm after 2 years in the nursery pool. The team aims to grow them to as large as 4 cm over the same period. Normally, corals receive 80% of their energy and nutrition from photosynthetic algae inside their own bodies, while the other 20% is obtained by capturing food using their tentacles. To enhance the nutrition of these juvenile corals, researchers conducted an experiment that introduced the brine shrimps into the hatchery. This resulted in more colorful and beautiful corals that were able to harvest more energy and grew faster. The second goal is to develop hybrid corals in the future.

Knowledge transfer and collaboration with other countries

“...There have been international collaborations to restore coral reefs in Western Asia Pacific Region and to neighboring countries coming to learn onsite...”

Scientists predicted that 90% of corals worldwide will be at risk in 50 years. If measures are not implemented to conserve corals today, our future generations might not have a chance to see coral reefs. Although coral reefs can restore themselves, the process is long. In addition, from the way coral reefs are being exploited today, recovery might take 10–20 years.

In more developed countries where regulations are strictly enforced, recovering corals may not be necessary because they might not be significantly affected. However, despite revised regulations in Thailand, the lack of discipline and enforcement results in severe reef damage. As a result, reef restoration is a serious and continuing concern. That said, fully recovering these fragile ecosystems is practically impossible. However, recovery of corals will hasten reef restoration from a natural 20 years to 7–8 years with human intervention.

Today, the research group is working together with colleagues in Japan and Taiwan to study and develop many promising techniques, such as freezing of sperms and eggs similar to the conservation of stem cells for use in the next 20 years. Taiwan is already leading the way in this endeavor. In addition, other collaborations aim to stimulate coral restoration across the region’s tropical seas by sharing knowledge, case studies, and trends in coral restoration research in the Western Pacific region, China, Korea, Japan, and ASEAN countries under the marine biodiversity project of UNESCO-IOC/ WESTPAC. These activities are conducted through meetings, seminars, and demonstrations of coral sexual propagation technique to neighboring countries facing similar problems as Thailand, such as the Philippines, Malaysia, and India. The team is also trying to educate and foster awareness of marine resource conservation among students, young people, and other organizations from private and public sectors, with the aim of preserving Thailand’s rich marine environment and resources for the future.

Assoc. Prof. Suchana Chavanich, Ph.D.

With a Ph.D. in zoology from the University of New Hampshire, USA, she is the first female researcher to conduct a research in Antarctica, and is a member of the first successful research team in the sexual propagation of corals in Thailand. She is an inspiring figure for Thailand’s youth and the general public in environmental conservation and marine biology research.

Assoc. Prof. Suchana, Ph.D., is now a Deputy Managing Director of Chula Unisearch and a lecturer at the Department of Marine Science, Faculty of Science, Chulalongkorn University.





"Around us"
Assoc. Prof. Thavivongse Sriburi, Ph.D.

Quality of Education

regolas10.blogspot.com



It is undisputable that education is an essential foundation for national development. Sadly, we have all seen recent news reports pointing to the declining quality of education in Thailand, which has now even been overtaken by neighboring countries. This situation has triggered the country to revisit the subject of education reform and to analyze possible causes and solutions at all levels, particularly policy.

Every child needs *"basic education"* to equip them with the knowledge and critical faculties to navigate their lives productively, make good choices and contribute to society. In 1972 UNESCO defined the term as meaning *"...education for everyone regardless of gender and age so that they have access to general knowledge useful for life. Basic education should foster the eagerness to study, to learn, and to develop the abilities to learn, ask questions, observe, analyze, and be aware that one is part of the community and responsible for oneself and others."*

Before the UNESCO definition was coined, in 1970 the United States defined basic education as *"...teaching students to know how to communicate, calculate, and socialize so that they are literate, know how to research further knowledge, experience the world of working, social welfare, able to work with employers, know proper consumption, and health development."*

It is clear that this definition focuses on preparing children for a meaningful contribution and quality of life in adulthood, rather than merely focus on delivery of knowledge and basic literacy/numeracy at school. Therefore, it is important to agree on the definition of basic education as the basis for education reform in Thailand.

for Thai Children

It is generally acknowledged that Thailand's education system is in crisis, particularly at primary and secondary levels. In spite of the much-heralded victories of Thai students in high-profile international contests, it is obvious that quality of education is poor, particularly in rural schools. A bright future for Thai children is determined by two key factors: their passion and support from parents and school teachers. Other relevant factors may include family income, knowledge and attentiveness of teachers, and availability of learning materials. It is therefore necessary to analyze the potential causes of differences in quality of education.

