Final Report

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ASIAN TRANSPORTATION RESEARCH SOCIETY

Managing Change in Driving Behaviour for Creating Safe Community by Students and Public Participation

Phase II

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ATRANS

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CHAPTER 1 Introduction

1.1 Introduction

In 2015, Thailand has been ranked the second highest in road traffic fatality rate in the world according to the World Health Organization (WHO, 2015), with 36 deaths per 100,000 population. Thai government has been putting a lot of efforts and budget to save more lives from road accident. Many activities have been deployed to reduce number of accidents, such as raising public awareness on driving safely through public events and media, improving road geometries, and law enforcement. However, the latest statistics indicates that our efforts have not yet reach the goal of saving lives.

Most of accidents caused by drivers. It was found that three distinct patterns of behaviour have a powerful influence on driver safety: (1) lapses or absentminded behaviour, (2) errors caused by misjudgement of danger or failures of observation, and (3) violations or deliberate neglect of safe driving (Blockey and Hartley 1995; Parker et al. 1995). However, research on driver behaviour has focused almost entirely on individual differences as contributors to unsafe driving behaviour (Moeckli and Lee, 2007). They suggest that safety culture is an important influence on driving behaviour, and plays a critical role in driving safety (Lee, 2006).

It is very likely that improving driving behaviour can decrease accident rate significantly. Safe driving behaviours cannot be achieved by law enforcement alone, and without cooperation from the public. To be successful, changing driver behaviour must be a structured process that is carefully planned and managed seamlessly with public participation.

There are two key questions: what are causes of unsafe driving behaviours? and how to manage change in unsafe driving behaviours? Those who can answer these questions clearly are road users. This project will help to answer the questions by setting process and environment to allow active road users to be researchers and activists in changing driving behaviour.

The project first mainly focuses on students in universities. This is because most young people use two-wheelers which are therefore exposed to the risk of crashes involving larger and faster moving vehicles. Moreover, young people are more prone to take risks on the road, particularly as motorcycle drivers.

Thus, objectives of this research are: (1) to establish “ATRANS Road Safety Club” in university level, local community level, and municipality level; (2) to design and implement safety interventions for managing change in driving behaviour; and (3) to develop young ambassadors for creating safe community.

In the project - Phase I (2016), five ATRANS Road Safety Clubs were established in five universities including Ubon Ratchathani University (UBU), Khon Kaen University (KKU), Prince of Songkla University (PSU), Chiang Mai University (CMU) and Burapha University (BU). The clubs called “Safe You Safe Me: Road Safety Club” (SYSM). The key project activities in Phase I including: SYSM Workshop, Safety on Campus @ KKU, and Safety on Campus @ PSU, as well as data collection on students’ attitudes and behaviours.

SYSM Workshop was hosted by KKU during 13-17 June 2016. This was to provide practical training for student representatives. There were five students from each university. The purposes of the workshop were to train the representatives for understanding road safety concepts, being leaders in their universities, and working on road safety campaigns.

Campaigns “Safety on Campus” were implemented at KKU on 24 November 2016 and at PSU on 28 November 2016. There were about 100 participations at KKU and 200 participations at PSU. The activities included; for example: special lecture on road safety, introduction of ATRANS Safety Map, helmet decoration, and giving free helmets. Data on students’ attitudes and behaviours was conducted in both universities.

Furthermore, SYSM clubs were established informally in five universities. There have been three different approaches in setting up the SYSM clubs and doing activities in the five universities, as presented in Table 1.1. For the “voluntary approach” in KKU and PSU, the clubs have been leading by active voluntary students from various faculties and guiding by post-grad students and ATRANS members. For the “systematic approach” in UBU and CMU, the clubs have been linking with the students’ unions and councils. For the “small scale approach” in BU, the club has starting in the Faculty of Political Science.

However, the clubs cannot stand by themselves within one year (in Phase I). The clubs need to recruit more members for the clubs, need further development to be sustainable clubs, and need to include road safety campaign as a routine work in the universities, as well as attempt to create innovative interventions to manage change in unsafe driving behaviours. Thus, these whole activities will be continuing in Phase II.

Table 1.1 Different approaches in doing road safety activities

Approach	Feature	Case	Remark
Voluntary approach	Leading by active students and Guiding by post-grad students and ATRANS members	KKU PSU	• Depending on some students • Need strong support from ATRANS • Progress well in short term • Need further development to be sustainable clubs
Systematic approach	Linking with student unions and councils	UBU CMU	• Rather slow progress • Independence from ATRANS • Road safety campaign could be a routine work
Small scale approach	Starting in faculty level	BU	• Having flexibility • Difficulty in recruiting members and sustaining the activities

1.2 Study framework and research questions

The study framework presents in Figure 1.1. This study is not a pure research, it also involve community engagement. People in selected communities work as assistant researchers. They set up road safety clubs, investigate causes of road accidents in their communities, and design interventions for managing change in driving behaviour. This process is called participatory action research (PAR).

Figure 1.1 Study framework

Each community attempt to answer two research questions including:

- What are the causes of unsafe driving behaviours?
- How to manage change in unsafe driving behaviours?

1.3 Outputs of the projects

Outputs of the projects include:

- “ATRANS Road Safety Club” in university level, local community level, and municipality level;
- Effective safety interventions for managing change in driving behaviour;
- Young road safety ambassadors for creating safe community.

CHAPTER 2 Methodology

One of the basis models for understanding change was developed by Kurt Lewin in the 1950s, and is still used today. His model is for managing change known as three steps: Unfreeze – Change – Refreeze. This model is elaborated into five phases to manage change in driving behaviour (Greenroad Technologies, 2015), as shown in Figure 2.1.

