MAHIDOL UNIVERSITY FIRST YEAR STUDENTS' ENVIRONMENTAL PERCEPTION THROUGH COMMUNICATION PROCESSES

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MAHIDOL UNIVERSITY FIRST YEAR STUDENTS' ENVIRONMENTAL PERCEPTION THROUGH COMMUNICATION PROCESSES

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ABSTRACT

The purposes of this survey research were to study the environmental perception through communication processes of Mahidol University first year students as well as to investigate the association between environmental perceptions (knowledge about environmental problems and perception about the importance of environmental problems) and environmental information (environmental media exposure, interest in environmental information, education about environmental problems, and feelings about environmental problems). The sample consisted of 350 randomly selected first year students in Mahidol University. A questionnaire made by the researcher was employed for data collection. Statistics in terms of percentage, mean, mode, standard deviation, and Chi-square test were used for data analysis.

The results showed that most of the sample had knowledge about environmental problems and perception about the importance of environmental problems at a high level. The results of the hypothesis testing showed that the knowledge about environmental problems depended on the extent of environmental media exposure, education and feelings about environmental problems with a statistical significance of .05.

These findings firmly suggest that the authorities involved should provide more environmental education, information and knowledge about environmental problems including environmental activities and participation for students who then can disseminate correct environmental information to other people in the future.

KEY WORDS: ENVIRONMENTAL PERCEPTION/
COMMUNICATION PROCESSES

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การรับรู้สิ่งแวดล้อมของนักศึกษาปริญญาตรี ชั้นปีที่ 1 มหาวิทยาลัยมหิดล โดยกระบวนการสื่อสาร
(MAHIDOL UNIVERSITY FIRST YEAR STUDENTS' ENVIRONMENTAL PERCEPTION THROUGH COMMUNICATION PROCESSES)

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ศษ.ม. (สิ่งแวดล้อมศึกษา)

คณะกรรมการควบคุมวิทยานิพนธ์: รัชชานนท์ ศุภพงศ์พิเชฐ, พบ.ด., วศิน ปลื้มเจริญ, ศษ.ม., ศุภชัย ศุกรวรรณ, พบ.ม.

บทคัดย่อ

การวิจัยครั้งนี้เป็นการวิจัยเชิงสำรวจเพื่อศึกษาการรับรู้สิ่งแวดล้อมของนักศึกษาปริญญาตรี ชั้นปีที่ 1 มหาวิทยาลัยมหิดล โดยกระบวนการสื่อสาร และศึกษาความเกี่ยวข้องระหว่างการรับรู้สิ่งแวดล้อม (ความรู้เกี่ยวกับปัญหาสิ่งแวดล้อมและการรับรู้ความสำคัญของปัญหาสิ่งแวดล้อม) กับข้อมูลข่าวสารสิ่งแวดล้อม (การรับสื่อสิ่งแวดล้อม, ความสนใจข้อมูลข่าวสารสิ่งแวดล้อม, การได้รับการศึกษาเกี่ยวกับปัญหาสิ่งแวดล้อม และความรู้สึกต่อปัญหาสิ่งแวดล้อม) กลุ่มตัวอย่างประกอบด้วยนักศึกษาปริญญาตรี ชั้นปีที่ 1 มหาวิทยาลัยมหิดล จำนวน 350 คน เก็บรวบรวมข้อมูลโดยใช้แบบสอบถามที่ผู้วิจัยสร้างขึ้น แล้วนำข้อมูลมาวิเคราะห์โดยใช้โปรแกรมสำเร็จรูปสำหรับงานวิจัยทางสังคมศาสตร์ สถิติที่ใช้ในการวิเคราะห์ข้อมูล ได้แก่ ค่าร้อยละ ค่าเฉลี่ย ฐานนิยม ส่วนเบี่ยงเบนมาตรฐาน และการทดสอบไค-สแควร์

ผลการวิจัยพบว่า กลุ่มตัวอย่างส่วนใหญ่มีความรู้เกี่ยวเกี่ยวกับปัญหาสิ่งแวดล้อม และการรับรู้ความสำคัญของปัญหาสิ่งแวดล้อมในระดับสูง จากการทดสอบสมมติฐาน พบว่า ความรู้เกี่ยวกับปัญหาสิ่งแวดล้อมมีความเกี่ยวข้องกับการรับสื่อสิ่งแวดล้อม ความรู้เดิม และความรู้สึกต่อปัญหาสิ่งแวดล้อมอย่างมีนัยสำคัญทางสถิติที่ระดับ .05

จากการวิจัยครั้งนี้มีข้อเสนอแนะว่า หน่วยงานต่าง ๆ ที่เกี่ยวข้องควรมีการจัดการศึกษาเพื่อเพิ่มพูนความรู้และสร้างความเข้าใจที่ถูกต้องเกี่ยวกับปัญหาสิ่งแวดล้อม รวมทั้งการจัดกิจกรรมสิ่งแวดล้อมศึกษาและการมีส่วนร่วม เพื่อนักศึกษาจะสามารถนำความรู้ไปถ่ายทอดต่อไปได้อย่างถูกต้อง

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CHAPTER I
INTRODUCTION

1.1 Statement

Environmental education, awareness and training are considered to be important tools in any attempt at achieving sustainable development. A fourth tool may be added to this list; namely, "communication". In both developing and developed countries the work of environmental managers can be greatly facilitated, and their capacity enhanced, through the application of appropriate skills in environmental education and communication. Indeed, such skills are indispensable in achieving the desired goals of any environmental management programme, regardless of geo-political considerations.

One of the means through which the noble goal of promoting people's environmental education can be reached is through the wide dissemination of environmental information; or, in other words, through environmental communication, which may be defined as a modality of communication concerned with environmental matters and which takes the particular characteristics of environmental issues into account, including their complexity, with the ultimate aim of providing information which is (a) clearly understood, (b) unambiguous and (c) scientifically sound (i.e. does not contain technical inaccuracies).

Whereas the context here is the "environment" (other contexts could be, for example, politics or economics), "environmental communication" refers to the modality which is used for the transmission of information. Considering the modality per se, this line of thinking suggests that for both communicating environmental issues and for disseminating environmental information, increasingly greater use should be made of the effective vehicles of the mass media such as radio, television and the press in various geographical regions.

Also, the environmental information passed onto the public separately through radio, television and the press is often not evenly dealt with and lacks objectivity. Despite their many advantages, both television (which relies on the attractiveness of moving images) and radio (which is based on the transmission of oral reports) lack the long-term perspective one can often find in the printed medium. As observed by Leal Filho, the press has a number of special characteristics, listed below, which reinforce its potential role in raising environmental awareness and illustrate its potential usefulness in environmental conservation.

1 Provision of permanent registers: under normal circumstances, environmental articles published tend to be available in perpetuity. If properly managed, newspaper articles can be kept for re-reading, consultation and further reference for many years. This represents the most cost-effective way of retrieving environmental information, not requiring tapes or electronic equipment for its use.

2 Comprehensive approach: printed articles facilitate the establishment of links between the topic under consideration and other issues; it is thus possible to widen the scope of a given problem or issue as much as is deemed necessary or desirable.

3 Plurality of sources: printed papers and articles, containing as they do information emanating from a variety of sources (e.g. scientists, economists, governmental authorities), can be gathered for subsequent comparison and cross-checking for consistency.

4 Cost-effectiveness: for their price, newspapers and news magazines represent the cheapest information source available.

The concept and definition of “environmental literacy” is also important in the context of environmental education and communication. It may be defined as:

“A process of increased awareness on environmental issues both on a local and regional scale, complemented by a knowledge of the causes and consequences of environmental problems, including particularities relating to their impact on an individual’s life-style.”

This definition includes awareness, for example, of pollution within the city or region where an individual lives. An individual who is not aware of the main environmental issues or problems where he or she lives, or of the impact of these

problems on his or her livelihood, may be defined as 'environmentally illiterate'. It is to be noted, however, that, thanks to advances in environmental communication, increasingly fewer people now belong to this category.

But the management of environmental literacy is not a simple process. In order properly to inform people about facts and figures on the environment, information needs to be disseminated systematically and in a way in which it is easily understood by those for whom it is intended. The following approaches are usually adopted in communicating environmental issues:

- formal education (schools, kindergartens);
- informal education (outdoor activities, fieldwork);
- mass media (television, radio, newspapers);
- other sources (talks among friends, religious events, etc.).

The ultimate aim of environmental education and communication is to provide the public with information on the environment with two objectives: first, to make them environmentally literate; second, to make them commit themselves to the cause of environmental protection and conservation. (Walter, 1998)

Based on a presentation of the approach by Blumler and Katz (1974), the model is presented in Dagram 1-1.

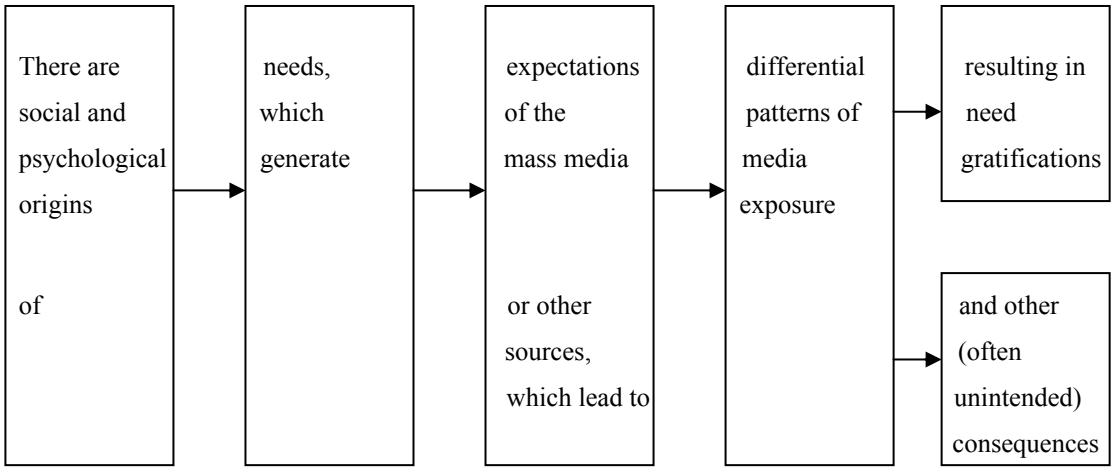

Diagram 1-1 A model of the uses and gratifications approach (Blumler and Katz, 1974)

The basic assumption of the uses and gratifications model is that audience members more or less actively seek the content that seems to be the most gratifying. The degree of perceived gratification depends on the needs (and interest) of the individual. The more individuals perceive that the actual content is need-fulfilling, the greater the chance that they will choose it. (Windahl, 1992)

Every day each of us faces many challenges involving communication. (Ruben, 1988) Nowadays, several media involving in our lives. We are received many information every day from media exposure by individuals.

Mahidol University first year students, have potential as a great leader in the future.

For all the reasons enumerated above it is apparent that environmental perception through communication processes of Mahidol University first year students is of tremendous importance and usefulness.

1.2 Objective of the Study

To study the environmental perception through communication processes of Mahidol University first year students.

1.3 Research Questions

This research wants to know that Mahidol University first year students':

1.3.1 General information (Background)

1.3.2 Environmental media exposure

1.3.3 Topic in environmental information

1.3.4 Environmental information dissemination

1.3.5 Interest in environmental information

1.3.6 Environmental problems experience (education about environmental problems)

1.3.7 Feelings about environmental problems

1.3.8 Perception about the importance of environmental problems

1.3.9 Perception of Green House Effect including meaning, cause, effect, importance, sources of information, and information dissemination

1.3.10 Perception of Acid Rain including meaning, cause, effect, importance, sources of information, and information dissemination

1.3.11 Perception of Ozone Depletion including meaning, cause, effect, importance, sources of information, and information dissemination

1.3.12 Perception of Air Pollution including meaning, cause, effect, importance, sources of information, and information dissemination

1.3.13 Perception of Water Pollution including meaning, cause, effect, importance, sources of information, and information dissemination

1.3.14 Perception of Hazardous Waste including meaning, cause, effect, importance, sources of information, and information dissemination

1.3.15 Perception of Forest and Soil Degradation including meaning, cause, effect, importance, sources of information, and information dissemination

1.3.16 Perception of Coastal and Marine Degradation including meaning, cause, effect, importance, sources of information, and information dissemination

1.3.17 Perception of Environmental Problems in Community including environmental problems, pollution, level of problem, violent problem, sources of information, and information dissemination

1.3.18 Perception of Conservation including meaning, participation, necessary, sources of information, and information dissemination

1.3.19 Association between Knowledge about environmental problems and Environmental media exposure

1.3.20 Association between Knowledge about environmental problems and Interest in environmental information

1.3.21 Association between Knowledge about environmental problems and Education about environmental problems

1.3.22 Association between Knowledge about environmental problems and Feelings about environmental problems

1.3.23 Association between Perception about the importance of environmental problems and Environmental media exposure

1.3.24 Association between Perception about the importance of environmental problems and Interest in environmental information

1.3.25 Association between Perception about the importance of environmental problems and Education about environmental problems

1.3.26 Association between Perception about the importance of environmental problems and Feelings about environmental problems

1.4 Hypothesis

1.4.1 Knowledge about environmental problems was depended on Environmental media exposure.

1.4.2 Knowledge about environmental problems was depended on Interest in environmental information.

1.4.3 Knowledge about environmental problems was depended on Education about environmental problems.

1.4.4 Knowledge about environmental problems was depended on Feelings about environmental problems.

1.4.5 Perception about the importance of environmental problems was depended on Environmental media exposure.

1.4.6 Perception about the importance of environmental problems was depended on Interest in environmental information.

1.4.7 Perception about the importance of environmental problems was depended on Education about environmental problems.

1.4.8 Perception about the importance of environmental problems was depended on Feelings about environmental problems.

1.5 Scope of the Study

1.5.1 In this study dealt with Mahidol University first year students on bachelor degree in the first semester 2004 from 15 faculties at Salaya.

1.5.2 Variables;

- **Independent Variables** as faculty, sex, age, place of birth, address, vehicle, interest, media exposure, topic in environmental information, information dissemination, interest in environmental information, environmental problems experience and feelings about environmental problems.

- **Dependent Variables** as perception about the importance of environmental problems, and perception of environmental problems in world, country, and community.

1.6 Definitions

1.6.1 **Environmental Perception** means the process of receiving the information on environmental problems and interpreting that information for understanding and perceiving the following facts: environmental problems: world, country, and community.

1.6.2 **Communication Processes** means media exposure, interest in environmental information, environmental problems experience and feelings about environmental problems of Mahidol University first year students.

1.7 Conceptual Framework for the Study

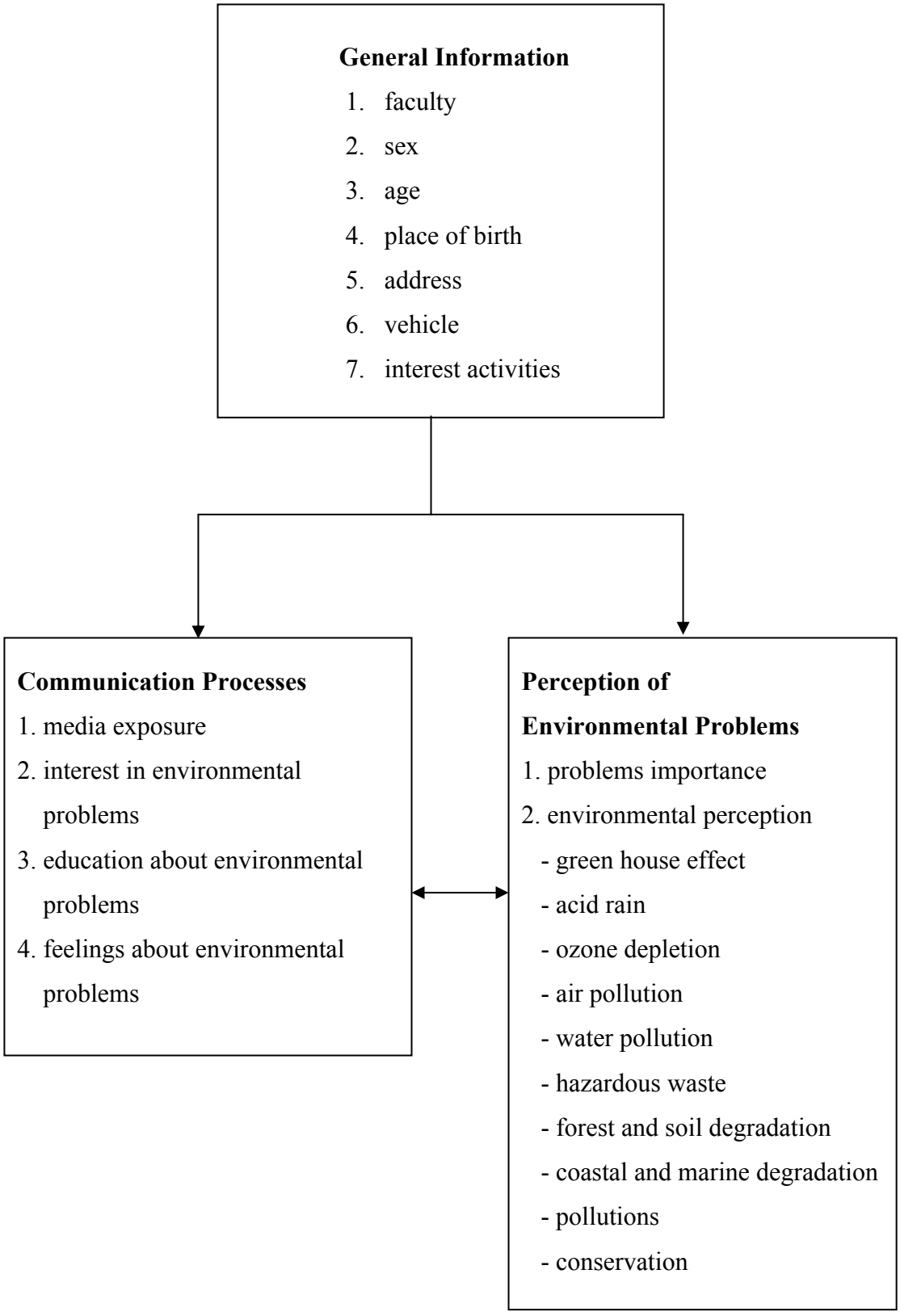

Diagram 1-2 Conceptual Framework

1.8 Expected Results

1.8.1 Knowing existing environmental perception of Mahidol University first year students.

1.8.2 Knowing communication processes about environmental problems of Mahidol University first year students.

1.8.3 Knowing media exposure information, usefulness for selecting suitable media to use in environmental education.

1.8.4 Making use of the study results as a guidelines for an improvement in planning of environmental education.

CHAPTER II
LITERATURE REVIEW

A study of Mahidol University first year students' environmental perception through communication processes, concepts, theories, documents and related researches were as follows:

2.1 Communication Process
2.2 Perceptions
2.3 Environmental Education and Communication
2.4 Environmental Problems
2.5 Relevant Research

2.1 Communication Process

2.1.1 Definitions of Communication

Human communication is the process through which individuals in relationships, groups, organizations and societies create, transmit and use information to organize with the environment and one another. (Ruben, 1988)

Communication: The exchange and sharing of information, attitudes, ideas, or emotions. While early definitions of communication stressed a linear movement from a source to a receiver, current conceptualizations of communication stress mutuality and shared perceptions. Instead of "sending" or "receiving," people participate in the communication process. (Windahl, 1992)

As special as human communication seems to us, it is important to understand that our ability and need to engage in communication is not wholly unique. We share much in common with many other living systems. Communication is viewed as the process through which living systems informationally adapt to,

organize with, link themselves to, or endeavor to establish a commonness with their environment and one another. (Ruben, 1988)

The information used as the basis for behavior is derived by producing and responding to cues, messages, or data in the environment. The world in which living systems exist is filled with a vast array of such messages. Some of these, such as the words exchanged between friends, or the mating call of a bird, are purposefully created by another living system. Other cues, such as the flash of lightning or the sound of a falling tree are not. Both purposeful and non-purposeful are vital as potential sources of the information necessary to behavior, as illustrated in Figure 2-1.

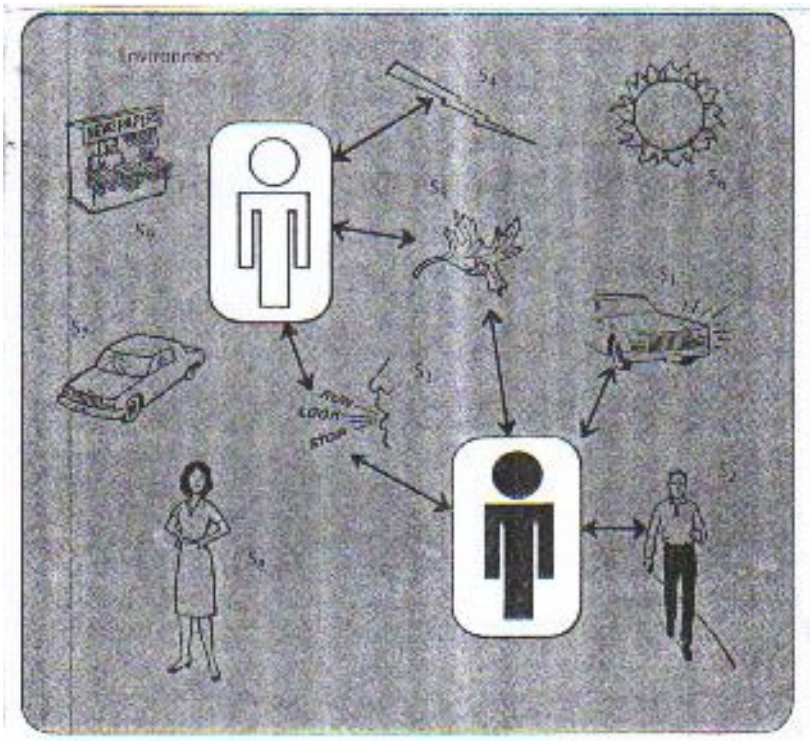

Figure 2-1 Communication Sources and Modes

Within an environment there are a number of potential information sources to which a living system may attend and react, represented by S_1 through S_9 in the illustration above. Some of these data, cues, or messages may be produced by inanimate sources, such as the sound of a horn, the visible flash of lightning, or the touch of a leaf blowing past in the wind--S_1, S_4, and S_5. Other data, S_2 and S_3, taking

the form of a smell, taste, sound or sight, are produced by other living systems. These messages may be unintended like the sound created by a person walking down the street (S_2), or, they may be more purposeful, such as spoken words (S_3). At any instant, many potential information sources are not taken account of all—S_6 ,S_7 ,S_8 and S_9. (Ruben, 1988)

2.1.2 Communication Theory

The review of communication models suggests that whereas the S-M-R predominated during much of the history of the field, the past quarter-century has brought some fundamental change to this perspective. The evolution has been from a sender and message-centered concept to a receiver and meaning-centered view, from a one-way perspective to a circular or spiraling framework, from a static view to a process-oriented way of thinking, from a view centered on public speaking to a perspective that potentially includes all behavior. (See Table 2-1).

