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Improved adaptive capacity and resilience system to cope with shocks and stresses at the general education in Cambodia

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Abstract

Education is one of the sectors which require immediate attention and address to adapt to rapid social, economic, and environmental changes. This paper, accordingly, analyses a resilience system to natural hazards, epidemics, and violations. The research focuses upon (1) long-term and short-term shocks and stresses, (2) the adaptive capacities of the school management team, teachers, students, and parents, and (3) the de-factor supporting mechanisms by the Ministry of Education Youth and Sport (MoEYS), Provincial Office of Education (PoE), District of Education (DoE) and local authorities to establish resilience system at schools in Cambodia. The online surveys were conducted by using structured questionnaires to collect quantitative data among 641 students, 345 parents, and 249 school representatives at upper secondary schools in 12 provinces and Phnom Penh. The research reveals that, however, schools have started to establish resilient systems to reduce risks and vulnerabilities from natural hazards, epidemics, and violations; their adaptive capacity is limited due to the insufficiency of human and financial resources. School representatives and students identified long-term shocks and stresses due to ponds, water wells, broken bricks, trees, reptiles, and traffic accidents as long-term shocks and stresses and short-term shocks and stresses due to flood, drought, storm, dead lightning, and epidemic. The research suggests that school representatives, parents, and

students had inadequate opportunities to participate in activities in response to short-term and long-term shocks and stresses. Many schools do not have their own human financial resources; the interventions were mainly made by government agencies, local authorities, and Non-governmental Organizations (NGOs). In these recent years, schools have been engaging students and parents in dealing with shocks and stresses in reducing risks and vulnerabilities from natural hazards, epidemics, and violations. The effort and investment of government agencies, United Nations, NGOs, local government, and private sectors have gradually advanced the school physical infrastructure such as school buildings, water access, and sanitation; they are very useful for promoting resilient schools at upper secondary schools in Cambodia.

Keywords: Adaptive capacity, resilience, shocks, and stresses, general education, Cambodia

Background

Cambodia is one of the world's most affected nations and has faced several constraints and challenges with natural hazards (Yusuf & Fransisco, 2009), epidemics (NCDM & MoP, 2009), and social change (Sok, 2013). Education is one of the most direct effects of those constraints and challenges, especially from the impact of floods, droughts, heavy storms, typhoons, epidemics, and different forms of violation. Schools in Cambodia are delivering general education over ten months, starting in November and finishing by August in the following year, with ordinary school breaks in September and October. This academic calendar has faced some challenges due to climate variability, especially floods and drought. Schools located in the flood plain and in flood-prone areas face flooding in the early part of the academic year, as October is a flooding period with peak rainfall in the country. In addition, schools may face drought in May. As a result, the capacity of parents and children and teachers are built with basic knowledge on disaster management that helps reduce risks and negative impacts on students' lives (World Vision, 2014).

Natural hazards also disturb conditions of physical, cognitive, and physiological immaturity of the students (Save the Children, 2009). In these recent years, floods and droughts have increased threats and pressure on

students regarding health concerns such as malaria, diarrhea, and undernutrition and social stability, and students' welfare (UNICEF, 2008). Annual flood has negatively impacted the students' schooling. Today, an estimated 950 schools have been affected by flood; they included 35 pre-schools, 783 primary schools, 95 lower secondary schools, and 37 upper-secondary schools across 18 provinces. School closures due to flood damage affect approximately 187,714 students (93,936 girls and 93,778 boys). Every year floods delay classes and destroys schools located in flood-prone areas. During the flood, students are difficult to travel to schools because of poor road conditions. Students are unsafe to travel across rivers. In the meanwhile, their parents do not wish their children to go to school during the flood because children take a long time and expensive to arrive at school. As a result, students, especially from low-income families, turn to a high absenteeism rate at the beginning of each academic year. Moreover, schools are used as an emergency shelter during the flood, resulting in damages to school structures, especially the school floor (ADPC, 2008).

Over decades, the education system in Cambodia has focused on traditional classroom teaching; however, the spread of Covid-19 has required a rapid transition to distance and online learning. In response to the crisis, schools across the country have strategically maneuvered their offerings during the new normal by ensuring their core services continue to be provided online (Chet & Sok, 2020). Enabling remote learning has been the primary alternative for various schools and educational institutions. Initiatives including online, TV or radio-based learnings were put in place to support students' learnings in public and private schools. The Covid-19 pandemic has severely disrupted the education sector reform efforts. The closure of schools during the Covid-19 pandemic is likely to impact further the education sector in the medium and long term if no mitigation is put in place. If there is strong adaptive capacity and a resilient system in place, the education sector in Cambodia cannot continue even during the epidemic and natural hazards (World Bank, 2020).

Since 2020, the Royal Government of Cambodia (RGoC) has taken essential steps, including school closure, to prevent the spread of Covid-19. On 16 March 2020, the Ministry of Education Youth and Sport (MoEYS) announced a nation-wide closure of all public and private schools in response to the global pandemic. These school closures represent an additional burden on schools and students, as student's face-to-face -

learning in schools was already restricted due to Covid-19 prevention school re-opening strategies (Chet & Sok, 2020). Covid-19 pandemic has affected efforts at improving the quality of education because student learning is likely to lag behind due to learning loss during school closure. The education sector also has caused an increase in drop-out in the medium term (2 to 3 years), delay of assessment of student learning outcomes, and less effectiveness of teachers (World Bank, 2020).

There is no doubt that schools are now required to be adaptive and resilient to human actions and natural hazards for long-term educational development strategies. Since the 2000s, the terms "adaptation" (Bebbington, 1999) and resilience (Cinner, Fuentes, & Randriamahazo, 2009) have comprehensively been used for mitigating negative impacts from climate change. The concept of resilience is a critical framework that helps the communities to adapt to social and environmental change (Folke et al., 2005). In general, resilience facilitates the communities to respond to problems and constraints which cause long-term and short-term adverse impacts. According to DFID (2011), a community is successful or failed in a resilient system to return to a normal situation or to be better from its vulnerability in a short-term period.

However, resilience is widely applied in response to climate change's negative impact; this concept is also applicable to the education sector. The existing studies regarding adaptation and resilience in education remain limited; they mainly focused upon the impact of the flood on students and school (Heng, 2019), school damage from disaster (MoEYS, 2013), destruction of students' education (NCDM, 2014), and support on educational development (Pahl-Wostl et al., 2013). Yet, there is no study regarding the resilience system to cope with shocks and stresses in Cambodia's general education. As the result of the Covid-19 pandemic and annual flood, general education from primary to upper secondary levels requires being adaptive and resilient to human actions (i.e., economic, social, violence) and hazards (i.e., climate change, other natural disasters, health pandemics).

In early 2021, the UNESCO Institute for Lifelong Learning and Springer Nature published an article on "Preparing education for the crises of tomorrow: A framework for adaptability", Green et al. (2021) proposed a framework for adaptability. This framework is a very suitable concept for this study because it has been tested and used in educational sectors to be

resilient during shock and stress, for example, COVID-19. The primary goals of our proposed framework for adaptability are to embed resilience in the educational system such that it can spontaneously reconfigure in response to internal or external shocks in times of crisis and to provide for freedom enhancing lifelong and life-wide education in times of relative calm. Critical elements of the framework include (1) cooperation, (2) inclusion, and (3) flexibility within and between stakeholders at the individual, community, state, and global levels (page 866).

This research, accordingly, aims to analyze a resilience system to the COVID-19 pandemic, natural hazards, social, economic, and technological changes. Building resilient schools for general education to cope with shocks and stresses are essential to reduce its impacts. The specific objectives of the research are as follows: (1) to do risk analysis of long-term and short-term shocks and stresses affecting the educational sector due to the COVID-19 pandemic, natural hazards, social, economic, and technological changes; (2) To examine the adaptive capacities of the school management team, teachers, students, and parents in response to short-term and long-term shocks and stresses; and (3) To analyze supporting mechanisms by MoEYS, PoE, DoE and local authorities to establish resilience system at schools in Cambodia.

Research Methodology

This research was mainly based on an online survey by using a structured questionnaire to collect quantitative data. Surveys were conducted among school presentative (i.e., school principals, teachers), students, and parents. The fieldwork was carried out in 12 provinces and the capital; they include Kratie, Mondulkiri, Ratanak Kiri, Preah Vihear, Banteay Meanchey, Oddar Meanchey, Pailin, Pursat, Koh Kong, Steung Treng, Kampong Cham, Kampong Thom, and Phnom Penh. Two schools per province/city were recruited for this study. The selection of the study provinces is to represent all four Cambodian regions; east (Kratie, Mondulkiri, and Ratanak Kiri), north-west (Preah Vihear, Banteay Meanchey, and Oddar Meanchey), Cardamoms (Pailin, Pursat and Koh Kong), and plain (Steung Treng, Kampong Cham, and Kampong Thom). The selection of Phnom Penh, the capital of Cambodia, is very significant to explore characteristics of adaptation and resilience in the urban areas of Cambodia if

compared to the other four regions. Also, Phnom Penh is marked for piloting the tool.