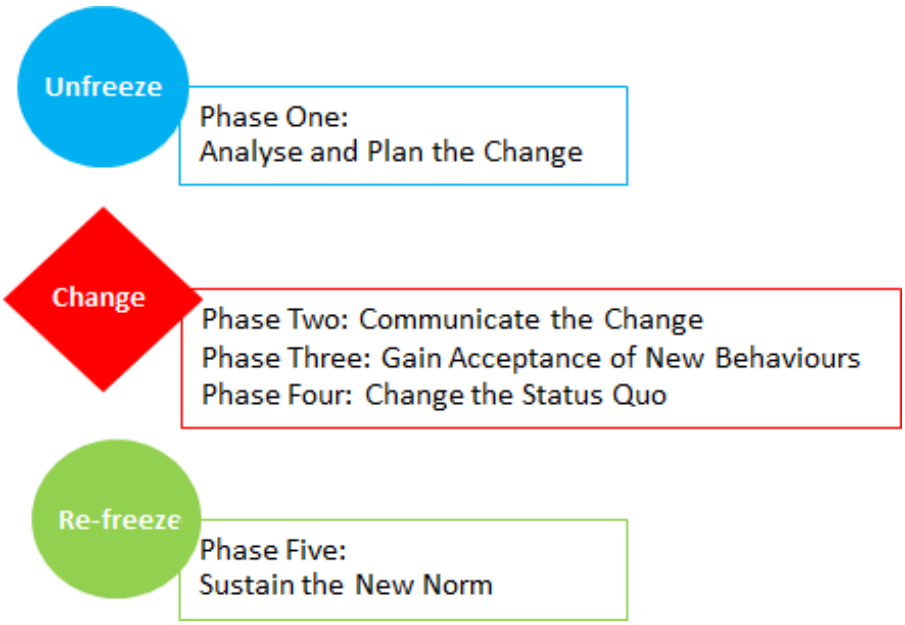


Figure 2.1 Model for managing change in driving behaviour

Firstly, “unfreeze” current behaviours, accident data in study areas will be collected and analysed. Secondly, “change”, countermeasures will be designed and communicated to gain acceptance from road users, then the measures will be implemented to manage change of unsafe driving behaviours (status quo). Finally, the best practice will be propagating to the public to ensure that the behaviour changes that make driving risk-free become the permanent norm, and become culture of safe driving.

Methodology of this research is based on Participatory Action Research (PAR). This is defined as “systematic inquiry, with the collaboration of those affected by the issue being studied, for purposes of education and taking action or effecting change” (Green et al., 2003: 419). PAR typically involves community action to address issues raised through the research process (Kemmis and McTaggart 2005). This reframes social research as a powerful form of public engagement (Gibson-Graham 1994).

ATRANS Road Safety Clubs are established in universities. The clubs seek to engage members of local communities, including: schools, universities, local governments, community leaders, and the public in general. ATRANS Road Safety Clubs aims to educate, enlighten and empower local communities to create their own safe community. Objectives of the clubs are for studying unsafe driving behaviours, designing and implementing countermeasures to manage the behaviours, and propagating them to road users to make culture of safe driving. The clubs will also develop young ambassadors as trainers to take up this to each individual to bring the change in driving behaviours.

All members of ATRANS Road Safety Clubs participate in research. They share ownership in research projects and activities, with the focus of research defined by analyses of social problems at the local level.

This project is separated into three years, starting from small community (inside university campuses) to the bigger ones (districts and municipalities), as shown in Figure 2.2.

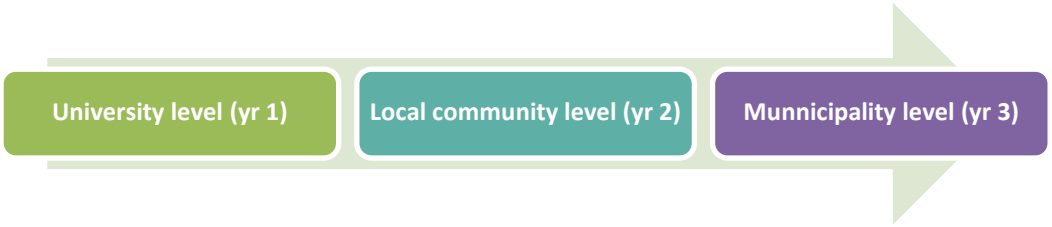


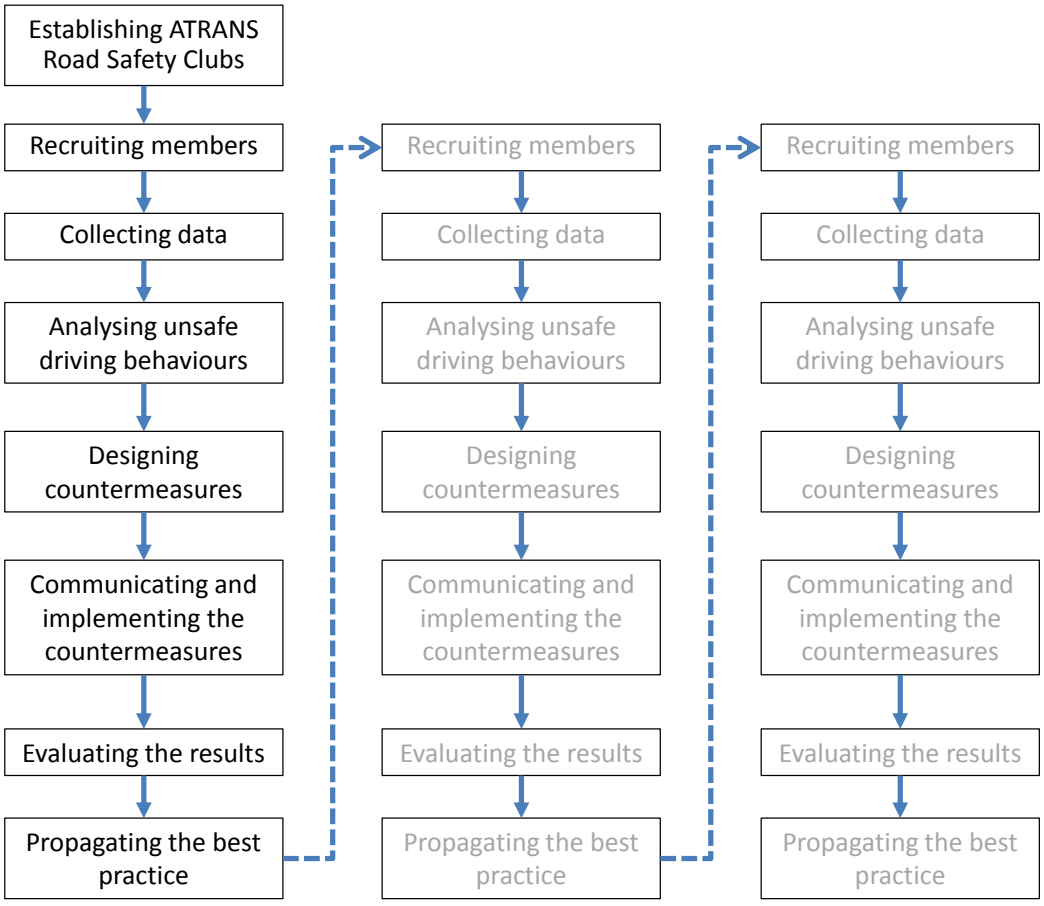
Figure 2.2 Project steps

Based on the model in Figure 1, for each year, project activities are set as shown in Figure 2.3. In the first year, it is intended to establish five ATRANS Road Safety Clubs in five universities including Ubon Ratchathani University, Khon Kaen University, Prince of Songkla University, Chiang Mai University and Burapha University. The clubs are organised and managed by students, and supervised by ATRANS members. The members are trained about road safety. Then, they plan and study unsafe driving behaviours. Data collection is based on secondary data, ATRANS road safety map, focus group and questionnaire survey. The data are analysed to understand causes of unsafe driving behaviours. Each club may find different unsafe driving behaviours, or the same behaviours but different causes. The clubs design and implement countermeasures (which are suitable for local conditions) to manage the behaviours. The comparative case studies provide an assessment of the project as a whole. Evaluation process is done to identify best practices. Finally, the experiences are summarised and propagated to road users to make culture of safe driving.