Taken collectively, the theories and models advanced in the past twenty-five years have substantially broadened our understanding of the nature of communication and have pointed out some of the short-comings of earlier approaches. They have provided the foundation for the development of a more comprehensive explanation of the role of communication in human behavior. (Ruben, 1988)

Communication is both ancient and newly emergent, interdisciplinary in heritage, the home of scholars and professionals, a science and an art or humanity, and concerned with technology. (Ruben, 1988)

In the last twenty-five years a number of models of the communication process have been advanced, expanding on the work of earlier scholars. One of the most frequently mentioned of this was set forth by David Berlo in 1960 in his book “The Process of Communication”. In some respects the model looked much like the original Aristotelian view of communication, including the traditional elements of source, message, channel, and receiver.

Table 2-1 Model of Communication: An Overview

Model	How Communication Works	Major Factors Stressed in Explaining Communication Outcomes	Directional Flow
Aristotle	Speaker constructs messages that brings about persuasive effects among listeners	Source and message	One-way
Lasswell	Speaker constructs messages, selects a channel, and thereby brings about a range of effects among listeners	Source, message and channel	One-way
Shannon-Weaver	Source encodes message and transmits through channel to receiver	Source, message, noise	One-way with feedback
Schramm[1]	Source encodes message and transmits through channel to receiver	Source and message	One-way
Schramm[2]	Source encodes message and transmits information through channel to receiver if they have shared field of experience	Source, message, receiver	One-way
Schramm[3]	An individual encodes message and transmit information through channel to another person who in turn transmits message to source, etc., providing feedback to enable both persons to improve communication fidelity	Source, message, receiver, feedback	Circular(through feedback)
Katz-Lazarsfeld	Source encodes messages and transmits information through mass media to opinion leaders who relay it to public	Channel, message, receiver, opinion leader	One-way (mediated)
Westley-MacLean	Source selectively encodes messages and transmits information in modified form to receiver who decodes, encodes, and transmits information in modified form to other individual(s) with feedback at every step	Receiver, meaning, feedback	Circular(through feedback)
Berlo	Source encodes messages and transmits to receiver whose interpretation of the message depends on his/her meanings	Source, receiver, meaning, process	One-way
Dance	Individuals encode and decode messages based on previous communication experiences	Process, time	Helical-spiral
Watzlawick-Beavin-Jackson	Individuals exchange messages through behavior , the meaning of which varies with each person depending largely upon the communicative relationship between them	Receiver, meaning, process, metacommunication	Two-way
Rogers-Kincaid	Individual linked together by networks create and share information in order to reach mutual understanding	Networks, information, time	Spiral

For each of these elements, controlling factors were listed. The skills, attitudes, knowledge, culture, and social system of the source were all seen as important to understanding the way communication operates, as were the content, treatment, and code of message. The model acknowledged all five senses as potential information channels and indicated that the same factors influenced receivers as sources (Figure 2-2).

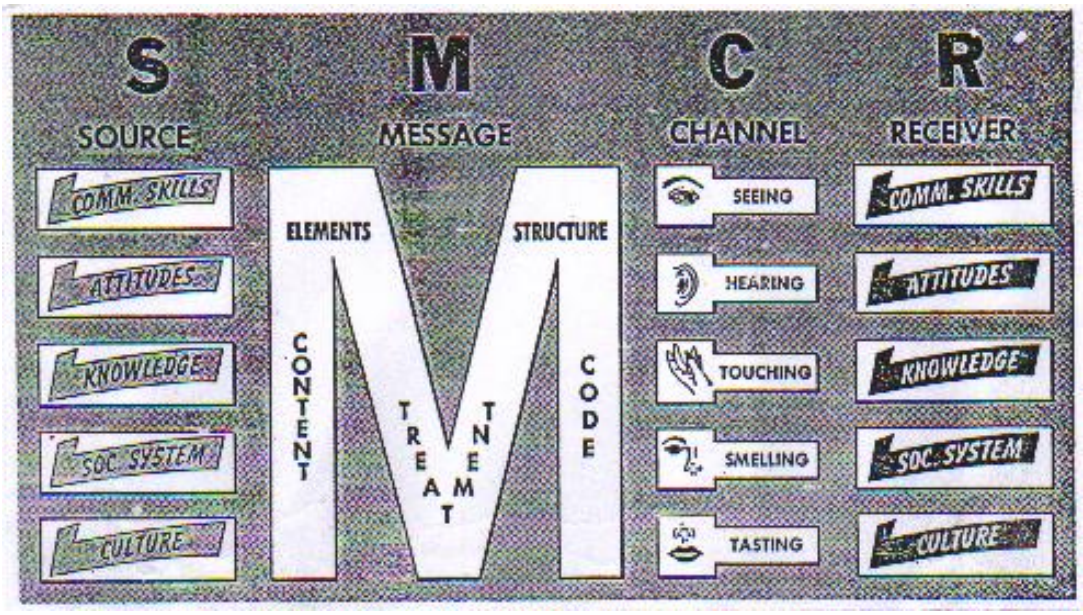

Figure 2-2 Berlo Model

In his discussions of the model, Berlo, more than other before, emphasized the idea that communication was a process. He also stressed the idea that "meanings are in people, not in words"—anther way of saying that the interpretation of a message depends mainly on the meaning of the words or gestures to the sender and receiver, rather than on the elements of the message in and of themselves. In emphasizing the importance of the meaning attached to a message by a source and receiver, the Berlo framework reinforced a shift away from views of communication to perspectives that focused on the interpretation of information.

2.1.3 The Individual

For individuals, communication plays an indispensable role. Through sending and receiving information we react to and act toward the people, objects, and events in our environment. It is also through communication that we interact and negotiate meanings with others. (Ruben, 1988)

Communication also plays an important role in the development of self and self-concept. "Becoming" is a term coined to refer to this developmental process. The role of communication in the process of "becoming" begins with the act of conception and continues throughout our lives, as we adjust to the variety of individuals, influences, and circumstances that beset us. (Ruben, 1988)

To a large extent our individual identities and self-concepts are a consequence of having adapted to the messages (*X*s) created for us by our family and the relationships, groups, organizations, and culture of which we have been a part.

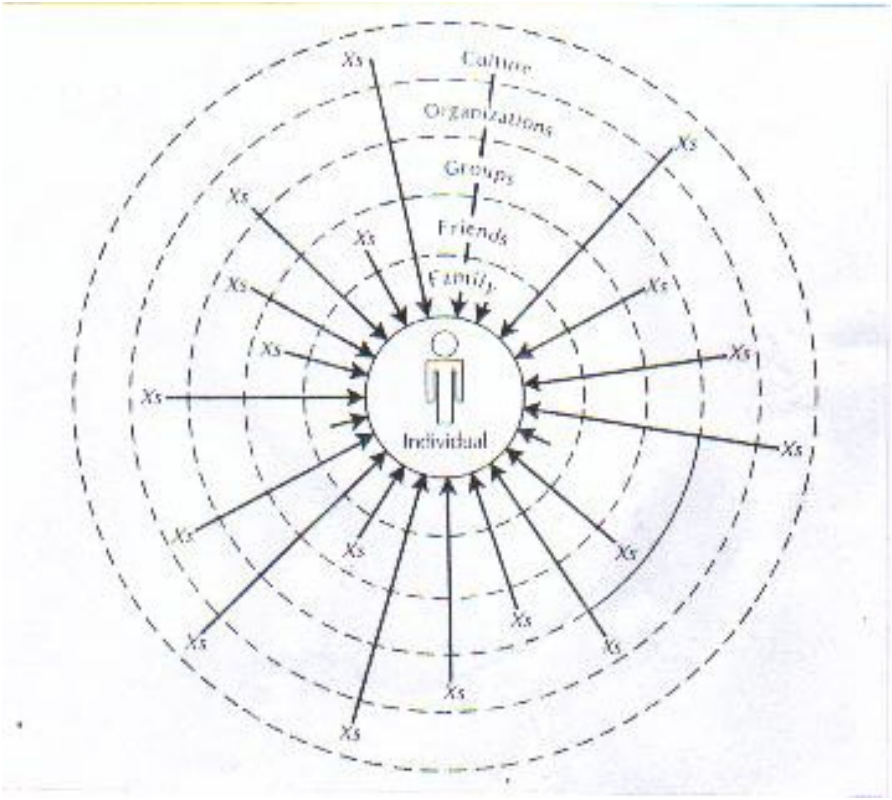

Figure 2-3 Process of individual identities and self-concepts

As we develop and become mobile, the number and diversity of shaping influences increase. As shown in Figure 2-3, encounters with caretakers and family members are supplemented by face-to-face dealings with peers, and by our experiences in relationships, groups, organizations, and society. The impact of these interactions is sometimes quite dramatic. For instance, we often come to share the values, opinions, occupational preferences, outlooks, political preferences of family members, close friends, or peer group members. We may come to use the same "buzz words" or slang phrases they use. Similarly, we often adopt similar styles of dress, and even develop the same gestures. Some of these shaping influences have a fundamental and lasting impact on our development, others much less so.

Mass communication and communication technologies also play a role in our self-development, in that day provide us with a wealth of information relative to such facets of life as masculinity and femininity, age, race, occupation, consumption, violence, criminality, eating and nutrition, and family and interpersonal relations.

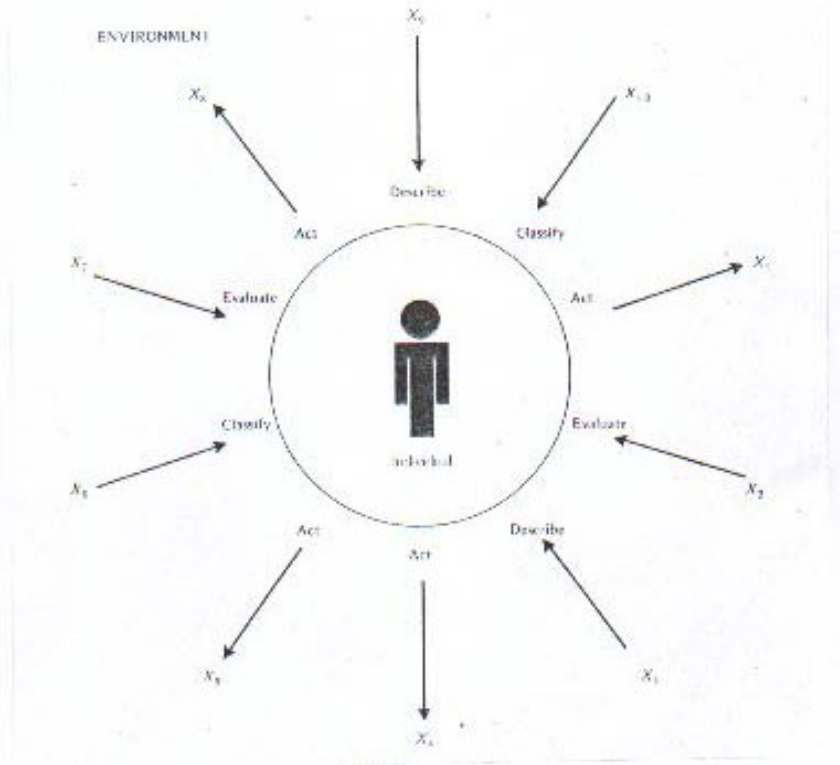

Figure 2-4 Dynamics of human life

In the ongoing dynamics of human life, individuals must not only select, interpret, and remember information, but must also use the resulting information as the basis for making the decisions that guide their behavior, as shown in Figure 2-4. Carrying out these activities involves what we may think of as an information-processing cycle (Figure 2-5) through which data is used as the basis for description, classification, evaluation, and action. (Ruben, 1988)

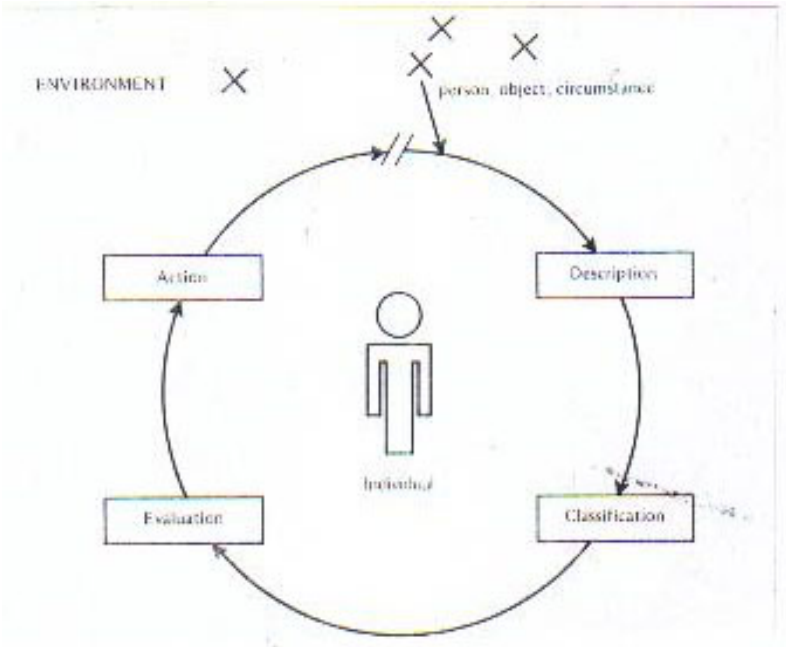

Figure 2-5 Information processing cycle

We use data to which we react to describe, classify, and evaluate the objects, people, and circumstances in our environment. When we act based upon our reactions, we create messages, completing the information processing cycle.

2.1.4 Information Reception

Human information reception involves the transformation of messages, data, or cues into a form that can be used. The conversion into information for present and future use is an active process, one which involves three elements: selection,

interpretation, and retention. The nature of information reception, and the processes involved in sensing and making sense of the people, objects and circumstances in our environment (Figure 2-6). Individuals play and active role in this process through they may have little awareness that it is taking place.

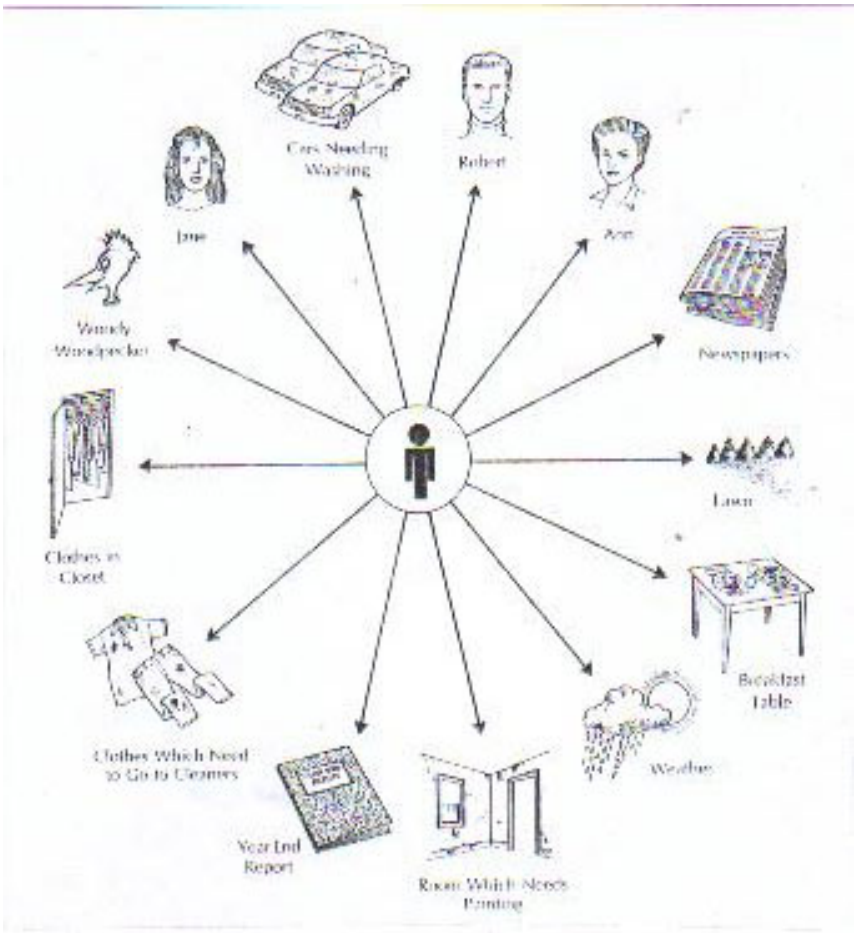

Figure 2-6 Sources of the data competing for attention

Selection, interpretation, and retention are primary facets of information reception. The first, involves the selective attention to particular environmental data from all those to which an individual is exposed. The second consists of the transformation of those data into a form that has value and utility for the individual, a process that directly involves retention, and short and long-term memory. In actual operation, selection, interpretation and retention are very much interrelated activities.

A number of factors influence selection, interpretation, and retention. Many of them have to do with the individual and his or her needs, attitudes, beliefs, values, goals, capabilities, uses, style, experience, and habits.

Other factors that influence information reception have to do with the message, data, or cues themselves—their origin, mode, physical character, novelty, and organization. The sources also have an impact on message reception, including their proximity, credibility, authoritativeness, attractiveness, similarity, motivation, intention, style, status, power, and authority. Message reception may also be affected by factors related to the medium and environment in which data are created and/or reacted to. (Ruben, 1988)

At any one point in time we are surrounded by a large number of persons, events, objects, and circumstances that are sources of the data competing for our attention.

2.2 Perceptions

2.2.1 Definition of perception

Perception is a psychological process that allows the people to accept and understand using their five sensory organs- ears, eyes, nose, mouth and body. When in use this behavior can affect the person's self concept. Many people attribute meaning to perception. (Krittiya Chitraphan, 2000)

Garrison and Magoon (1972) defined the meaning of perception as a process of the brain translating from the body through contact stimulation or their environment to get an understanding of the contact or the environment. The perception of the simulation depends on the past experiences of the person in order to translate its meaning.

Pranee Ramasuta (1985: 57) described that perception is a process of physical sensation using the existing knowledge and experience to help interpret it into understanding.

Warin Sai-eob-uea and Sunee Theeradakorn (1979: 37) described that perception is a process of brain to interpret received information. The perception allows us to know what and how the stimulus is and what it refers to by using existing experience to help interpret.

Pachnee Choeijanya et al. (1987: 71-73) described that perception is a process of mind to respond to the stimulus received. It is a process of information choosing, manipulating and interpreting as our own understanding and feeling. Perception is, normally, taken place with unawareness or unwillingness and always depending on experience. So we can learn to develop this process.

By the way, whether the perception will happen or not, it depends on information receiver to choose it or not. This is like information filter for human perception.

1. Factor of mind is the most important factor. If the information receiver runs out of interest and refuses to accept the information, the communication will become inefficient. In the other hand, it is a process of make a decision to accept the information for consideration which is depending on some stimulus and to interpret its meaning into the understanding or responding. (Nopparat awongkolthoot, 1991: 29)

2. Factor of society is an indirectly influence factor which provides experience, vision, thought, and normal behavior of the information receiver. (Chawarat Cherdchai, 1984: 164)

Prapan Srisawad (2003: 10) described that perception derives from translating or interpreting and varies in each person depending on existing experience or knowledge.

Perception: the process by which we come to understand ourselves and others. In the past, perception was treated as passive and objective. Meaning was thought to be inherent in the stimuli being perceived. The contemporary view of

perception is that it is a subjective, active, and creative process. People perceive and attribute meaning. (Judy, 1997)

Perception is the process of selecting, organizing, and interpreting sensory data in a way that enables us to make sense of our world. Perceptions are personally based. They are affected by the perspective we adopt, our sensory capabilities, our past experiences, and our level of motivation. The accuracy of our perceptions is strongly influenced by perceptual sets (readiness to process stimuli in predetermined ways), selective exposure (a tendency to close ourselves to new experiences), and selective perception (an inclination to distort our perceptions of stimuli to make them conform to our need for internal consistency or closure). (Gamble, 1993)

Perceptions are flavored by emotional feelings (such as fear, guilt, and embarrassment), limited by lack of educational background (e.g., they are quantitative in probability, uncertainty, reading graphs), steeped in biases (cultural, social, gender), confused by language (we hear what we want to, different connotations of words), and thus provide a block to the communication of facts in general and environmental risks specifically. “Actual, measurable risks are assumed to belong to the real world of hard, material things, whereas perceived risks are thought to lie in the domain of fallible human beliefs and intuitions” is a quote that sums up how too many view this situation. Many people believe that what is really happening is not nearly as important as what we think or believe is happening. (Cothern, 1996)

Perceptions are deeply rooted in our feelings and emotional being as well as the cultural backgrounds in which each of us developed. “How people interpret a given set of facts about risk may depend on a host of variables, such as their institutional affiliations, their trust in the information provider, their prior experience with similar risk situations, and their power to influence the source of the risk.”

Perceptions are closely tied to values and for too many people the moral and ethical test is whether it feels right, and thus judgment is based too often only on feelings. “Our values, and therefore our actions, are closely tied in with our perceptions.” The perception is that the criterion is how we think we ought to be treated.

The public suffers from a limitation in understanding in that some perceptions are inaccurate, risk information may frighten people, and strong beliefs are hard to modify. In this area of risk communication there has been research and thought. Some feel that the use of two-way communication is an important missing ingredient. Others observe that we seldom talk to each other; usually we talk past each other. One observation is that it might be better to reduce the use of words with negative connotation such as: death's uncertainty, regulation, rule, law, fear, embarrassment. It would be better to use positive thoughts such as: stewardship, quality of life, justice, freedom, and Mortimer Adler's six great ideas, viz., truth, goodness, beauty, liberty, equality, and justice. This leads to one final question: how important are opinion polls that show majority feelings? What role should these play in environmental risk decision making?

Many have observed that everything is connected to everything else. In that sense and in even a deeper sense, values, perceptions, and ethics are connected. On the other hand, no two people share the same perception of anything.

In summary, perception is a process of thinking using mental skills when a person is faced with stimulation. Translating the meaning of a stimulation or a situation requires that it must be passed on to the sensory system which, in turn, translates meaning, based on past experience or learning. Perception summarizes the data a person receives. The perceiver defines the stimulation, summarizing the type of stimulation presented to the people who will react depending on his formed opinions, beliefs and past experiences. (Krittiya Chitraphan, 2000)

2.2.2 Process of perception

Jamnien chaungchote et al. (1990: 3) described that the process of perception consists of the physical sensation -process of perceiving physical sensation from any stimulus, and the interpreting of that perceiving- that is depending on the intelligence, observation, intention, interest, and quality of mind of that person at that moment.

Applying the existing knowledge or experience to the interpreting needs the sufficient of knowledge while the experience is also much important.