Providing a large sample size has enabled its findings to be better generalized to the context of the education sector in Cambodia. The survey collected 641 students (429 female and 212 male) at upper secondary schools (grade 10 to 12), 345 parents (196 female and 149 male), and 249 school representatives (78 female and 171 male). Researchers at the Department of Policy of MoEYS worked with the education offices and schools in the 12 provinces and Phnom Penh to collect data by using an online survey. Data collection made during the COVID-19 pandemic was not easy, and online surveys among students and parents were quite difficult. Many students and parents did not have a smartphone, so schools were helping them to access their devices during the interviews. At the same time, this research has a couple of limitations, such as lack of field observation at school sites and no interaction with the respondents for clarification and explanation. In addition, researchers were not able to conduct participatory tools and methods to collect qualitative data among school representatives, students, and parents. When time is allowed, qualitative data may be collected to explain quantitative data collected from the survey.

Results and Findings

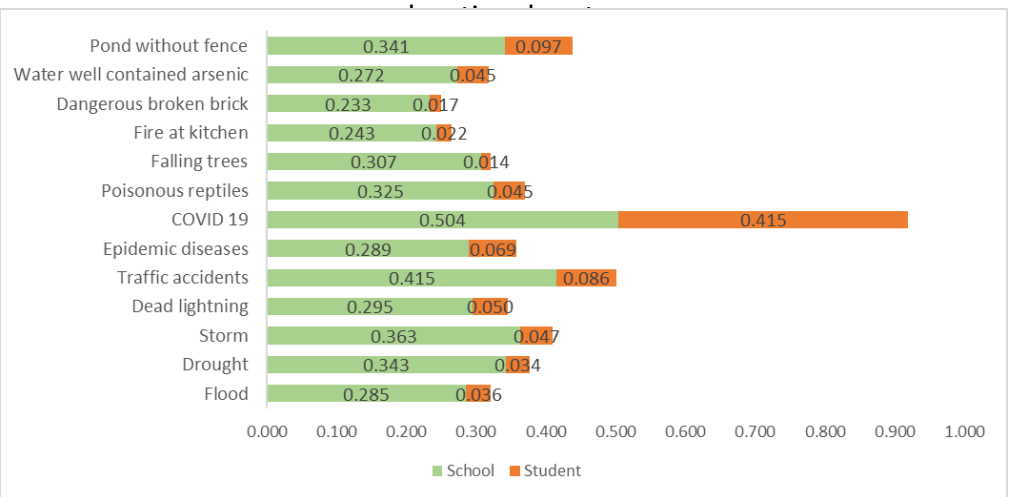
Short-term and short-term shocks and stresses on the educational sector

School presentative and students assessed the vulnerability caused by different types of shock and stresses at upper secondary schools; they lasted both short-term and long-term periods (Figure 1). Long-term shocks and stresses were mainly caused by insufficient school physical infrastructures and limited capacity to cope with long-term stock and stress. Facilities, buildings, and surrounding school environment such as ponds, water wells, broken bricks, trees, reptiles, and traffic accidents were considered as long-term shocks and stresses; students have been suffered from slight injury, serious injury, or even death. Drown in the pond without the fence, and injury of broken brick collapse, fall of the tree, and beating by reptiles were occasionally reported at a school setting. Students might be vulnerable to long-term shocks and stresses at any day or time if schools do not address enough effort and prevention measures to reduce their

vulnerability and risks. Schools also frequently reported traffic accidents and concerns of parents about their children's safety, especially schools along the national roads.

Natural hazards (flood, drought, storm, and dead lightning) and epidemics (COVID-19 and other communicative diseases) were considered as short-term shocks and stresses. Annual floods may affect schooling, but drought and storms occasionally cause destruction of students' schooling. In general, schools' adaptive capacity remained weak to cope with shocks and stresses due to natural hazards and epidemic disasters. Students may miss their classes during floods and storms. Drought has been indirectly affected student education, but it is mainly suffered by their parents. If rice or crops of their parents were destroyed by water shortage or drought, students might drop their studies for supplementary income generation. For the year 2021, both school representatives and students similarly assessed a moderate degree of COVID-19 impacts and a low degree of other types of shocks and stresses. COVID-19 has suddenly stopped schooling and changed the ways of teaching and learning. In the past, storms and floods only delayed a few days of their schooling; but the COVID-19 pandemic was seriously suffered in the education sector for almost two years. The experience of COVID-19 and other epidemic diseases such as bird flu was now getting more and more unpredicted.

Figure 1. Long-term and short-term shocks and stresses affecting the



Notes: WAI = Weight Average Index measured on a five-point scale [Very Low (VL) = 0.00-0.20, Low (L) = 0.21-0.40, Moderate (M) = 0.41-0.60, High (H) = 0.61-0.80, Very High (VH) = 0.81-1.00]; OA = Overall Assessment.

The survey also included other long-term social factors such as emotional, physical, and sexual violations; students assessed low degree of violation experience at schools, on the ways to schools, and in the communities (Figure 2). The students confirmed that the safe learning environment was gradually improving; students rated high degrees of positive discipline delivered by teachers at schools, the language used by teachers, and treatment from the teacher while teaching. Students assessed their high satisfaction of seat arrangement with girls, but only moderate degree of seat arrangement with girls. Teachers felt more comfortable arranging the seat of the boy with the girl as gender mainstreaming approached, but they had difficulty asking girls to sit near boys. The current intervention of government agencies through the MoEYS and MoWA, and NGOs have positively improved safe school learning environment. In these recent years, students have agreed that emotional, physical, and sexual violations faced by the student were very low and exceptionally occurring only.

Figure 3 describes students' satisfaction towards schools' physical infrastructure and curriculum. Overall, students were highly satisfied with the available physical infrastructure and curriculum. However, a high degree of their satisfaction was not fully reflected in the conditions of buildings and physical infrastructure; but they were pleased with the available infrastructure settings. Students recalled the schools' conditions in the past five or ten years. At that time, school buildings and physical infrastructure were not as good as the conditions in the present time. The investment of government agencies, UN agencies, NGOs, local government, and private sectors have gradually improved the school infrastructure. Improved physical infrastructure for the school building, water access, and sanitation are very useful for promoting safe school programs through reducing disaster risks and protecting child rights. Moreover, students are highly satisfied with the curriculum because all the contents, methods, and practices are applied nationwide. All the public schools in Cambodia are using the same textbooks, so their contents and methods are well prepared.

