

## **CYBERSAFETY IN EDUCATION FOR THE 21<sup>ST</sup> CENTURY: A COMPARATIVE STUDY OF MALAYSIA AND THAILAND**

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### **ABSTRACT**

Education for the 21st Century must recognise cybersafety issues faced by students in schools. Cybersecurity threats are everywhere and students must be able to cope with an environment where cyber threats and risks persist. What are these threats and risks and how do students in Malaysia and Thailand handle them? This paper attempts to compare and contrast cybersafety issues among school students in Malaysia and Thailand. The sample for this survey comprised 1,896 students from Malaysia and 1,336 students from Thailand. The quantitative research approach was used to explore and confirm relationship among variables. Four important factors influencing cybersafety among students in Malaysia comprise i. availability of help through significant others, parents and teachers (including counsellors), ii. accessing negative sites, iii. tendency to hide things from parents, and iv. feeling of discomfort when surfing negative sites. On the other hand, factors in Thailand include: i. ready availability of help if bullied or proper avenues are available, ii. victim of cyberbullying, iii. experiences of cyberbullying, and iv. experiences with accessing negative websites. The findings showed high construct reliability and high construct validity which was confirmed through Structural Equation Modeling. The study showed that Malaysia and Thailand's cybersafety issues differed significantly ( $p < .05$ ) in 6 constructs, i.e. i. existence of problematic situations or negative experiences, ii. peer pressure, iii. parent-children gap, iv. sexting, v. cyber-bullying, and vi. dealing with negative experience or mediation strategies. The study recommended the following: i. parents in both Malaysia and Thailand should play a pivotal role in their children's well-being in cybersafety issues, ii. Malaysia and Thailand should develop local-based strategies to suit local contexts in cybersafety issues, and iii. overcoming new cyber risks in Malaysia and Thailand should follow best practices in other countries which have successfully overcome them.

**Keywords:** *Cybersafety, Cybersecurity, Cyberbullying*

## **INTRODUCTION**

Cybersafety is a contemporary issue which needs to be studied in depth as research indicates the existence of cyberbullying among school children. The proliferation of internet use in education is a result of democratisation in online access to teaching and learning. Practically all schools now have access to the internet where teachers and students undertake lessons either synchronously or asynchronously. Learning can also take place ubiquitously. Learning in the 21<sup>st</sup> century must take into consideration cybersecurity issues, particularly cybersafety. In the case of Malaysia and Thailand, all schools have internet connectivity and there are many web-based applications in use for teaching and learning. In Malaysia, all schools, whether urban or rural have access to the Frog Virtual Learning Environment (VLE). Students and teachers can now gain access in a borderless environment within and outside the school via this platform. Being able to do this means that students operate in an “open environment” and this can expose them to cyber threats, cyber frauds and other cyber security issues. The question is “How do our students confront these problems?” This study attempts to look into students’ action as a result of internet use related to cyberbullying and cybersafety concerns. It compares these issues among school students in Malaysia and Thailand – their habits and how they carry themselves when confronted with problematic situations while surfing the internet. Cybersafety in this study refers to keeping information safe and secure and being responsible for one’s action online. Cyber threats would include stalking, child pornography, identity theft, bullying, data theft, and data mining which could cause problems to our school students. Computers enable child predators, pornographers, identity thieves, bullies, stalkers, and other computer-assisted criminals to operate more openly (Galicki, Havens, & Pelker, 2014).

## **CYBERSAFETY AND SCHOOL CHILDREN**

Malaysia and Thailand have been consistently looking into ways to improve cybersafety in schools. In the case of Thailand, national laws have been passed to ensure children surf the web in a safe manner. A cyber security law was recently enacted in Thailand to give agencies sweeping powers to spy on internet traffic, order the removal of contents, or even seize computers without judicial oversight (The Straits Times, 16 November 2018). In the case of Malaysia, many initiatives have been put in place by the Ministry of Education (MOE) in collaboration with the private sector to promote cybersafety in schools. The Digi CyberSafe Programme is an initiative of Digi Telecommunications Malaysia and MOE to ensure that children use the internet in a safe environment. This is a proactive initiative to raise awareness and engage various communities on the subject. This study is a result of such an initiative.