Tracing the history of education in Thailand, many attempts have been made to introduce a range of systems, ranging from homeschooling by parents to the temple schooling system. Many of these attempts succeeded in stimulating children to learn. Especially under temple schooling, children learn about personal morals, civic duties and responsibilities, as well as traditional topics and skills such as self-defense. The key role in temple schooling lies with the masters or the monks, who have full discretion over the curriculum. Later, when education in Thailand became more systematized, students had to attend the class according to a rigidly defined curriculum. In theory, this should be effective if children were taught the appropriate subjects at the appropriate age, using proven teaching methods. In reality, the trouble lies with the quality of teachers.

In the past, teaching was regarded as an important profession, revered by students and parents alike. Teachers were respected figures within every community for many students, becoming a teacher was a noble aspiration. However, over time, attitudes began to change. The passion to become a teacher has dropped dramatically due to low salaries or status. More importantly, teachers in rural areas face major obstacles that affected the quality of teaching, including the lack of teaching equipment, and the need to meet onerous or even impossible requirements made by central government agencies. The centralized education policy could not adequately satisfy the needs and challenges of children in rural schools. Taken alongside the government's unrealistic expectations that teachers must teach their students subjects with which they were unfamiliar, it was inevitable that motivation levels fell amongst both teachers and students.

The fact that teachers are forced to relocate to teach somewhere else far away from their home is also a major problem. Teaching vacancies are open to anyone with teaching certificate, and frequently attract



applicants from far afield as well as from the local area. After working for a while, teachers from other parts of the country may prefer to return to their hometown, while others want to increase their knowledge and advance in their career path rather than focusing on teaching. Teachers commute to their homes after work on Fridays, returning on Sunday evenings; some take higher degree classes at weekends. All these distract from the teachers' focus at their school. As mentioned earlier, teachers are respected by local people in rural areas, and often represent the hope of the community as the pioneer or leader of activities. Today, this image has become obscure and tarnished. A further problem is class size: vacancies in rural schools are often hard to fill, especially if the school is small, remotely located or difficult to access. As a result, there are therefore often insufficient teachers in rural schools to provide a quality education. Unfortunately, it is compulsory for schools to teach every subject required by the Ministry of Education. This situation forces the headmaster to assign teachers of one specialty to teach other subject which may not be his or her specialty. Some physical education teachers are made to teach English; with the best of intentions, this places students at a serious disadvantage in receiving a quality education.

The quality disparity between urban and rural schools requires urgent attention. The problem is evident at every level, ranging from the physical aspects of schools to libraries, computer labs, laboratories, learning equipment and materials. Urban schools are almost always better equipped and can cater for all their students. In contrast, most rural schools do not enjoy the same standards. Starved of budgets, they often lack even essential items such as textbooks, learning media or even internet access, making it difficult for students to study independently outside the curriculum itself, and limiting the range of activities in which students can participate.



The social context, both within the school and outside in the family and local community, serves as an important driver for a rounded basic education through participation in sports, competitions and other school-based activities. Students from urban schools have easy access to such activities that help them learn. In contrast, students from remote rural schools are limited by distance and financial support from their schools or families.

Current attempts to reform Thailand's education system, especially at primary and secondary levels, involve consolidation of smaller schools with larger schools. The three goals of the central government's reform process are: 1) to narrow disparities; 2) to develop quality of people; and 3) to increase national competitiveness. The initiative began with the Cabinet's approval on 29 March 2016 of a project to produce more teachers for local-level development. The first phase of the project is expected to be fast-tracked and implemented in the first 3 years (2016 – 2018), with the next phase (2019 – 2029) to be included in a broader national reform plan.