2.2.3 Influential factors of perception

There are two types of influential factor is classified to the attribute of receiver and the attribute of stimulus. (Sathit Wongsawan, 1984: 79-105)

1. Attribute of receiver is an influential factor to the process of perception which is classified into two categories:

- Physical, e.g. sex, age, nationality, education, etc are influential to the perception. Effective perception is also depending on the quality of body sensor, e.g. whether the receiver is deep or short-sight. Two or more body sensors working together causes better result of perception, e.g. tongue and noses for taste perception, eyes and ears for visual perception.

- Mental, e.g. memory, maturity, intelligence, observation, interest, skill, vogue, culture, etc.

2. Attribute of stimulus is the external factor that makes people feeling interested. Some attributes of stimulus can cause inconsistent perception: the distance, similarity, and continuation of stimulus.

2.2.4 Importance of perception

Perception is important to attitude, emotion and behavior. Perception causes some emotions, which will become the attitude and the finally causes behavior. (Prapan Srisawad, 2003: 11)

2.2.5 Perception measurement

Questionnaire (Anan Srisopa, 1984: 141) is a written list of questions which are to be answered by respondents. Questionnaires are mostly consisted of questions about facts, opinions, attitudes or sentiments of respondents. Questionnaire has been widely used by researchers. Perception is a process in which our brains translate and

interpret physical sensations into knowledge and understandings. Interpretations and understandings need past knowledge and experiences or skills as supportive factors. Therefore, perception measurement can be conducted in form of tests, knowledge and understanding measurements including sentiments resulting from interpretation and translation when stimulating factors stimulate individual' s nerve center.

2.3 Environmental Education and Communication

The search for alternative ways of promoting sustainable economic growth began with the publication of the book entitled Silent Spring (Carson, 1962), and the process has continued with the publication of The Limits to Growth (Meadows,1972) and the report entitled Our Common Future (WCED, 1987). Driven by the need to promote sound environmental training, the debate has been raised to the highest international level, culminating in a recommendation enshrined in Agenda-21 (UN, 1992) stating that the "principles of environmental education and sustainable development should be part of the training of specialists in all areas".

Although the need for environmental education has been recognized since the 1960s (Chiappo, 1978; McCarson, 1978), its relevance as a tool for sustainable living (Leal Filho, 1993), and the need for incorporating environmental education in the framework of training programmes, has only recently been widely acknowledged by international organizations such as the United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP), UNESCO and the European Union (EU). Nowadays environmental education is seen as an important tool in fostering a sense of environmental awareness amongst professionals in all areas and at all levels (e.g. workers, managers and professionals such as doctors, engineers and lawyers). As acknowledged by Atchia (1995), perhaps the greatest need for environmental education is in the training of in-service professionals as well as of those training to enter the profession of environmental management. This is so because, in order for them to be able to make sound decisions on environmental issues and problems, environmental managers and decision-makers must have a comprehensive and holistic view of the "environment".

The most widely accepted definition of environmental education has been proposed by the International Union for the Conservation of Nature (IUCN). In its "Workshop on Environmental Education", held in Carson City (Nevada, USA) in 1970, environmental education was defined as follows:

Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his bio-physical surroundings. (IUCN, 1970: 7)

More recently, Leal Filho (1996a: 6) has defined environmental education as "a process directed towards increasing the general level of public concern about environmental dynamics as well as fostering awareness of the need for public participation in order to promote environmental conservation". In addition to the discussion on its definition, the description of the principles and practices of environmental education has been the subject of several works (e.g. Disinger, 1983; Hale, 1993; Leal Filho and Hale, 1992, 1994). According to Leal Filho (1996a), the prime objective of environmental education is to help people to interpret the environment and to stimulate them to:

- see their surroundings with an appreciative but critical eye;
- acquire a range of relevant skills;
- understand something of the process of the physical world, and to gain a basic knowledge of the ecological principles and relationships between organisms and the environment;
- understand something of the economic, technological, planning and political processes which affect their use of the environment;
- develop some insight into other people's environment, life-styles and problems;
- develop concern both for their own environment and that of others;
- acquire a basis on which to make informed decisions about environmental issues that affect them and society at large, and to develop the willingness to do so.

The following are some traditional areas of concern for environmental education:

- environmental education in schools;
- teacher training and environmental education;
- environmental education at the university level;
- environmental education and communities;
- environmental education projects;
- networking and environmental education;
- adult environmental education.

As can be seen, the use of environmental education in the context of environmental management programmes is not yet a well-established area, although this situation is gradually changing. Environmental education is, however, well-established as both a requirement (WCED, 1987) and a tool for sustainable development (Schneider, 1993). Indeed, it has been consistently mentioned in the international literature (e.g. Bain, 1994; Hardoy, 1992; McCormick, 1995) as an item that needs to be taken into account in promoting sustainable development. In this context it is clear that, as modern environmental education continues to evolve, it will increasingly pervade applied disciplines such as those of environmental management and environmental legislation which are certain to be developed further in the late 1990s and beyond.

Before we begin to examine the linkages between environmental education, communication and awareness, and how they relate to environmental management, it is important to conceptualize their connections and relationships. Although there is no consensus among experts on the stage or level at which the impact of information on environmental awareness is actually felt, all these elements are nevertheless closely related, and ought therefore to be conceptualized as a whole.

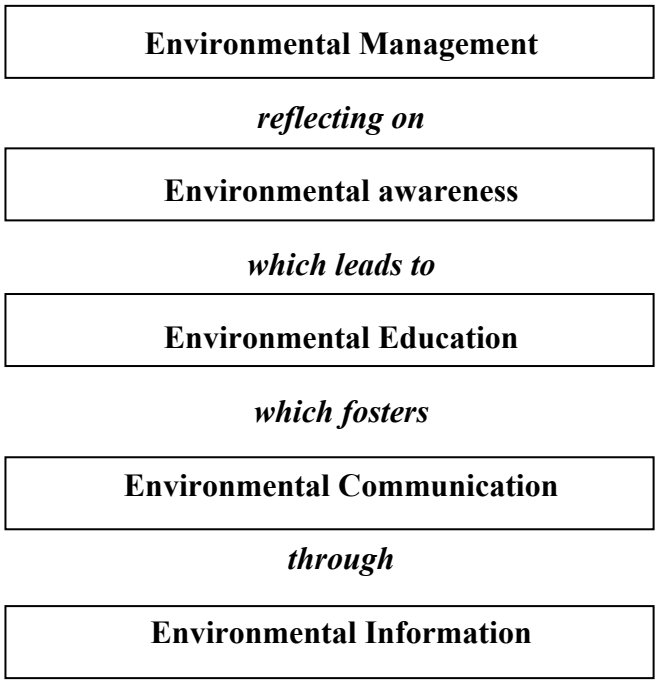

Figure 2-7 Relationship between environmental education, communication, awareness and management

Figure 2-7 illustrates the relationships between these elements by using a "step" approach. As can be seen, even though a hierarchical relationship can be built in the "bottom-up" fashion, the complexity inherent in environmental matters may mean that some of the "step" may be "jumped" over. One could also invert the picture and start with "environmental management" in what would then be in the "top-down" fashion. Thus the choice of what would be the best approach under a given set of conditions would depend very much on the context of those conditions.

However, it is widely acknowledged that, in order to derive maximum benefits regardless of the focus in question, decisions concerning the environment need to be made on a sound technical basis, although this is not the only requirement. In order fully to enlist public support, decisions also need to be communicated effectively. Annals of environmental management show that there have often been cases in which lack of communication and co-operation has led to misunderstanding,

failed communication and conflicts over values. In such cases the systematic use of educational and communication skills, especially among the main actors, can prove very useful. In general, the main actors, who are often also the main target groups, in education and communication in the context of environmental management are:

- governmental agencies;
- the private sector,
- non-governmental agencies.

The above grouping is based on the recognition that the first group is responsible for making laws for controlling and regulating production processes, the second for the production of goods and services, and the third for the mornitoring (as citizens or on behalf of citizens) of the way in which society behaves.

In the past there has been insufficient opportunity for the public to participate in environmental issues, and their involvement in environmental matters, especially in decision-making, has been limited too. Perhaps because of this and other reasons many people did not fully realize until recently the links between economics, politics and the environment (Jacobs, 1991). This state of affairs is gradually changing, however, as more and more people become aware of the need to be actively involved in decision-making processes. There is also a growing public interest in influencing the outcome of initiatives which may lead to structural changes in the physical environment.

To co-ordination of inputs from both the public and the agencies in charge of environmentally related developments, or from other initiatives which could alter the environmental status of a certain site, is the only reliable way of ensuring that a given project or scheme is environmentally sound, morally acceptable and ethically correct. To this end both education and communication have a key role to play, because they facilitate an understanding of the various strategic elements in the short, medium and long term. (Walter, 1998)

2.4 Environmental Problems

Very few people realize that the environment problems cannot be solved without fundamental social change from industrial-affluent-consumer society. The problem is basically due to the fact that our society is fiercely intent on producing and consuming as much as possible, and increasing the volume as fast as possible every year, without any limit in sight. We are already far beyond sustainable per capita levels of resource use and environmental impact, but our supreme goal is economic growth; i.e., to increase production and consume and the GDP all the time and without limit.

Most people and all governments refuse to face up to the limits to growth analysis of our situation. We can only have an ecologically sustainable society if we move to The Simpler Way, i.e., to a society in which we have materially simple lifestyles, in highly self-sufficient local economies that are run mostly through cooperative arrangements, in a quite new economy; one that is not driven by the profit motive and market forces and has no economic growth.

2.4.1 The basic cause of the environmental problems

Our way of life in rich countries like Australia involves consumption of huge volumes of resources, and consequently it involves dumping vast amounts of wastes into the environment. To provide a US lifestyle to one person about 80 tonnes of materials have to be processed every year, much of it mining waste. Energy equal to 7 tonnes of oil has to be used. For each kilo of food eaten some 10 kg of soil are lost. At least 4.5 ha of productive land are needed just to provide one person living in a rich world city with their food, water, living space and energy. If all the world's people were to live as we do, productive land equal to 3.5 times all the world's productive land would be needed, and world population is very likely going to almost double before it stabilizes around 9-10 billion.

In other words the way we live is not just somewhat unsustainable; it is far beyond a sustainable level of resource use and environmental impact. If all the people we are to have on earth soon were to have the Australian average per capita energy

use then world energy production would have to be 9 - 10 times what it is today. Yet the top priority in our society is to increase production, consumption, living standards and the GDP, all the time and without limit.

We cannot reduce these demands for resources from nature and the dumping of wastes into nature unless we change to a very different society, one in which all can live well on very low material living standards.

2.4.2 The problems

Consider the way the main problems connect directly with our affluent living standards.

- The greenhouse problem

A number of the gases we are putting into the atmosphere have the effect of trapping energy that comes to the earth as sunlight but which would otherwise be radiated back into space. The main contributor is carbon dioxide, accounting for about half the greenhouse effect. Humans generate about 24 billion tonnes of carbon dioxide each year, mostly from the burning of fossil fuels (coal, oil and gas) in rich countries.

The carbon dioxide content of the atmosphere has increased by about 25% since humans began to use fossil fuels in large quantities 150 years ago. The concentration is now around 350 ppm and increasing by about 1.5% p.a. The effects can't be predicted with confidence but this increase could result in a 1-2 degree rise in average global temperature by 2030. The expected rise at the poles is much greater. If the greenhouse effect continues into the 22nd century then polar ice would begin to melt eventually bring about a sea rise of perhaps a hundred metres. Even a half metre rise would cause huge problems for the many people who live on low lying islands and in coastal regions.

Probably the most undesirable effects will be hotter and drier climates in many Third World regions such as the African Sahel, where millions of people even now have difficulty growing enough food, and more frequent occurrence of extreme

climatic events such as storms, floods, droughts and cyclones. These can devastate food production.

It is possible that positive feedback effects from several sources could suddenly produce a catastrophic runaway greenhouse effect. For example,

- As the warming dries out the Arctic tundra it begins to rot, releasing greenhouse gases.

- As the tropical rainforest is destroyed we lose the cloud their moisture generates. That cloud presently reflects much solar energy back into space, cooling the earth.

- As the warming reduces the formation of polar ice each year less salt is separated to fall to the bottom causing the huge currents that take carbon-rich water down.

- As these currents diminish less nutrients are brought up to feed the plankton which take in much carbon.

- As the oceans warm and become more polluted coral reefs dissolve, ceasing to take carbon from the atmosphere and releasing their carbon to the ocean.

It seems that the global atmospheric system can flip from one state to another fairly quickly. Some ice ages have come and gone relatively suddenly. The worry is that human activity could tip the system into a new state, for example, bringing on a new ice age. Nature moves 100 times as much carbon into and out of the atmosphere as humans do, so we might trigger or lever huge shifts and runaway effects in nature's processes.

- The ozone problem

In the mid 1980s it was realized that the ozone in the atmosphere is being depleted. There is only a very small quantity of this gas. If all the molecules of ozone were brought together at normal pressure they would make up a layer around the earth less than 3 mm thick. Yet ozone performs the extremely important function of blocking out much of the ultraviolet light that comes from the sun and is harmful to life. Life on earth was only able to emerge from the seas on to the land after plants had released enough oxygen to create an ozone shield.

In the late 1980s scientists observed a large hole forming each year in the ozone over the Antarctic. More recently another hole has appeared over the Arctic. By the early 1990's there had been about a 3-5% reduction in the amount of ozone in the whole atmosphere. The main destructive gases, CFCs, remain active in the atmosphere for 100 years.

The ozone problem illustrates the most important aspect of the general environment problem, i.e., the damage being done to the life support systems of the planet. Increased ultraviolet light coming to earth will have undesirable effects on various biological systems, including the productivity of broad leaf plants (and therefore agriculture) and the micro-organisms in the sea which account for a considerable proportion of the world's oxygen and which take much carbon from the atmosphere. Processes such as these are crucial in maintaining the conditions necessary for the health of the entire planet, and the most worrying aspect of the environment problem is that in many ways human activity is degrading these systems and processes that make life on earth possible.

- Acid rain

In the heavily industrialized areas of North America and Europe the rainfall has become acidic due to the amount of nitrogen and sulphur entering the atmosphere especially from cars and power stations. As a result forests and lakes are dying. This is one more factor reducing the productivity of agriculture and more importantly degrading the life support systems of the planet. There will be strong pressure to increase use of fossil fuels and fertilizers in coming decades, increasing the release of acid to the atmosphere.

- Soil damage

All life on earth depends on the earth's fragile “life jacket” made up by the thin layer of topsoil (average depth only 30 cm) from which all living things derive their sustenance. We are treating this vital resource in a way that cannot continue for many more decades. Our agriculture is one of the most unsustainable aspects of our society. Consider the main damaging effects.

- Water logging and salinity in irrigated areas are destroying much land.

- Large areas of good farm land are continually being turned into urban settlements.

- Large scale use of pesticides reduces soil fertility.

- Much land is being lost to the spread of deserts, at a global rate of 6 million ha p.a. Another 20 million ha became unprofitable to farm each year.

- Rainfall is increasingly acidic.

- Soil nutrients are not returned to the soil. We throw away all our food wastes, and animal and human wastes. These should all be returned to the soil. Modern agriculture is therefore well-described as “soil mining”.

- Soils are becoming more acidic due to use of artificial fertilizers.

- The Greenhouse and ozone problems will have undesirable effects on agriculture in coming years.

- Another important reason why our agriculture is unsustainable is that it depends on large quantities of energy, especially oil. In addition to all the energy used in tractor fuel, fertilizers, irrigation and pesticides there are huge transport and packaging energy costs. We will not be able to farm as we do now when much less oil is available in a few decades time. We could not do it now if world oil output were shared equally among all the world's people. We in rich countries can use so much in our agriculture only because we take most of the world’s oil production.

These trends cannot continue for many more decades. We are destroying our capacity to meet our agricultural needs. Remember that there will probably be twice as many people to feed late next century and it is likely that there will then be much less land than there is now.

To solve these problems we must move to a very different form of agriculture in which we mostly depend on small farms and gardens, tree crops, “edible landscapes” throughout cities, local self-sufficiency in food (hence little transport), recycling of nutrients and thus negligible use of ploughing, artificial fertilizers or pesticides.

- The pollution of the oceans

Large quantities of wastes are dumped into the world's oceans every year, including the run-off of excess fertilizer from farmland, and 2 million tonnes of oil which affects photosynthesis and the amount of sunlight reflected from the planet.

- The loss of forests

Around 16-20 million hectares of rainforest are being lost each year and most of the remaining forest might have been destroyed by early in the 21st century. In addition about 4 million ha of other forest types are being lost every year. This destruction not only reduces the rate at which carbon is taken out of the atmosphere, but the rotting of cleared vegetation and exposed soil humus is also putting carbon into the atmosphere, possibly equal to 40% of the input from fossil fuel burning.

The loss of the rainforest could also reduce the planet's cloud cover and therefore greatly increase its temperature.

Tropical forest loss is the main cause of the loss of species.

- The loss of species

The expansion of human activity is destroying habitats and causing the extinction of plant and animal species at an accelerating rate. This is probably the most serious of all ecological problems. There are probably 10 to 30 million species in existence, mostly undiscovered as yet. In the 300 years to 1970 humans probably caused the extinction of about 300 species. Some biologists estimate that we are now losing 17,500 species every year, about 2 every hour. In the next 20 years one million plant and animal species could be made extinct. At this rate, in the next 50 years half of all species could be lost.

We have entered a period of rapid extinction unlike any since 60 million years ago when the dinosaurs suddenly died out. The result will be the weakening of the life-support systems of the planet, because it is the diversity and complexity of life forms which maintains these systems, for example recycling nutrients and maintaining the atmosphere.

2.4.3 Effects on human health

Since World War II humans have had to live in a new chemical environment, increasingly surrounded by and taking in many pollutants created by our industries. Thousands of new chemicals are invented each year and tonnes of these new substances are released into the environment each year, entering our water, air and food. Only a few are ever tested thoroughly for their long term health effects. Many of these wastes are known to be poisonous. Chemicals leaching from dumps into drinking water supplies is a major problem.

This increase in the contamination of our environment is probably a major factor responsible for the increasing incidence of cancers. Some people argue that we are experiencing an epidemic. Between 1940 and 1975 the American incidence increased 40%. About 80% of cancers are thought to be due to pollutants in our environment.

Two worrying factors here are biological magnification, the way some harmful substances become more concentrated as they move up food chains, and synergism, the way some substances in our environment can interact with each other to have greater effects. For example the probability of an asbestos worker who is a smoker contracting cancer is about 10 times as great as the probability for smokers in general or that for asbestos workers in general. These two factors together interact to produce a much greater risk.

We have little idea how the many new chemicals we are exposed to could be interacting within us to cause illnesses, but the more we saturate our environment with new chemicals the more likely such effects are.

Many people just assume that all we need to do to solve the environmental and resource problems is have tighter pollution control, buy products that are recyclable, and design more energy efficient products, etc. This is what advocates of “Environmentally Sustainable Development” usually believe. They do not see that we need to change our lifestyles or the economy. The “limits to growth” argument is that there is no chance of solving the major global problems we face unless we go much further and drastically reduce the amount of producing and consuming going on,

because the problems are essentially due to the very high levels of resource use and waste involved in our way of life.

2.4.4 Environmentally sustainable development

There is much reference on the part of economists and governments to the concept of "environmentally sustainable development". However, this is in general only an attempt to take some steps to reduce the environmental impact of economic activity, but there is never any question of reducing the volume of production and sales, or of eliminating grossly unnecessary or wasteful or luxurious production. "Ecologically Sustainable Development" is only about looking for ways of continuing to produce, but in ways that will have reduce environmental impact. The crucial point is that the volume of production and consumption currently taking place is far beyond levels that can be kept up, extended to all the world's people, or remedied by technical advance. The inescapable conclusion from the limits to growth analysis of our situation is that there must be drastic reduction in the volume of economic activity taking place in the world at present. This is the last thing that economists, corporations, and governments want to year, so they opt to pretend that it is sufficient to look for less environmentally damaging ways of continuing to produce and sell as much as possible.

2.5 Relevant Research

Dolporn Peukkong (1998: Abstract) had studied local people's perceptions and realizations toward environmental impacts arising from power plant in Suratthani province and found that local people's perceptions were moderate but having higher level of realization. Those depended on age, occupation, educational background, distance, local's residents working in power plant and period of settlement of local residents and with statistical level at .05.

Sukumaporn Sukkaw (1997: Abstract) had studied conditions and environmental problems of the Ratanakosin Island and Bangkokians' perceptions.

The study revealed that Bangkokian was a big sampling group with high perceptions about environmental problems surrounding Ratanakosin Island. Interestingly, they seldom followed up news and information but paying attention only when problems arised. The government's officials had more perceptions about environmental problems than those of students and individual groups. As students has more perceptions than individual groups, persons who realized the value of island tended to have more perception about conditions and environmental problems of the Ratanakosin Island than persons who paid less attention to it. The extreme conservationists actually had more perceptions about the Ratanakosin's conditions and environmental problems than the ordinary conservationists.

The study of previous research works found that individual's perceptions were based on their basic factors such as gender, age, educational level including different occupations. Those basic factors created the different perceptions. Psychological theory stated that individual with different experiences and intentions had different perceptions. Researcher has come to the same conclusion as above mentioned by using the results of this research together with relevant theories.

Somchai Ampanthong (1989: 98, referred in Pamornratana Sutham 1990: 28) had conducted the research about knowledge, attitudes and behaviors of the secondary schools' executives in Bangkok Metropolitan towards environmental problems in Thailand. The results showed that the level of attitudes towards environmental problems in Thailand of the secondary schools' executives depended on news and information they perceived by .005 statistical mean.

Daranee Auitrakul (1989: 102) had studied about knowledge and opinions concerning natural resources conservation in Khoa Khiew-Khao Chompu Wildlife Sanctuaries Reserve and found that different perceptions of news and information of individual created different knowledge and opinions by .001 statistical mean.

The results of mentioned research, researcher had hypothesized that local people who regularly consume news and information about environmental conservation have more perceptions of environmental problems resulting from tourism developments than local people who less consume news and information.

Plengpin Mun-U (1997: Abstract) studied "Knowledge and practices about environmental problems or SAO committee in Payao Province" and it was found that SAO committee have knowledge about environmental problems at moderate level. It was also found that knowledge in environmental problems or SAO committee depended on the following variables: education level, time reside in the vicinity, and information receiving at statistically significant at level .05. SAO committee are practicing on environmental problems at good level and it was found that the practice on environmental problems depended on information receiving with statistically significant at level .05.

Phiree Chaicha, (2002: 80-90) studied on information reception and environmentally friendly products consumption among women in Bangkok Metropolis area. The result was found that most of sample group received the information through television media, followed by radio, newspaper, and journal/magazine orderly. It was illustrated that different age, occupation, marital status, education level, and income of sample group had different information reception, and different behavior. Knowledge and behavior regarding the green products had no correlation statistically significant at .05 level.