The governments of both Malaysia and Thailand have ensured that all schools have internet access to facilitate school administration, teaching and learning. Malaysia has gone one step ahead in introducing the Frog VLE where teachers can teach using this platform and students can learn via this system during and after school hours. This has resulted in an open-access system where students can be on their own during computer lab lessons and after school hours.

Parents play an important role in guiding their children identify contents which are appropriate for their needs. As students spend most of the time at home, the home environment acts to develop a culture where students know how to handle things when confronted with cyber threats. In both Malaysia and Thailand, parental supervision can lead to the development of appropriate behavior and decorum in internet etiquette. This etiquette if not nurtured properly will pose problems later on and will have a bearing on how students develop in their adult life.

## **BACKGROUND TO THE STUDY**

For the purpose of comparison in this study, only schools around Kuala Lumpur and its peripheral areas were used. This would match the type of schools in Thailand where only Bangkok schools and its peripheral areas were included. This study attempts to answer three research questions: i. What are the indicators of cyberbullying in Malaysia and Thailand? ii. Are there differences in these indicators between Malaysia and Thailand? and iii. What are the factors which influence cybersafety in Malaysia and Thailand?

## **THE RESEARCH PROBLEM**

Cybersafety is a major concern in both Malaysia and Thailand. Attempts have been made by the Ministries of Education in both countries to reduce cyberbullying. Findings from the Digi Yellow Heart Cyberbullying and Youth Disposition Survey 2018 (Kuldip, Soon & Ling, 2018) show that 20.5% of respondents comprising students from schools and colleges indicated that they had been bullied online. From another perspective, the same study also shows that 42.1% of the respondents knew of someone who had been bullied online. This shows some concern on cyberbullying among Malaysian students. A joint study by CyberSecurity Malaysia and Digi Cybersafe's Stop Cyberbullying in 2017 found that 58% of the respondents experienced cyberbullying on social media or chat apps and 75% had received nasty messages in multi-player online games. In Thailand, a study conducted by Sittichai (2014) attempted to classify cyberbullying into traditional and cyber victimisation. This study found between 3.7% and 6% of students had been cyberbullied based on a strict criterion classification, and that 15% and 16% respectively were based on a more lenient criterion.

Cyberbullying could be the result of the use of social media such as Facebook, YouTube, Twitter, LinkedIn, Skype, Instagram, Pinterest, Tumblr, Google+ and others. Cyberbully actions were deemed threatening and dangerous and were damaging to the students (Hollandsworth, Dowdy, & Donovan, 2011). Smith et al. (2008) defines cyberbullying as: "An aggressive, intentional act carried out by a group or individual, using electronic forms of contact, repeatedly and over time against a victim who cannot easily defend himself or herself." There is a need to educate students about the effects of this unethical behaviour (Oxley, 2011). While the goal is to educate children in making responsible decisions using social media and other aspects of the internet, there is still a need for parents to supervise their children wherever possible. While creating some control mechanism on internet use may be ideal, teaching digital citizenship will deliver the skills and tools students need to communicate in a global society using 21<sup>st</sup> Century means.

## **BRIEF REVIEW OF LITERATURE ON CYBERSAFETY**

A quick look at the current literature shows that cybersafety is a concern of many governments. Today, students literally have the world at their fingertips, and they must be taught how to behave, react, and interact in a fast paced cyber-world (Oxley, 2011). Technology has changed the way information is received and understood. "Responsible and ethical use of the Internet is not something that children or teenagers, in particular, consider to be important and serious consequences are beginning to emerge as a result of careless and offensive online behaviour" (Oxley, 2011). Students not only need a set of rules, but they need to understand the basis for these rules and be able to apply what the rules say to different situations they may encounter (Oxley, 2011). In addition, students must be informed about ethics.

The International Society for Technology in Education (ISTE) created the National Educational Technology Standards (NETS) for administrators, teachers and students. These are known as ISTE Standards – S, ISTE Standards – T and ISTE Standards – A (ISTE, 2015). These standards address the ethical use of the internet for students, teachers, and administrators. Students are posting and behaving inappropriately online; believing they are completely anonymous. In fact, anything posted can become

viral in a matter of hours, making personal information and data available to thousands of people is one thing that is not considered by many (Oxley, 2011). In Thailand, a proposed cybersecurity law would give the government sweeping powers to control cybersafety issues such as blocking websites and using defamation laws to prosecute critics (Channel News Asia, 16 November 2016). In Malaysia, the government in collaboration with Cyber Security Malaysia has produced a guide book which helps parents identify cyber threats.