In the second and third years, the activities will be expended into larger areas, which are district and municipality levels. The students would be young ambassadors to disseminate the

change model and participate in local community for creating safe community.

In summary, the whole project's goal would be to facilitate collaborations between researchers and regional organisations with selected local communities in order to identify and address local issues regarding driving and road safety. Together, they would develop an action plan to address local driving issues and participate in its implementation. The project would be community-based in order to ensure relevancy for local driving circumstances, and the behaviour changes that make driving risk-free become culture of safe driving.



(a) Year 1 University level (b) Year 2 Local community level (c) Year 3 Municipality level

Figure 2.3 Project activities

The project in Phase II is divided two tasks

- Encouragement of behaviour change
- Evaluation of behaviour change

2.1 Encouragement of behaviour change

The clubs seek to engage members of local communities, including: schools, universities, local governments, community leaders, and the public in general. ATRANS Road Safety Clubs aims to educate, enlighten and empower local communities to create their own safe community. Objectives of the clubs are for studying unsafe driving behaviours, designing and implementing countermeasures to manage the behaviours, and propagating them to road users to make culture of safe driving. The clubs will also develop young ambassadors as trainers to take up this to each individual to bring the change in driving behaviours. All members of ATRANS Road Safety Clubs participate in research. They share ownership in research projects and activities, with the focus of research defined by analyses of social problems at the local level.

This task involves campaigns for encouraging change of unsafe driving behaviour. The activities include:

1. Workshop in a community. This workshop focuses on providing a practical training for community representatives. The purposes are to help people to evaluate road accident problem in their community, to understand road safety concept, to be able to find out causes of road accidents, and to be able to initially tackle the problem by themselves.

2. Education for students. This relates to activities that encourage students in the universities to drive safely on roads. The main target is motorcycle which is the main travel mode for students. Campaigns focus on three main behaviours including helmet wearing, speeding, and drink and drive.

3. Soft enforcement on students' behaviour. This relates to campaigns that enforce students to behave safely while riding motorcycle, particularly on helmet wearing.

2.2 Evaluation of behaviour change

After the campaigns for encouraging change of unsafe driving behaviour, the project is planned to evaluate the bahaviour change based a questionnaire survey. The evaluation is based on the Transtheoretical Model (TTM) which aims to explain a change in risky behaviour.

TTM identifies four transtheoretical dimensions of change (Prochaska & DiClemente, 1984; Prochaska et al.,1992; Prochaska & DiClemente, 2005; Prochaska et al., 2008):

1. Stages of Change: people make attitudinal, intentional, motivational, and behavioural changes as they move through the precontemplative, contemplative, preparation, action, and maintenance stages of readiness for change.

- Precontemplation stage – being unaware of the problem behavior
- Contemplation stage – starting to think about the problem and ambivalence
- Preparation stage – being motivated to take action in the immediate future
- Action stage – investing time and energy in taking the necessary steps toward an actual behavioral change
- Maintenance stage – working steadily to sustain the achieved change

2. Processes of Change: These are the overt and covert activities that various therapy systems use to initiate change.

Experiential processes include:

- "consciousness raising" (greater awareness) is characterized by active gathering of information about oneself and the problem behavior;
- "dramatic relief" (emotional arousal) is the process of experiencing and expressing feelings about the problem behavior and possible solutions;
- "environmental reevaluation" (social reappraisal) means the consideration and assessment of how the problem behavior affectsthe physical and social environment;
- "self-reevaluation" (self-reappraisal) is the emotional and rational analysis of how the problem behavior or the behavior change affects the self and self-perception;
- "social liberation" (environmental opportunities) is characterized by awareness, availability, and acceptance of alternative life styles and cues that support the change;

Behavioral processes include:

- "self-liberation" (committing) means deciding to commit to changing the problem behavior, including the belief in the ability to change successfully;
- "stimulus control" (re-engineering) involves the control or avoidance of situations, persons, or other cues that trigger the problem behavior, in order to support the occurrence of new behavior;
- "counter-conditioning" (substituting) is the act of substituting an alternative and healthier behavior for the problem behavior;
- "helping relationships" (supporting) implies the active use of social support to make the attempts to change easier;
- "reinforcement management" (rewarding) is the systematic use of reinforcement and (self-)rewarding strategies to attain and stabilize the target behavior.

3. Pros and Cons of Changing: The relative pros and cons of changing undergo a shift as clients move through the stages. Cons outweigh pros in the precontemplative stage, become equivalent by the contemplative stage, and lose relevance by the action stage. Pros gain strength and motivation increases as clients move through the stages.

4. Levels of Change: More intensive intervention is required depending on whether problems are conscious or unconscious. Some problems are symptomatic responses to a difficult situation, but more complex problems may have nested levels: e.g., symptoms may be supported by maladaptive cognitions, which create interpersonal conflicts that repeat childhood family conflicts, which were internalized in the form of intrapersonal conflicts.

CHAPTER 3 Results

As presented in Chapter 2, the project is divided two tasks (1) encouragement of behaviour change, and (2) evaluation of behaviour change. The first task was done during May – August 2017. The results are presented in Section 3.1. The second task was during October - November 2017. The results are presented in Section 3.2.

3.1 Encouragement of behaviour change

The activities for encouragement of behaviour change

3.1.1 Workshop in a community

A Workshop on road safety was done on 10 May 2017 (Pictures shown in Appendix B) in Khamahuan district in Mukdahan province. The district locates in the suburb of Mukdahan city. It has 16 villages, covering area about 140 km^2 with about 12,000 residents.

There were 50 people (representatives from every village) attending the workshop. The workshop focuses on providing a practical training for community representatives. The outputs of this workshop were (1) the community understanding the overview of road accident problems, (2) knowing causes of local road accidents, and (3) identifying risk spots and countermeasures.

3.1.2 Education for students

Road Safety Orientation at the Prince of Songkla University, PSU (Pictures shown in Appendix C). Members of the PSU Safety Club (who attended the road safety training in Khon Kaen in 2016), called “Safety fighter”, presented the road safety orientation to about 100 students (2nd year) at the Department of Civil Engineering on 21st August 2017. This was to educate junior students (age around 19-20 years old) to understand about road safety and to avoid unsafe driving behaviour.

3.1.3 Soft enforcement on students' behaviour of helmet wearing

A road safety campaign at the Ubon Ratchathani University, UBU (Pictures shown in Appendix D) during August – September 2017 was about enforcement on students' behaviour to wear helmet. It was a check point at every university's gates to stop students who did not wear helmet. These students was explained why they should wear helmet. They also was recorded their names and deducted some scores. The activity was done by volunteer students and university's staff, not by traffic police, so it can be called "soft enforcement".