Roger and Shoemaker (1971: 208-209) stated the effectiveness of mass communication that mass media were able to access to receiver therefore, it should impact to receiver directly so it increased knowledge and distributed the information, including changing people attitude effectively.

Richmond (1977: 37) studied the knowledge and attitude of high school students in their 5th year in England. Results showed that students felt lowly about their environment. However, if they were responsible for a duty, their attitude will become negative. Males had more knowledge about environmental issues than females; their attitudes did not differ, in a statistically significant way.

Zacher (1977: 5016) studied on the factors toward the knowledge on environment aspect of student grade 11 in the State of Montana, the research results

found that sex, size of family, newspaper reading, environmental knowledge studying in the school, and demographic attribute of student when comparing of different factors it showed that the male student had mean scores, higher that the female mean scores, the child from small family had higher mean scores than the big family, the child who read the newspaper more than copies had the mean scores higher than the child who read lesser than 3 copies.

Pongkit Siriyong (1999: Abstract) studied media exposure on aids, knowledge, attitude and preventive behavior of aids among the head of households in rural area, Suratthani. Results showed that most of the head of households ever received aids information from television and aids information exposure from mass media, personal media, and specialized media of the head of households were nearly.

Worapan Pisutthanon (2004: Abstract) studied health risk behaviors of personnel and local residents involved in solid waste disposal site of Nonthaburi province. It was found that people received significant information about infection and disability through media and government sources but not through personal contacts. Information about injury was received through newspaper and magazines but not to a significant extent through other media sources.

CHAPTER III
RESEARCH METHODOLOGY

This study is a survey research aimed to examine environmental perception of Mahidol University first year students in bachelor degree. In the research methodology, used the conceptual survey descriptions to collect data by using questionnaire as a tool. Questionnaires were guided by the research documents and the related information in order to cover all of the useful information. This chapter focused on the following topics:

3.1 Population and Samples
3.2 Research Tool
3.3 Construction and Development of Tool Quality
3.4 Data Collection
3.5 Data Analysis

3.1 Population and Samples

3.1.1 The population

The population in this study were first year students on bachelor degree in the first semester 2004 of Mahidol University amount 2,657 persons. (Table 3-1)

3.1.2 The Samples

Samples in this study are sampling by accidental sampling. The sample size calculated by the formula recommend by Taro Yamane (1973:725) as follows:

$$n = \frac{N}{1 + Ne^2}$$

when n = sample size

N = total number of population

e = sampling error ($e = .05$)

When instead in the formula, the sample size as follow:

$$n = \frac{2,657}{1 + (2,657)(.05)^2}$$

$$= 348$$

So the sample size is at least 348. Finally, 350 samples were based upon the population size of this survey research. The list of the faculty in Mahidol University are showing in the Table 3-1 (detailed names are shown in APPENDIX A).

Table 3-1 Faculty and amount of Mahidol University first year students on bachelor degree in the first semester 2004

No.	Faculty	Amount
1	BM	68
2	DT	78
3	EG	335
4	EN	28
5	MT	156
6	NS	223
7	PH	139
8	PI	88
9	PY	118
10	RA	288
11	SC	538
12	SI	356
13	SP	64
14	VS	32
15	AR	146
Total	**15**	**2,657**

3.2 Research Tool

The questionnaire was used as a tool for data collection. It was constructed by the researcher by basing on the study of texts, documents, and thesis advisory committee recommendations, including studying the related researchers. All these knowledge was composed to construct the questionnaire. The questionnaire contains the following information:

3.2.1 General information

Part one is general information which included sex, age, faculty, birth place, address, vehicle, and interest.

3.2.2 Communication processes

Part two is a questionnaire about communication behavior including consumed of news and information about environment: media exposure, environmental information, information dissemination, environmental interesting, environmental problems experience, and feelings to environmental problems.

3.2.3 Environmental perception

Part three is a questionnaire about environmental perception including:

(1) Perception of importance to environmental problems,

(2) Perception of environmental problems in world, country, and community (including problems knowledge, cause, effect, importance, media, and information dissemination) as follows:

World

- Green House Effect
- Acid Rain
- Ozone Depletion

Country

- Air Pollution
- Water Pollution
- Hazardous Waste
- Forest and Soil Degradation
- Coastal and Marine Degradation

Community

- Pollutions
- Conservation

3.3 Construction and Development of Tool Quality

The questionnaire was constructed and tried out with the following steps:

Step 1: The researcher studied the concepts and results of related study and it was complemented with studying the content from text books, theses, and other documents about the solid waste. After the tool was constructed then the researcher asked the recommendations from thesis advisory committee and experts to consider and examine the clearness and correctness of language scope of the content, and the content validity including the comments and recommendations. It was improved and corrected to be complete to be framework and concepts for research tool construction.

Step 2: The questionnaire was constructed and proposed to thesis advisory committee and experts to give the opinions to determine the validity, then it was improved again.

Step 3: The constructed questionnaire was tried out with 30 first year students of Mahidol University in order to correct and improve before collecting actual data from samples. The questionnaires were checked for scoring and analyzing for knowledge aspects with analysis of difficulty level, discrimination power and reliability.

The content analysis of difficulty level and discrimination the 25% high group-low group technique was used, the formula as follows:

$$\text{Difficulty level (P)} = \frac{N_H + N_L}{N}$$

$$\text{Discrimination power (D)} = \frac{N_H - N_L}{N/2}$$

Where P = Difficulty level

D = Discrimination power

N_H = Number of respondents with right answer in the 25% high group

N_L = Number of respondents with right answer in the low group

n = Total number of respondents in both groups

For the criteria in choosing questions with a difficulty level between 0.2-0.8 and a discrimination power value of at least 0.2 for the real test.

Once the questions for the knowledge assessment are selected according to the difficulty and discrimination power values, the researcher must then analyze the questionnaire for reliability by the Kuder-Richardson 20 (KR-20), with the formula as follows:

$$r_n = \left\{\frac{n}{n-1}\right\}\left\{1-\frac{\sum pq}{s_t^2}\right\}$$

Where r_n = Reliability value

n = Number of questions

p = Proportion of respondents who answered the question correctly

q = Proportion of respondents who answered the question incorrectly (1-p)

s^2_t = Variance of the total score

The reliability of question in this section was determined by using the Alpha Coefficient formula of Cronbach, as follows:

$$\alpha = \frac{n}{n-1}\left[1-\frac{\sum s^2_i}{s^2_t}\right]$$

Where α = Reliability value of questionnaire

n = Total number of questions

s^2_i = Variance of single item

s^2_t = Variance of total items

3.4 Data Collection

Data was collected with following steps:

3.4.1 The tried out and developed questionnaire was given to Mahidol University first year students by accidental sampling amount 350 persons from various faculties and explaining by researcher to respondents to understand the questionnaire.

3.4.2 The questionnaires were collected and then examined for completeness, subsequently, the completed questionnaires were further analyzed to determine the statistical value.

3.5 Data Analysis

The completed questionnaires were transferred to coding sheet and analyzed with the program of statistical package for social sciences for windows (SPSS/for windows) by defining the significant level at .05. The general information was analyzed using the percentage, mean, and standard deviation. Chi-square test was used to calculate the association between Knowledge about environmental problems and Perception about the importance of environmental problems (dependent variable) and independent variable (Environmental media exposure, Interest in environmental information, Education about environmental problems, and Feelings about environmental problems). The formula was as follows:

$$\chi^2 = \sum \frac{[f_o - f_e]^2}{f_o}$$

where f_o = Frequency of performance

f_e = Frequency of Expectation

Knowledge Level of Sample Group

The questions were multiple choice types, with the respondent asked to choose the most correct answer. There were 3 ranges of scores as follows:

0-12 scores	meant	Low level of Knowledge
13-19 scores	meant	Moderate level of Knowledge
20-26 scores	meant	High level of Knowledge

Perception Level of Sample Group

The questions were checked for the choice and scores were 0, 1, 2, 3, 4, and 5 for the order of choices chosen respectively. There were 3 ranges of scores as follows:

0-24 scores	meant	Low level of Perception
25-37 scores	meant	Moderate level of Perception
38-50 scores	meant	High level of Perception

The results will show in tables including description.

CHAPTER IV
RESULTS

This research was study on the “Mahidol University first year students’ environmental perception through communication processes”. The researcher selected the survey research method and the questionnaire were used for data collection with the sample of population 2,657 personnel from 15 faculties at Salaya. From the calculation 348 people would be sample group by sampling with the proportional sampling to size according to the various faculties, then the accidental sampling was used for various faculties. The research collected 350 copies of questionnaires and analyzed to determine the statistic values. The results can be concluded by dividing in to 4 parts as follows:

4.1 General information of the sample group consisted of variance: faculty, sex, age, place of birth, address, vehicle, and interest.

4.2 Environmental communication processes of the sample group including: environmental media exposure, topic in environmental information, information dissemination, interest in environmental information, environmental problems experience, and feelings about environmental problems.

4.3 Environmental perception of the sample group consisted of: perception about the importance of environmental problems and perception of environmental problems in world, country, and community (including meaning, cause, effect, importance, sources of information, and information dissemination).

4.4 Analysis and explanation about the association between environmental perceptions and environmental information by hypothesis testing.

The results in part 4.1-4.3 were showed by Answer the questions of Mahidol University first year students from research questions, and the results in part 4.4 were showed by hypothesis testing from hypothesis.

4.1 General Information of Sample Group

The general information of sample group was classified by faculty, sex, age, place of birth, address, vehicle, and interest activities in term of number and percentage of Mahidol University first year students.

The results are as the followings:

Question 1: General information (Background)

Answer: General information, collected from the sample group, consist of faculty, sex, age, place of birth, address, vehicle, and interested activity. The result will be expressed in percentage, shown in Table 4-1.

According to the results, it was found that:

(1) Faculty, were revealed that most of sample group 39.1% from SC, followed by 27.1% from AR, 10.3% from EG, 8.0% from EN, 4.3% from SI, 2.6% from PY, 1.7% from NS, 1.1% from BM, 1.1% from MT, 1.1% from PI, 1.1% from RA, .9% from PH, .6% from DT, .6% from SP, and .3% from VS respectively.

(2) Sex, were revealed that most of sample group was 68.0% female, and the rest was male 32.0%.

(3) Age, were revealed that most of sample group was 60.6% in age 18 years, followed by 33.7% in age 19 years, 3.7% in age 20 years, and 2.0% in age 17 years respectively.

(4) Place of Birth, were revealed that most of sample group was 51.7% come from other provinces, and the rest was come from Bangkok 48.3%.

(5) Present address, were revealed that most of sample group was 72.0% live inside Mahidol University, followed by 24.3% live at home, 2.0% live at other places, and 1.7% live outside Mahidol University respectively.

(6) Vehicle, were revealed that most of sample group was 66.3% not have vehicle, followed by 22.3% have bicycle, 8.3% have personal car, and 3.1% have motorcycle respectively.

Table 4-1 Number and Percentage of sample group classified by General information (Background)

No.	General information	Number	Percentage
1	**Faculty**		
	1. BM	4	1.1
	2. DT	2	.6
	3. EG	36	10.3
	4. EN	28	8.0
	5. MT	4	1.1
	6. NS	6	1.7
	7. PH	3	.9
	8. PI	4	1.1
	9. PY	9	2.6
	10. RA	4	1.1
	11. SC	137	39.1
	12. SI	15	4.3
	13. SP	2	.6
	14. VS	1	.3
	15. AR	95	27.1
	Total	**350**	**100.0**
2	**Sex**		
	1. male	112	32.0
	2. female	238	68.0
	Total	**350**	**100.0**
3	**Age**		
	1. 17 years	7	2.0
	2. 18 years	212	60.6
	3. 19 years	118	33.7
	4. 20 years	13	3.7
	Total	**350**	**100.0**
4	**Place of Birth**		
	1. Bangkok	169	48.3
	2. Others	181	51.7
	Total	**350**	**100.0**
5	**Present address**		
	1. Inside university	252	72.0
	2. Outside university	6	1.7
	3. Home	85	24.3
	4. Others	7	2.0
	Total	**350**	**100.0**

Table 4-1 (Continued) Number and Percentage of sample group classified by General information (Background)

No.	General information	Number	Percentage
6	**Vehicle**		
	1. None	232	66.3
	2. Bicycle	78	22.3
	3. Motorcycle	11	3.1
	4. Personal car	29	8.3
	Total	**350**	**100.0**
7	**Interest activities**		
	1. Nothing	115	32.9
	2. Talk to friends	185	52.9
	3. Part-time job	88	25.1
	4. Go outside	173	49.4
	5. Hobby	141	40.3
	6. Talk about social problem	106	30.3
	7. Reading books	253	72.3
	8. Movie	188	53.7
	9. Listen to radio	249	71.1
	10. Playing sports	191	54.6
	11. Watching television	229	65.4
	12. Internet	221	63.1
	13. Others	39	11.1
	Mode = reading books		

(7) Interest activities, were revealed that most of sample group was 72.3% reading books, followed by 71.1% listen to radio, 65.4% watching television, 63.1% internet, 54.6% playing sports, 53.7% movies, 52.9% talk to friends, 49.4% go outside, 40.3% hobby, 32.9% nothing, 30.0% talk about social problem, 25.1% part-time job, and 11.1% other activities respectively.

4.2 Environmental communication processes

The environmental communication processes of sample group was classified by environmental media exposure, topic in environmental information, information dissemination, interest in environmental information, education about

environmental problems, and feelings about environmental problems in term of number and percentage of Mahidol University first year students.

The results are as the followings:

Question 2: Environmental media exposure

Answer: Environmental media exposure, collected from the sample group, consist of never or ever received environmental information through environmental media exposure: printed media such as newspapers, journal/magazine, and leaflet, electronics media such as television, radio, and internet, personal media such as friends and parents, experiences as education, and other media. The result will be expressed in percentage, shown in Table 4-2 and Table 4-3.

Table 4-2 Number and Percentage of sample group, classified by Environmental media exposure

No.	Environmental media exposure	Number	Percentage
1	Received	304	86.9
2	Never received	46	13.1
Total		**350**	**100.0**

According to the results, it was found that:

The most of sample group was 86.9% ever received environmental information and the rest was never received 13.1%.

The environmental media that the sample group were exposed the environmental information most was 82.9% television, followed by 62.3% newspapers, 51.1% radio, 47.1% educated, 41.1% internet, 40.0% journal/magazine, 30.0% friends, 21.4% leaflet, 18.9% parents, and 4.3% other media respectively.

Table 4-3 Number and Percentage of sample group, classified by Environmental media

No.	Environmental media exposure	Number	Percentage
1	Newspapers	218	62.3
2	Journal/Magazine	140	40.0
3	Leaflet	75	21.4
4	Television	290	82.9
5	Radio	179	51.1
6	Internet	144	41.1
7	Friends	106	30.3
8	Parents	66	18.9
9	Education	165	47.1
10	Others	15	4.3
Mode = Television			

Question 3: Topic in environmental information

Answer: Topic in environmental information, collected from the sample group, consist of natural resources, bio-diversity, environmental problem, conservation, and other topics. The result will be expressed in percentage, shown in Table 4-4.

According to the results, it was found that:

The topic in environmental information were revealed that most of sample group was 55.1% ever received environmental problems information, followed by 27.1% ever received natural resources information, 8.0% ever received conservation information, 5.7% ever received bio-diversity information, and 4.0% ever received other topic in environmental information respectively.

Table 4-4 Number and Percentage of sample group, classified by Topic in environmental information

No.	Environmental topic	Number	Percentage
1	Natural resource	95	27.1
2	Bio-diversity	20	5.7
3	Environmental problems	193	55.1
4	Conservation	28	8.0
5	Others	14	4.0
Mode = Environmental problems			

Question 4: Environmental information dissemination

Answer: Environmental information dissemination, collected from the sample group, consist of had environmental information dissemination or not. The result will be expressed in percentage, shown in Table 4-5.

Table 4-5 Number and Percentage of sample group, classified by Environmental information dissemination

No.	Environmental information dissemination	Number	Percentage
1	Yes	300	85.7
2	No	50	14.3
Total		**350**	**100.0**

According to the results, it was found that:

The most of sample group was 85.7% had environmental information dissemination and the rest was 14.3% had no environmental information dissemination.

Question 5: Interest in environmental information

Answer: Interest in environmental information, collected from the sample group, consisted of 3 levels: high, moderate, and low interest in environmental information. The result will be expressed in percentage, shown in Table 4-6.

Table 4-6 Number and Percentage of sample group, classified by Interest in environmental information

No.	Interest in environmental information	Number	Percentage
1	High	34	9.7
2	Moderate	232	66.3
3	Low	84	24.0
Mode = Moderate			

According to the results, it was found that:

The interest in environmental information were revealed that most of sample group was 66.3% interest in environmental information at moderate level, followed by 24.0% interest in environmental information at low level, and 9.7% interest in environmental information at high level respectively.

Question 6: Education about environmental problems

Answer: Education about environmental problems, collected from the sample group, consisted of never or ever had education about environmental problems. The result will be expressed in percentage, shown in Table 4-7.

According to the results, it was found that:

The most of sample group was 54.9% never had education about environmental problems and the rest was 45.1% had education about environmental problems.

Table 4-7 Number and Percentage of sample group, classified by their Education about environmental problems

No.	Education about environmental problems	Number	Percentage
1	Ever	158	45.1
2	Never	192	54.9
Total		**350**	**100.0**

Question 7: Feelings about environmental problems

Answer: Feelings about environmental problems, collected from the sample group, consist of 3 feelings: nothing, interesting, and worry and should be solved. The result will be expressed in percentage, shown in Table 4-8.

Table 4-8 Number and Percentage of sample group, classified by Feelings about environmental problems

No.	Feelings about environmental problems	Number	Percentage
1	Nothing	14	4.0
2	Interesting	73	20.9
3	Worry and Should be solved	263	75.1
Mode = Worry and Should be solved			

According to the results, it was found that:

The feelings about environmental problems were revealed that most of sample group was 75.1% feel worry and should be solved, followed by 20.9% feel interesting, and 4.0% feel nothing respectively.

4.3 Environmental perception

Question 8: Perception about the importance of environmental problems

Answer: Perception about the importance of environmental problems, collected from the sample group, consist of 6 level: 5 importance levels and don't know level about 10 environmental problems. Ten environmental problems were the environmental problems in world, country, and community: green house effect, acid rain, ozone depletion, air pollution, water pollution, increasing of waste and hazardous waste, forest and soil degradation, coastal and marine degradation, noise and visual pollution, and conservation. The result will be expressed in percentage and mode of importance level, shown in Table 4-9.

According to the results, it was found that:

(1) Perception about the importance of green house effect problem, most of sample group was 62.9% perceived at high important level.

(2) Perception about the importance of acid rain problem, most of sample group was 42.9% perceived at high important level.

(3) Perception about the importance of ozone depletion problem, most of sample group was 47.1% perceived at high important level.

(4) Perception about the importance of air pollution problem, most of sample group was 45.7% perceived at high important level.

(5) Perception about the importance of water pollution problem, most of sample group was 53.1% perceived at high important level.

(6) Perception about the importance of increasing of waste and hazardous waste problem, most of sample group was 51.1% perceived at high important level.

(7) Perception about the importance of forest and soil degradation problem, most of sample group was 42.3% perceived at highest important level.

(8) Perception about the importance of coastal and marine degradation problem, most of sample group was 46.0% perceived at high important level.

(9) Perception about the importance of noise and visual pollution problems, most of sample group was 46.0% perceived at high important level.

(10) Perception about the importance of conservation, most of sample group was 45.1% perceived at highest important level.

Table 4-9 Number, Percentage, Mean, Standard Deviation, and Mode of the Perception about the importance of environmental problems

Environmental problems	Importance level						$\bar{X}$	S.D.	N	Mode
	0	1	2	3	4	5				
1. Green house effect	5 (1.4)	2 (.6)	1 (.3)	47 (13.4)	220 (62.9)	75 (21.4)	4.00	.80	350	**4**
2. Acid rain	9 (2.6)	2 (.6)	23 (6.6)	131 (37.4)	150 (42.9)	35 (10.0)	3.47	.96	350	**4**
3. Ozone depletion	3 (.9)	1 (.3)	- -	35 (10.0)	165 (47.1)	146 (41.7)	4.27	.78	350	**4**
4. Air pollution in Bangkok	2 (.6)	1 (.3)	4 (1.1)	34 (9.7)	160 (45.7)	149 (42.6)	4.27	.78	350	**4**
5. Water pollution in industrial area	3 (.9)	1 (.3)	5 (1.4)	44 (12.6)	186 (53.1)	111 (31.7)	4.12	.81	350	**4**
6. Increasing of waste and hazardous waste	2 (.6)	1 (.3)	4 (1.1)	48 (13.7)	179 (51.1)	116 (33.1)	4.14	.78	350	**4**
7. Forest and soil degradation	2 (.6)	- -	2 (.6)	52 (14.9)	146 (41.7)	148 (42.3)	4.24	.79	350	**5**
8. Coastal and marine degradation	1 (.3)	3 (.9)	8 (2.3)	83 (23.7)	161 (46.0)	94 (26.9)	3.95	.85	350	**4**
9. Noise and visual pollution	1 (.3)	3 (.9)	24 (6.9)	109 (31.1)	161 (46.0)	52 (14.9)	3.66	.86	350	**4**
10. Conservation	1 (.3)	1 (.3)	7 (2.0)	45 (12.9)	138 (39.4)	158 (45.1)	4.26	.82	350	**5**

0 = Don't know
1 = Not important
2 = Less important
3 = Moderate
4 = High important
5 = Highest important

Question 9: Perception of Green House Effect

Answer: Perception of green house effect, collected from the sample group, consist of meaning, cause, effect, level of problem, sources of information, and information dissemination. The result will be expressed in percentage, shown in Table 4-10.

According to the results, it was found that:

(1) Meaning, most of sample group was 90.0% gave the correct answer, and only 10.0% gave the incorrect answer about green house effect problem.

(2) Cause, most of sample group was 74.0% gave the correct answer, and 26.0% gave the incorrect answer about green house effect problem.

(3) Effect, most of sample group was 81.7% gave the correct answer, and only 18.3% gave the incorrect answer about green house effect problem.

(4) Level of problem, most of sample group was 91.4% perceived the problem at high level, followed by 4.0% unsure, 3.4% perceived the problem at low level, and 1.1% perceived no problem respectively.

(5) Sources of information, most of sample group was 65.7% received information through printed media, followed by 12.0% received information through personal media, 10.6% never received information, 6.3% received information through experiences, and 5.4% received information through electronics media respectively.

(6) Information dissemination, most of sample group was 52.9% had no information dissemination, and 47.1% had information dissemination.