## RESEARCH METHODOLOGY

The survey research design was used for this study. Quantitative data were collected using a sample of 3,232 school students, i.e. comprising 1,896 (58.7%) students from Malaysia and 1,336 (41.3%) from Thailand. The items in the questionnaire were developed using a 5-point Likert-type rating scale. Data were analysed using SPSS Statistics and SPSS AMOS. Among the statistical measures included descriptive statistics, t-tests, factor analysis and goodness-of-fit Structural Equation Modeling (SEM) statistics. T-tests were used to compute differences in findings between Malaysia and Thailand while factor analysis was used to determine the factors using the Principal Component Method (PCM). These were then confirmed using SEM analysis to show goodness-of-fit in the measurement model. A reliability analysis was also undertaken to determine the internal consistency of the principal components generated via PCM and then confirmed using the Goodness-of-Fit index, Comparative Fit Index, and Root Mean Square Error of Approximation. The findings showed good construct validity of the principal components with Cronbach alpha values for the components having values greater than 0.7.

## FINDINGS FROM THIS STUDY

Table 1 shows the distribution of gender by country. Of the total sample of 3,168 respondents, 1,874 (59.2%) of the students were male and 1,294 (40.8%) were female. The gender distribution of Malaysia was quite evenly represented, i.e. 50.2% (952) male and 49.8% (944) female. On the other hand, Thailand had a predominance of male respondents with a sample of 72.5% (922) male and 27.5% (350) female.

Table 1: Distribution by Country and Gender

			Country		Total
			Malaysia	Thailand	
Gender	Male	Count	952	922	1874
		% within country	50.2%	72.5%	59.2%
	Female	Count	944	350	1294
		% within Country	49.8%	27.5%	40.8%
Total	Count	1896	1272	3168	
	% within Country	100.0%	100.0%	100.0%	

## Internet Use

As internet use has a direct bearing on cybersafety issues, the findings show very high regular internet use among respondents, i.e. 95.7% of students in Thailand and 94.8% in Malaysia (see Table 2). The high percentage of students using internet indicates high penetration of internet connectivity in schools and at home.

Table 2: Internet Use among Students

Internet Use		Country		Total	
		Malaysia	Thailand		
Do you use the internet?	Yes	Count	1798	1213	3011
		% within Country	94.8%	95.7%	95.2%
	No	Count	98	54	152
		% within Country	5.2%	4.3%	4.8%
Total		Count	1896	1267	3163
		% within Country	100.0%	100.0%	100.0%

## Cyber Safety Issues

Findings from the seven constructs of this study as rated by students share many common issues between Malaysia and Thailand. The constructs in this study are as follows:

- Construct 1: Problematic situations and negative experiences
- Construct 2: Peer pressure
- Construct 3: Parent-children gap
- Construct 4: Sexting
- Construct 5: Cyberbullying
- Construct 6: Dealing with negative experience / mediation strategies
- Construct 7: New risks

The mean ratings of the seven constructs are shown in Table 3 and their differences by country are shown in Table 4. For Construct 1, Malaysian students rated with an overall mean of 2.57 (S.D.= .561; n = 1,896) and Thailand recorded a lower mean rating of 2.20 (S.D. = .621; n = 1,272). All the constructs, i.e. Construct 1 to Construct 6 show significant differences in the mean ratings between Malaysia and Thailand ( $p < .05$ ). However, findings showed no significant difference in the perceptions of students with regard to Construct 7, i.e. New risks ( $p > .05$ ). From the mean output, Malaysian students recorded a higher mean rating for Construct 1, Construct 2, Construct 3, Construct 4, Construct 6 and Construct 7. However, Thailand had a higher mean rating for Construct 5 on Sexting (see Table 3).

What could be the possible causes of these significant differences in the mean ratings? In the case of Malaysia, students had been exposed to the special programmes by Cyber Security Malaysia, Digi Telecommunications and teachers on the dangers of web-surfing through the many smart partnership programmes undertaken by the Ministry of Education and Internet Service Providers. Many activities such as cyber security talks had been initiated with school teachers and students on the dangers of free association and the correct approaches to be carried out when assessing websites of dubious origins. Thailand had a lower mean rating, meaning students tended to rate low on the items in Construct 1, thereby having the tendency to disagree on the various aspects highlighted in the questionnaire. The items provided a listing of the “dangers” of different types of negative situations prevalent in the internet. Could this mean that students in Thailand were less exposed to the remedial measures when

confronted with problematic situations? All these could be answered through a more comprehensive examination of the prevailing situations in the respective countries.