3.2 Evaluation of behaviour change

The campaigns for encouraging change of unsafe driving behaviour were evaluated basing on the Transtheoretical Model (TTM) which aims to explain a change in risk behaviour (as presented in Chapter 2). A questionnaire survey was designed to collect data on attitudes and behaviour change.

3.2.1 Data collection and descriptive statistic

Data collection in three Universities: Khon Kaen University (KKU), Prince of Songkla University (PSU), and Ubon Ratchathani University (UBU). Data collection was done during October-November 2017, in total 1,250 samples. This was divided equally among universities and groups of faculties, as presented in Table 3.1.

Table 3.1 Number of samples from each university

	All	KKU	UBU	PSU
Number of sample	1,250	450	401	399
Science faculties	33%	33%	30%	36%
Health care faculties	31%	33%	28%	33%
Social faculties	35%	33%	42%	31%

The main transport mode for students is motorcycle for all three universities as presented in Table 3.2.

Table 3.2 Modal spilt of the samples

Transport Mode	All	KKU	UBU	PSU
Car	12%	13%	8%	14%
MC	73%	76%	86%	56%
Bike	2%	2%	4%	1%
Walk	7%	2%	0%	21%
PT	5%	7%	1%	6%

Students' perceptions on problems in daily life: including accident, security, earning less than expenditure, health and accommodation, are presented in Figure 3.1. It shows that accident is the highest concern compared to other problems. But it is only about 30% perceive accident problem as serious.

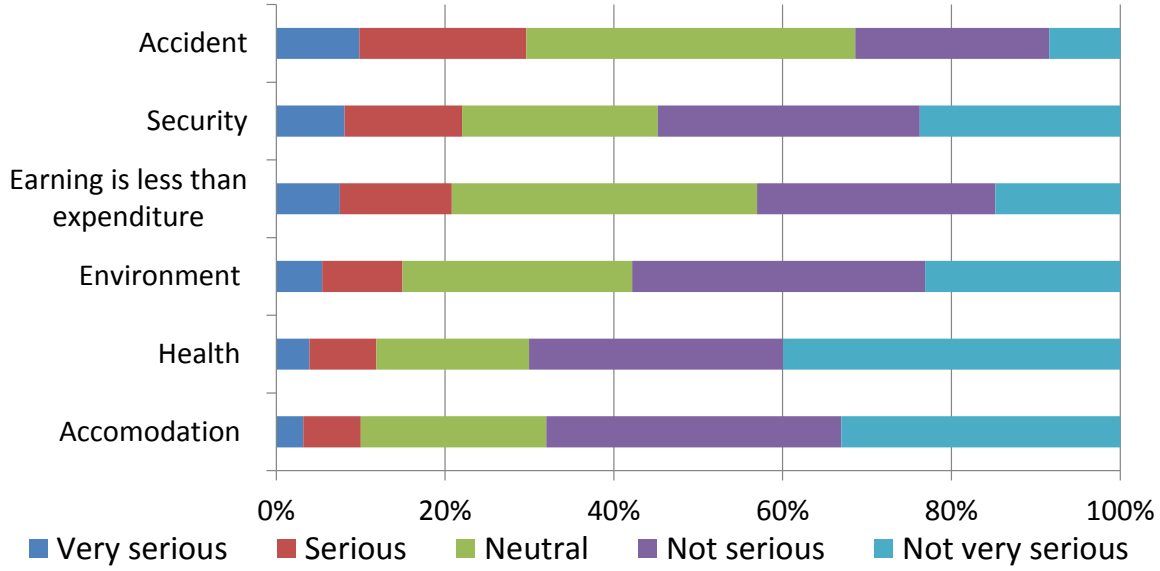


Figure 3.1 Perception of problems in daily life

Most students have experiences on road accident at least once, particularly PSU students (as presented in Table 3.3)

Table 3.3 Experiences of road accident

Number of accident	All	KKU	UBU	PSU
0	37%	45%	49%	0%
1	33%	28%	27%	53%
2	18%	16%	14%	27%
3+	12%	10%	10%	20%

Most of those who ever have experiences on road accident were slightly injury, only few ever got serious injury (as presented in Table 3.4).

Table 3.4 Injury levels

Injury	All	KKU	UBU	PSU
Slightly Injury	62%	67%	60%	59%
Some Injury	32%	27%	34%	37%
Serious Injury	6%	6%	6%	5%

Most of students use motorcycle as a main transport mode. Only a third always wear helmet (as presented in Table 3.5).

Table 3.5 Wearing helmet

	All	KKU	UBU	PSU
Always	30%	23%	36%	33%
Often	43%	38%	44%	48%
Sometime	19%	28%	15%	14%
When having enforcement	4%	5%	3%	5%
Never	3%	6%	1%	1%

Most of students have not ever been penalised during last one year, when not wearing helmet (as presented in Table 3.6).

Table 3.6 Experience on penalty, when not wearing helmet

	All	KKU	UBU	PSU
Never	78%	76%	71%	88%
1-2 times/year	19%	20%	24%	12%
3+ times/year	3%	4%	5%	1%

Most students wear helmet because they think helmet can reduce accident injury, and when there is police enforcement (as presented in Table 3.7). They tend to not wear helmet when travelling for a short distance or on small roads (as presented in Table 3.8).

Table 3.7 Reasons to wear helmet

Wearing, because	
Reducing accident injury	86%
Police enforcement	75%
Families or close friends force to wear	24%
Families or close friends suggest to wear	21%
Others wear	14%

Table 3.8 Reasons not to wear helmet

Not wearing, because	
Short distance travelling	76%
Travelling on small roads	55%
No police	31%
In a hurry	30%
Loss of hair style	23%
Difficulty in carrying	20%
Uncomfortable	19%
No helmet	19%
Confidence in riding without accident	6%
Others not wearing	5%

3.2.2 Analysis of the Transtheoretical Model (TTM)

This study applies TTM to evaluate behaviour change of helmet wearing. The core constructs of the TTM contain three main dimensions: stages of change (5 stages), processes of change (10 processes) and decisional balance (Pros & Cons), as explained in Chapter 2. The behaviour change is evaluated through the stage of change. Activities or campaigns could directly influence wearing helmet behaviour or through the processes of change. Wearing helmet behaviour could be also affected by personal characteristics, experiences and perceptions. The framework for evaluation of the helmet behaviour change is shown in Figure 3.2.