Table 4-10 Number and Percentage of sample group, classified by Perception of Green house effect

No.	Green house effect	Number	Percentage
1	**What is green house effect?**		
	1. Correct	315	90.0
	2. Incorrect	35	10.0
	Total	**350**	**100.0**
2	**What cause of green house effect?**		
	1. Correct	259	74.0
	2. Incorrect	91	26.0
	Total	**350**	**100.0**
3	**What effect of green house effect?**		
	1. Correct	286	81.7
	2. Incorrect	64	18.3
	Total	**350**	**100.0**
4	**Level of green house effect problem**		
	1. No problem	4	1.1
	2. Low	12	3.4
	3. High	320	91.4
	4. Unsure	14	4.0
	Mode = High		
5	**Sources of green house effect information**		
	1. Never	37	10.6
	2. Printed media	230	65.7
	3. Electronics media	19	5.4
	4. Personal media	42	12.0
	5. Experiences	22	6.3
	Mode = Printed media		
6	**Green house effect information dissemination**		
	1. Yes	165	47.1
	2. No	185	52.9
	Total	**350**	**100.0**

Question 10: Perception of Acid Rain

Answer: Perception of acid rain, collected from the sample group, consist of meaning, cause, effect, level of problem, sources of information, and information dissemination. The result will be expressed in percentage, shown in Table 4-11.

According to the results, it was found that:

(1) Meaning, most of sample group was 79.4% gave the correct answer, and 20.6% gave the incorrect answer about acid rain problem.

(2) Cause, most of sample group was 84.6% gave the correct answer, and only 15.4% gave the incorrect answer about acid rain problem.

(3) Effect, most of sample group was 68.6% gave the correct answer, and 31.4% gave the incorrect answer about acid rain problem.

(4) Level of problem, most of sample group was 76.3% perceived the problem at high level, followed by 12.6% perceived the problem at low level, 8.9% unsure, and 2.3% perceived no problem respectively.

(5) Sources of information, most of sample group was 53.4% received information through printed media, followed by 26.9% never received information, 11.1% received information through personal media, 4.6% received information through experiences, and 4.0% received information through electronics media respectively.

(6) Information dissemination, most of sample group was 70% had no information dissemination, and 30% had information dissemination.

Table 4-11 Number and Percentage of sample group, classified by Perception of Acid rain

No.	Acid rain	Number	Percentage
1	**What is acid rain?**		
	1. Correct	278	79.4
	2. Incorrect	72	20.6
	Total	**350**	**100.0**
2	**What cause of acid rain?**		
	1. Correct	296	84.6
	2. Incorrect	54	15.4
	Total	**350**	**100.0**
3	**What effect of acid rain?**		
	1. Correct	240	68.6
	2. Incorrect	110	31.4
	Total	**350**	**100.0**
4	**Level of acid rain problem**		
	1. No problem	8	2.3
	2. Low	44	12.6
	3. High	267	76.3
	4. Unsure	31	8.9
	Mode = High		
5	**Sources of acid rain information**		
	1. Never	94	26.9
	2. Printed media	187	53.4
	3. Electronics media	14	4.0
	4. Personal media	39	11.1
	5. Experiences	16	4.6
	Mode = Printed media		
6	**Acid rain information dissemination**		
	1. Yes	105	30.0
	2. No	245	70.0
	Total	**350**	**100.0**

Question 11: Perception of Ozone Depletion

Answer: Perception of ozone depletion, collected from the sample group, consist of meaning, cause, effect, level of problem, sources of information, and information dissemination. The result will be expressed in percentage, shown in Table 4-12.

According to the results, it was found that:

(1) Meaning, most of sample group was 58.0% gave the incorrect answer, and 42.0% gave the correct answer about ozone depletion problem.

(2) Cause, most of sample group was 87.4% gave the correct answer, and only 12.6% gave the incorrect answer about ozone depletion problem.

(3) Effect, most of sample group was 74.0% gave the correct answer, and 26.0% gave the incorrect answer about ozone depletion problem.

(4) Level of problem, most of sample group was 90.9% perceived the problem at high level, followed by 4.9% unsure, 2.3% perceived the problem at low level, and 2.0% perceived no problem respectively.

(5) Sources of information, most of sample group was 52.3% received information through printed media, followed by 22.3% never received information, 14.0% received information through personal media, 7.4% received information through electronics media, and 4.0% received information through experiences respectively.

(6) Information dissemination, most of sample group was 64.3% had no information dissemination, and 35.7% had information dissemination.

Table 4-12 Number and Percentage of sample group, classified by Perception of Ozone depletion

No.	Ozone depletion	Number	Percentage
1	**What is ozone depletion?**		
	1. Correct	147	42.0
	2. Incorrect	203	58.0
	Total	**350**	**100.0**
2	**What cause of ozone depletion?**		
	1. Correct	306	87.4
	2. Incorrect	44	12.6
	Total	**350**	**100.0**
3	**What effect of ozone depletion?**		
	1. Correct	259	74.0
	2. Incorrect	91	26.0
	Total	**350**	**100.0**
4	**Level of ozone depletion problem**		
	1. No problem	7	2.0
	2. Low	8	2.3
	3. High	318	90.9
	4. Unsure	17	4.9
	Mode = High		
5	**Sources of ozone depletion information**		
	1. Never	78	22.3
	2. Printed media	183	52.3
	3. Electronics media	26	7.4
	4. Personal media	49	14.0
	5. Experiences	14	4.0
	Mode = Printed media		
6	**Ozone depletion information dissemination**		
	1. Yes	125	35.7
	2. No	225	64.3
	Total	**350**	**100.0**

Question 12: Perception of Air Pollution

Answer: Perception of air pollution, collected from the sample group, consist of meaning, cause, effect, level of problem, sources of information, and information dissemination. The result will be expressed in percentage, shown in Table 4-13.

According to the results, it was found that:

(1) Meaning, most of sample group was 81.7% gave the correct answer, and only 18.3% gave the incorrect answer about air pollution problem.

(2) Cause, most of sample group was 91.7% gave the correct answer, and only 8.3% gave the incorrect answer about air pollution problem.

(3) Effect, most of sample group was 83.1% gave the correct answer, and only 16.9% gave the incorrect answer about air pollution problem.

(4) Level of problem, most of sample group was 91.4% perceived the problem at high level, followed by 4.0% perceived the problem at low level, 3.1% unsure, and 1.4% perceived no problem respectively.

(5) Sources of information, most of sample group was 56.9% received information through printed media, followed by 22.9% never received information, 7.7% received information through electronics media, 6.6% received information through experiences, and 6.0% received information through personal media respectively.

(6) Information dissemination, most of sample group was 61.7% had no information dissemination, and 38.3% had information dissemination.

Table 4-13 Number and Percentage of sample group, classified by Perception of Air pollution

No.	Air pollution	Number	Percentage
1	**What is air pollution?**		
	1. Correct	286	81.7
	2. Incorrect	64	18.3
	Total	**350**	**100.0**
2	**What cause of air pollution?**		
	1. Correct	321	91.7
	2. Incorrect	29	8.3
	Total	**350**	**100.0**
3	**What effect of air pollution?**		
	1. Correct	291	83.1
	2. Incorrect	59	16.9
	Total	**350**	**100.0**
4	**Level of air pollution problem**		
	1. No problem	5	1.4
	2. Low	14	4.0
	3. High	320	91.4
	4. Unsure	11	3.1
	Mode = High		
5	**Sources of air pollution information**		
	1. Never	80	22.9
	2. Printed media	199	56.9
	3. Electronics media	27	7.7
	4. Personal media	21	6.0
	5. Experiences	23	6.6
	Mode = Printed media		
6	**Air pollution information dissemination**		
	1. Yes	134	38.3
	2. No	216	61.7
	Total	**350**	**100.0**

Question 13: Perception of Water Pollution

Answer: Perception of water pollution, collected from the sample group, consist of meaning, cause, effect, level of problem, sources of information, and information dissemination. The result will be expressed in percentage, shown in Table 4-14.

According to the results, it was found that:

(1) Meaning, most of sample group was 90.0% gave the correct answer, and only 10.0% gave the incorrect answer about water pollution problem.

(2) Cause, most of sample group was 91.7% gave the correct answer, and only 8.3% gave the incorrect answer about water pollution problem.

(3) Effect, most of sample group was 93.7% gave the correct answer, and only 6.3% gave the incorrect answer about water pollution problem.

(4) Level of problem, most of sample group was 92.3% perceived the problem at high level, followed by 4.6% perceived the problem at low level, 2.3% unsure, and .9% perceived no problem respectively.

(5) Sources of information, most of sample group was 53.7% received information through printed media, followed by 23.7% never received information, 10.6% received information through electronics media, 7.1% received information through experiences, and 4.9% received information through personal media, respectively.

(6) Information dissemination, most of sample group was 63.1% had no information dissemination, and 36.9% had information dissemination.

Table 4-14 Number and Percentage of sample group, classified by Perception of Water pollution

No.	Water pollution	Number	Percentage
1	**What is water pollution?**		
	1. Correct	315	90.0
	2. Incorrect	35	10.0
	Total	**350**	**100.0**
2	**What cause of water pollution?**		
	1. Correct	321	91.7
	2. Incorrect	29	8.3
	Total	**350**	**100.0**
3	**What effect of water pollution?**		
	1. Correct	328	93.7
	2. Incorrect	22	6.3
	Total	**350**	**100.0**
4	**Level of water pollution problem**		
	1. No problem	3	.9
	2. Low	16	4.6
	3. High	323	92.3
	4. Unsure	8	2.3
	Mode = High		
5	**Sources of water pollution information**		
	1. Never	83	23.7
	2. Printed media	188	53.7
	3. Electronics media	37	10.6
	4. Personal media	17	4.9
	5. Experiences	25	7.1
	Mode = Printed media		
6	**Water pollution information dissemination**		
	1. Yes	129	36.9
	2. No	221	63.1
	Total	**350**	**100.0**

Question 14: Perception of Hazardous Waste

Answer: Perception of hazardous waste, collected from the sample group, consist of meaning, cause, effect, level of problem, sources of information, and information dissemination. The result will be expressed in percentage, shown in Table 4-15.

According to the results, it was found that:

(1) Meaning, most of sample group was 70.6% gave the correct answer, and 29.4% gave the incorrect answer about hazardous waste problem.

(2) Cause, most of sample group was 83.1% gave the correct answer, and only 16.9% gave the incorrect answer about hazardous waste problem.

(3) Effect, most of sample group was 82.3% gave the correct answer, and only 1717% gave the incorrect answer about hazardous waste problem.

(4) Level of problem, most of sample group was 82.3% perceived the problem at high level, followed by 9.7% perceived the problem at low level, 6.0% unsure, and 2.0% perceived no problem respectively.

(5) Sources of information, most of sample group was 46.3% received information through printed media, followed by 38.3% never received information, 8.3% received information through electronics media, 3.7% received information through personal media, and 3.4% received information through experiences respectively.

(6) Information dissemination, most of sample group was 71.4% had no information dissemination, and 28.6% had information dissemination.

Table 4-15 Number and Percentage of sample group, classified by Perception of Hazardous waste

No.	Hazardous waste	Number	Percentage
1	**What is hazardous waste?**		
	1. Correct	247	70.6
	2. Incorrect	103	29.4
	Total	**350**	**100.0**
2	**What cause of hazardous waste?**		
	1. Correct	291	83.1
	2. Incorrect	59	16.9
	Total	**350**	**100.0**
3	**What effect of hazardous waste?**		
	1. Correct	288	82.3
	2. Incorrect	62	17.7
	Total	**350**	**100.0**
4	**Level of hazardous waste problem**		
	1. No problem	7	2.0
	2. Low	34	9.7
	3. High	288	82.3
	4. Unsure	21	6.0
	Mode = High		
5	**Sources of hazardous waste information**		
	1. Never	134	38.3
	2. Printed media	162	46.3
	3. Electronics media	29	8.3
	4. Personal media	13	3.7
	5. Experiences	12	3.4
	Mode = Printed media		
6	**Hazardous waste information dissemination**		
	1. Yes	100	28.6
	2. No	250	71.4
	Total	**350**	**100.0**

Question 15: Perception of Forest and Soil Degradation

Answer: Perception of forest and soil degradation, collected from the sample group, consist of meaning, cause, effect, level of problem, sources of information, and information dissemination. The result will be expressed in percentage, shown in Table 4-16.

According to the results, it was found that:

(1) Meaning, most of sample group was 84.0% gave the correct answer, and only 16.0% gave the incorrect answer about forest and soil degradation problem.

(2) Cause, most of sample group was 90.0% gave the correct answer, and only 10.0% gave the incorrect answer about forest and soil degradation problem.

(3) Effect, most of sample group was 88.9% gave the correct answer, and only 11.1% gave the incorrect answer about forest and soil degradation problem.

(4) Level of problem, most of sample group was 86.9% perceived the problem at high level, followed by 7.1% perceived the problem at low level, 3.7% unsure, and 2.3% perceived no problem respectively.

(5) Sources of information, most of sample group was 55.1% received information through printed media, followed by 29.1% never received information, 8.3% received information through electronics media, 4.3% received information through personal media, and 3.1% received information through experiences respectively.

(6) Information dissemination, most of sample group was 68.0% had no information dissemination, and 32.0% had information dissemination.

Table 4-16 Number and Percentage of sample group, classified by Perception of Forest and soil degradation

No.	Forest and soil degradation	Number	Percentage
1	**What is forest and soil degradation?**		
	1. Correct	294	84.0
	2. Incorrect	56	16.0
	Total	**350**	**100.0**
2	**What cause of forest and soil degradation?**		
	1. Correct	315	90.0
	2. Incorrect	35	10.0
	Total	**350**	**100.0**
3	**What effect of forest and soil degradation?**		
	1. Correct	311	88.9
	2. Incorrect	39	11.1
	Total	**350**	**100.0**
4	**Level of forest and soil degradation problem**		
	1. No problem	8	2.3
	2. Low	25	7.1
	3. High	304	86.9
	4. Unsure	13	3.7
	Mode = High		
5	**Sources of forest and soil degradation information**		
	1. Never	102	29.1
	2. Printed media	193	55.1
	3. Electronics media	29	8.3
	4. Personal media	15	4.3
	5. Experiences	11	3.1
	Mode = Printed media		
6	**Forest and soil degradation information dissemination**		
	1. Yes	112	32.0
	2. No	238	68.0
	Total	**350**	**100.0**

Question 16: Perception of Coastal and Marine Degradation

Answer: Perception of coastal and marine degradation, collected from the sample group, consist of meaning, cause, effect, level of problem, sources of information, and information dissemination. The result will be expressed in percentage, shown in Table 4-17.

According to the results, it was found that:

(1) Meaning, most of sample group was 75.7% gave the correct answer, and 24.3% gave the incorrect answer about coastal and marine degradation problem.

(2) Cause, most of sample group was 82.6% gave the correct answer, and only 17.4% gave the incorrect answer about coastal and marine degradation problem.

(3) Effect, most of sample group was 84.3% gave the correct answer, and only 15.7% gave the incorrect answer about coastal and marine degradation problem.

(4) Level of problem, most of sample group was 81.7% perceived the problem at high level, followed by 10.0% perceived the problem at low level, 5.4% unsure, and 2.9% perceived no problem respectively.

(5) Sources of information, most of sample group was 45.4% received information through printed media, followed by 36.3% never received information, 9.1% received information through electronics media, 4.6% received information through personal media, and 4.6% received information through experiences respectively.

(6) Information dissemination, most of sample group was 71.4% had no information dissemination, and 28.6% had information dissemination.

Table 4-17 Number and Percentage of sample group, classified by Perception of Coastal and marine degradation

No.	Coastal and marine degradation	Number	Percentage
1	**What is coastal and marine degradation?**		
	1. Correct	265	75.7
	2. Incorrect	85	24.3
	Total	**350**	**100.0**
2	**What cause of coastal and marine degradation?**		
	1. Correct	289	82.6
	2. Incorrect	61	17.4
	Total	**350**	**100.0**
3	**What effect of coastal and marine degradation?**		
	1. Correct	295	84.3
	2. Incorrect	55	15.7
	Total	**350**	**100.0**
4	**Level of coastal and marine degradation problem**		
	1. No problem	10	2.9
	2. Low	35	10.0
	3. High	286	81.7
	4. Unsure	19	5.4
	Mode = High		
5	**Sources of coastal and marine degradation information**		
	1. Never	127	36.3
	2. Printed media	159	45.4
	3. Electronics media	32	9.1
	4. Personal media	16	4.6
	5. Experiences	16	4.6
	Mode = Printed media		
6	**Coastal and marine degradation information dissemination**		
	1. Yes	100	28.6
	2. No	250	71.4
	Total	**350**	**100.0**

Question 17: Perception of Environmental Problems in Community

Answer: Perception of environmental problems in community, collected from the sample group, consist of environmental problems, pollution, level of problem, violent problem, sources of information, and information dissemination. The result will be expressed in percentage, shown in Table 4-18.

According to the results, it was found that:

(1) Environmental problem, most of sample group was 86.9% perceived in community have environmental problem, but 13.1% perceived in community not have environmental problem.

(2) Pollution in community, most of sample group was 66.9% perceived air pollution, follow by 60.3% perceived waste pollution, 53.7% perceived water pollution, 48.0% perceived noise pollution, 32.9% perceived visual pollution, and 5.1% perceived other pollution respectively.

(3) Level of problem in community, most of sample group was 40.6% perceived the problem at low level, followed by 26.3% perceived the problem at moderate level, 25.1% perceived the problem at high level, 6.0% perceived no problem, and 2.0% unsure respectively.

(4) Violent problem, most of sample group was 72.0% perceived violent problem in community, and 28.0% perceived no violent problem in community.

(5) Sources of information, most of sample group was 40.3% never received information, followed by 26.3% received information through experiences, 23.1% received information through printed media, 6.6% received information through personal media, and 3.7% received information through electronics media respectively.

(6) Information dissemination, most of sample group was 62.0% had no information dissemination, and 38.0% had information dissemination.

Table 4-18 Number and Percentage of sample group, classified by Perception of Environmental problems in community

No.	Environmental problems in community	Number	Percentage
1	**Is there environmental problems in your community?**		
	1. Yes	304	86.9
	2. No	46	13.1
	Total	**350**	**100.0**
2	**Pollutions in community**		
	1. Air pollution	234	66.9
	2. Water pollution	188	53.7
	3. Noise pollution	168	48.0
	4. Waste pollution	211	60.3
	5. Visual pollution	115	32.9
	6. Others	18	5.1
	Mode = Air pollution		
3	**Level of problem**		
	1. No problem	21	6.0
	2. Low	142	40.6
	3. Moderate	92	26.3
	4. High	88	25.1
	5. Unsure	7	2.0
	Mode = Low		
4	**Violent of problem**		
	1. Yes	252	72.0
	2. No	98	28.0
	Total	**350**	**100.0**
5	**Sources of information**		
	1. Never	141	40.3
	2. Printed media	81	23.1
	3. Electronics media	13	3.7
	4. Personal media	23	6.6
	5. Experiences	92	26.3
	Mode = Never		
6	**Information dissemination**		
	1. Yes	133	38.0
	2. No	217	62.0
	Total	**350**	**100.0**

Question 18: Perception of Conservation

Answer: Perception of conservation, collected from the sample group, consist of meaning, participation, necessary, sources of information, and information dissemination. The result will be expressed in percentage, shown in Table 4-19.

Table 4-19 Number and Percentage of sample group, classified by Perception of Conservation

No.	Conservation	Number	Percentage
1	**What is conservation?**		
	1. Correct	270	77.1
	2. Incorrect	80	22.9
	Total	**350**	**100.0**
2	**Participation**		
	1. Yes	266	76.0
	2. No	84	24.0
	Total	**350**	**100.0**
3	**Necessary of conservation**		
	1. High necessary	283	80.9
	2. Moderate	39	11.1
	3. Unnecessary	19	5.4
	4. Don't know	9	2.6
	Mode = High necessary		
4	**Sources of conservation information**		
	1. Never	95	27.1
	2. Printed media	190	54.3
	3. Electronics media	138	39.4
	4. Personal media	79	22.6
	5. Experiences	55	15.7
	Mode = Printed media		
5	**Conservation information dissemination**		
	1. Yes	175	50.0
	2. No	175	50.0
	Total	**350**	**100.0**

According to the results, it was found that:

(1) Meaning, most of sample group was 77.1% gave the correct answer, and 22.9% gave the incorrect answer about conservation.

(2) Participation, most of sample group was 76.0% had participation, and 24.0% had no participation.

(3) Necessary, most of sample group was 80.9% perceived the conservation at high necessary level, followed by 11.1% perceived the conservation at moderate level, 5.4% perceived the conservation at unnecessary level, and 2.6% don't know respectively.

(4) Sources of information, most of sample group was 54.3% received information through printed media, followed by 39.4% received information through electronics media, 27.1% never received information, 22.6% received information through personal media, and 15.7% received information through experiences respectively.

(5) Information dissemination, both of sample group was 50% had no information dissemination, and 50% had information dissemination.

4.4 Hypothesis Testing

The results of testing 8 hypotheses in this research were showed by proved the hypothesis as follows:

4.4.1 The association between the environmental information and the knowledge about environmental problems

Analysis the association between the knowledge about environmental problems and the environmental information including environmental media exposure, interest in environmental information, education about environmental problems, and feelings about environmental problems resulted as the followings:

The results indicated that most of sample group had knowledge about environmental problems at high level. The details showed in Table 4-20.

Table 4-20 Number and Percentage of sample group, classified by Knowledge about environmental problems

No.	Knowledge about environmental problems	Number	Percentage
1	Low	24	6.8
2	Moderate	71	20.3
3	High	255	72.9
Total		**350**	**100.0**
Mode = High	**Minimum** = 0		**Maximum** = 26
Mean = 20.4257	**S.D.** = 5.0481		

Table 4-20 showed that the level of knowledge about environmental problems scores were divided into three levels, including low, moderate, and high level of knowledge. It was found that most of sample had knowledge about environmental problems at high level (72.9%) followed by moderate level (20.3%) and low level (6.8%) respectively.

Hypothesis

4.4.1.1 **Knowledge about environmental problems was depended on Environmental media exposure.**

Exposure to environmental information happened via several channels: printed media, electronics media, personal media, etc. But in this association test, the exposure was classified into 2 groups: had received (Ever) and never had received (Never). The association between knowledge about environmental problems and environmental media exposure was tested using Chi-square. The association test result showed that Knowledge about environmental problems was depended on

Environmental media exposure with statistical significance of .05, corresponding to the existing assumption, as in the Table 4-21.

Table 4-21 Association between Knowledge about environmental problems and Environmental media exposure

No.	Environmental media exposure	Knowledge about environmental problems							
		Low		Moderate		High		Total	
		n	%	n	%	n	%	n	%
1	Never	5	1.4	17	4.9	24	6.9	46	13.1
2	Ever	19	5.4	54	15.4	231	66.0	304	86.9
Total		24	6.8	71	20.3	255	72.9	350	100.0
Chi-Square = 11.609[a]				**df = 2**				**Significance = .003***	

***** P<.05

[a.] 1 cells (16.7%) have expected count less than 5. The minimum expected count is 3.15.