Figure 2. Long-term social factors and learning environment

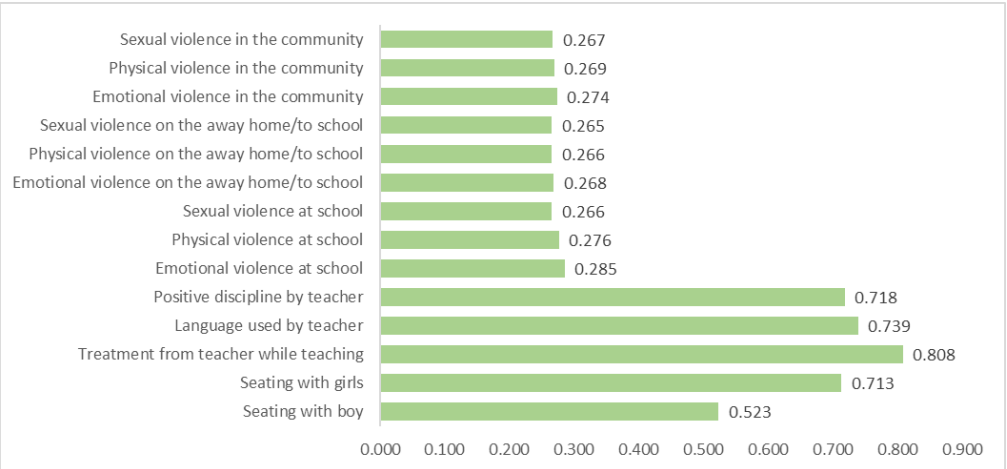


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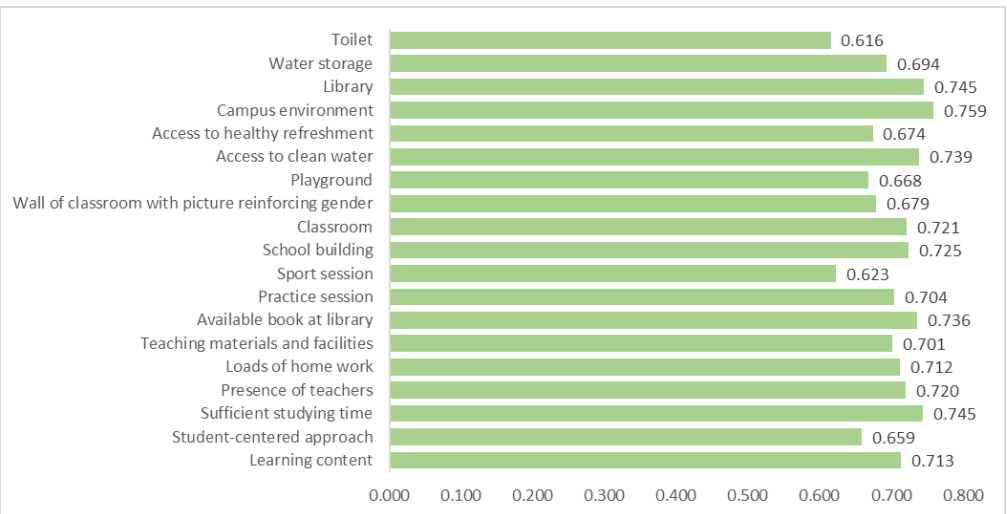
Figure 3. Students' satisfaction of towards schools' physical Infrastructure

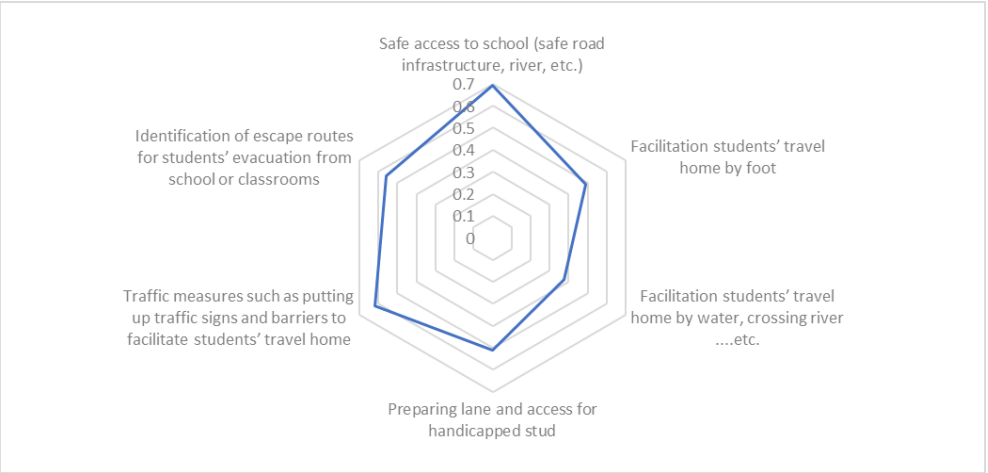


Notes: WAI = Weight Average Index measured on a five-point scale [Very dissatisfied (VL) = 0.00-0.20, Dissatisfied (L) = 0.21-0.40, Moderate (M) = 0.41-0.60, Satisfied (H) = 0.61-0.80, Very satisfied (VH) = 0.81-1.00]; OA = Overall Assessment; *Significance at the 0.05 level; **Significance at the 0.01 level.

In these recent years, disaster risk reduction (DRR) has become a crucial part of the school curriculum in Cambodia. In 2007, the MoEYS implemented the child-friendly school policy to help safe schools focus on health, safety, and child protection. Over time, DRR integration and safe school programs in the education sector have developed through various policies and frameworks to ensure students' safety before, during, and after hazards. While a child-friendly school policy is promoted, school safety initiatives and the DRR/CCA integrated curriculum developed for primary school from grade 4, grade 5, and grade 6. Herewith, the DRR curriculum is integrated into Grade 8's earth science and geography subjects. Furthermore, to ensure a safe learning and teaching activities during the disaster, the MoEYS also disseminated the guidelines on setting up temporary learning shelters during emergencies, primarily floods, to the Provincial Department of Education, Youth, and Sport (MoEYS, 2014).

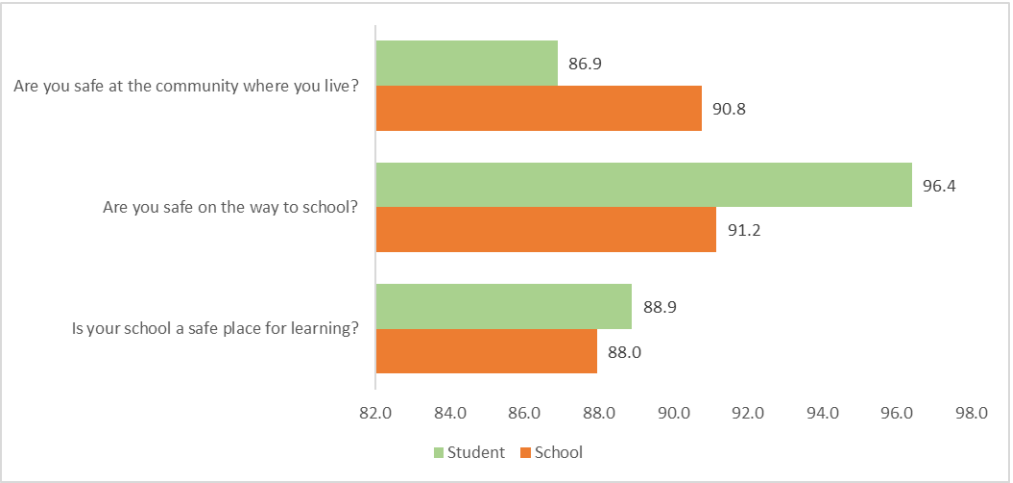
Overall, students were satisfied with school facilities helping them to safely access school and traffic measures such as putting up traffic signs and barriers to facilitate students' travel home. Students rated moderate satisfaction towards preparing lanes and access for handicapped stud, facilitation students' travel home by foot, and Identification of escape routes for students' evacuation from school or classrooms. Yet, students were not satisfied with facilitation students' travel from home by water and crossing river.

Figure 4. Teachers' satisfaction toward students' accessibility to school facilities



Notes: WAI = Weight Average Index measured on a five-point scale [*Very dissatisfied (VL) = 0.00-0.20, Dissatisfied (L) = 0.21-0.40, Moderate (M) = 0.41-0.60, Satisfied (H) = 0.61-0.80, Very satisfied (VH) = 0.81-1.00*]; OA = Overall Assessment; *Significance at the 0.05 level; **Significance at the 0.01 level.

Figure 5. Safe school, safe way to school, and safe community



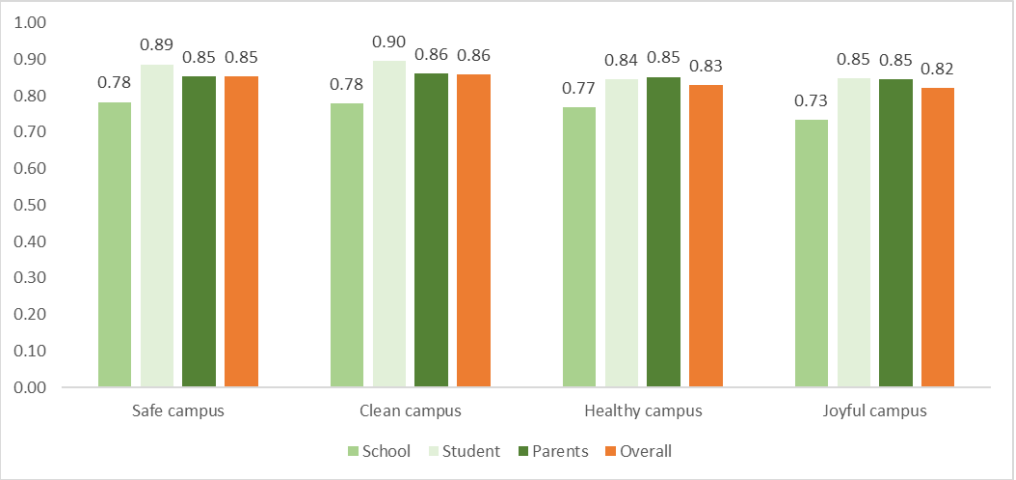
Note: *Chi-Square Tests*: P-*value* =0.000 for sale school, P-*value*=.001 for safe way to school, P-*value*=0.111.