This pilot project to produce more teachers for local development is limited to some specialties in response to an urgent demand from the Office of Basic Education, Office of the Non-Formal and Informal Education, and other agencies. The project aims to attract professionals with knowledge and expertise to the teaching profession. This project uses the curriculum and process with a strong focus on practice. After this program, graduates are expected not only to have acquired relevant knowledge and professional expertise, but also to demonstrate a commitment to moral and ethical principles before they become teachers at a school in their hometown. The ultimate goal is local development and solving the problem of teacher transfers. The first-stage implementation will be gradual, so that universities that produce teaching professions slowly reduce their capacity and modify their program to aim for teachers for local development. However, the implementation should be done continuously in the long run to produce quality teachers to the volume that satisfactorily enhances quality learners and education of Thailand.

Although this project can address some part of the problem in the rural area as expected by the government, many other issues remain to be addressed. Nevertheless, this initiative represents a practical beginning for Thailand's educational reform process. Without serious and continuous intervention, the quality of education for Thai students will certainly continue its alarming decline, with serious and lasting impacts on culture, society and national development. Our neighbors have already prioritized reform of, and investment in, their national education systems as the cornerstone of their respective societies, economic growth and competitiveness: why can't Thailand?





Loei-Lao PDR ecotourism development cooperation project to link the two banks of the Mekong River

Saowanee Wijitkosum, Ph.D.

The Mekong River carries major tourism potential due to its rich and unspoilt natural resources, its historical significance and its social and ethnic diversity. Along both the Lao and Thai banks of the Mekong River, tourism is growing, and has been designated as a tourism promotion area for tourism development by both countries.

Loei Province, bordering Lao PDR, has been designated as a focus for cooperation between Lao PDR and Thailand in tourism development, where the Mekong River forms the boundary between Sanakham and Chiang Khan Districts. Its diverse natural resources and pristine forests, and cultural similarities to Lao PDR have made Loei an important and fast-growing tourist destination; however, there has to date been no effort to leverage the cross-border potential through concrete bilateral cooperation.

To address this need, an ecotourism development cooperation project was launched to link tourism along the two banks of the Mekong River in Thailand and Laos, and further into the Greater Mekong Subregion (GMS) in Xaignabouli, Luang Prabang, Vang Vieng and Vientiane in Laos. Cooperation will be created in policy and planning for tourism development, improving the transportation network linking tourist areas, upgrading system utilities that support and encourage tourism, preparation of rules and regulations as well as development of key tourist attractions as magnets to attract tourism and ensure the highest standards of sustainable tourism management. Preparations are also under way to boost cross-border tourism. A new Customs and Immigration facility will be established at Loei Airport, which is scheduled to be upgraded as an international airport in the future. This will be strategically important both to



accommodate increasing numbers of tourists, and also to boost Thailand's position under the ASEAN Economic Community (AEC) in the GMS.

Chula Unisearch was commissioned by the Designated Areas for Sustainable Tourism Administration (Public Organization), or DASTA, as a consultant to conduct a study of options for development of cooperation on ecotourism to link the two banks along the Mekong River. The study comprised the following components:

1) A stakeholder consultation meeting to discuss drafting of guidelines for cooperation in cross-border ecotourism development linking both banks of the Mekong River. The meeting brought together key stakeholders in tourism development from both sides of the border, from public and private sectors, to focus on identifying goals, key challenges, target groups and key areas where guidelines are required.

2) Development of a 5-year Operation Plan for ecotourism development cooperation. By conducting a comprehensive analysis of the problems, potential and development needs, a set of comprehensive marketing and promotional guidelines were drafted to cover areas including the public transportation network, infrastructure and facilities to support and encourage ecotourism development. In addition, procedures and methods were defined in an Operational Plan to convert ideas into action, for use by relevant authorities. A conceptual design for a flagship project was also presented with the goal of developing infrastructure and facilities management in the city, focusing on cross-border linkages.

3) Pilot ecotourism development activities that are appropriate to the area's physical and social context to jointly promote the strengths and highlights of both areas.