Table 4-21 showed the results of association between knowledge about environmental problems and environmental media exposure. It was found that most of sample group 304 people had ever received the environmental media exposure and had the knowledge about environmental problems at high level 255 people or 72.9 percent when test the association between knowledge about environmental problems and environmental media exposure.

4.4.1.2 **Knowledge about environmental problems was depended on Interest in environmental information.**

The association between knowledge about environmental problems and interest in environmental information was tested using Chi-square. The association test result showed that Knowledge about environmental problems was not depended on Interest in environmental information with statistical significance of .05, not corresponding to the existing assumption, as in the Table 4-22.

Table 4-22 Association between Knowledge about environmental problems and Interest in environmental information

No.	Interest in environmental information	Knowledge about environmental problems							
		Low		Moderate		High		Total	
		n	%	n	%	n	%	n	%
1	Low	6	1.7	15	4.3	67	19.1	88	25.1
2	Moderate	16	4.6	49	14.0	167	47.7	232	66.3
3	High	2	.6	7	2.0	21	6.0	30	8.6
Total		24	17.7	71	20.3	255	72.9	350	100.0
Chi-Square = .863[a]				**df = 4**				**Significance = .930**	

***** P<.05

[a.] 1 cells (11.1%) have expected count less than 5. The minimum expected count is 2.06.

Table 4-22 showed the results of association between knowledge about environmental problems and interest in environmental information. It was found that most of sample group 232 people had interest in environmental information at moderate level and had the knowledge about environmental problems at high level 167 people or 47.7 percent, when test the association between knowledge about environmental problems and interest in environmental information.

4.4.1.3 **Knowledge about environmental problems was depended on Education about environmental problems.**

The association between knowledge about environmental problems and education about environmental problems was tested using Chi-square. The association test result showed that Knowledge about environmental problems was depended on Education about environmental problems with statistical significance of .05, corresponding to the existing assumption, as in the Table 4-23.

Table 4-23 Association between Knowledge about environmental problems and Education about environmental problems

No.	Education about environmental problems	Knowledge about environmental problems							
		Low		Moderate		High		Total	
		n	%	n	%	n	%	n	%
1	Never	17	4.9	47	13.4	128	36.6	192	54.9
2	Ever	7	2.0	24	6.9	127	36.3	158	45.1
Total		24	6.9	71	20.3	255	72.9	350	100.0
Chi-Square = 8.398[a]				**df = 2**				**Significance = .015***	

* P<.05

[a.] 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.83.

Table 4-23 showed the results of association between knowledge about environmental problems and education about environmental problems. It was found that most of sample group 192 people never had education about environmental problems and had the knowledge about environmental problems at high level 128 people or 36.6 percent when test the association between knowledge about environmental problems and education about environmental problems.

4.4.1.4 **Knowledge about environmental problems was depended on Feelings about environmental problems.**

The association between knowledge about environmental problems and feelings about environmental problems was tested using Chi-square. The association test result showed that Knowledge about environmental problems was depended on Feelings about environmental problems with statistical significance of .05, corresponding to the existing assumption, as in the Table 4-24.

Table 4-24 Association between Knowledge about environmental problems and Feelings about environmental problems

No.	Feelings about environmental problems	Knowledge about environmental problems							
		Low		Moderate		High		Total	
		n	%	n	%	n	%	n	%
1	None	3	.9	4	1.11	7	2.0	14	4.0
2	Interesting	8	2.3	8	2.3	57	16.3	73	20.9
3	Worry and should be solved	13	3.7	59	16.9	191	54.6	263	75.1
Total		24	6.9	134	20.3	255	72.9	350	100.0
Chi-Square = 13.013[a]				**df = 4**				**Significance = .011***	

* P<.05

[a.] 2 cells (22.2%) have expected count less than 5. The minimum expected count is .96.

Table 4-24 showed the results of association between knowledge about environmental problems and feelings about environmental problems. It was found that most of sample group 263 people had feelings about environmental problems at worry and should be solved level and had the knowledge about environmental problems at high level 191 people or 54.6 percent, when test the association between knowledge about environmental problems and feelings about environmental problems.

4.4.2 The association between the environmental information and the perception about the importance of environmental problems

Analysis the association between the perception about the importance of environmental problems and the environmental information including environmental media exposure, interest in environmental information, education about environmental problems, and feelings about environmental problems resulted as the followings:

The results indicated that most of sample group had perception about the importance of environmental problems at moderate level. The details showed in Table 4-25.

Table 4-25 Number and Percentage of sample group, classified by Perception about the importance of environmental problems

No.	Perception about the importance of environmental problems	Number	Percentage
1	Low	3	.9
2	Moderate	79	22.6
3	High	268	76.6
Total		**350**	**100.0**
Mode = High	**Minimum** = 0		**Maximum** = 50
Mean = 40.3971	**S.D.** = 5.4081		

Table 4-25 showed that the level of perception about the importance of environmental problems scores were divided into three levels, including low, moderate, and high level of perception. It was found that most of sample had perception about the importance of environmental problems at high level (76.6%) followed by moderate level (22.6%) and low level (.9%) respectively.

Hypothesis

4.4.2.1 **Perception about the importance of environmental problems was depended on Environmental media exposure.**

The association between perception about the importance of environmental problems and environmental media exposure was tested using Chi-square. The association test result showed that Perception about the importance of environmental problems was not depended on Environmental media exposure with statistical

significance of .05, not corresponding to the existing assumption, as in the Table 4-26.

Table 4-26 Association between Perception about the importance of environmental problems and Environmental media exposure

No.	Environmental media exposure	Perception about the importance of environmental problems							
		Low		Moderate		High		Total	
		n	%	n	%	n	%	n	%
1	Never	0	.0	14	4	32	9.1	46	13.1
2	Ever	3	.9	65	18.6	236	67.4	304	86.9
Total		3	.9	79	22.6	268	76.6	350	100.0
Chi-Square = 2.244[a]				**df = 2**				**Significance = .326**	

***** P<.05

[a.] 2 cells (33.3%) have expected count less than 5. The minimum expected count is .39.

Table 4-26 showed the results of association between perception about the importance of environmental problems and environmental media exposure, found that most of sample group 304 people had ever received environmental media exposure and had the perception about the importance of environmental problems at high level 236 people or 67.4 percent when test the association between perception about the importance of environmental problems and environmental media exposure.

4.4.2.2 **Perception about the importance of environmental problems was depended on Interest in environmental information.**

The association between perception about the importance of environmental problems and interest in environmental information was tested using Chi-square. The association test result showed that Perception about the importance of environmental problems was not depended on Environmental media exposure with statistical

significance of .05, not corresponding to the existing assumption, as in the Table 4-27.

Table 4-27 Association between Perception about the importance of environmental problems and Interest in environmental information

No.	Interest in environmental information	Perception about the importance of environmental problems							
		Low		Moderate		High		Total	
		n	%	n	%	n	%	n	%
1	Low	1	.3	22	6.3	65	18.6	88	25.1
2	Moderate	2	.6	55	15.7	175	50.0	232	66.3
3	High	0	.0	2	.6	28	8.0	30	8.6
Total		3	.9	79	22.6	268	76.6	350	100.0
Chi-Square = 5.286[a]				**df = 4**				**Significance = .259**	

***** P<.05

[a.] 3 cells (33.3%) have expected count less than 5. The minimum expected count is .26.

Table 4-27 showed the results of association between perception about the importance of environmental problems and interest in environmental information. It was found that most of sample group 232 people had interest in environmental information at the moderate level and had the perception about the importance of environmental problems at high level 175 people or 50.0 percent, when test the association between perception about the importance of environmental problems and interest in environmental information.

4.4.2.3 **Perception about the importance of environmental problems was depended on Education about environmental problems.**

The association between perception about the importance of environmental problems and education about environmental problems was tested using Chi-square. The association test result showed that Perception about the importance of

environmental problems was not depended on Education about environmental problems with statistical significance of .05, not corresponding to the existing assumption, as in the Table 4-28.

Table 4-28 Association between Perception about the importance of environmental problems and Education about environmental problems

No.	Education about environmental problems	Perception about the importance of environmental problems							
		Low		Moderate		High		Total	
		n	%	n	%	n	%	n	%
1	Never	1	.3	50	14.3	141	40.3	192	54.9
2	Ever	2	.6	29	8.3	127	36.3	158	45.1
Total		3	.9	79	22.6	268	76.6	350	100.0
Chi-Square = 3.376[a]				**df = 2**				**Significance = .185**	

* P<.05

[a.] 2 cells (33.3%) have expected count less than 5. The minimum expected count is 1.35.

Table 4-28 showed the results of association between perception about the importance of environmental problems and education about environmental problems. It was found that most of sample group 192 people never had education about environmental problems and had the perception about the importance of environmental problems at high level 141 people or 40.3 percent when test the association between perception about the importance of environmental problems and education about environmental problems.

4.4.2.4 **Perception about the importance of environmental problems was depended on Feelings about environmental problems.**

The association between perception about the importance of environmental problems and feelings about environmental problems was tested using Chi-square. The association test result showed that Perception about the importance of

environmental problems was not depended on Feelings about environmental problems with statistical significance of .05, not corresponding to the existing assumption, as in the Table 4-29.

Table 4-29 Association between Perception about the importance of environmental problems and Feelings about environmental problems

No.	Feelings about environmental problems	Perception about the importance of environmental problems							
		Low		Moderate		High		Total	
		n	%	n	%	n	%	n	%
1	None	0	.0	7	2.0	7	2.0	14	4.0
2	Interesting	1	.3	17	4.9	55	15.7	73	20.9
3	Worry and should be solved	2	.6	55	15.7	206	58.9	263	75.1
Total		3	.9	79	22.6	268	76.6	350	100.0
Chi-Square = 6.787[a]				**df = 4**				**Significance = .148**	

* P<.05

[a.] 4 cells (44.4%) have expected count less than 5. The minimum expected count is .12.

Table 4-29 showed the results of association between perception about the importance of environmental problems and feelings about environmental problems. It was found that most of sample group 263 people had feelings about environmental problems at worry and should be solved level and had the perception about the importance of environmental problems at high level 206 people or 58.9 percent, when test the association between perception about the importance of environmental problems and feelings about environmental problems.

CHAPTER V
DISCUSSION

This research was study on "Mahidol University first year students' environmental perception through communication processes". The survey research was selected and the questionnaires were used for data collection with 350 samples from the population of the 2,657 personnel from 15 faculties of Mahidol University at Salaya. The results would be discussed as following discussion.

5.1 Answer the research questions

The results of study can be summarized in order to answer the research objective and research questions as follows:

Question 1: Mahidol University first year students' general information

General information of Mahidol University first year students consisted of faculty, sex, age, place of birth, address, vehicle, and interest activities. From the results, it was found that:

1. Faculty, there are 15 faculties of Mahidol University at Salaya. Sample group was 350 students from various faculties. Most of sample group selected from SC and AR.

2. Sex, most of sample group was female 238 students, and the rest was male 112 students.

3. Age, most of sample group was 18-19 years old.

4. Place of birth, both of sample group come from other provinces and Bangkok.

5. Address, most of sample group live inside Mahidol University.

6. Vehicle, most of sample group don't have vehicle

7. Interest activities, most of sample group loved to reading books, followed by listen to radio, watching television, internet, playing sports, movies, etc.

Question 2: Environmental media exposure

Environmental media exposure of Mahidol University first year students consisted of never or ever received environmental information through environmental media exposure: printed media such as newspapers, journal/magazine, and leaflet, electronics media such as television, radio, and internet, personal media such as friends and parents, experiences as educated, and other media. From the results, it was found that:

1. Most of sample group was ever received environmental information 304 students, and the rest was never received environmental information 46 students.

2. Most of sample group received environmental information from television, followed by newspapers, radio, educated, internet, journal/magazine, friends, leaflet, parents, and other media respectively.

Question 3: Topic in environmental information

Topic in environmental information of Mahidol University first year students consisted of natural resources, bio-diversity, environmental problem, conservation, and other topics. From the results, it was found that:

The most of sample group received environmental problem topic, followed by natural resources, conservation, bio-diversity, and other topic in environmental information respectively.

Question 4: Environmental information dissemination

Environmental information dissemination of Mahidol University first year students consisted of students had talked to people about environmental information or not. From the results, it was found that:

The most of sample group had environmental information dissemination 300 students, and the rest was no environmental information dissemination 50 students.

Question 5: Interest in environmental information

Interest in environmental information of Mahidol University first year students consisted of three levels of interesting: high, moderate, and low. From the results, it was found that:

The most of sample group was interest in environmental information at moderate level 232 students, followed by low level, and high level respectively.

Question 6: Environmental problems experience

Environmental problems experience of Mahidol University first year students consisted of ever had education about environmental problems or never. From the results, it was found that:

The most of sample group never had education about environmental problems 192 students, and the rest 158 students had education about environmental problems in their experience.

Question 7: Feelings about environmental problems

Feelings about environmental problems of Mahidol University first year students consisted of three feelings about environmental problems: nothing, interesting, and worry and should be solved. From the results, it was found that:

The most of sample group feel worry and should be solved about environmental problems 263 students, followed by interesting and nothing respectively.

Question 8: Perception about the importance of environmental problems

Perception about the importance of environmental problems of Mahidol University first year students consisted of five levels of the importance of environmental problems: highest important, high important, moderate, less important, and not important, and don't know level about ten environmental problems in world , country, and community. From the results, it was found that:

The most of sample group perceived high important about environmental problems: green house effect, acid rain, ozone depletion, air pollution in Bangkok, water pollution in industrial area, increasing of waste and hazardous waste, coastal and marine degradation, and noise and visual pollution. And perceived highest important about environmental problems: forest and soil degradation, and conservation.

Question 9: Perception of Green House Effect including meaning, cause, effect, importance, sources of information, and information dissemination

Perception of Green House Effect of Mahidol University first year students consisted of knowledge about meaning, cause, and effect of green house effect, level of problem, sources of problem, and information dissemination. From the results, it was found that:

1. Most of sample group perceived correct meaning, cause and effect of green house effect.

2. Most of sample group perceived the green house effect problem at high level, followed by unsure, low level, and no problem respectively.

3. Most of sample group received green house effect information through printed media, followed by personal media, never received, experience, and electronics media respectively.

4. Most of sample group had no green house effect information dissemination 185 students, and 165 students had dissemination about green house effect information.

Question 10: Perception of Acid Rain including meaning, cause, effect, importance, sources of information, and information dissemination

Perception of Acid Rain of Mahidol University first year students consisted of knowledge about meaning, cause, and effect of acid rain, level of problem, sources of problem, and information dissemination. From the results, it was found that:

1. Most of sample group perceived correct meaning, cause and effect of acid rain.

2. Most of sample group perceived the acid rain problem at high level, followed by low level, unsure, and no problem respectively.

3. Most of sample group received acid rain information through printed media, followed by never received, personal media, experience, and electronics media respectively.

4. Most of sample group had no acid rain information dissemination 245 students, and 105 students had dissemination about acid rain information.

Question 11: Perception of Ozone Depletion including meaning, cause, effect, importance, sources of information, and information dissemination

Perception of Ozone Depletion of Mahidol University first year students consisted of knowledge about meaning, cause, and effect of ozone depletion, level of problem, sources of problem, and information dissemination. From the results, it was found that:

1. Most of sample group perceived correct cause and effect, but perceived incorrect meaning of ozone depletion.

2. Most of sample group perceived the ozone depletion problem at high level, followed by unsure, low level, and no problem respectively.

3. Most of sample group received ozone depletion information through printed media, followed by never received, personal media, electronics media, and experience respectively.

4. Most of sample group had no ozone depletion information dissemination 225 students, and 125 students had dissemination about ozone depletion information.

Question 12: Perception of Air Pollution including meaning, cause, effect, importance, sources of information, and information dissemination

Perception of Air Pollution of Mahidol University first year students consisted of knowledge about meaning, cause, and effect of air pollution, level of problem, sources of problem, and information dissemination. From the results, it was found that:

1. Most of sample group perceived correct meaning, cause and effect of air pollution.

2. Most of sample group perceived the air pollution problem at high level, followed by low level, unsure, and no problem respectively.

3. Most of sample group received air pollution information through printed media, followed by never received, electronics media, experience, and personal media respectively.

4. Most of sample group had no air pollution information dissemination 216 students, and 134 students had dissemination about air pollution information.

Question 13: Perception of Water Pollution including meaning, cause, effect, importance, sources of information, and information dissemination

Perception of Water Pollution of Mahidol University first year students consisted of knowledge about meaning, cause, and effect of water pollution, level of problem, sources of problem, and information dissemination. From the results, it was found that:

1. Most of sample group perceived correct meaning, cause and effect of water pollution.

2. Most of sample group perceived the water pollution problem at high level, followed by low level, unsure, and no problem respectively.

3. Most of sample group received water pollution information through printed media, followed by never received, electronics media, experience, and personal media respectively.

4. Most of sample group had no water pollution information dissemination 221 students, and 129 students had dissemination about water pollution information.

Question 14: Perception of Hazardous Waste including meaning, cause, effect, importance, sources of information, and information dissemination

Perception of Hazardous Waste of Mahidol University first year students consisted of knowledge about meaning, cause, and effect of hazardous waste, level of problem, sources of problem, and information dissemination. From the results, it was found that:

1. Most of sample group perceived correct meaning, cause and effect of hazardous waste.

2. Most of sample group perceived the hazardous waste problem at high level, followed by low level, unsure, and no problem respectively.

3. Most of sample group received hazardous waste information through printed media, followed by never received, electronics media, personal media, and experience respectively.

4. Most of sample group had no hazardous waste information dissemination 250 students, and 100 students had dissemination about hazardous waste information.

Question 15: Perception of Forest and Soil Degradation including meaning, cause, effect, importance, sources of information, and information dissemination

Perception of Forest and Soil Degradation of Mahidol University first year students consisted of knowledge about meaning, cause, and effect of forest and soil degradation, level of problem, sources of problem, and information dissemination. From the results, it was found that:

1. Most of sample group perceived correct meaning, cause and effect of forest and soil degradation.

2. Most of sample group perceived the forest and soil degradation problem at high level, followed by low level, unsure, and no problem respectively.

3. Most of sample group received forest and soil degradation information through printed media, followed by never received, electronics media, personal media, and experience respectively.

4. Most of sample group had no forest and soil degradation information dissemination 238 students, and 112 students had dissemination about forest and soil degradation information.

Question 16: Perception of Coastal and Marine Degradation including meaning, cause, effect, importance, sources of information, and information dissemination

Perception of Coastal and Marine Degradation of Mahidol University first year students consisted of knowledge about meaning, cause, and effect of coastal and marine degradation, level of problem, sources of problem, and information dissemination. From the results, it was found that:

1. Most of sample group perceived correct meaning, cause and effect of coastal and marine degradation.

2. Most of sample group perceived the coastal and marine degradation problem at high level, followed by low level, unsure, and no problem respectively.

3. Most of sample group received coastal and marine degradation information through printed media, followed by never received, electronics media, personal media and experience respectively.

4. Most of sample group had no coastal and marine degradation information dissemination 250 students, and 100 students had dissemination about coastal and marine degradation information.

Question 17: Perception of Environmental Problems in Community including environmental problems, pollution, level of problem, violent problem, sources of information, and information dissemination

Perception of Environmental Problems in Community of Mahidol University first year students consisted of perceived environmental problems or not,

pollutions in community, level of problem, violent problem, sources of problem, and information dissemination. From the results, it was found that:

1. Most of sample group perceived environmental problems in community 304 students.

2. Most of sample group perceived in community had air pollution, followed by waste pollution, water pollution, noise pollution, visual pollution, and other pollution respectively.

3. Most of sample group perceived the environmental problems in community at low level, followed by moderate level, high level, no problem, and unsure respectively.

4. Most of sample group perceived the environmental problems in community was violent problem 252 students, and the rest perceived no problem 98 students.

5. Most of sample group never received environmental problems in community information, followed by received environmental problems in community information through experience, printed media, personal media, and electronics media respectively.

6. Most of sample group had no environmental problems in community information dissemination 217 students, and 133 students had dissemination about environmental problems in community information.

Question 18: Perception of Conservation including meaning, participation, necessary, sources of information, and information dissemination

Perception of Conservation of Mahidol University first year students consisted of knowledge about meaning of conservation, participation, necessary, sources of information, and information dissemination. From the results, it was found that:

1. Most of sample group perceived correct meaning of conservation.

2. Most of sample group had participation in conservation 266 students, and the rest was 80 students had no participation in conservation.

3. Most of sample group perceived the necessary of conservation at high necessary level, followed by moderate level, unnecessary level, and don't know respectively.

4. Most of sample group received conservation information through printed media, followed by electronics media, never received, personal media and experience respectively.

5. Both of sample group had conservation information dissemination 175 students, and had no conservation information dissemination 175 students.

5.2 Hypothesis testing

The results of study can be discussed according to the hypotheses as follows:

Hypothesis 1:

Knowledge about environmental problems was depended on Environmental media exposure.

The environmental media exposure was classified into two types: ever had exposure and never had exposure. It was found that there was association between environmental media exposure and knowledge about environmental problems with statistical significance of .05, corresponding to the existing assumption. This proved the hypothesis 1.

This can be explained that there was association between environmental media exposure and knowledge about environmental problems, i.e. the more environmental media exposure, the more knowledge about environmental problems.

Hypothesis 2:

Knowledge about environmental problems was depended on Interest in environmental information.

Interest in environmental information was classified into three levels: low, moderate, and high interested in environmental information. It was found that there was no association between interest in environmental information and knowledge about environmental problems with statistical significance of .05, not corresponding to the existing assumption. It did not follow the hypothesis 2.

This can be explained that there was no association between interest in environmental information and knowledge about environmental problems. This showed that interest in environmental information was not the influential factor of knowledge about environmental problems.

Hypothesis 3:

Knowledge about environmental problems was depended on Education about environmental problems.

Education about environmental problems was classified into two types: ever had education and never had education about environmental problems. It was found that there was association between education about environmental problems and knowledge about environmental problems with statistical significance of .05, corresponding to the existing assumption. This proved the hypothesis 3.

This can be explained that there was association between education about environmental problems and knowledge about environmental problems, i.e. the more education about environmental problems, the more knowledge about environmental problems.

Hypothesis 4:

Knowledge about environmental problems was depended on Feelings about environmental problems.

Feelings about environmental problems were classified into three feelings: none, interesting, and worry and should be solved feelings about environmental

problems. It was found that there was association between feelings about environmental problems and knowledge about environmental problems with statistical significance of .05, corresponding to the existing assumption. This proved the hypothesis 4.

This can explain that there was association between feelings about environmental problems and knowledge about environmental problems, i.e. the more feelings about environmental problems, the more knowledge about environmental problems.

Hypothesis 5:

Perception about the importance of environmental problems was depended on Environmental media exposure.