**Table 3: Descriptive Group Statistics**

	Country	N	Mean	Std. Deviation	Std. Error Mean
Construct 1: Problematic Situations & Negative Experiences	Malaysia	1896	2.5699	.56142	.01289
	Thailand	1336	2.1928	.63042	.01725
Construct 2: Peer Pressure	Malaysia	1896	1.9364	.82275	.01890
	Thailand	1333	1.7832	.87447	.02395
Construct 3: Parent-Children Gap	Malaysia	1896	2.6638	.55075	.01265
	Thailand	1336	2.2440	.60710	.01661
Construct 4: Sexting	Malaysia	1896	1.5203	.79293	.01821
	Thailand	1332	1.6655	.89692	.02458
Construct 5: Cyberbullying	Malaysia	1896	1.8754	.82257	.01889
	Thailand	1333	1.6382	.81025	.02219
Construct 6: Dealing with Negative Experience / Mediation Strategies	Malaysia	1896	3.3615	.53641	.01232
	Thailand	1336	2.9285	.87415	.02392
Construct 7: New Risks	Malaysia	1896	1.7324	.71505	.01642
	Thailand	1336	1.7194	.66998	.01833

**Table 4: Differences in Malaysia and Thailand Ratings Based on Constructs**

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Construct 1: Problematic Situations and Negative Experiences	Equal variances assumed	17.663	.000	17.865	3230	.000	.37709	.02111
	Equal variances not assumed			17.511	2658.995	.000	.37709	.02153
Construct 2: Peer Pressure	Equal variances assumed	11.271	.001	5.074	3227	.000	.15316	.03018
	Equal variances not assumed			5.021	2755.656	.000	.15316	.03051
Construct 3: Parent-Children Gap	Equal variances assumed	16.586	.000	20.448	3230	.000	.41978	.02053
	Equal variances not assumed			20.107	2694.047	.000	.41978	.02088

Construct 4: Sexting	Equal variances assumed	28.617	.000	-4.851	3226	.000	-.14523	.02994
	Equal variances not assumed			-4.748	2635.771	.000	-.14523	.03059
Construct 5: Cyberbullying	Equal variances assumed	1.937	.164	8.117	3227	.000	.23719	.02922
	Equal variances not assumed			8.139	2893.745	.000	.23719	.02914
Construct 6: Dealing with Negative Experience / Mediation Strategies	Equal variances assumed	346.166	.000	17.413	3230	.000	.43300	.02487
	Equal variances not assumed			16.096	2036.434	.000	.43300	.02690
Construct 7: New Risks	Equal variances assumed	17.497	.000	.523	3230	.601	.01302	.02489
	Equal variances not assumed			.529	2983.863	.597	.01302	.02461

Construct 7 concerns “New Risks” such as those associated with drugs, hate sites, weapons, and suicide. In this regard, the findings show a general disagreement on the accessibility factor, meaning students in Malaysia and Thailand avoided these sites. Thailand had a slightly lower mean (mean = 1.72; S.D. = .670) as compared to Malaysia (mean = 1.73; S.D. = .715) (see Table 3). The implication of this construct is that on the whole, students in Malaysia and Thailand were well-prepared to face new risks as a result of new developments and new issues taking place. These issues were negative in nature and the relatively low mean ratings seemed to indicate a high level of awareness among students. This could be probably due to effective programmes in schools or a sense of awareness by parents and teachers or a tendency to be cautious when confronted with risks deemed against norms or decency.

On the issue of gender differences, findings on cyberbullying varied between male and female students. Table 5 shows the mean ratings of the 7 constructs. Male students tended to rate higher for Construct 2, Construct 4, Construct 5 and Construct 7 while female students tended to rate higher for Construct 1, Construct 3, and Construct 6. Higher ratings would mean respondents agreeing to the items which made up those constructs. This shows a generally higher agreement for male students on peer pressure, sexting, cyberbullying and new risks while female students generally agreed higher on negative experiences, parent-children gap and mediation strategies. These findings were found to be aligned with the varied nature of research based on gender (Tokunaga, 2010). For example, in the research conducted by Fanti, Demetriou & Hawa (2012) and Salmivalli & Pöyhönen (2012) boys tended to be more involved than girls in cyberbullying issues. On the other hand, studies by Smith et al., 2008; Livingstone and Haddon, Görzing & Ólafsson, 2011 showed little gender differences.