CLMVT Forum: Toward a Shared Prosperity



Saowanee Wijitkosum, Ph.D., Deputy Managing Director of Chula Unisearch, attended the opening ceremony and participated in meetings at the **CLMVT Forum: Toward a Shared Prosperity**, held recently at the Dusit Thani Hotel Bangkok. The event was organized jointly by the Ministry of Commerce, Ministry of Tourism and Sports, Ministry of Industry and The Board of Investment of Thailand (BOI). The forum's objectives were to promote and develop economic, trade, investment and tourism development in Thailand and the CLMV countries (Cambodia, Laos, Myanmar and Vietnam) and drive investment growth in each country by enhancing cooperation and eliminating barriers to trade.

Gen. Prayut Chan-o-cha, Prime Minister of Thailand, presided over the opening ceremony and delivered a keynote speech on the topic **CLMVT: Prosper Together**. Also participating were the Ministers responsible for the economic Ministries (Commerce, Tourism and Sports, and Industry), as well as the Board of Investment of Thailand (BOI), senior private sector representatives and business leaders from the 5 countries as well as academics from various universities.

The CLMVT Forum is organized on an annual basis by Thailand as *"The Heartland of ASEAN"* in order to serve as a unique platform for discussion and negotiation among CLMVT countries, with the aim of working together to drive economic growth in the CLMVT countries. This year's CLMVT Forum focused on four main themes: 1) the potential of CLMVT in terms of linkages in various sectors, from the perspective of major industry sectors (automotive, IT/electronics, hotels & services, and logistics); 2) discuss issues and solutions related to existing barriers to trade, investment and tourism within the AEC; 3) development of the CLMVT countries both in terms of business and quality of life, including promotion and development of business startups; and 4) harness the potential of the digital era to drive future regional development of the CLMVT countries through promoting e-Commerce, e-Transactions and e-Tourism.

In his address to the forum, Prime Minister Gen Prayut Chan-ocha stressed the Forum's role in boosting trade and investment in order to achieve the fundamental shared goal to drive economic growth and markets of all the CLMVT countries. He also urged removal of any requirements that hamper cross-border trade and investment through the establishment of the National Single Window, and other measures to create a favourable climate for investment flows across the region.



Seminar on “Solid biofuels as an alternative energy source for survival of Thai industry”



The office of the Permanent Secretary, Ministry of Industry together with **Chula Unisearch**, recently organized a joint seminar on the topic “*Solid biofuels as an alternative energy source for survival of Thai industry*”. The event, held on Saturday 30 July, 2016 at IMPACT Muang Thong Thani, brought together diverse stakeholders to debate approaches to the use of solid biofuels in the industrial sector. The event attracted more than 150 delegates from government and industry, who shared the latest information and views on key issues. The event was also attended by a number of current biofuel users and manufacturers as well as the general public.

The office of the Permanent Secretary, ministry of Industry, appointed **Chula Unisearch** as its consultant in a project to promote use of biofuels produced from waste generated in processing

agricultural products, including waste wood, wood chips, sawdust, cassava waste, and empty palm fruit bunches (EFB) in factories with high production capacity. Aside from cost-effective utilization of resources, this approach can reduce energy costs and reduce environmental impacts such as greenhouse gas emissions from combustion of fossil fuels. Following project completion in November 2016, it is anticipated that 4 factory-level prototypes for production and use of solid biofuels will be in operation. In addition, in-depth technical guidance will have been provided to at least 50 private sector entrepreneurs considering switching to solid biofuels. In addition, a plan and promotional measures have been prepared to promote use of solid biofuels. Technical advice and investment support will be offered to help drive wider adoption of solid biofuels in the industrial sector in an integrated manner, following government policy to boost the country’s use of renewable energy to enhance energy security. The policy also aims to deliver other benefits including efficient, cost-effective and environmentally-friendly natural resource management.