The environmental media exposure was classified into two types: ever had exposure and never had exposure. It was found that there was no association between environmental media exposure and perception about the importance of environmental problems with statistical significance of .05, not corresponding to the existing assumption. It did not follow the hypothesis 5.

This can be explained that there was no association between environmental media exposure and perception about the importance of environmental problems. This showed that environmental media exposure was not the influential factor of perception about the importance of environmental problems.

Hypothesis 6:

Perception about the importance of environmental problems was depended on Interest in environmental information.

Interest in environmental information was classified into three levels: low, moderate, and high interest in environmental information. It was found that there was no association between interest in environmental information and perception about

the importance of environmental problems with statistical significance of .05, not corresponding to the existing assumption. It did not follow the hypothesis 6.

This can be explained that there was no association between interest in environmental information and perception about the importance of environmental problems. This showed that interest in environmental information was not the influential factor of perception about the importance of environmental problems.

Hypothesis 7:

Perception about the importance of environmental problems was depended on Education about environmental problems.

Education about environmental problems was classified into two types: ever had education and never had education about environmental problems. It was found that there was no association between education about environmental problems and perception about the importance of environmental problems with statistical significance of .05, not corresponding to the existing assumption. It did not follow the hypothesis 7.

This can be explained that there was no association between education about environmental problems and perception about the importance of environmental problems. This showed that education about environmental problems was not the influential factor of perception about the importance of environmental problems.

Hypothesis 8:

Perception about the importance of environmental problems was depended on Feelings about environmental problems.

Feelings about environmental problems were classified into three feelings: none, interesting, and worry and should be solved feelings about environmental problems. It was found that there was no association between feelings about environmental problems and perception about the importance of environmental

problems with statistical significance of .05, not corresponding to the existing assumption. It did not follow the hypothesis 8.

This can explain that there was no association between feelings about environmental problems and perception about the importance of environmental problems. This showed was not the influential factor of perception about the importance of environmental problems.

The results of the hypothesis testing showed that the knowledge about environmental problems depended on environmental media exposure, education and feelings about environmental problems with statistical significance of .05. This can explain that student who had more knowledge about environmental problems, will have more environmental media exposure, education and feelings about environmental problems.

It was showed the importance of use and gratifications and selective exposure theory that: receiver had different information selective process with past experiences, belief, and attitude including perceived information for gratification by individual. According to the research result, found that persons who received environmental information because they were interested in environmental problems before and educated about environmental information from school, so environmental problems was important to them.

It was consistent with Wannee Jongsaksawad (1993) that samples, Mahidol University first year students were teenagers. They had more and widely social behavior than child, friends were importance, need more learning and role in social. Learning need and freedom thinking given them chances for media exposure.

Environmental media exposure was associated with knowledge about environmental problems, Because nowadays environmental problems become social problem, so environmental problems information was presented effects of problems to human health and living, social, and national economic. The receiver might be worried about effect of problem to themselves. It was bring about personal behavior at last. Besides, a battlefield of people for prevented and solved environmental problems by media, created attruistic prosocial behavior in people (Deaux, 1984). The occurrence behavior was due to realization of receiver, not only from sender.

The authorities presented environmental information through mass media, It was follow agenda setting theory that not only receiver learned about general information from media, but also learned to give the importance to these information by quantity of the importance from media (Denis, 1981). Agenda setting showed association of environmental information presentation that more environmental problems information presented by media, more environmental problems importance and perception of receiver.

According to perception about the importance of environmental problems, sample group give important to environmental problems at a high level. It was not associated with media exposure, interest in environmental information, education about environmental problems, and feelings about environmental problems. From the results, the researcher assumed that sample group, university students may be effect from several factors. Sukanya Teerawanich concluded that association with social institutes was depended on growth. That is sample group might had experiences with environmental problems, educated in school or university and information from personal media (friends, teachers), mass media, and other specialized media. As well as environmental problems was one of social problem that well known for all people.

It was relevant to the study of Preecha Upayokin, knowledge and attitude of high manager to environmental problems and policy in Thailand. The results showed that both background and environmental information pursuance effected to attitude at low level because environmental problems was problem of social. It was pertinent to Wanna Juarattanasirikul that environmental item receiving was no correlation to realize in environmental conservation.

CHAPTER VI
CONCLUSIONS AND RECOMMENDATIONS

The research on Mahidol University first year students' environmental perception through communication processes was a survey research with the main objective to study environmental perception through communication processes of Mahidol University first year students. The study was able to answer research questions and hypothesis testing that: the association between environmental perceptions (Knowledge about environmental problems and Perception about the importance of environmental problems) and environmental information (Environmental media exposure, Interest in environmental information, Education about environmental problems, and Feelings about environmental problems).

The population of the research was Mahidol University first year students on bachelor degree in the first semester 2004 from 15 faculties at Salaya. Size of sample group was 350 students.

Research tool was the questionnaires, which are established by the researcher. The structure of the questionnaire is divided into three parts, those are: general information, environmental communication processes, and environmental perception.

The Statistical Package for the Social Sciences (SPSS) was used to analyze information. Statistical analysis used the frequency, percentage, mean, mode, standard deviation, and Chi-square test.

The research result can be summarized as the followings:

6.1 Conclusions

6.1.1 General information of sample group

The information presented the background of the sample group in term of general information: faculty, sex, age, place of birth, address, vehicle, and interest activities. The results were revealed that most of sample group were from SC 39.1 percent, followed by AR, EG, EN, SI, PY, NS, BM, MT, PI, RA, PH, DT, SP, and VS respectively. Distributed by sex, most of sample group were female 68.0 percent, and the rest were male 32.0 percent. Most of sample group were 18 years old 60.6 percent, followed by 19, 20, and 17 years old respectively. From this study most of sample group come from other provinces 51.7 percent, nearly to students come from Bangkok 48.3 percent. Most of sample group live inside Mahidol University 72.0 percent, followed by live at home, live at other places, and live outside Mahidol University respectively. Distributed by vehicle, most of sample group not have vehicle 66.3 percent, followed by have bicycle, have personal car, and have motorcycle respectively. All of the samples were mostly loved to reading books 72.3 percent, near by listen to radio 71.1 percent ,followed by watching television, internet, playing sports, movies, talk to friends, go outside, hobby, nothing, talk about social problem, part-time job, and other activities respectively.

6.1.2 Environmental communication processes

The results were revealed that most of sample group ever received environmental information 86.9 percent, and the rest never received environmental information 13.1 percent. Most of sample group were exposed the environmental information from television 82.9 percent, followed by newspapers, radio, educated, internet, journal/magazine, friends, leaflet, parents, and other media respectively. Distributed by topic in environmental information, most of sample group ever received environmental problems topic 55.1 percent, followed by natural resources, conservation, bio-diversity, and other topic in environmental information respectively. After received environmental information, most of sample group had

environmental information dissemination 85.7 percent, and the rest 14.3 percent had no environmental information dissemination. About environmental information, most of sample group interested in environmental information at moderate level 6.3 percent, followed by low level, and high level respectively. Most of sample group never have education about environmental problems 54.9 percent, near by students 45.1 percent had education about environmental problems. From the result, most of sample group feel worry and should be solved about environmental problems 75.1 percent, followed by feel interesting, and feel nothing respectively.

6.1.3 Environmental perception

The most of sample group perceived high important about environmental problems of green house effect, acid rain, ozone depletion, air pollution in Bangkok, water pollution in industrial area, increasing of waste and hazardous waste, coastal and marine degradation, and noise and visual pollution. And perceived highest important about environmental problems of forest and soil degradation, and conservation.

The most of sample group perceived correct knowledge about meaning, cause, and effect of green house effect problem. Most of samples perceived the problem at high level, received information from printed media, and no information dissemination.

The most of sample group perceived correct knowledge about meaning, cause, and effect of acid rain problem. Most of samples perceived the problem at high level, received information from printed media, and no information dissemination.

The most of sample group perceived correct knowledge about cause and effect of ozone depletion problem, but perceived incorrect meaning. Most of samples perceived the problem at high level, received information from printed media, and no information dissemination.

The most of sample group perceived correct knowledge about meaning, cause, and effect of air pollution problem. Most of samples perceived the problem at high level, received information from printed media, and no information dissemination.

The most of sample group perceived correct knowledge about meaning, cause, and effect of water pollution problem. Most of samples perceived the problem at high level, received information from printed media, and no information dissemination.

The most of sample group perceived correct knowledge about meaning, cause, and effect of hazardous waste problem. Most of samples perceived the problem at high level, received information from printed media, and no information dissemination.

The most of sample group perceived correct knowledge about meaning, cause, and effect of forest and soil degradation problem. Most of samples perceived the problem at high level, received information from printed media, and no information dissemination.

The most of sample group perceived correct knowledge about meaning, cause, and effect of coastal and marine degradation problem. Most of samples perceived the problem at high level, received information from printed media, and no information dissemination.

The most of sample group perceived environmental problems in community. Most of samples perceived air pollution, followed by waste pollution, water pollution, noise pollution, visual pollution, and other pollution respectively, and perceived the problem at low level. Most students perceived violent problem, never received information, and no information dissemination.

The most of sample group perceived correct knowledge about meaning of conservation. Most of samples had participation, and perceived the conservation at high necessary level, received information from printed media, and both of had/no information dissemination.

6.1.4 Hypothesis testing

1. Knowledge about environmental problems was depended on Environmental media exposure with statistical significance of .05, corresponding to the existing assumption. This proved the hypothesis 1.

2. Knowledge about environmental problems was not depended on Interest in environmental information with statistical significance of .05, not corresponding to the existing assumption. It did not follow the hypothesis 2.

3. Knowledge about environmental problems was depended on Education about environmental problems with statistical significance of .05, corresponding to the existing assumption. This proved the hypothesis 3.

4. Knowledge about environmental problems was depended on Feelings about environmental problems with statistical significance of .05, corresponding to the existing assumption. This proved the hypothesis 4.

5. Perception about the importance of environmental problems was not depended on Environmental media exposure with statistical significance of .05, not corresponding to the existing assumption. It did not follow the hypothesis 5.

6. Perception about the importance of environmental problems was not depended on Interest in environmental information with statistical significance of .05, not corresponding to the existing assumption. It did not follow the hypothesis 6.

7. Perception about the importance of environmental problems was not depended on Education about environmental problems with statistical significance of .05, not corresponding to the existing assumption. It did not follow the hypothesis 7.

8. Perception about the importance of environmental problems was not depended on Feelings about environmental problems with statistical significance of .05, not corresponding to the existing assumption. It did not follow the hypothesis 8.

6.2 Recommendations

6.2.1 The recommendations from the study

The research of Mahidol University first year students' environmental perception through communication processes resulted in the following recommendations:

1. According to the research results, most of sample group had knowledge about environmental problems at a high level and feel worry and should be solved about environmental problems. Some students know some side of problem. So, the authorities involved should provide environmental education for more information and knowledge about environmental problems including environmental activities and participation to students who can disseminate correct environmental information to other people in the future.

2. It was found from the research that most of sample group had disseminated environmental information to other people such as friends, parents, and others. If they had more knowledge about environmental problems and chance to participating with other people, they will be good media to disseminate environmental information to people for good environment in the future.

6.2.2 Recommendation for the further study

This research causes researcher to know the obstructions during the research, so the researcher provides plans of improvement for further research as the followings:

1. To study environmental perception of other sample group such as students in other level, students in other university, people in community, and other.

2. To study the strategies and methods on media creation to support the environmental information publicizing to reach the target group.

3. To study focus on factors of interesting, participating, and translating about environmental information.

4. To study factors that have influence on perception about environmental problems and protection to be used as guideline for solving environmental problems.

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APPENDIX

APPENDIX A

LIST OF FACULTY IN MAHIDOL UNIVERSITY

No.	Faculty's name	Short name
1	Bangkok Metropolitan Medical College	BM
2	Faculty of Dentistry	DT
3	Faculty of Engineering	EG
4	Faculty of Environment and Resource Studies	EN
5	Faculty of Medical Technology	MT
6	Faculty of Nursing	NS
7	Faculty of Public Health	PH
8	Faculty of Medicine Praboromarajchanok	PI
9	Faculty of Pharmacy	PY
10	Faculty of Medicine at Ramathibodi Hospital	RA
11	Faculty of Science	SC
12	Faculty of Medicine at Siriraj Hospital	SI
13	College of Sports Science and Technology	SP
14	Faculty of Veterinary Science	VS
15	Faculty of Arts	AR

APPENDIX B
QUESTIONNAIRE

แบบสอบถาม เรื่อง การรับรู้สิ่งแวดล้อมของนักศึกษาปริญญาตรีชั้นปีที่ 1 มหาวิทยาลัยมหิดล โดยกระบวนการสื่อสาร

คำชี้แจง : โปรดใส่เครื่องหมาย / ใน ❍ และ/หรือเขียนข้อความหรือระบุหมายเลข 1, 2, 3,... ลงในช่องว่าง

<u>ตอนที่ 1 ข้อมูลส่วนตัว</u>

1. ท่านเป็นนักศึกษาปริญญาตรี ชั้นปีที่ 1 มหาวิทยาลัยมหิดล
   คณะ..... สาขาวิชา.....
2. เพศ ❍ ชาย ❍ หญิง
3. อายุ.....ปี
4. ภูมิลำเนา ❍ กรุงเทพมหานคร ❍ จังหวัด.....
5. ที่อยู่ปัจจุบัน ❍ หอพักของมหาวิทยาลัย ❍ หอพัก/บ้านเช่านอกมหาวิทยาลัย
   ❍ บ้านตนเอง/บ้านญาติ ❍ อื่น ๆ (ระบุ).....
6. พาหนะที่ใช้ ❍ ไม่มีพาหนะ ❍ จักรยาน ❍ จักรยานยนต์
   ❍ รถยนต์ส่วนตัว ❍ อื่น ๆ (ระบุ).....
7. เมื่อมีเวลาว่างท่าน **ชอบหรือสนใจ** ทำกิจกรรมอะไร มากหรือบ่อยครั้งที่สุด เรียงตามลำดับ
   (โปรดระบุหมายเลข 1, 2, 3, ...)

.....❍ ไม่ทำอะไรเลย	.....❍ คุยกับเพื่อน
.....❍ ทำงานหารายได้พิเศษ	.....❍ ไปพักผ่อนตามสถานที่ต่าง ๆ
.....❍ ทำงานอดิเรกเล็ก ๆ น้อย ๆ	.....❍ พูดคุยถึงปัญหาที่เกิดขึ้นในสังคม
.....❍ อ่านหนังสือ/สิ่งพิมพ์ต่าง ๆ	.....❍ ชมภาพยนตร์
.....❍ ฟังวิทยุ รายการ.....	.....❍ ออกกำลังกาย/เล่นกีฬา
..... ❍ ดูโทรทัศน์ รายการ.....	.....❍ ใช้คอมพิวเตอร์ในระบบอินเตอร์เนท
.....❍ อื่น ๆ (ระบุ)……	เพื่อ.....

ตอนที่ 2 การรับรู้ข้อมูลข่าวสารเกี่ยวกับปัญหาสิ่งแวดล้อม และแหล่งข้อมูล

- **การรับข่าวสารสิ่งแวดล้อม**

1. ท่านเคยได้รับข่าวสารเกี่ยวกับสิ่งแวดล้อมบ้างหรือไม่

❍ เคย ❍ ไม่เคย ❍ ไม่แน่ใจ

ถ้าเคย จากแหล่งใดบ้าง (เรียงตามลำดับ 1, 2, 3, ...)

….❍ สถานศึกษา ….❍ โทรทัศน์ ....❍ หนังสือพิมพ์ ….❍ อินเตอร์เนท

….❍ วิทยุ ....❍ วารสาร ….❍ ญาติพี่น้อง ….❍ เพื่อน

....❍ ใบปลิว/แผ่นพับ .....❍ อื่น ๆ (ระบุ).....

2. ข่าวสารสิ่งแวดล้อมที่ท่านได้รับเป็นข่าวสารเกี่ยวกับเรื่องใดบ้าง (ตอบได้มากกว่า 1 ข้อ)

❍ ทรัพยากรธรรมชาติ ❍ ความหลากหลายทางชีวภาพ

❍ ปัญหาสิ่งแวดล้อม ❍ การอนุรักษ์พลังงาน

❍ อื่น ๆ (ระบุ).....

3. ท่านเคยพูดคุยหรือสนทนาเกี่ยวกับปัญหาสิ่งแวดล้อมกับบุคคลอื่น ๆ หรือไม่ บ่อยครั้งแค่ไหน

❍ ไม่เคย ❍ เคย

4. ท่านสนใจข่าวสารเกี่ยวกับปัญหาสิ่งแวดล้อม มากน้อยเพียงใด

❍ สนใจมาก ❍ ปานกลาง ❍ สนใจน้อย ❍ ไม่สนใจ

5. ท่านเคยได้รับการอบรม/ศึกษา เกี่ยวกับปัญหาสิ่งแวดล้อม สาเหตุ และการป้องกันแก้ไขหรือไม่

❍ ไม่เคย ❍ เคย

6. ปัจจุบัน ท่านรู้สึกอย่างไรมากที่สุดเกี่ยวกับปัญหาสิ่งแวดล้อม

❍ เฉย ๆ ❍ น่าสนใจ/ติดตาม

❍ วิตกเกี่ยวกับสิ่งแวดล้อมเป็นพิษและควรแก้ไขปัญหา

- **การรับรู้ปัญหาสิ่งแวดล้อม**

คำชี้แจง: โปรดทำเครื่องหมาย √ ในช่องที่ตรงกับการรับรู้ของท่าน และวงกลมเพื่อเลือกคำตอบที่ถูกต้องที่สุด

1. ตามการรับรู้ของท่าน ปัญหาสิ่งแวดล้อมต่อไปนี้มีความสำคัญอยู่ในระดับใด

ปัญหาสิ่งแวดล้อม	ระดับความสำคัญของปัญหา					
	ไม่ทราบ	ไม่สำคัญ	สำคัญน้อย	สำคัญปานกลาง	สำคัญมาก	สำคัญมากที่สุด
1. ปัญหาปรากฏการณ์เรือนกระจก						
2. ปัญหาฝนกรด						
3. ปัญหาการทำลายชั้นโอโซน						
4. ปัญหามลพิษทางอากาศในกรุงเทพมหานคร						
5. ปัญหามลพิษทางน้ำบริเวณเขตอุตสาหกรรม						
6. ปัญหาปริมาณขยะและของเสียอันตรายเพิ่มมากขึ้น						
7. ปัญหาทรัพยากรป่าไม้ถูกทำลายและดินเสื่อมคุณภาพ						
8. ปัญหาความเสื่อมโทรมของทรัพยากรน้ำและชายฝั่งทะเลบริเวณแหล่งท่องเที่ยว						
9. ปัญหามลพิษทางเสียงและทัศนียภาพตามเมืองใหญ่						
10. ปัญหาการอนุรักษ์พลังงาน						

2. ปัญหาสิ่งแวดล้อมระดับโลก

- **ปรากฏการณ์เรือนกระจก**

1. ท่านทราบข้อมูลเกี่ยวกับ **ปรากฏการณ์เรือนกระจก** หรือไม่

❍ ไม่ทราบ ❍ ทราบ

ปรากฏการณ์เรือนกระจก คืออะไร

ก. การเพิ่มขึ้นของเรือนกระจกในประเทศต่าง ๆ ทั่วโลก

ข. การที่อุณหภูมิความร้อนบนผิวโลกสูงขึ้นกว่าปกติ

ค. การที่พลังงานของดวงอาทิตย์ส่องลงมายังโลกเพิ่มขึ้น

ง. การที่ระดับน้ำทะเลทั่วโลกเพิ่มสูงขึ้น

2. ท่านทราบหรือไม่ว่า **ปรากฏการณ์เรือนกระจก** เกิดจากสาเหตุใด

❍ ไม่ทราบ ❍ ทราบ

ปรากฏการณ์เรือนกระจก เกิดจากสาเหตุในข้อใด

ก. ก๊าซคาร์บอนไดออกไซด์เพิ่มสูงขึ้น

ข. การพัฒนาอุตสาหกรรมของทุกประเทศเพิ่มขึ้น

ค. การตัดไม้ ทำลายป่าทั่วโลก

ง. สภาพอากาศแปรปรวนอย่างรุนแรง

3. ท่านทราบหรือไม่ว่า **ปรากฏการณ์เรือนกระจก** มีผลกระทบอย่างไร

❍ ไม่ทราบ ❍ ทราบ

ปรากฏการณ์เรือนกระจก มีผลกระทบอย่างไร

ก. ทำให้อุณหภูมิบนผิวโลกสูงขึ้น

ข. ทำให้สภาพอากาศเปลี่ยนแปลง

ค. เกิดความแห้งแล้งทั่วโลก

ง. ทั้ง ก ข และ ค

4. ท่านคิดว่า **ปรากฏการณ์เรือนกระจก** เป็นปัญหาหรือไม่ อย่างไร

❍ ไม่เป็นปัญหา ❍ มีปัญหาต่ำ ❍ มีปัญหาสูง ❍ ไม่แน่ใจ

5. ท่านทราบข้อมูลเกี่ยวกับ **ปรากฏการณ์เรือนกระจก** จากแหล่งใด (เลือกตอบได้มากกว่า 1 ข้อ)

❍ ไม่มี

❍ ทราบจาก ❍ สื่อสิ่งพิมพ์ (ระบุ).....

❍ สื่ออิเลกทรอนิกส์ (ระบุ).....

❍ สื่อบุคคล (ระบุ).....

❍ ตนเอง (ระบุ).....

6. เมื่อท่านทราบข้อมูลเกี่ยวกับ **ปรากฏการณ์เรือนกระจก** แล้ว ท่านมีการถ่ายทอดไปยังบุคคลอื่นหรือไม่ กับใครบ้าง

❍ ไม่มีการถ่ายทอด ❍ ถ่ายทอดให้แก่.....