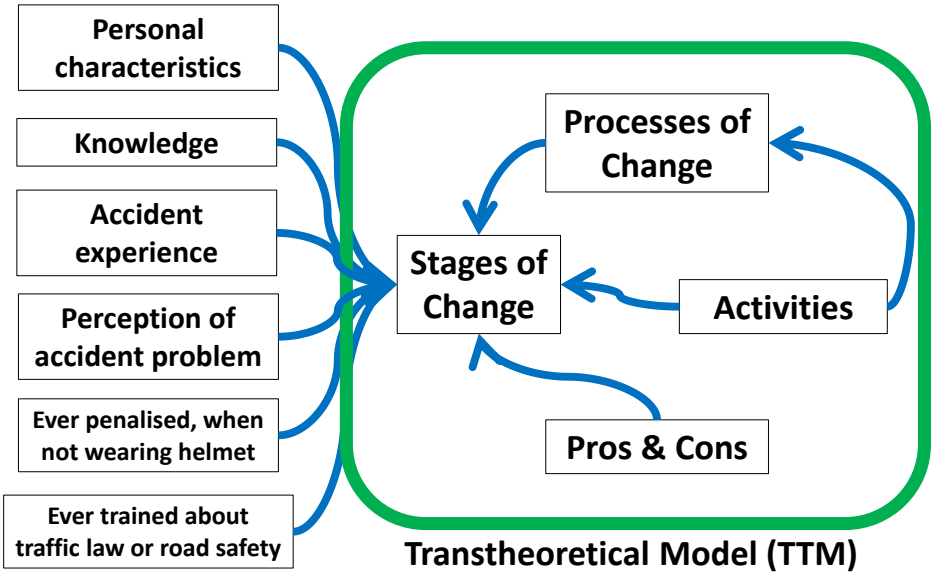


Figure 3.2 Framework for evaluation of the helmet behaviour change

According to TTM, stages of change for wearing helmet behaviour are divided into five stages, and can be seen as three broad groups as: unaware, having intention, and being behaviour, as shown in Table 3.9.

Table 3.9 Stages of change for wearing helmet behaviour

Stages of change		**Wearing helmet**	
Precontemplation stage	being unaware of the problem behaviour	Wearing helmet is not an important behaviour	Unaware
Contemplation stage	starting to think about the problem and ambivalence	Wearing helmet is an important behaviour	Having intention
Preparation stage	being motivated to take action in the immediate future	Wearing helmet is a behaviour that I should do	
Action stage	investing time and energy in taking the necessary steps toward an actual behavioural change	I usually ware helmet	Being behaviour
Maintenance stage	working steadily to sustain the achieved change	I have been wearing helmet more than a year	

The questionnaire asked students to indicate which stages they were currently (during last year) and previously (longer than a year). The results found that proportion of those who usually and always ware helmet (helmet wearing as behaviour) increases from 20% to 35% (as presented in Table 3.10). About 40% of students have increased their stages of helmet wearing behaviour (at least one stage), while another 40% have not changed, and less than 20% have decreased their stages of behaviour (as presented in Table 3.11).

Table 3.10 Proportion of students for each stages of wearing helmet behaviour

Stages of change	**Pervious**	**Current**
Wearing helmet is not an important behaviour	16%	4%
Wearing helmet is an important behaviour	27%	27%
Wearing helmet is an behaviour that I should do	37%	35%
I usually ware helmet	10%	20%
I always ware helmet more than a year	10%	15%

Table 3.11 Proportion of students for changing stages of wearing helmet behaviour

Changing	**All**	**KKU**	**UBU**	**PSU**
Decrease	17%	14%	20%	18%
Stable	41%	44%	38%	42%
Increase	42%	42%	42%	40%

The processes of change for wearing helmet behaviour are divided into 10 stages, as shown in Table 3.12. The students were asked how much (with 1-4 scales) road safety activities or campaigns influence their processes of change. The students were also asked what road safety activities they involved during last year, including:

- Seeing campaigns in media (TV, Radio)
- Seeing campaigns organized by related agencies (public, private, university)
- Attending campaigns organized by related agencies (public, private, university)
- Enlightened by families or close friends to wear helmet

Table 3.12 Processes of change for wearing helmet behaviour

Experiential process		**Wearing helmet**
Consciousness raising	Finding and learning new facts, ideas, and tips that support the healthy behaviour change	The activities let me know and learn importance of wearing helmet
Dramatic relief	Experiencing the negative emotions (fear, anxiety, worry) that go along with unhealthy behavioural risks	The activities make me feel that not wearing helmet is a risk
Self-reevaluation	Realizing that the behaviour change is an important part of one's identity as a person	The activities make me realize that wearing helmet is an important thing for me
Environmental reevaluation	Realizing the negative impact of the unhealthy behaviour or the positive impact of the healthy behaviour on one's proximal social and/or physical environment	The activities make me realize that wearing helmet is an important thing to do in the society
Social liberation	Realizing that the social norms are changing in the direction of supporting the healthy behaviour change	The activities make me realize that social norm is supporting wearing helmet
Behavioural process		
Self-liberation	Making a firm commitment to change	The activities make me interested to wear helmet
Stimulus control	Removing reminders or cues to engage in the unhealthy behaviour and adding cues or reminders to engage in the healthy behaviour	The activities make me remembrance of wearing helmet when riding motorcycle
Counterconditioning	Substitution of healthier alternative behaviours and cognitions for the unhealthy behaviour	The activities let me meeting those who always wear helmet
Helping relationships	Seeking and using social support for the healthy behaviour change	The activities support me to wear helmet
Reinforcement management	Increasing the rewards for the positive behaviour change and decreasing the rewards of the unhealthy behaviour	The activities make me feel that wearing helmet is useful

All data collected by the questionnaire was analysed basing on the framework in Figure 3.2. The five stage of change (in Table 3.2) were grouped into three categories of behaviours (unaware, having intention and being behaviour). However, the sample of the unaware group was only 20% and not significantly different from having intention group, so these were merged to be one group. Thus, in the statistical analysis, there were two stages of behaviour: helmet wearing as behaviour (helmet behaviour) and not wearing helmet as behaviour (others).

There were two types of measurement scales for the collected data: nominal and ordinal. These data were analysed by nonparametric methods, including: Chi Square test[1] and Phi and Cramer's V[2], in order to test which factors significantly associate with helmet wearing behaviour (dependent variable). The variables that associated with the behaviour change were included in the logistic regression model, as follows.

$$ln\left[\frac{\Pr(Helmet\ behaviour)}{\Pr(Others)}\right] = Constant + \ \beta1(\mathrm{HR}) + \beta2(\mathrm{RM}) + \beta3(SD) + \beta4(NPE)$$

Where

HR = Process of helping relationship

RM = Process of reinforcement management

SD = Short distance travelling

NPE = No police enforcement

The result of parameter in the model is presented in Table 3.13.

Table 3.13 Multinomial logistic regression model for wearing helmet behaviour

Variables	Coefficients	P-value
Constant	-0.3962	0.01
β1	0.3738	0.03
β2	0.3197	0.04
β3	-0.4002	0.01
β4	-0.3882	0.01
No. of sample	1,066	
Nagelkerke R^2_N	0.069	

The variables that significantly influence wearing helmet behaviour include (1) process of helping relationship, (2) process of reinforcement management, (3) short distance travelling, and no police enforcement.

[1] to test whether 2 nominal variables are associated.
[2] Value between 0 and 1 that indicates how strongly two nominal variables are associated.