Students and school representatives shared different views regarding safety at schools, on the way to school, and in the community (Figure 5). While almost all the school representatives (90.8%) believed the community was safe, 96.4% of the students confirmed safety along the way to school. Similarly, school representatives (88.0%) and students (88.9%) considered schools were safe for students to come and learn. Safety on the way to schools has been many schools' work to reduce risks of children during their travel to school and back home. Many schools pay great attention to students' travel by foot because the accidents may happen at any time, especially for schools along the national roads. At some schools, traffic issues remain severe, but it is getting better now because the students and teachers are aware of traffic law. Herewith, students and teachers were working to prepare signs and installed the traffic signs for student's awareness-raising. It was challenging to solve traffic problems, and school was challenging to communicate with the police.

In these recent years, schools have been working to create a safe and inclusive environment by tackling bullying and harassment and preventing self-harm or risk from natural hazards. For example, disaster-prone schools have prepared for early intervention, emergency training, and prevention activities to ensure that all students are safe at school. Students, school representatives, and parents described their satisfaction in terms of safe campus, clean campus, healthy campus, and joyful campus (Figure 6).

Both school representatives and parents similarly and significantly assessed a very high degree of safe schools, clean campus, healthy campus, and joyful campus; school representatives rated high degree of satisfaction of all the four indicators. Parents believe that learning happens best in a friendly, safe, and orderly school environment. School principals accept that their first responsibility is to foster such a climate, and the public continues to confirm that priority. Students and teachers similarly described that a good school environment includes friendly, healthy, and respectful relationships. Students need care from their parents, teachers, and school management team for promoting positive social-emotional skills, including compassion and empathy.

Figure 6. Satisfaction of students, school representatives, and parents with school services



Note: P-*value*= 0.000 for safe campus, P-*value*=0.000 for clean campus, P-*value*=0.000 for healthy campus, P-*value*=0.000 for joyful campus.

Logistic regression was employed to predict key factors influencing a safe place for learning (Table 1); school representatives suggested flood, COVID 19 pandemic, and water well-contained arsenic as the barriers to safe school establishment. School representatives explained that schools were using water from rains, underground water, and wetlands around the schools. Water, especially from underground water, may contain arsenic. When students drink water with arsenic levels, they may have harmful health effects depending on how much you drink and how sensitive you are to it. The main problem is that arsenic is not visible or tasted in water.

Table 1. Key factors influencing a safe place for teaching

Attributes	**B**	**Standard error**	**P-*value***
Flood	-1.762	.856	.040
Drought	-1.607	.974	.099
Storm	.618	1.308	.636
Dead lightning	-.977	1.047	.351
Traffic accidents	-.208	.727	.775
Epidemic diseases	1.283	1.242	.301
COVID 19	-1.091	.500	.029
Poisonous reptiles	17.729	5843.849	.998
Falling trees	-2.501	1.797	.164
Fire at kitchen	38.590	15874.333	.998
Dangerous broken brick, stone...	-20.896	14218.353	.999
Water well contained arsenic	-2.194	.979	.025
Pond without fence	1.881	1.317	.153
Constant	4.047	.399	.000

At the same time, the logistic regression model was also employed to predict key factors influencing a safe place for learning based on students' perspectives. Students suggested that factors such as the language used by teachers and physical violence at schools were influencing safe and friendly schools. Students claimed that gentle wording and positive disciplines delivered by teachers were important to establish a good learning environment and to improve the quality of basic education. At schools, the physical violation was seriously affecting a safe and friendly learning environment.

Table 2. Key factors influencing a safe and friendly place for students learning

Attributes	**B**	**Standard error**	**P-value**
Seating with boy	.181	.797	.821
Seating with girls	-.496	.497	.318
Treatment from teacher while teaching	.284	.607	.640
Language used by teacher	1.212	.551	.028
Positive discipline by teacher	-.946	.572	.098
Emotional violence at school	-1.781	2.451	.467
Physical violence at school	-4.165	1.477	.005
Sexual violence at school	-.451	2.344	.847
Emotional violence on the away home/to school	12.301	2837.711	.997
Physical violence on the away home/to school	87.087	7919.796	.991
Sexual violence on the away home/to school	-43.331	5139.778	.993
Emotional violence in the community	56.812	5871.110	.992
Physical violence in the community	84.823	8760.461	.992
Sexual violence in the community	-39.972	4730.274	.993
Constant	3.366	.470	.000

Adaptive capacity to shocks and stresses in the education sector

Participation of all the key stakeholders, including school representatives, parents, and students were very important for improving adaptive capacity to cope with shock and stress for better education of children at school. Figure 7 confirmed that school representatives, parents, and students had limited opportunities to participate in activities in response to short-term and long-term shocks and stresses dues to natural hazards, COVID-19, and violations. Many schools closely worked with NGOs and local government to be ready for combating violations at school and on the way to school and for managing disaster risk reduction. NGOs and schools also build the capacity of the students to know how to do self-protection. At the commune level, the commune council organized the meeting to prepare an

annual commune investment plan; teachers, school principals, and parents were invited to raise the priority for their community development.

School representatives had higher opportunities to participate in the workshop at schools and in other provinces, training, meeting with Commune Councils (CoCs), and safe school panning. In addition, school representatives actively engaged in voluntary work to carry out activities in response to short-term and long-term shocks and stresses. Interestingly, one-quarter of the students (33.4%) participated in the workshop in another province. In the communities, there were many NGOs working to support schools; they organized the workshop and invited students to share their views and concern for planning and policy implications. Comparatively, parents were less engaged in coping with shock and stress due to natural hazards, COVID-19, and school-based violations.

Figure 7. Engagement of school, parents, and parents in response to shocks

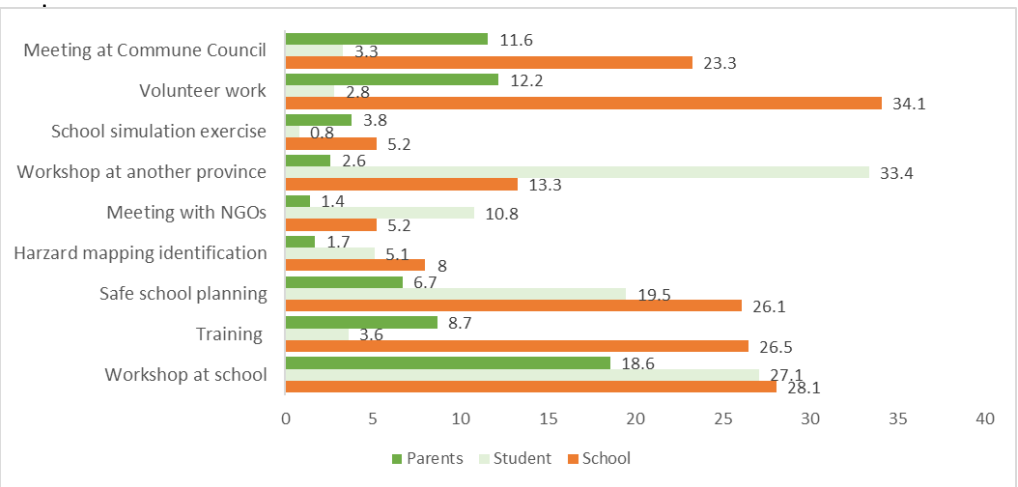


Figure 8 illustrates the roles and responsibilities of school representatives, parents, and students when they engaged in activities or events in response to shock and stress dues to natural hazards, COVID-19 pandemic, and violation. Overall, they all were just participants; they only sat and listened rather than decision-making and discussion. During activities or events participated, 8.4% of teachers and 4.1% of parents were involved in the discussion; they brought the issues concerning shocks and stresses and also shared their opinion for improving the actions and programs. At many schools, the Provincial Office of Education and NGOs worked to support safe schools through capacity building and infrastructure development. The local

government and NGOs also held many events to permit school principals, teachers, and parents to discuss and to share their opinions and suggestion to improve the quality of education.

Multiple regression analysis predicted key influencing factors suggested by school representatives in supporting safe schools for disaster risk reduction. School representatives suggested four out of 21 indicators influencing factors suggested by the school in supporting the safe school for disaster risk reduction; they include (1) preparing education continuity plan that is inclusive, free from abuse and violence, (2) preparation of emergency materials in responding to disasters, (3) putting up warning signs at dangerous places, and (4) maintenance of school's materials and documents during disasters. School representatives believe action plans, warning signs, school's materials, and documents and emergency materials were influencing the support of the safe school for disaster risk reduction (Table 2).