- **ฝนกรด (acid rain)**

1. ท่านทราบข้อมูลเกี่ยวกับ **ฝนกรด** หรือไม่

❍ ไม่ทราบ ❍ ทราบ

ฝนกรด คืออะไร

ก. น้ำฝนรวมกับซัลเฟอร์ไดออกไซด์ในอากาศ

ข. น้ำฝนกลายเป็นน้ำกรด

ค. น้ำฝนรวมกับออกซิเจนในอากาศ

ง. ทั้ง ก ข และ ค

2. ท่านทราบหรือไม่ว่า **ฝนกรด** เกิดจากสาเหตุใด

❍ ไม่ทราบ ❍ ทราบ

ฝนกรด เกิดจากสาเหตุในข้อใด

ก. ควันพิษจากโรงงานอุตสาหกรรม

ข. น้ำเสียจากโรงงานอุตสาหกรรม

ค. น้ำเสียจากบ้านเรือน

ง. ขยะมูลฝอย

3. ท่านทราบหรือไม่ว่า **ฝนกรด** มีผลกระทบอย่างไร

❍ ไม่ทราบ ❍ ทราบ

ฝนกรด มีผลกระทบอย่างไร

ก. สิ่งก่อสร้าง อาคาร บ้านเรือน ถูกกัดกร่อน

ข. ป่าไม้ และผลผลิตทางการเกษตรถูกทำลาย

ค. แหล่งน้ำเปลี่ยนสภาพเป็นกรดมากขึ้น

ง. ทั้ง ก ข และ ค

4. ท่านคิดว่า **ฝนกรด** เป็นปัญหาหรือไม่ อย่างไร

❍ ไม่เป็นปัญหา ❍ มีปัญหาต่ำ ❍ มีปัญหาสูง ❍ ไม่แน่ใจ

5. ท่านทราบข้อมูลเกี่ยวกับ **ฝนกรด** จากแหล่งใด (เลือกตอบได้มากกว่า 1 ข้อ)

❍ ไม่มี

❍ ทราบจาก ❍ สื่อสิ่งพิมพ์ (ระบุ).....

❍ สื่ออิเลกทรอนิกส์ (ระบุ).....

❍ สื่อบุคคล (ระบุ).....

❍ ตนเอง (ระบุ).....

6. เมื่อท่านทราบข้อมูลเกี่ยวกับ **ฝนกรด** แล้ว ท่านมีการถ่ายทอดไปยังบุคคลอื่นหรือไม่ กับใครบ้าง

❍ ไม่มีการถ่ายทอด ❍ ถ่ายทอดให้แก่.....

- **การทำลายชั้นโอโซน**

1. ท่านทราบข้อมูลเกี่ยวกับ **การทำลายชั้นโอโซน** หรือไม่

❍ ไม่ทราบ ❍ ทราบ

การทำลายชั้นโอโซน คืออะไร

ก. ชั้นโอโซนถูกทำลายโดยสารเคมีจากอุตสาหกรรม

ข. อากาศมีสารพิษปนเปื้อนในปริมาณสูงมาก

ค. บรรยากาศมีสารพิษเพิ่มสูงขึ้น

ง. ทั้ง ก ข และ ค

2. ท่านทราบหรือไม่ว่า **การทำลายชั้นโอโซน** เกิดจากสาเหตุใด

❍ ไม่ทราบ ❍ ทราบ

การทำลายชั้นโอโซน เกิดจากสาเหตุในข้อใด

ก. สาร CFCs และสารทำละลายบางตัวที่ใช้ในอุตสาหกรรม

ข. การนำโอโซนมาใช้ในปริมาณที่มากเกินไป

ค. การส่งดาวเทียมขึ้นไปมากขึ้น

ง. ฝนกรด

3. ท่านทราบหรือไม่ว่า **การทำลายชั้นโอโซน** มีผลกระทบอย่างไร

❍ ไม่ทราบ ❍ ทราบ

การทำลายชั้นโอโซน มีผลกระทบอย่างไร

ก. เกิดโรคมะเร็งผิวหนังมากขึ้น

ข. พืชและสัตว์กลายพันธุ์

ค. อุณหภูมิโลกสูงขึ้น

ง. ทั้ง ก ข และ ค

4. ท่านคิดว่า **การทำลายชั้นโอโซน** เป็นปัญหาหรือไม่ อย่างไร

❍ ไม่เป็นปัญหา ❍ มีปัญหาต่ำ ❍ มีปัญหาสูง ❍ ไม่แน่ใจ

5. ท่านทราบข้อมูลเกี่ยวกับ **การทำลายชั้นโอโซน** จากแหล่งใด (เลือกตอบได้มากกว่า 1 ข้อ)

❍ ไม่มี

❍ ทราบจาก ❍ สื่อสิ่งพิมพ์ (ระบุ).....

❍ สื่ออิเลกทรอนิกส์ (ระบุ).....

❍ สื่อบุคคล (ระบุ).....

❍ ตนเอง (ระบุ).....

6. เมื่อท่านทราบข้อมูลเกี่ยวกับ **การทำลายชั้นโอโซน** แล้ว ท่านมีการถ่ายทอดไปยังบุคคลอื่นหรือไม่ กับใครบ้าง

❍ ไม่มีการถ่ายทอด ❍ ถ่ายทอดให้แก่.....

3. ปัญหาสิ่งแวดล้อมระดับประเทศ

- **มลพิษทางอากาศ**

1. ท่านทราบข้อมูลเกี่ยวกับ **มลพิษทางอากาศ** หรือไม่

❍ ไม่ทราบ ❍ ทราบ

มลพิษทางอากาศ คืออะไร

ก. อากาศปนเปื้อนสารพิษ

ข. อากาศมีฝุ่นละออง

ค. อากาศมีกลิ่นเหม็น

ง. ทั้ง ก ข และ ค

2. ท่านทราบหรือไม่ว่า **มลพิษทางอากาศ** เกิดจากสาเหตุใด

❍ ไม่ทราบ ❍ ทราบ

มลพิษทางอากาศ เกิดจากสาเหตุในข้อใด

ก. ไอเสียจาก ยานพาหนะ

ข. ควันพิษจากโรงงานอุตสาหกรรม

ค. การเผาป่า หรือไฟไหม้

ง. ทั้ง ก ข และ ค

3. ท่านทราบหรือไม่ว่า **มลพิษทางอากาศ** มีผลกระทบอย่างไร

❍ ไม่ทราบ ❍ ทราบ

มลพิษทางอากาศ มีผลกระทบอย่างไร

ก. ทำลายสุขภาพและความเป็นอยู่ของคนและสัตว์

ข. ผลผลิตทางการเกษตรเสียหาย

ค. เกิดปรากฏการณ์เรือนกระจก

ง. ทั้ง ก ข และ ค

4. ท่านคิดว่า **มลพิษทางอากาศ** เป็นปัญหาหรือไม่ อย่างไร

❍ ไม่เป็นปัญหา ❍ มีปัญหาต่ำ ❍ มีปัญหาสูง ❍ ไม่แน่ใจ

5. ท่านทราบข้อมูลเกี่ยวกับ **มลพิษทางอากาศ** จากแหล่งใด (เลือกตอบได้มากกว่า 1 ข้อ)

❍ ไม่มี

❍ ทราบจาก ❍ สื่อสิ่งพิมพ์ (ระบุ).....

❍ สื่ออิเลกทรอนิกส์ (ระบุ).....

❍ สื่อบุคคล (ระบุ).....

❍ ตนเอง (ระบุ).....

6. เมื่อท่านทราบข้อมูลเกี่ยวกับ **มลพิษทางอากาศ** แล้ว ท่านมีการถ่ายทอดไปยังบุคคลอื่นหรือไม่ กับใครบ้าง

❍ ไม่มีการถ่ายทอด ❍ ถ่ายทอดให้แก่.....

- **มลพิษทางน้ำ**

1. ท่านทราบข้อมูลเกี่ยวกับ **มลพิษทางน้ำ** หรือไม่

❍ ไม่ทราบ ❍ ทราบ

มลพิษทางน้ำ คืออะไร

ก. น้ำเน่าเสีย

ข. น้ำปนเปื้อนสารเคมีอันตราย

ค. น้ำมีปริมาณออกซิเจนต่ำ

ง. ทั้ง ก ข และ ค

2. ท่านทราบหรือไม่ว่า **มลพิษทางน้ำ** เกิดจากสาเหตุใด

❍ ไม่ทราบ ❍ ทราบ

มลพิษทางน้ำ เกิดจากสาเหตุในข้อใด

ก. การทิ้งขยะ สิ่งปฏิกูลลงแหล่งน้ำ

ข. การปล่อยน้ำเสียลงแหล่งน้ำ

ค. การใช้น้ำในปริมาณมากเกินไป

ง. ทั้ง ก และ ข

3. ท่านทราบหรือไม่ว่า **มลพิษทางน้ำ** มีผลกระทบอย่างไร

❍ ไม่ทราบ ❍ ทราบ

มลพิษทางน้ำ มีผลกระทบอย่างไร

ก. ผลผลิตทางการเกษตรเสียหาย

ข. สัตว์น้ำตาย หรือสูญพันธุ์

ค. เกิดโรคต่าง ๆ ในคน และสัตว์

ง. ทั้ง ก ข และ ค

4. ท่านคิดว่า **มลพิษทางน้ำ** เป็นปัญหาหรือไม่ อย่างไร

❍ ไม่เป็นปัญหา ❍ มีปัญหาต่ำ ❍ มีปัญหาสูง ❍ ไม่แน่ใจ

5. ท่านทราบข้อมูลเกี่ยวกับ **มลพิษทางน้ำ** จากแหล่งใด (เลือกตอบได้มากกว่า 1 ข้อ)

❍ ไม่มี

❍ ทราบจาก ❍ สื่อสิ่งพิมพ์ (ระบุ).....

❍ สื่ออิเลกทรอนิกส์ (ระบุ).....

❍ สื่อบุคคล (ระบุ).....

❍ ตนเอง (ระบุ).....

6. เมื่อท่านทราบข้อมูลเกี่ยวกับ **มลพิษทางน้ำ** แล้ว ท่านมีการถ่ายทอดไปยังบุคคลอื่นหรือไม่ กับใครบ้าง

❍ ไม่มีการถ่ายทอด ❍ ถ่ายทอดให้แก่.....

- **ของเสียอันตราย**

1. ท่านทราบข้อมูลเกี่ยวกับ **ของเสียอันตราย** หรือไม่

❍ ไม่ทราบ ❍ ทราบ

ของเสียอันตราย คืออะไร

ก. ขยะที่เป็นของมีคมสามารถทำอันตรายต่อร่างกายได้

ข. ขยะที่มีสารพิษ ปนเปื้อนเชื้อโรค ระเบิด หรือติดไฟได้

ค. อาหารที่บูดเน่า และส่งกลิ่นเหม็นรุนแรง

ง. เศษอาหารที่ทิ้งไม่ถูกที่ทำให้เป็นอันตรายต่อผู้รู้เท่าไม่ถึงการณ์

2. ท่านทราบหรือไม่ว่า **ของเสียอันตราย** เกิดจากสาเหตุใด

❍ ไม่ทราบ ❍ ทราบ

ของเสียอันตราย เกิดจากสาเหตุในข้อใด

ก. แหล่งชุมชนมีการทิ้งถ่านไฟฉาย หลอดไฟ แบตเตอรี่ ยาหมดอายุ อย่างไม่ถูกวิธี

ข. โรงงานอุตสาหกรรมมีการรวมทิ้ง สารเคมีต่าง ๆ ชิ้นส่วนอิเล็กทรอนิกส์ อย่างไม่ถูกต้อง

ค. การทิ้งบรรจุภัณฑ์ของสารปราบศัตรูพืชที่ใช้ในการเกษตรลงแหล่งน้ำต่าง ๆ

ง. ทั้ง ก ข และ ค

3. ท่านทราบหรือไม่ว่า **ของเสียอันตราย** มีผลกระทบอย่างไร

❍ ไม่ทราบ ❍ ทราบ

ของเสียอันตราย มีผลกระทบอย่างไร

ก. สารพิษกระจายสู่แหล่งน้ำ ทำให้เกิดมลพิษทางน้ำ

ข. เกิดการระเบิด ทำลายชีวิตและทรัพย์สิน

ค. เกิดปฏิกิริยาเคมีกลายเป็นควันพิษ ทำให้เกิดโรคทางเดินหายใจ ผิวหนัง ระบบประสาท

ง. ทั้ง ก ข และ ค

4. ท่านคิดว่า **ของเสียอันตราย** เป็นปัญหาหรือไม่ อย่างไร

❍ ไม่เป็นปัญหา ❍ มีปัญหาต่ำ ❍ มีปัญหาสูง ❍ ไม่แน่ใจ

5. ท่านทราบข้อมูลเกี่ยวกับ **ของเสียอันตราย** จากแหล่งใด (เลือกตอบได้มากกว่า 1 ข้อ)

❍ ไม่มี

❍ ทราบจาก ❍ สื่อสิ่งพิมพ์ (ระบุ).....

❍ สื่ออิเลกทรอนิกส์ (ระบุ).....

❍ สื่อบุคคล (ระบุ).....

❍ ตนเอง (ระบุ).....

6. เมื่อท่านทราบข้อมูลเกี่ยวกับ **ของเสียอันตราย** แล้ว ท่านมีการถ่ายทอดไปยังบุคคลอื่นหรือไม่ กับใครบ้าง

❍ ไม่มีการถ่ายทอด ❍ ถ่ายทอดให้แก่.....

- **ปัญหาความเสื่อมโทรมของทรัพยากรป่าไม้และดิน**

1. ท่านทราบข้อมูลเกี่ยวกับ **ปัญหาความเสื่อมโทรมของทรัพยากรป่าไม้และดิน** หรือไม่

❍ ไม่ทราบ ❍ ทราบ

ปัญหาความเสื่อมโทรมของทรัพยากรป่าไม้และดิน คืออะไร

ก. ป่าไม้ถูกทำลายและดินเสื่อมคุณภาพ

ข. ป่าเสื่อมโทรม และดินขาดธาตุอาหารที่จำเป็นต่อพืช

ค. พื้นที่ป่าไม้ลดลง เกิดความแห้งแล้ง

ง. ทั้ง ก ข และ ค

2. ท่านทราบหรือไม่ว่า **ปัญหาความเสื่อมโทรมของทรัพยากรป่าไม้และดิน** เกิดจากสาเหตุใด

❍ ไม่ทราบ ❍ ทราบ

ปัญหาความเสื่อมโทรมของทรัพยากรป่าไม้และดิน เกิดจากสาเหตุในข้อใด

ก. การลักลอบตัดไม้

ข. การทำไร่เลื่อนลอย

ค. ไฟไหม้ป่า

ง. ทั้ง ก ข และ ค

3. ท่านทราบหรือไม่ว่า **ปัญหาความเสื่อมโทรมของทรัพยากรป่าไม้และดิน**มีผลกระทบอย่างไร

❍ ไม่ทราบ ❍ ทราบ

ปัญหาความเสื่อมโทรมของทรัพยากรป่าไม้และดินมีผลกระทบอย่างไร

ก. สภาพลมฟ้าอากาศแปรปรวน เกิดพายุ ความแห้งแล้ง

ข. น้ำท่วม ดินถล่ม

ค. ดินไม่เหมาะสมต่อการเกษตรกรรม

ง. ทั้ง ก ข และ ค

4. ท่านคิดว่า **ปัญหาความเสื่อมโทรมของทรัพยากรป่าไม้และดิน** เป็นปัญหาหรือไม่ อย่างไร

❍ ไม่เป็นปัญหา ❍ มีปัญหาต่ำ ❍ มีปัญหาสูง ❍ ไม่แน่ใจ

5. ท่านทราบข้อมูลเกี่ยวกับ **ปัญหาความเสื่อมโทรมของทรัพยากรป่าไม้และดิน** จากแหล่งใด (เลือกตอบได้มากกว่า 1 ข้อ)

❍ ไม่มี

❍ ทราบจาก ❍ สื่อสิ่งพิมพ์ (ระบุ).....

❍ สื่ออิเลกทรอนิกส์ (ระบุ).....

❍ สื่อบุคคล (ระบุ).....

❍ ตนเอง (ระบุ).....

6. เมื่อท่านทราบข้อมูลเกี่ยวกับ **ปัญหาความเสื่อมโทรมของทรัพยากรป่าไม้และดิน** แล้ว ท่านมีการถ่ายทอดไปยังบุคคลอื่นหรือไม่ กับใครบ้าง

❍ ไม่มีการถ่ายทอด ❍ ถ่ายทอดให้แก่.....

- **ปัญหาความเสื่อมโทรมของน้ำและทรัพยากรชายฝั่งทะเล**

1. ท่านทราบข้อมูลเกี่ยวกับ **ปัญหาความเสื่อมโทรมของน้ำและทรัพยากรชายฝั่งทะเล** หรือไม่

❍ ไม่ทราบ ❍ ทราบ

ปัญหาความเสื่อมโทรมของน้ำและทรัพยากรชายฝั่งทะเล คืออะไร

ก. ทรัพยากรชายฝั่งถูกทำลาย เกิดความเสียหาย และปนเปื้อนสารพิษ

ข. ชายฝั่งถูกกัดเซาะ พังทลาย

ค. สัตว์น้ำลดจำนวนลง

ง. ระดับน้ำทะเลสูงขึ้น

2. ท่านทราบหรือไม่ว่า **ปัญหาความเสื่อมโทรมของน้ำและทรัพยากรชายฝั่งทะเล** เกิดจากสาเหตุใด

❍ ไม่ทราบ ❍ ทราบ

ปัญหาความเสื่อมโทรมของน้ำและทรัพยากรชายฝั่งทะเลเกิดจากสาเหตุในข้อใด

ก. การระบายน้ำเสียลงสู่แหล่งน้ำ

ข. การเติบโตของเมือง และแหล่งท่องเที่ยว

ค. การบุกรุกพื้นที่ชายฝั่ง

ง. ทั้ง ก ข และ ค

3. ท่านทราบหรือไม่ว่า **ปัญหาความเสื่อมโทรมของน้ำและทรัพยากรชายฝั่งทะเล** มีผลกระทบอย่างไร

❍ ไม่ทราบ ❍ ทราบ

ปัญหาความเสื่อมโทรมของน้ำและทรัพยากรชายฝั่งทะเลมีผลกระทบอย่างไร

ก. พื้นที่ป่าชายเลนลดลง

ข. น้ำทะเลชายฝั่งปนเปื้อนสารพิษ

ค. แหล่งเพาะพันธุ์สัตว์น้ำถูกทำลาย

ง. ทั้ง ก ข และ ค

4. ท่านคิดว่า **ปัญหาความเสื่อมโทรมของน้ำและทรัพยากรชายฝั่งทะเล** เป็นปัญหาหรือไม่ อย่างไร

❍ ไม่เป็นปัญหา ❍ มีปัญหาต่ำ ❍ มีปัญหาสูง ❍ ไม่แน่ใจ

5. ท่านทราบข้อมูลเกี่ยวกับ **ปัญหาความเสื่อมโทรมของน้ำและทรัพยากรชายฝั่งทะเล** จากแหล่งใด (เลือกตอบได้มากกว่า 1 ข้อ)

❍ ไม่มี

❍ ทราบจาก ❍ สื่อสิ่งพิมพ์ (ระบุ).....

❍ สื่ออิเลกทรอนิกส์ (ระบุ).....

❍ สื่อบุคคล (ระบุ).....

❍ ตนเอง (ระบุ).....

6. เมื่อท่านทราบข้อมูลเกี่ยวกับ **ปัญหาความเสื่อมโทรมของน้ำและทรัพยากรชายฝั่งทะเล** แล้ว ท่านมีการถ่ายทอดไปยังบุคคลอื่นหรือไม่ กับใครบ้าง

❍ ไม่มีการถ่ายทอด ❍ ถ่ายทอดให้แก่.....

4. ปัญหาสิ่งแวดล้อมระดับท้องถิ่น (กทม. และปริมณฑล)

- **ปัญหามลพิษ**

1. ในท้องถิ่นของท่านมี **ปัญหาสิ่งแวดล้อม** หรือไม่ มีปัญหาอะไรบ้าง (เลือกตอบได้มากกว่า 1 ข้อ)

❍ ไม่มี ❍ มี

❍ ปัญหามลพิษทางอากาศ ❍ปัญหามลพิษทางน้ำ

❍ ปัญหามลพิษทางเสียง ❍ ปัญหาขยะมูลฝอย

❍ ปัญหามลพิษทางทัศนียภาพ ❍ ปัญหาอื่น ๆ (ระบุ).....

2. ท่านคิดว่า **ปัญหาสิ่งแวดล้อมในท้องถิ่น** ของท่านมีความรุนแรงอยู่ในระดับใด

❍ ไม่มีปัญหา ❍ มีปัญหามาก ❍ มีปัญหาน้อย ❍ ปานกลาง ❍ ไม่แน่ใจ

3. ท่านคิดว่า **ปัญหาสิ่งแวดล้อมในท้องถิ่น** ด้านใดมีความรุนแรงหรือไม่

❍ ไม่มี ❍ มี

4. ท่านทราบข้อมูลเกี่ยวกับ **ปัญหาสิ่งแวดล้อมในท้องถิ่น** จากแหล่งใด

❍ ไม่มี

❍ ทราบจาก ❍ สื่อสิ่งพิมพ์ (ระบุ).....
❍ สื่ออิเลกทรอนิกส์ (ระบุ).....
❍ สื่อบุคคล (ระบุ).....
❍ ตนเอง (ระบุ).....

5. เมื่อท่านทราบข้อมูลเกี่ยวกับ **ปัญหาสิ่งแวดล้อมในท้องถิ่น** แล้ว ท่านมีการถ่ายทอดไปยังบุคคลอื่นหรือไม่ กับใครบ้าง

❍ ไม่มีการถ่ายทอด ❍ ถ่ายทอดให้แก่.....

- **การอนุรักษ์พลังงาน**

1. ท่านทราบข้อมูลเกี่ยวกับ **การอนุรักษ์พลังงาน** หรือไม่

❍ ไม่ทราบ ❍ ทราบ

การอนุรักษ์พลังงาน คืออะไร

ก. การผลิตพลังงานอย่างมีประสิทธิภาพ

ข. การใช้พลังงานอย่างมีประสิทธิภาพ

ค. การใช้พลังงานอย่างประหยัดและคุ้มค่าที่สุด

ง. ทั้ง ก ข และ ค

2. ท่านสามารถมีส่วนร่วมใน **การอนุรักษ์พลังงาน** ได้ด้วยวิธีการใดบ้าง

❍ ไม่มีส่วนร่วม

❍ มีส่วนร่วมโดย.....

3. ท่านคิดว่า **การอนุรักษ์พลังงาน** มีความจำเป็นในระดับใด

❍ ไม่จำเป็น ❍ จำเป็นมาก ❍ ปานกลาง ❍ ไม่ทราบ

4. ท่านทราบข้อมูลเกี่ยวกับ **การอนุรักษ์พลังงาน** จากแหล่งใด

❍ ไม่มี

❍ ทราบจาก ❍ สื่อสิ่งพิมพ์ (ระบุ).....
❍ สื่ออิเลกทรอนิกส์ (ระบุ).....
❍ สื่อบุคคล (ระบุ).....
❍ ตนเอง (ระบุ).....

5. เมื่อท่านทราบข้อมูลเกี่ยวกับ **การอนุรักษ์พลังงาน** แล้ว ท่านมีการถ่ายทอดไปยังบุคคลอื่นหรือไม่ กับใครบ้าง

❍ ไม่มีการถ่ายทอด ❍ ถ่ายทอดให้แก่.....

BIOGRAPHY

NAME	Miss Siriwan Tripet
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INSTITUTION ATTENDED	Chulalongkorn University, 1995-1998 Bachelor of Science Mahidol University, 1999-2004 Master of Education (Environmental Education)
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