Coefficients of the two processes have positive sign, indicating that the processes would influence wearing helmet behaviour. On the other hand, coefficients of the other variables have negative sign indicating that for a short distance travelling and when having no police enforcement; students tend to not wearing helmet as behaviour.

The constant also has negative sign, indicating that without any encouragement; students basically are not likely to wear helmet as behaviour. The goodness of fit is rather low. This indicates that although the four variables are significant, still there are unknown various factors that affect the behaviour.

The analysis also assessed how road safety activities affect the behaviour. It found that the activities did not directly affect the behaviour, but they influence through the process of change. The campaigns organised by government and private sectors could support those who attend the events to wear helmet, while families and close friends of students could make them feel that wearing helmet is useful, as summarised in Figure 3.3. Activities that students do not personally involve (including campaigns in media e.g. TV and Radio, and campaigns presented by related agencies) could not significantly influence the helmet wearing behaviour.

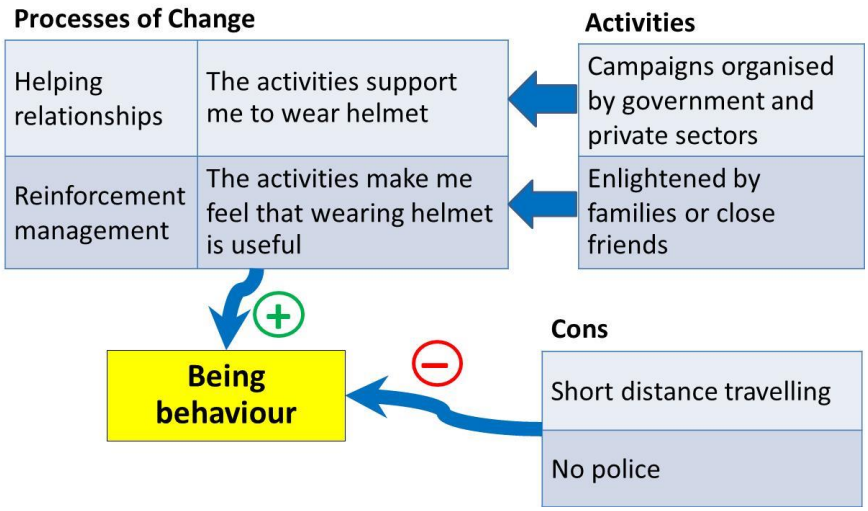


Figure 3.3 Summary of the results

CHAPTER 4 Conclusions

This study aimed to manage change in unsafe driving behaviour. It focused on students' wearing helmet behaviour. A few workshops were organised in universities and communities. Then evaluation of behaviour change was done in order to understand what activities and factors could influence wearing helmet behaviour.

The study found that all students understand that helmet can save life and know that by law motorcycle users (both riders and passengers) must wear helmet. However, only about a third of students always wear helmet as behaviour, and only 30% perceive accident problem as serious.

Students are less likely to perceive road accident as "my serious problem". So they value the cost of accident less than the convenience of unsafe driving behaviours e.g. not wearing helmet. Driving behaviour change is the first and most important thing that has to be changed, in order to create safe society. However, typical campaigns and activities (TV, roadside messages, etc.) are unlikely to influence behaviour (only intention).

Some activities directly affect the processes of change. Students attending campaigns organised by government and private sectors perceive that the activities support them to wear helmet. The enlightenment by families and close friends also significantly make students feel that wearing helmet is useful.

To manage change in risk driving behaviour, the study suggests that enforcement is the most effective strategy to influence the change, particularly in a short term. Effective enforcement and penalty could reduce value of the convenience of not wearing helmet. However, safe driving behaviours cannot be achieved by law enforcement alone.

For a long term, road safety education could increase students' perception on the value of the cost of road accident. The study found that education measures that could affect the behaviour change include campaigns promoting to save lives of families and friends, direct campaigns for each road user group and each behaviour, and campaigns to change perception of "no accident for short distance traveling".

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Appendix A: Transtheoretical Model

The Transtheoretical Model (or TTM, Prochaska & DiClemente,1984; Prochaska, DiClemente, & Norcross, 1992; Prochaska,Redding, & Evers, 2008) is aimed at explaining a change in an unhealthy or risky behavior. This appendix provide a summary of TTM, which is from Prochaska et al. (2008), as follows.

The TTM uses stages of change to integrate processes and principles of change across major theories of intervention. The TTM emerged from a comparative analysis of leading theories of psychotherapy and behavior change in an effort to integrate a field that had fragmented into more than 300 theories of psychotherapy (Prochaska, 1984).

From initial studies of smoking, the stage model rapidly was expanded to include investigations and applications to a broad range of health and mental health behaviors, including alcohol and substance abuse, anxiety and panic disorders, bullying, delinquency, depression, eating disorders and obesity, high-fat diets, HIV/AIDS prevention, mammography and other cancer screening, medication compliance, unplanned pregnancy prevention, pregnancy and smoking, radon testing, sedentary lifestyles, sun exposure, and physicians practicing preventive medicine.

The core constructs of the TTM includes (as briefly describes in Table A1):

- Stages of Change
- Processes of Change
- Decisional Balance
- Self-Efficacy

Table A1 Transtheoretical Model Constructs

Constructs		Description
Stages of Change	Precontemplation	No intention to take action within the next 6 months
	Contemplation	Intends to take action within the next 6 months
	Preparation	Intends to take action within the next 30 days and has taken some behavioral steps in this direction
	Action	Changed overt behavior for less than 6 months
	Maintenance	Changed overt behavior for more than 6 months
Processes of Change	Consciousness raising	Finding and learning new facts, ideas, and tips that support the healthy behavior change
	Dramatic relief	Experiencing the negative emotions (fear, anxiety, worry) that go along with unhealthy behavioral risks
	Self-reevaluation	Realizing that the behavior change is an important part of one's identity as a person
	Environmental reevaluation	Realizing the negative impact of the unhealthy behaviour or the positive impact of the healthy behavior on one's proximal social and/or physical environment
	Self-liberation	Making a firm commitment to change
	Helping relationships	Seeking and using social support for the healthy behaviour change
	Counterconditioning	Substitution of healthier alternative behaviors and cognitions for the unhealthy behavior
	Reinforcement management	Increasing the rewards for the positive behavior change and decreasing the rewards of the unhealthy behavior
	Stimulus control	Removing reminders or cues to engage in the unhealthy behavior and adding cues or reminders to engage in the healthy

		behavior
	Social liberation	Realizing that the social norms are changing in the direction of supporting the healthy behavior change
Decisional Balance	Pros	Benefits of changing
	Cons	Costs of changing
Self-Efficacy	Confidence	Confidence that one can engage in the healthy behavior across different challenging situations
	Temptation	Temptation to engage in the unhealthy behavior across different challenging situations

Stages of Change

The stage construct is important, in part, because it represents a temporal dimension. In the past, behavior change often was construed as a discrete event, such as quitting smoking, drinking, or overeating. The TTM posits change as a process that unfolds over time, with progress through a series of five stages, although frequently not in a linear manner.