Figure 8. Roles of school, parents, and teachers in events in dealing with shocks and stresses

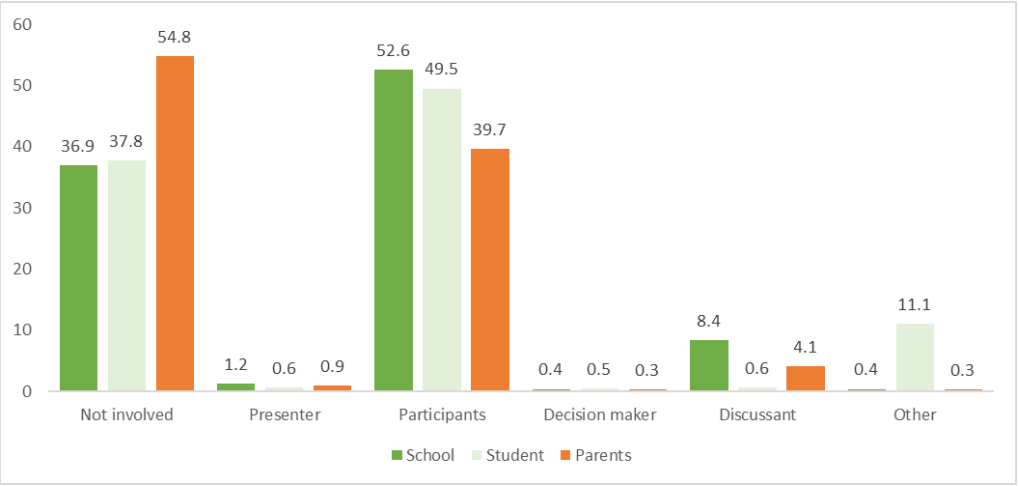


Table 2. Key influencing factors suggested by school representatives in supporting safe schools for disaster risk reduction

Attributes	**B**	**Standard error**	**P-*value***
Integration of DRR in primary school curriculum	-.209	.465	.653
Capacity building for teachers on disaster	-.432	.448	.334

risk reduction			
Regularly disseminate information to students about Do and Don't to be safe during disasters	.215	.417	.607
Training on first aid, prevention, and response to disasters	.465	.419	.267
Coordination with the community for common key messages on safe school	-.564	.437	.197
The DRR materials in school are gender and culture-sensitive, e.g., use the local language, all children can play any role in SDMC regardless of their gender	.215	.435	.621
The conduct of DRR education in extracurricular activities	.371	.502	.460
Establishment of committee for disaster management	.489	.679	.472
Establishment of inclusive, gender-sensitive committee for disaster management	.556	.643	.387
Identification of roles and responsibilities for committee for disaster management	.542	.671	.419
Assessment of risks, hazards, vulnerability, and capacity inside and outside of school	.219	.517	.671
Development of school safety plan or disaster risk reduction action plan	.045	.505	.929
Preparation of emergency materials in responding to disasters	.980	.450	.029
Development of early warning system for disasters (microphone, whistle, siren, and information board.....)	.517	.514	.314
Document development or slogans for risks reduction in school	.868	.502	.084
Development of safety signs	-.659	.527	.211
Putting up warning signs at dangerous places	-.975	.453	.031
Practice and improve simulation drills in	-.207	.524	.693

school to respond to disaster			
Maintenance of school's materials and documents during disasters	1.361	.429	.002
Prepare an education continuity plan that is inclusive, free from abuse and violence	-1.076	.458	.019
Coordinate with community and government for networking, advocacy and fundraising/resource mobilization	.358	.406	.378
Constant	-.638	.347	.066

Table 3 illustrates the result of multiple regression analysis to predict key factors influencing students supporting the safe school for disaster risk reduction through student councils. The model suggests that student councils were engaging in (1) establishment of a committee for student councils, (2) development of school safety plan or disaster risk reduction action plan, (3) preparation of emergency materials in responding to disasters and pandemics, and (4) development of safety signs. Using the existing system, the student council has gradually paid more and more attention to national and international NGOs to engage children in civic duty and helping behavior in society (KAPE, 2009). At many schools, teachers and the student council arranged traffic facilitation when students were traveling from home and leaving school to ensure a safe trip. All vehicles were requested to stop for students to travel across the national roads or highways to ensure students' safety. Student councils also involved many other activities led by their teachers and NGO staff to reduce risk from natural hazards and epidemic outbreaks such as COVID-19 and bird flue.

Table 3. Key influencing factors suggested by students in supporting the safe school for disaster risk reduction through student councils

Attributes	**B**	**Standard error**	**P-*value***
Establishment of committee for student councils	1.085	.358	.002
Identification of roles and responsibilities for committee for student councils	-.228	.364	.531
Assessment of risks, hazards, vulnerability, and capacity	-.281	.290	.333

Development of school safety plan or disaster risk reduction action plan	.601	.241	.012
Preparation of emergency materials in responding to disasters and pandemic	.896	.270	.001
Development of early warning system for disasters (microphone, whistle, siren, and information board.....)	-.598	.307	.052
Document development or slogans for risks deduction in school	.171	.225	.446
Development of safety signs	.526	.257	.040
Putting up warning signs at dangerous places	-.165	.268	.539
Practice and improve simulation drills in school to respond to disaster and pandemic	-.295	.259	.254
Maintenance of school's materials and documents during disasters and pandemic	.031	.235	.895
Constant	-1.434	.146	.000

The factors influencing parents in supporting a child's learning at home were also predicted by using multiple regression analysis. The model suggests that parents' engagement in children's learning was associated with children's schoolwork, follow-up of children' study, and helping children to study online (Table 4). Many parents complained about their difficulty and time invested during their children's study online. Many parents have difficulties covering the expense of buying smartphones or computers for their children to study online.

Table 4. Key influencing factors suggested by parents in supporting child's learning

Attributes	**B**	**Standard error**	**P-*value***
To what degree are you involved in your children's school work?	.261	.040	.000
How often do you follow up on your children' studies?	.502	.049	.000
Schools are officially closed. However, how	.028	.032	.376

often did your children visit the school?			
The school encourages parent involvement in school activities	-.048	.064	.452
The school gives equal importance to extracurricular activities as much as academic activities.	-.021	.075	.780
The school's educational curriculum is good and is updated regularly	.030	.069	.668
In your opinion, do you think a mobile phone is necessary for your child at all times?	.008	.044	.860
How many percent do you assist your children in studying online?	.090	.037	.017
How often do you participate in parent meetings organized by the school?	-6.303E-5	.000	.814
(Constant)	.072	.060	.231

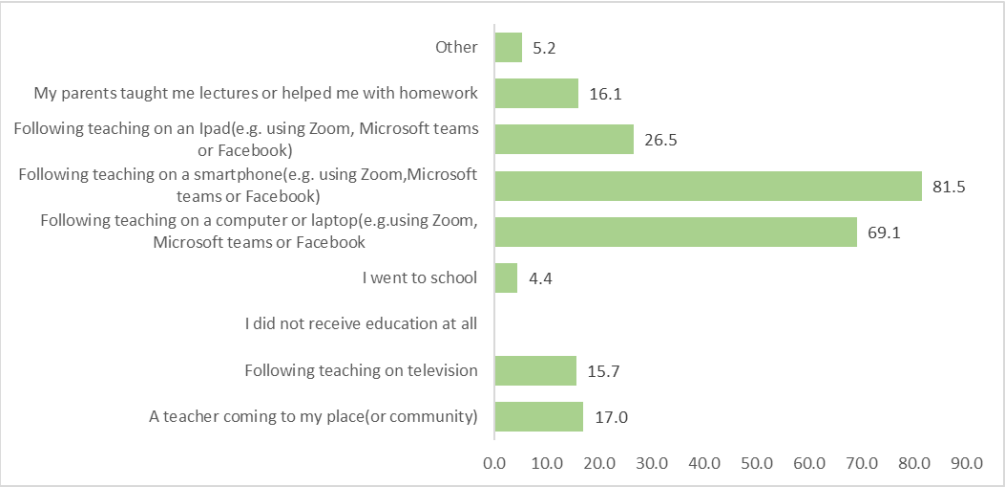
Teaching and learning during COVID pandemic

Social distance has limited gathering and meeting in a larger group, even at school. The MoEYS instructed all schools to close to prevent the spread of the disease. Therefore, teachers were not able to teach in the classroom, and they had to go to the communities for teaching. During COVID-19 pandemic, students mainly used smartphone (81.5%), computer or laptop (69.1%), and iPad (26.5%). Other options included the visit of teaching at students' communities (17.0%), watching a TV show on lessons (15.7). Interestingly, none of the students claim that they did not take any study. As a result, teachers and students could find an appropriate solution for their learning; however, the quality and quantity were not as good as in the classroom (Figure 8).