Table 5: Perceptions of Constructs by Gender and Country

Gender	Country		Construct 1: Problematic Situations & Negative Experiences	Construct 2: Peer Pressure	Construct 3: Parent-Children Gap	Construct 4: Sexting	Construct 5: Cyberbullying	Construct 6: Dealing with Negative Experience / Mediation Strategies	Construct 7: New Risks
Male	Malaysia	Mean	2.6151	2.1166	2.6996	1.6408	1.9335	3.3116	1.8312
		N	952	952	952	952	952	952	952
		S.D	.56272	.82691	.57644	.85680	.84946	.56025	.75625
	Thailand	Mean	2.2132	1.8322	2.2417	1.6641	1.6605	2.9006	1.7622
		N	922	921	922	920	920	922	922
		S.D	.62047	.90172	.61971	.92435	.85563	.89112	.70804
	Total	Mean	2.4173	1.9768	2.4743	1.6522	1.7993	3.1094	1.7973
		N	1874	1873	1874	1872	1872	1874	1874
		S.D	.62488	.87590	.64030	.89048	.86313	.76947	.73354
Female	Malaysia	Mean	2.5244	1.7546	2.6277	1.3988	1.8167	3.4118	1.6328
		N	944	944	944	944	944	944	944
		S.D	.55671	.77772	.52139	.70266	.79067	.50659	.65645
	Thailand	Mean	2.1492	1.6543	2.2519	1.6361	1.5645	2.9940	1.6049
		N	350	349	350	349	349	350	350
		S.D	.62048	.77094	.56629	.79832	.66504	.81554	.55734
	Total	Mean	2.4229	1.7275	2.5261	1.4629	1.7486	3.2988	1.6252
		N	1294	1293	1294	1293	1293	1294	1294
		S.D	.59812	.77688	.55921	.73697	.76679	.63337	.63109
Total	Malaysia	Mean	2.5699	1.9364	2.6638	1.5203	1.8754	3.3615	1.7324
		N	1896	1896	1896	1896	1896	1896	1896
		S.D	.56142	.82275	.55075	.79293	.82257	.53641	.71505
	Thailand	Mean	2.1956	1.7833	2.2445	1.6564	1.6341	2.9263	1.7189
		N	1272	1270	1272	1269	1269	1272	1272
		S.D	.62088	.87109	.60528	.89125	.80859	.87166	.67343
	Total	Mean	2.4196	1.8750	2.4954	1.5749	1.7786	3.1868	1.7270
		N	3168	3166	3168	3165	3165	3168	3168
		S.D	.61400	.84567	.60893	.83627	.82538	.72292	.69856

### Factors Influencing Cybersafety

All the rating scale items in the questionnaire were factor-analyse using the Principal Component Method (PCM) to determine important components or factors which influence cybersafety. The outputs in Table 6 and Table 7 show the salient rating components from students in Malaysia and Thailand respectively. The findings show many similarities for PCM analysis.

## Factors Influencing Malaysian Cybersafety

Four factors emerged from the study, these are: Factor 1: Availability of help through significant others, parents and teachers (including counsellors), ii. Factor 2: Accessing negative sites, iii. Tendency to hide things from parents, and iv. Feeling of discomfort when surfing negative sites. Factor 1 contributes the higher percentage to the variance (see Table 6).

Table 6: Factors Influencing Cybersafety among Malaysian Students

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
Factor 1	7.868	16.391	16.391
Factor 2	3.909	8.143	24.534
Factor 3	2.615	5.448	29.981
Factor 4	1.666	3.471	33.452

## Factors Influencing Thailand Cybersafety

For Thailand, four important factors influenced cybersafety among students. These are: Factor 1: Ready availability of help if bullied or proper avenues are available, Factor 2: Victim of cyberbullying, Factor 3: Experiences of cyberbullying, and Factor 4: Experiences with accessing negative websites (see Table 7).