Precontemplation is the stage in which people do not intend to take action in the near term, usually measured as the next six months. The outcome interval may vary, depending on the behavior. People may be in this stage because they are uninformed or under-informed about the consequences of their behavior. Or they may have tried to change a number of times and become demoralized about their abilities to change. Both groups tend to avoid reading, talking, or thinking about their high-risk behaviors.

In contemplation, people intend to change their behaviors in the next six months. They are more aware than precontemplators of the pros of changing but are also acutely aware of the cons. This balance between the costs and benefits of changing can produce profound ambivalence and keeps people stuck in contemplation for long periods of time. This phenomenon is often characterized as chronic contemplation or behavioural procrastination. These folks also are not ready for traditional action-oriented programs that expect participants to take action immediately.

In preparation, people intend to take action soon, usually measured as the next month. Typically, they already have taken some significant step toward the behaviour in the past year. They have a plan of action, such as joining a health education class, consulting a counselor, talking to their physician, buying a self-help book, or relying on a self-change approach. These are the people who should be recruited for actionoriented programs.

People in the action stage have made specific, overt modifications in their lifestyles within the past six months. Because action is observable, behavior change often has been equated with action. Typically, not all modifications of behavior count as action in this model. In most applications, people have to attain a criterion that scientists and professionals agree is sufficient to reduce risks for disease.

Maintenance is the stage in which people have made specific, overt modifications in their lifestyles and are working to prevent relapse, but they do not apply change processes as frequently as people in action. They are less tempted to relapse and are increasingly more

confident that they can continue their changes. Based on temptation and selfefficacy data, it was estimated that maintenance lasts from six months to about five years.

Processes of Change

Processes of change are the covert and overt activities people use to progress through stages. Processes of change provide important guides for intervention programs, as processes are like independent variables that people need to apply to move from stage to stage. Ten processes have received the most empirical support in research to date.

1. Consciousness raising involves increased awareness about the causes, consequences, and cures for a particular problem behavior. Interventions that can increase awareness include feedback, confrontations, interpretations, bibliotherapy, and media campaigns.

2. Dramatic relief initially produces increased emotional experiences, followed by reduced affect or anticipated relief if appropriate action is taken. Role-playing, grieving, personal testimonies, health risk feedback, and media campaigns are examples of techniques that can move people emotionally.

3. Self-reevaluation combines both cognitive and affective assessments of one's self-image with and without an unhealthy behavior, such as one's image as a couch potato and an active person. Values clarification, healthy role models, and imagery are techniques that can move people evaluatively.

4. Environmental reevaluation combines both affective and cognitive assessments of how the presence or absence of a personal behavior affects one's social environment, such as the impact of one's smoking on others. It can also include awareness that one can serve as a positive or negative role model for others. Empathy training, documentaries, testimonials, and family interventions can lead to such reassessments.

5. Self-liberation is both the belief that one can change and the commitment and re-commitment to act on that belief. New Year's resolutions, public testimonies, and multiple rather than single choices can enhance what the public calls willpower.

6. Social liberation requires an increase in social opportunities or alternatives, especially for people who are relatively deprived or oppressed. Advocacy, empowerment procedures, and appropriate policies can produce increased opportunities for minority health promotion, gay health promotion, and health promotion for impoverished people. These same procedures can

be used to help all people change, as is the case with smoke-free zones, salad bars in school lunchrooms, and easy access to condoms and other contraceptives.

7. Counterconditioning requires learning healthier behaviors that can substitutefor problem behaviors. Relaxation, assertion, desensitization, nicotine replacement, and positive self-statements are strategies for safer substitutes.

8. Stimulus control removes cues for unhealthy habits and adds prompts for healthieralternatives. Avoidance, environmental re-engineering, and self-help groups can provide stimuli that support change and reduce risks for relapse.

9. Contingency management provides consequences for taking steps in a particular direction. Although contingency management can include the use of punishment, we found that self-changers rely on reward much more than punishment. Reinforcements are emphasized, since a philosophy of the stage model is to work in harmony with how people change naturally. Contingency contracts, overt and covert reinforcements, incentives, and group recognition are procedures for increasing reinforcement and the probability that healthier responses will be repeated.

10. Helping relationships combine caring, trust, openness, and acceptance, as well as support for healthy behavior change. Rapport building, therapeutic alliances, counselor calls, and buddy systems can be sources of social support.

Decisional Balance

Decisional balance reflects an individual's relative weighing of the pros and cons of changing. Originally, TTM relied on Janis and Mann's (1977) model of decision making that included four categories of pros (instrumental gains for self and others and approval from self and others) and four categories of cons (instrumental costs to self and others and disapproval from self and others). Over many studies attempting to produce this structure of eight factors, a much simpler two-factor structure was almost always found—pros and cons of changing.

Self-Efficacy

Self-efficacy is the situation-specific confidence that people can cope with high-risk situations without relapsing to their former behaviors.

Temptation reflects the converse of self-efficacy—the intensity of urges to engage in a specific behavior when in difficult situations. Typically, three factors reflect most common types of temptations: negative affect or emotional distress, positive social situations, and craving.

Relationships Between Stages and Processes of Change.

One of the earliest empirical integrations was the discovery of systematic relationships between people's stages and the processes they were applying. Table A2 presents the empirical integration (Prochaska, DiClemente, and Norcross, 1992). This integration suggests that, in early stages, people apply cognitive, affective, and evaluative processes to progress through stages. In later stages, people rely more on commitments, conditioning, contingencies, environmental controls, and support for progressing toward maintenance or termination.

Table A2 Processes of Change That Mediate Progression Between the Stages of Change

	Precontemplation	Contemplation	Preparation	Action	Maintenance
Processes	Consciousness raising Dramatic relief Environmental reevaluation				
		Self-reevaluation			
				Self-liberation	
					Counterconditioning Helping relationships Reinforcement management Stimulus control

Note: Social liberation was omitted due to its unclear relationship to the stages.

Table A2 has important practical implications. To help people progress from precontemplation to contemplation, such processes as consciousness raising and dramatic relief should be applied. Applying processes like contingency management, counterconditioning, and stimulus control to people in precontemplation would represent a theoretical, empirical, and practical mistake. But for people in action, such strategies would represent optimal matching.

As with the structure of processes, relationships between the processes and stages have not been as consistent as relationships between stages and pros and cons of changing. Although part of the problem may be due to the greater complexity of integrating ten processes across five stages, processes of change need more basic research and may be more specific to each problem behavior.