Meeting on Loei-Lao PDR Tourism Development Cooperation for the Lan Xang Cultural Quadrangle



Assoc. Prof. Thavivongse Sriburi, Ph.D., Managing Director of Chula Unisearch, Saowanee Wijitkosum, Ph.D., Deputy Managing Director, Chula Unisearch and Unruean Leknoi, Ph.D., Social Research Institute, Chulalongkorn University, recently attended a meeting to discuss cooperation between Loei Province and the Lao People’s Democratic Republic, to promote tourism development in the Lan Xang Cultural Quadrangle. The event, held on Friday 5

August, 2016 at the Aun Rak Rim Khong Resort, Chiang Khan, Loei Province, attracted representatives from stakeholders related to tourism management from Thailand and Laos, including key government agencies, local administration organizations, and educational institutions, who provided information and comments on the major issues and constraints to tourism development along both banks of the Mekong River in Loei Provinces and Lao PDR. Participants also offered recommendations for drafting a strategic tourism development plan for the Lan Xang Cultural Quadrangle, to link tourism destinations in Loei and Nong Khai Provinces in Thailand to Luang Prabang Province and Vientiane Prefecture in Lao PDR as part of a joint tourism development initiative.

Certificate and closing ceremony for training course: “Preparation and development of personnel to support the Talent Mobility project”

On Wednesday 10 August, 2016, Assoc. Prof. Thavivongse Sriburi, Ph.D., Managing Director of Chula Unisearch, presided over the certificate



award and closing ceremony of the training course: **“Preparation and development of personnel to support the Talent Mobility Project”** for 2016. A total of 56 participants were trained under this course, held at the Gem and Jewelry Institute of Thailand, Faculty of Science, Chulalongkorn University.

The course is managed by **Chula Unisearch** in cooperation with the Office of the Higher Education Commission (OHEC), with the objective of maximizing the potential of academic and administrative personnel from higher education institutes and the private sector, by boosting their participation in R&D that responds to changes in the business environment and creating inter-institutional R&D linkages. The training module covered a total 60 hours, delivered over the period 6 July to 10 August, 2016.

Seminar “Biochar for development and rehabilitation towards sustainable agriculture”



On 22 August, 2016, Assoc. Prof. Thavivongse Sriburi, Ph.D., and Saowanee Wijtkosum, Ph.D., Managing Director and Deputy Managing Director of Chula Unisearch attended an exhibition *“Celebrating 70 Years of His Majesty the King’s Reign for Her Majesty’s 84 years Queen Sirikit, Mother of the Land”* held during 22-24 August 2016 at Huay Sai Royal Development Study Center, Cha-am, Phetchaburi. They participated in a seminar entitled *“Biochar for soil amelioration and sustainable agriculture”* organized by the biochar supplier network to exchange academic knowledge on the use of biochar as a soil ameliorant in agricultural soils, and also to create new partnerships among government agencies and the private sector, communities and academia. The seminar’s speakers presented problems and challenges in maximizing the potential of biochar, and offered guidelines to establish research cooperation as well as in dissemination

of knowledge in sustainable agriculture through annual meetings, training, etc. The event attracted researchers and professional staff from Chulalongkorn University, government officials from the Area 10 Ratchaburi Land Development Station and Huay Sai Royal Development Study Center, private sector manufacturers and distributors of biochar, farmers and others interested in biochar such as the head of Sirinart Rajini Ecosystem Learning Center, representatives from the Sufficiency Economy Center, Ratrardupatham (Ratchaburi) School, and Watnahuay School as well as mass media such as editor of the *Agricultural Nature Journal*.

Presenting “Biochar” at the Thailand Research Expo 2016



Assoc. Prof. Thavivongse Sriburi, Ph.D., and Saowanee Wijitkosum, Ph.D., Managing Director and Deputy Managing Director of Chula Unisearch, recently participated in the Thailand Research Expo 2016 organized by the National Research Council of Thailand (NRCT) in cooperation with research networks of Thailand from 17-21 August 2016 at Centara Grand & Bangkok Convention Centre at CentralWorld.

The authors presented their research findings on the topic *“Using Biochar for soil amelioration and increasing crop yield for food security and sustainable agriculture”*. The paper presented highlights of the authors’ work in disseminating and communicating knowledge and appropriate biochar technology to rural communities and locally-based agencies. The paper, which forms part of a NRCT-funded research cooperation between **Chula Unisearch** and the Environment Research Institute (ERIC) of Chulalongkorn University, was displayed in the Expo’s research highlights zone which showcased research contributing to developing the country towards a stable and sustainable wealth; the zone comprised a Research Community Mall, featuring a Food Corner, Health, Life & Style Gadget Land and Energy Complex.