Figure 9 describes how often school representatives, students, and parents visit schools during the COVID-19 pandemic. Their perceptions regarding students' academic performance were also drawn during the survey. Overall, school representatives, students, and parents rated a moderate degree of their school visits and a moderate degree of academic performance. During the COVID-19 pandemic, school representatives often

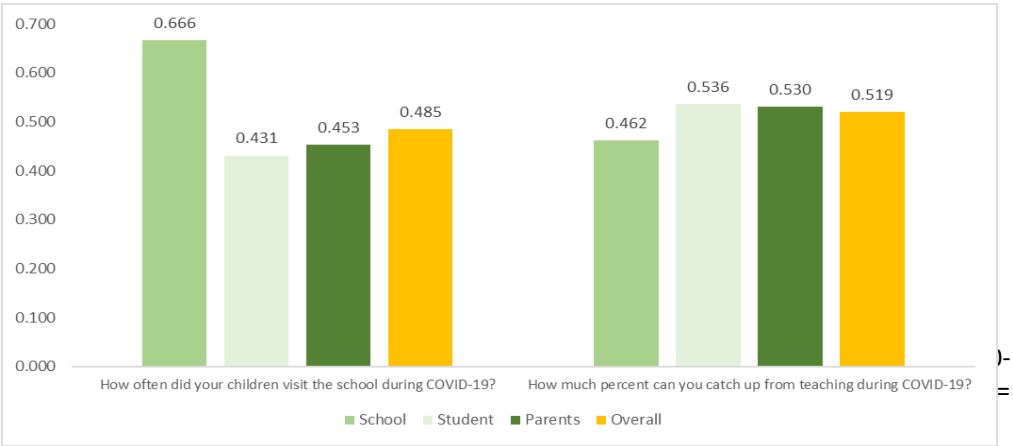
visited schools, and it was higher than those students and parents. Similarly, parents and students confirm significantly higher satisfaction of academic performance. COVID-19 tended not completely disrupt students' education. Both parents and students only visited schools occasionally and as requested by their teachers or school principals (Figure 9).

Figure 8. Means of teaching and learning during COVID-19



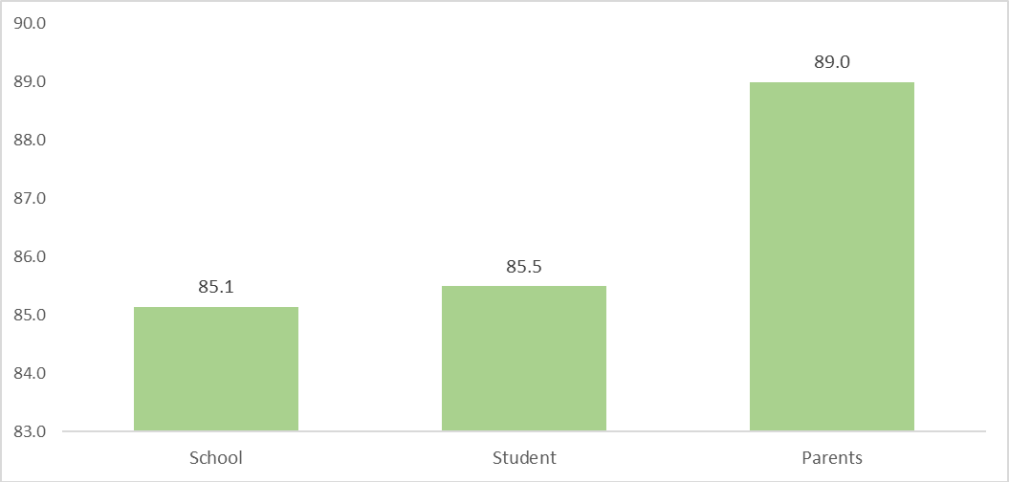
The majority of the respondents supported to have online teaching and to learn especially parents (89.0%). School representatives (85.1%) and students (85.5%) also thought online learning and teaching were the most appropriate alternatives; they supported and cooperated during the teaching and learning process (Figure 10).

Figure 9. School visit and learning performance of students during COVID-19



P-value=0.000 for school visit, P-value =0.000 for understanding of teaching

Figure 10. Support to have online teaching and learning

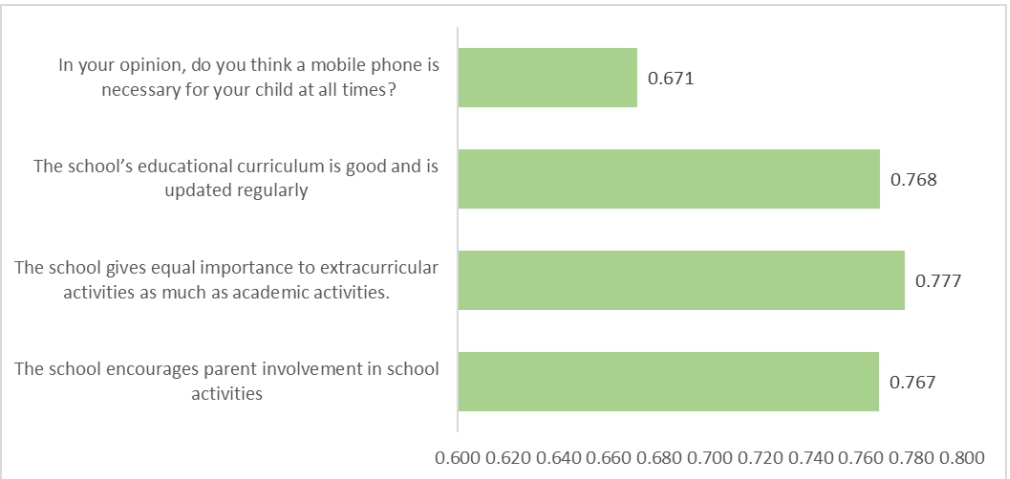


Notes: WAI = Weight Average Index measured on a five-point scale [Very low (VL) = 0.00-0.20, Low (L) = 0.21-0.40, Moderate (M) = 0.41-0.60, High (H) = 0.61-0.80, Very high (VH) = 0.81-1.00]; OA = Overall Assessment.
Note: Chi-Square, P-value=0.253

Supporting mechanism to establish resilience system at schools

Parents' engagement and support

Figure 11. Perception of parents towards children schooling



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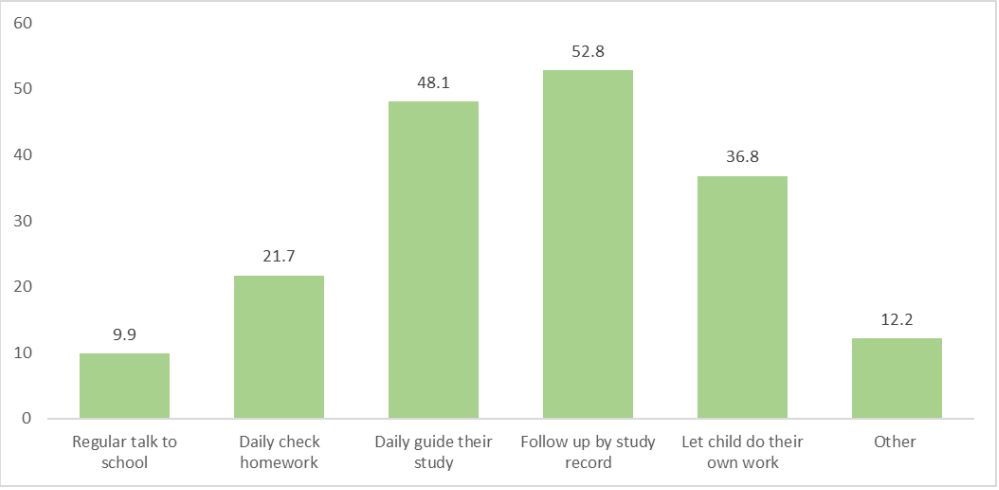
Parents tended to have high satisfaction with the educational curriculum, the necessity of mobile phones, equal importance to extracurricular activities. In addition, parents are also highly satisfied to get involved with school activities (Figure 11). Overall, parents learned that their involvement was very useful, and it is very important to ensure safe schools. Parents have started to get involved in schools' activities and contribute to school development physically and/or financially.

Figure 12. How do you follow up your children's study progress by parents?