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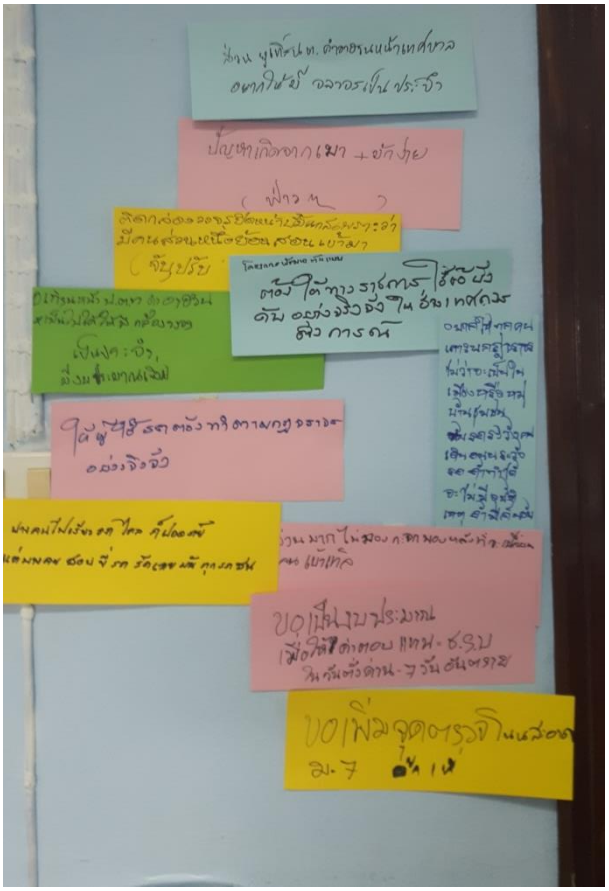
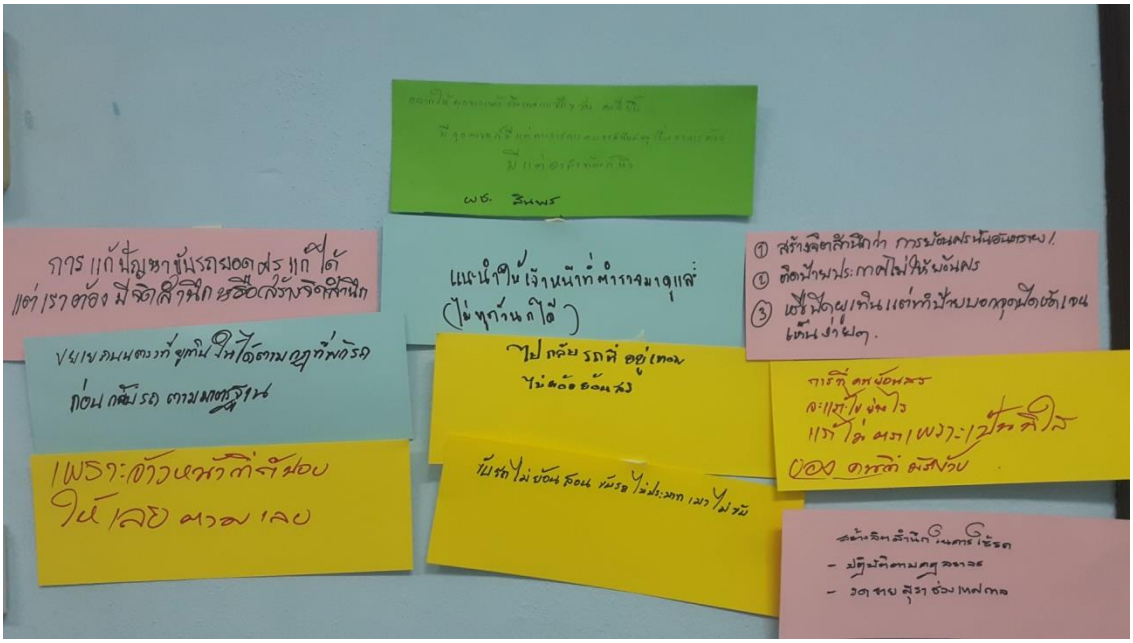
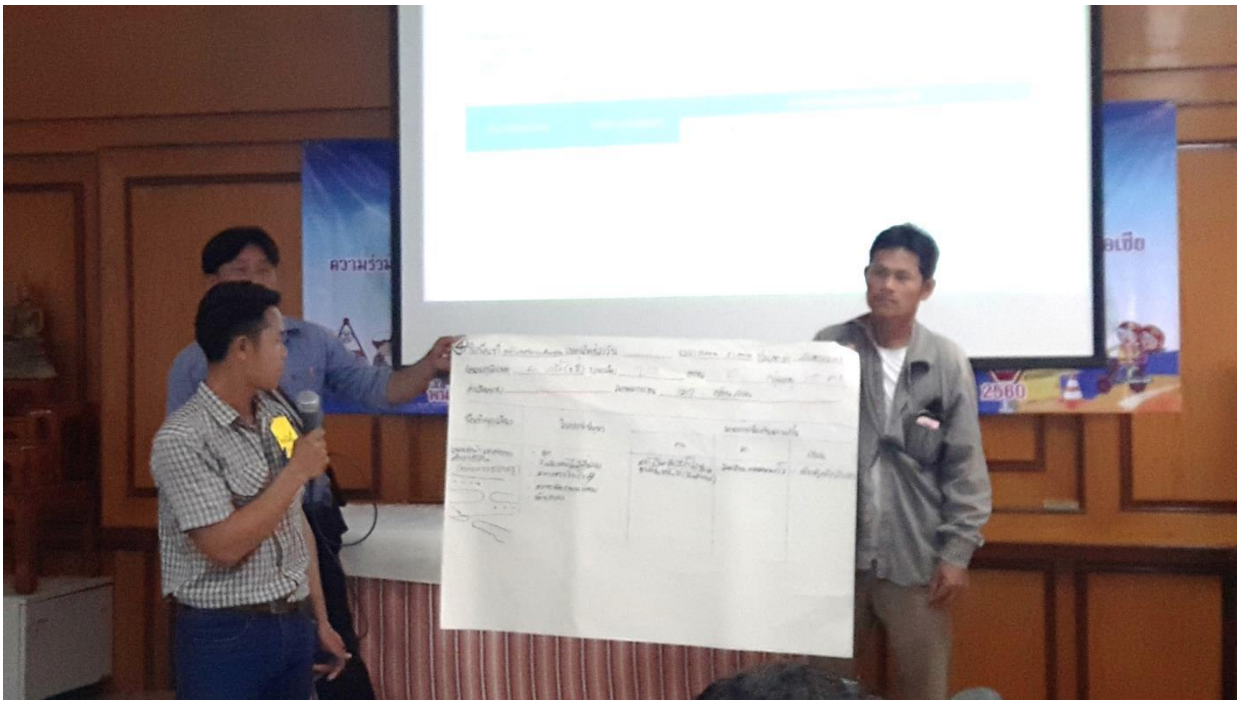
Appendix B: Workshop in Khamahuan District in Mukdahan Province







Appendix C: Road Safety Orientation at PSU

Appendix D: Road Safety Campaign at UBU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Final Report

Research Grant 2017

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