Table 7: Factors Influencing Cybersafety among Thailand Students

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
Factor 1	7.746	16.136	16.136
Factor 2	6.092	12.692	28.828
Factor 3	2.792	5.816	34.644
Factor 4	1.762	3.671	38.315

Comparing the findings of Malaysia and Thailand students, it can be concluded that the first factor is similar in the sense that there were avenues to obtain help from friends, parents and teachers when cybersafety issues emerged. This is a positive development as agencies in both Malaysia and Thailand have been active in undertaking programmes by reducing cyberbullying among students.

## Confirmatory Factor Analysis for Factors Influencing Cybersafety

The provide a confirmatory perspective to the above exploratory factors SEM analysis was used. The results showed a high level of model fit using path diagrams among the four factors for both Malaysia and Thailand. This would confirm the four factors and provide evidence of construct validity to the research undertaken.

### Malaysia's Path Diagram

Figure 1 shows Malaysia's path diagram based on standardised estimates. The results show a good model fit of .935 for Goodness-of-Fit Index (GFI), .895 for Comparative Fit Index (CFI) and .052 for Root Mean Square Error of Approximation (RMSEA) for the Malaysian data. This indicates acceptable values in model fit and therefore it can be concluded that the four factors had relatively high and acceptable validity in the measurement model.

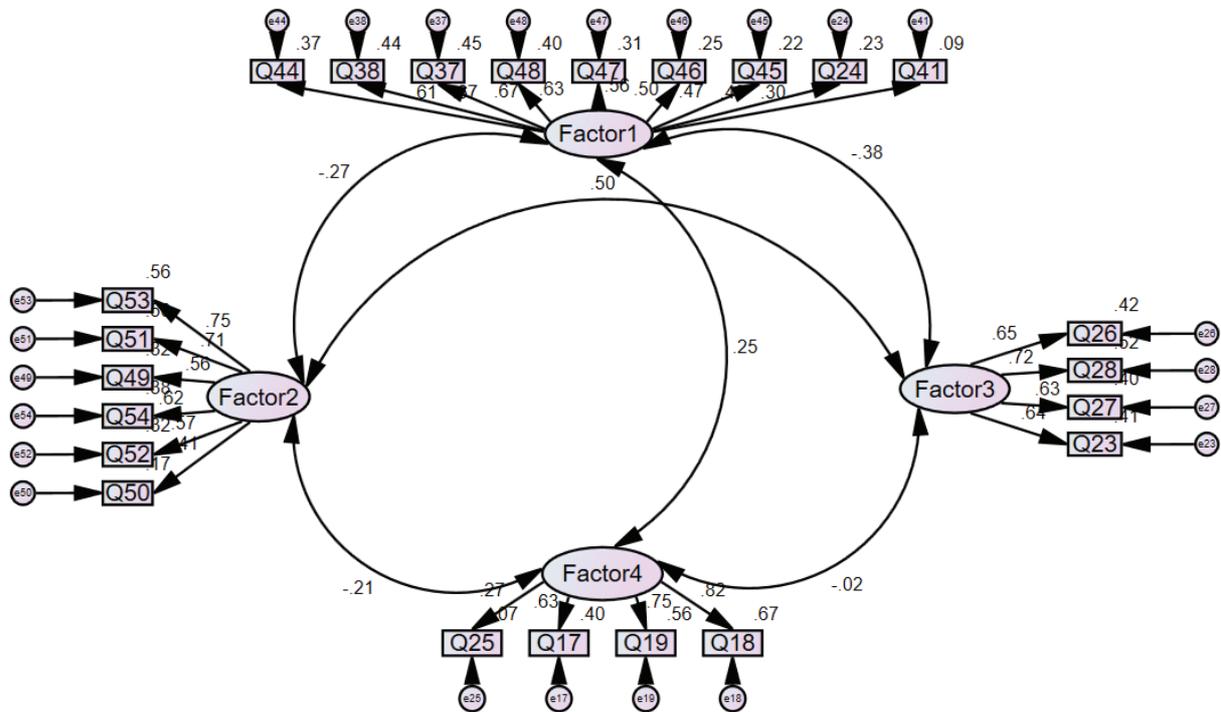


Figure 1: Path Diagram of Malaysia

### Thailand's Path Diagram

For Thailand (see Figure 2), SEM analysis shows a GFI of .926, CFI of .917 and RMSEA of .047 indicating good measurement model and good construct validity for the four factors.