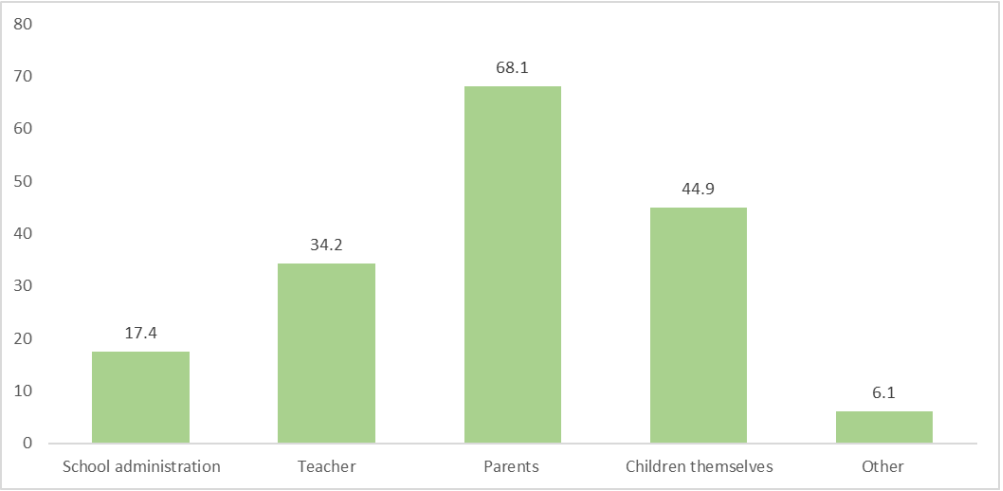
Notes: WAI = Weight Average Index measured on a five-point scale [Very low (VL) = 0.00-0.20, Low (L) = 0.21-0.40, Moderate (M) = 0.41-0.60, High (H) = 0.61-0.80, Very high(VH) = 0.81-1.00]; OA = Overall Assessment.
Note: helping student homework, to reduce academic stress (51.6%)

Parents followed up their children' s education in a different way; they included follow-up by study records (52.8%), daily guide of students' study (48.1%), daily check of homework (21.7%), and regularly talk to school (9.9%). Out of the total, 36.8% of parents let children do their own work (Figure 12).

The survey shows that 68.1% of parents claimed themselves as the person who is responsible for making decisions about the child's educational

needs. At the same time, almost half of the parents confirmed that children could make their children could make decisions in their educational needs. At school, teachers (34.2%) and school administration (17.4%) made the decision of children's needs (Figure 13).

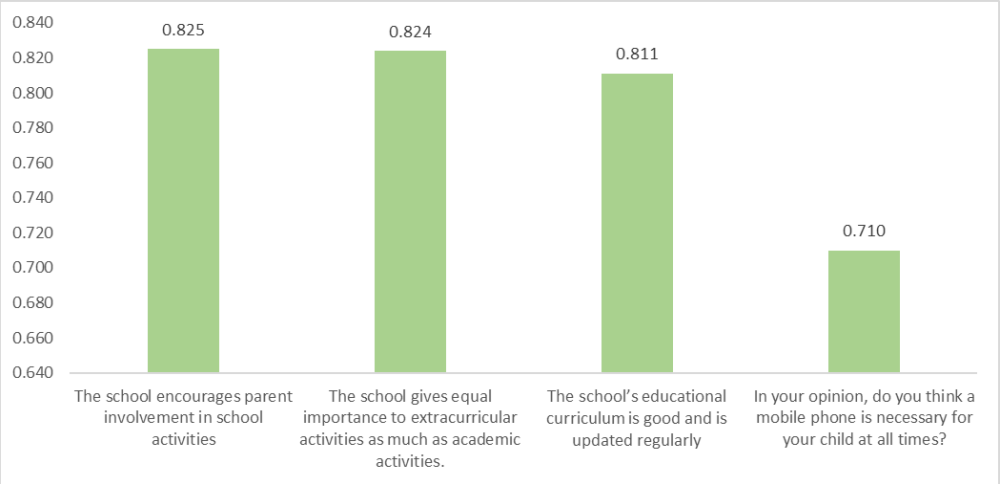
Figure 13. Responsible person in decision making of children's educational needs



School representative assessed very high degree of supporting safe school through engagement of parents, equal importance of extracurricular activities, regular update of educational curriculum, and necessary of mobile phone for online learning (Figure 14).

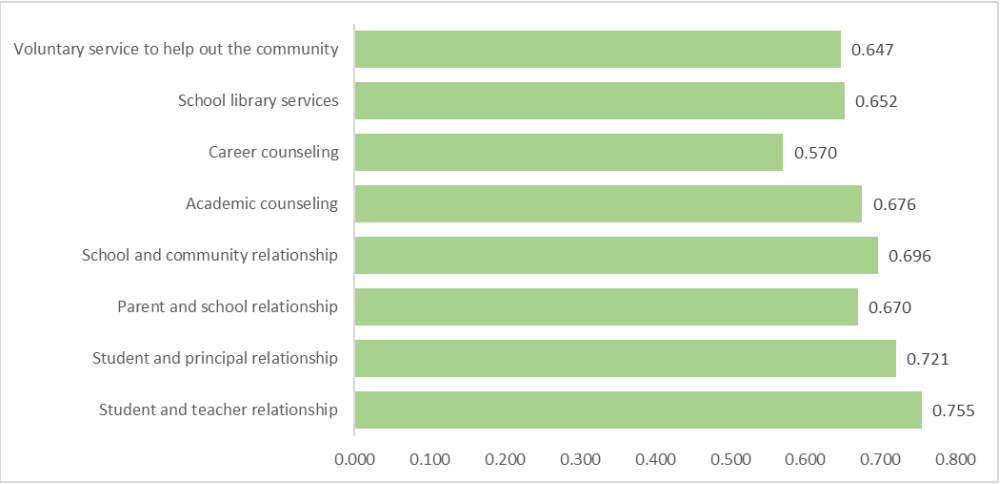
Teachers are highly satisfied with voluntary service to help out the community, library services, academic counseling, relationship between schools and community, the relationship between school and community, the relationship between school principals and students, and teachers and students. In the meanwhile, teachers rated their satisfaction towards career counseling (Figure 15)

Figure 14. Activities carried out in response to shock and stress



Notes: WAI = Weight Average Index measured on a five-point scale [Very low (VL) = 0.00-0.20, Low (L) = 0.21-0.40, Moderate (M) = 0.41-0.60, High (H) = 0.61-0.80, Very high (VH) = 0.81-1.00]; OA = Overall Assessment.

Figure 15. Satisfaction of teachers towards school services and communication



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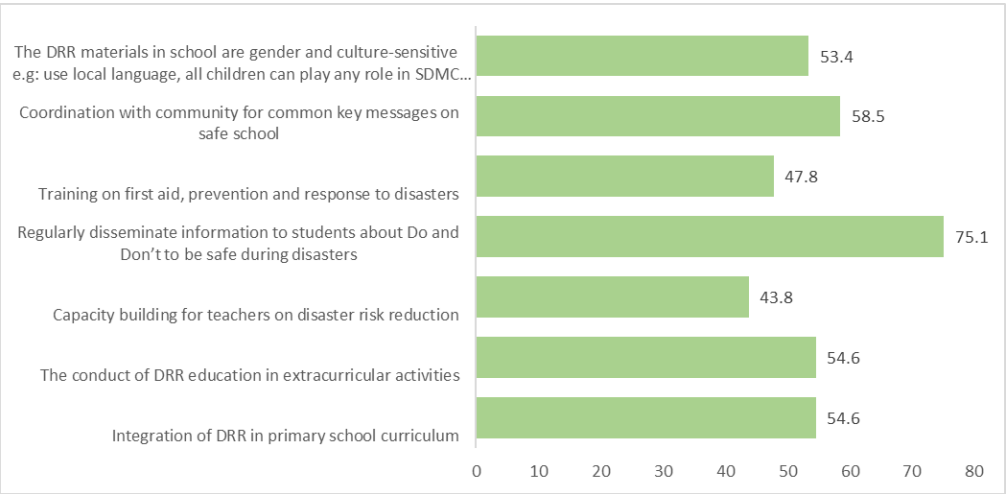
School representatives have been actively involved in various tasks and activities to reduce the risks and vulnerability of students at school. The

school representatives rated a high degree of their involvement in disseminating information to students about Do and Don't to be safe during a disaster. They rated moderate degree of other related activities; they included the presentation of DRR materials with a gender perspective, dissemination of common key message in the community on safe school, training on first aid, prevention and response to disasters, capacity building of teachers, DRR education in extracurricular activities, and integration of DRR (Figure 16).

Figure 17. Supporting mechanism to reduce risk



Notes: WAI = Weight Average Index measured on a five-point scale [Very low (VL) = 0.00-0.20, Low (L) = 0.21-0.40, Moderate (M) = 0.41-0.60, High (H) = 0.61-0.80, Very high (VH) = 0.81-1.00]; OA = Overall Assessment.