Research University Network at the Thailand Research Expo 2016

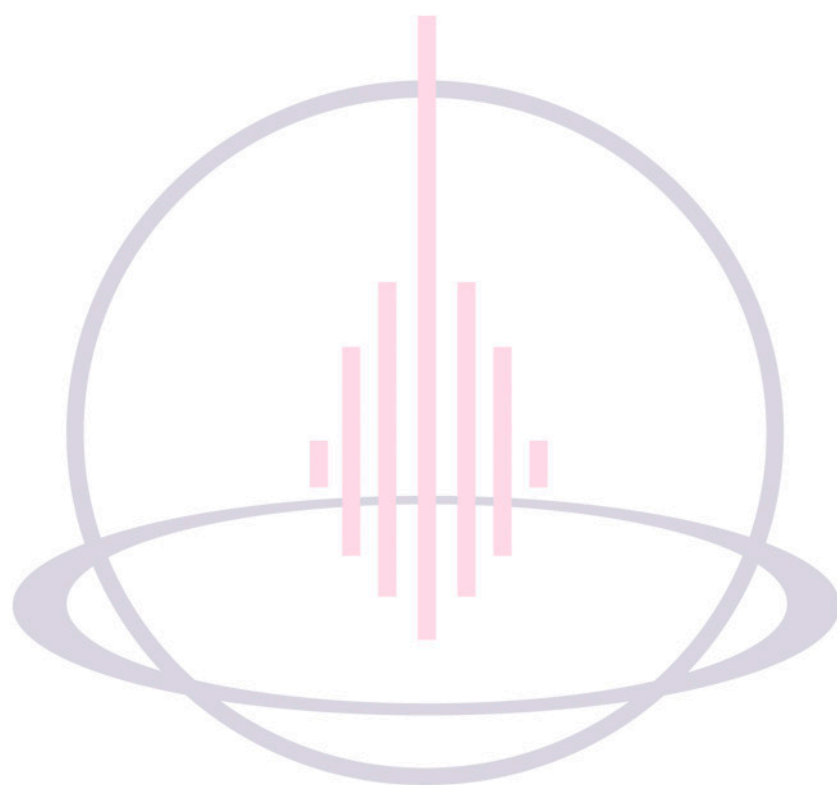


The Research University Network (RUN) is a cooperative initiative among seven Thai universities: Chulalongkorn, Kasetsart, Khon Kaen, Chiang Mai, Mahidol, Thammasat and Prince of Songkla. The RUN recently presented an exhibition of its research findings across 6 clusters: ASEAN studies, agriculture and food, climate change, energy, health, and materials science under the overall concept *“RUN Research for National Development Toward Stability, Prosperity and Sustainability”*. The event was held at the Thailand

Research Expo 2016 during 17-21 August 2016 at the Centara Grand & Bangkok Convention Centre at CentralWorld. Prof. Mongkol Techakumphu, DVM, Director of the RUN office, Assoc. Prof. Thavivongse Sriburi, Ph.D., Managing Director of Chula Unisearch, Saowanee Wijitkosum, Ph.D. and Assoc. Prof. Suchana Chavanich, Ph.D., Deputy Managing Director of Chula Unisearch, attended the event.

Chulalongkorn University presented the findings of 5 research studies: *“Monarchy and Muslims in Thailand”*, *“China’s Role in Mainland ASEAN: A Case Study in Mainland Southeast Asia”* and *“ASEAN’s Human Factor”* from the ASEAN Studies Cluster, *“Coral Culture and Rehabilitation under Climate Change”* from the Climate Change Cluster, and *“Quality Diesel Fuel from Used Vegetable Oil for Diesel Engines”* from the Energy Cluster.

Chula Unisearch coordinates between Chulalongkorn University and the university network under the concept *“Sincerely, Equally, Excellently”* in addressing research questions that are important at national, regional and global scales. RUN research aims to contribute to address social and environmental problems and to serve as a centre of knowledge and innovation covering the ASEAN countries and the Asian region.





UNISEARCH JOURNAL