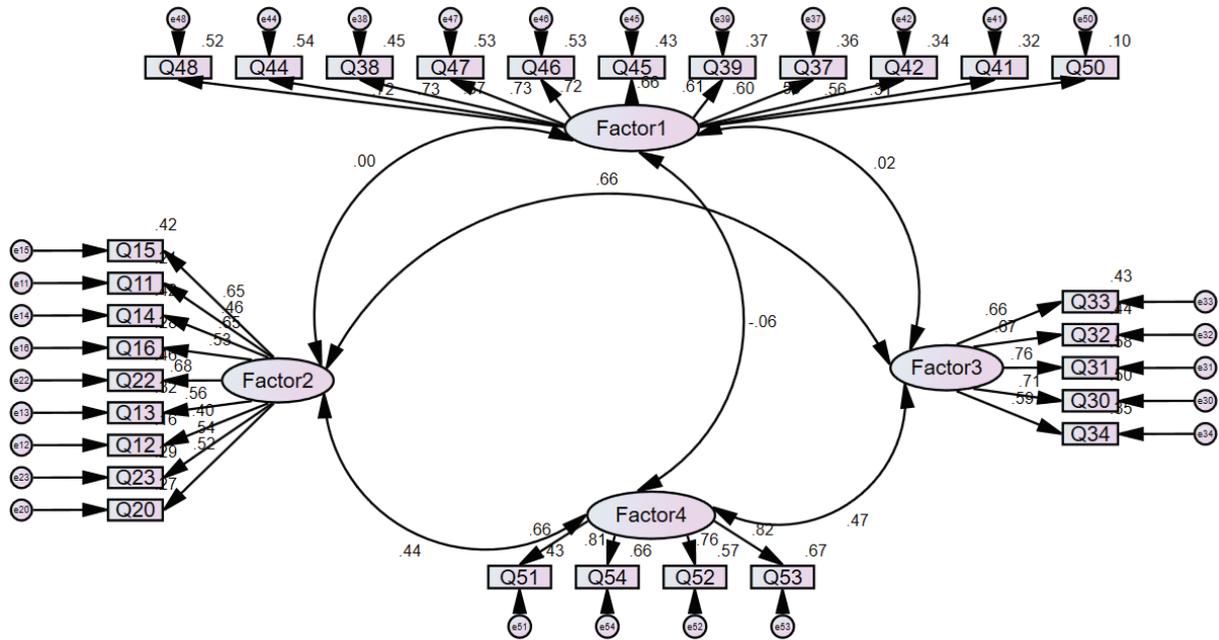


Figure 2: Path Diagram of Thailand

### DISCUSSION

There are many similarities and differences on how students address cybersafety in Malaysia and Thailand. A very important similarity is that in both Malaysia and Thailand students have proper avenues to seek help when confronted with cybersafety issues. The schools have put in place teachers and counsellors who can provide assistance when required. As in the case of Malaysia, every school has counselling teachers ready to help students. To ensure the well-being of students, the school curriculum should teach digital citizenship with the aim of making students literate in not only understanding the do's and don'ts of things but also develop in them healthy attitude and behaviour when surfing the internet. Students need to know the proper ways to interact with others online – what is appropriate and what is not. Parental role is important. Parents should be aware of what the child is doing on the internet – what sites he is visiting and why. Teachers should always impart positive values and ethics to children under their care. They should model appropriate behaviours and encourage students to be good citizens of cyberspace. The study recommended the following: i. parents in both Malaysia and Thailand should play a pivotal role in their children's well-being in cybersafety issues, ii. Malaysia and Thailand should develop local-based strategies to suit local contexts in cybersafety issues, and iii. overcoming new cyber risks in Malaysia and Thailand should follow best practices in other countries who have successfully overcome them.

## CONCLUSION

The evidence of this study shows significant differences between Malaysia and Thailand with regard to students' perceptions in 6 of the 7 constructs. The education system, management, and cultural environment in Malaysia and Thailand could have a bearing on how students perceive things. This study reveals one important factor – students practise self-control in both Malaysia and Thailand. The proliferation of internet use is unavoidable and there are existing “structures” which should be further strengthened to leverage on cyber security. There is a need to better monitor programmes which will have direct impact on the students' well-being.

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