Conclusion Remark and Policy implications

Based primarily upon our findings conducted at upper schools in 12 provinces and Phnom Penh, but with some additional insights from resilience system to the COVID-19 pandemic, natural hazards, social, economic, and technological changes in Cambodia, we conclude that: schools started to establish a resilient system to cope with shocks and stressed which are necessary to address the impacts of natural hazards, pandemics and violation. But schools' adaptive capacity remained limited because of the insufficiency of human and financial resources. Students confirm that the learning environment is getting better and better when risks and vulnerabilities of natural hazards are reduced. For example, students are still

able to take an online class during the long break of the COVID-19 pandemic. In addition, teachers delivered positive discipline, treated students well, and used gentle language during classes. The upgrade of school physical infrastructure and facilities are useful to improve the safety of students at schools and on the way to schools. Moreover, the awareness-raising and capacity building delivered by government agencies, local authorities, and NGOs have reduced emotional, physical, and sexual violations.

While school representatives and students identified long-term shocks and stresses are caused by the poor condition of facilities, buildings, and surrounding school environment, short-term shocks and stresses are suffered by natural hazards and epidemics. Long-term shocks and stresses caused by ponds, water wells, broken bricks, trees, reptiles, and traffic accidents may bring students with a slight injury, serious injury, or even death. Natural hazards (flood, drought, storm, and dead lightning) and epidemics (COVID-19 and other communicative diseases) were short-term shocks and stresses; they are postponing students' schooling and affecting the health condition of students. The research suggests that school representatives, parents, and students remained having limited opportunities to participate in activities in response to short-term and long-term shocks and stresses dues to natural hazards, COVID-19, and violations. Many schools do not have their own human, financial resources; the interventions were mainly made by government agencies, local authorities, and NGOs.

Schools have engaged students and parents in coping with shocks and stresses in reducing risks and vulnerabilities from natural hazards, epidemics, and violations. School principals and teachers participated in reducing vulnerabilities by preparing education continuity and emergency materials in responding to disasters, putting up warning signs at dangerous places, and maintenance of school materials during disasters. The existing structure of student councils helped students to engage in committee establishment, development of school safety plans, preparation of emergency materials in responding to disasters and pandemics, and development of safety signs. In sometimes, parents' engagement in children's learning was associated with children's schoolwork, follow-up of children' study, and helping children to study online. The effort and recent investment of government agencies, UN agencies, NGO, local government, and private sectors have gradually advanced the school physical infrastructure. Some physical infrastructures

such as school buildings, water access, and sanitation are very useful for promoting safe school programs through reducing disaster risks and protecting child rights.

For better planning and policy implication, the research is provided with some suggestions to cope with risks and vulnerability for establishing the resilient system and improved adaptive capacity as follows:

- The *Disaster Management Secretariat and Curriculum Development Department (CDD) of MoEYS* should play more role in promoting the existing mechanism to establish a resilience system at schools to build schools' adaptive capacity in reducing risk and vulnerability due to shock and stress. The Secretariat is good to be responsible for the functioning of Disaster Management Mechanism and play more role in promoting DRM activities in the education sector. The CDD should cooperate with schools and NGOs to ensure high quality of content knowledge of DRR/CCA and safe school program at upper secondary schools. The integration of content knowledge regarding DRR/CCA and safe school program must be aligned to the local context, available financial and human resources at schools. Moreover, the Secretariat is good to delegate tasks and responsibilities to PoE and DoE to follow up on school action plan for reducing risks and vulnerabilities at schools. By doing so, the Secretariat may allocate annual budgets to implement action plans developed by schools.
- *Department of Construction at MoEYS* increased their work with the Provincials Departmentof Education, Youth ad Sport (PoEYS) and District Office of Education, Youth and Sport (DoEYS) to identify schools that require upgrading their standards to be resilient to disasters. The quality control guidelines for school building construction should be strictly applied (MoEY, 2012) for safety and environmental protection, which are the cycle of disaster risk reduction. The department should consider improving physical infrastructures and facilities in disaster-prone areas to prevent damages and losses from flooding, storm, and other types of natural hazards.
- *The PoEYS and DoEYS* are good to prioritize in establishing resilient schools into an annual action plan and include a budget for activities at the DoE to work with the schools through capacity building, coaching, and follow-up of the usage of IEC materials. Moreover, the PoE and DoE

should develop a 5-year strategic plan for establishing resilient schools to natural hazards, epidemics, and violations.

- *The National and International donors* should continue to prioritize risk education and resilience at schools due to long-term and short-term shocks and stresses in the educational sector in Cambodia. Funding for NGOs to work with schools remained crucial because schools do not receive an annual budget from the MoEYS and cannot mobilize domestic resources for implementing the activities. If possible, large-scale and long-term funding should be mobilized to implement a national risk and vulnerabilities reduction. Intervention should focus on awareness-raising, capacity building, and infrastructure development at school levels. The donors should ensure that the program is only phased out when the MoYES can implement the program afterward.
- *Improved capacity of teachers and management staff through existing resources*. Schools need to consolidate the experiences gained with NGOs regarding risks and vulnerability reduction and make it available to reach other schools where they are now working. NGOs are working to build capacity and awareness-raising of schools to implement the resilient school program. School principals and teachers who earned experience with NGOs during the project implementation should be the focal persons to share with other teachers, especially new ones.
- *Engagement of community and parents***.** Parents are the local resources that are useful for supporting schools physically and financially. Many schools are also are built with help from parents. The study also witnessed in some provinces, where schools were required to fill soils in the ponds. Schools should keep closely working with parents to mobilize local resources for improving school infrastructure.
- *Shared with equal tasks and responsibilities for school committees*. The schools are using the existing structure of student councils for resilient school establishment; girls and boys are well distributed equally. However, tasks and responsibilities of girls and boys are separated; boys are assigned.

References

ADPC (2008) *A Study on Impact of Disasters on the Education Sector in Cambodia*. Bangkok: Asian Disaster Preparedness Center.

Bebbington, A. (1999). Capitals and capabilities: A framework for analyzing peasant viability, rural livelihoods, and poverty. World Development, 27, 2021–2044.

Chet, C. & Sok, S. (2020) Dangers and opportunities related to the COVID-19 epidemic for Higher Education Institutions in Cambodia. Cambodia Journal of Basic and Applied Research (CJBAR), 2(1), 20–26.

Cinner, J., Fuentes, M. P. B. M., & Randriamahazo, H. (2009). Exploring social resilience in Madagascar's marine protected areas. Exploring social resilience in Madagascar's marine protected areas. Ecology and Society, 14, 41.

DFID. (2011). Defining disaster resilience: A DFID approach paper. London: Department forInternational Development.

Folke, C., Hahn, T., Olsson, P., & Norberg, J. (2005). Adaptive governance of social-ecologicalsystems. Annual Review of Environment and Resources, 30, 441–473.

Green, C., Mynhier, L., Banfill, J., Edwards, P., Kim, J., & Desjardins, R. (2020). Preparing education for the crises of tomorrow: A framework for adaptability. *International Review of Education*, *66*(5), 857-879.

Heng, C. (2019). The impact of flooding on primary education in Kroch Chmar District, Tbong Khmum Province, Cambodia. *Cambodia Journal of Basic and Applied Research (CJBAR), 1(2)*, 84–98.

KAPE (2009) Children's Councils in Cambodia: a brief assessment. Phnom Penh: Kampuchean Action for Primary Education.

MoEYS (2012) *Quality Control Guidelines for School Building Construction*. Phnom Penh: Ministry of Education Youth and Sport.

MoEYS (2013) *Flood Assessment Report on Impacts and Damages on Education Sector*. Phnom Penh: Ministry of Education Youth and Sport.

MoEYS (2014) *Emergency Preparation and Response Plan for Education Sector 2014*. Phnom Penh: Ministry of Education Youth and Sport.

NCDM (2014) Post-flood early recovery need assessment report. Phnom Penh: the National Committee for Disaster Management.

Pahl-Wostl, C., Becker, G., Knieper, C., & Sendzimir, J. (2013) How multilevel societal learning processes facilitate transformative change: a comparative case study analysis on flood management. *Ecology and Society*, *18*(4), no−58.

Save the Children (2009) *Feeling the Heat: Child survival in a changing climate.* London: Save the Children.

UNICEF (2008) *Child Protection Strategy, 2008*. Phnom Penh: The United Nations Children's Fund is a United Nations.

World Bank (2020) Cambodia Economic Update. Cambodia in the time of COVID-19. Washington DC: World Bank.

World Vision. (2014). *Committing to Child-Centred Disaster Risk Reduction: An Opportunity at the World Conference for Disaster Risk Reduction*. Phnom Penh: World Vision.

Yusuf, A. A., & Fransisco, H. (2009). Climate Change Vulnerability Mapping for Southeast Asia.