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## **School of Transportation Sciences**

Master of Transportation Sciences

### **Master's thesis**

***Understanding the support of route2school (R2S) education implementation in Indonesia***

**Irene Febryana Sitohang**

Thesis presented in fulfillment of the requirements for the degree of Master of Transportation Sciences, specialization Traffic Safety

#### **SUPERVISOR :**

Prof. dr. Davy JANSSENS

#### **CO-SUPERVISOR :**

dr. Ariane CUENEN



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[www.uhasselt.be](http://www.uhasselt.be)  
Universiteit Hasselt  
Campus Hasselt:  
Martelarenlaan 42 | 3500 Hasselt  
Campus Diepenbeek:  
Agoralaan Gebouw D | 3590 Diepenbeek

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**PREFACE**

The thesis is submitted as a compilation of the master's program in transportation sciences with a specialisation in road safety at Hasselt University within the scope of the VLIR-UOS Master Scholarship. I had a pleasure working on this research and learned a lot about road safety education related to pedestrians.

I would like to thank Prof. dr. Davy Janssens (supervisor) and dr. Ariane Cuenen (co-supervisor) for their guidance and valuable input throughout the thesis process. I express my gratitude to the research participants, for without their help, this thesis could not have been completed. Finally, I would like to thank my family and friends who gave me immense support and encouragement throughout my study.



## SUMMARY

Road safety education (RSE) is essential for children to increase their knowledge and awareness of road safety despite their limited role in road traffic. Providing a formal RSE at school ensures continuous learning so that children can develop a good road safety culture. It can be done by engagingly delivering the topic through a gamified programme. Developed by the Transportation Research Institute (IMOB) in Belgium, the gamified RSE programme called Route2School (R2S) Education contains theory-based RSE, consisting of four modules: traffic knowledge, situation awareness, risk detection, and risk management. The programme focuses on children's role as pedestrians in familiar and unfamiliar situations. Its effect evaluation has been investigated in several countries, yet its implementation prospect as a formal programme at school has not been explored.

This master's thesis employed a combination of qualitative and quantitative research to understand how junior high schools (government and non-government schools), government, and students in Indonesia support R2S Education implementation. Acting as school representatives and students' guides in the experiment, teachers participated in pre- and post-experiment semi-structured interviews to understand RSE at school and how they evaluate the prospect of R2S Education. Students performed the programme where they were required to complete the evaluation survey afterwards. A semi-structured interview with the government provided insight into R2S Education implementation prospects from the government's perspective.

The qualitative analysis for schools and government generates two main themes: barriers and contributing factors to R2S Education implementation. Barriers are related to the current RSE condition at schools and the reality in society. Notably, it is found that the lack of priority for RSE in curriculum and regulation hinders the implementation of RSE at schools. This issue limits the discussion of barriers focusing on R2S Education in-depth. The contributing factors consist of subthemes related to the benefits of R2S Education, the programme set-up and content and the implementation prospect of R2S Education in school. These factors concern government, schools, students, and programme-makers to achieve positive implementation support.

The exploratory factor analysis grouped evaluation statements in the post-experiment survey into three factors, i.e., implementation prospect and R2S Education evaluation with the students' behaviour pre-experiment and the evaluation with their behaviour post-experiment. By performing ordinal regression analysis, it is revealed that there is a strong correlation between implementation support of students with aspects in the programme, i.e., final evaluation, teacher's guidance, theory-based programme, and badge. Further, the analysis concluded that students' characteristics do not influence their support.

By comparing the support between government and non-government schools, it is revealed that each school has different interests when evaluating R2S Education. The government school focused more on the programme set-up while the non-government school concentrated on behaviour. Nevertheless, both schools agree that there should be an emphasis on students' characteristics and the benefits they will get by implementing R2S Education. This research found that schools are linked to students and government, which indicates that schools' active involvement can raise the awareness and relevancy of RSE at schools and eventually increase the support for implementing R2S Education. The programme-makers can contribute by improving the programme according to the stakeholders' interests.



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**LIST OF ABBREVIATIONS**

Abbreviation	Referring to	First mention
AST	Active school travel	Subchapter 1.1
BRT	Bus rapid transit	Subchapter 1.3
CBD	Central business district	Subchapter 1.3
COVID-19	Coronavirus disease 2019	Subchapter 1.4
DKI Jakarta	<i>Daerah Khusus Ibukota Jakarta</i> (Special Capital Region of Jakarta)	Subchapter 1.3
GS	Government school	Subchapter 3.3.1
ICT	Information, communication, and technology	Subchapter 1.4
KMO Test	Kaiser-Meyer-Olkin Measure of Sampling Adequacy test	Subchapter 3.3.2
MRT Jakarta	<i>Moda Raya Terpadu Jakarta</i> (Mass Rapid Transit Jakarta)	Subchapter 1.3
N/A	Not applicable	Subchapter 4.1
NGO	Non-governmental organisation	Subchapter 1.1
NGS	Non-government school	Subchapter 3.3.1
OECD	Organisation for Economic Co-operation and Development	Subchapter 1.1
RRISK	Reduce Risk Increase Student Knowledge	Subchapter 1.1
RSE	Road safety education	Subchapter 1.1
R2S Education	Route2School Education	Subchapter 1.2
TPB	Theory of planned behaviour	Subchapter 2.4
UN	United Nations	Subchapter 1.1
UNICEF	United Nations Children's Fund	Subchapter 1.1
WHO	World Health Organization	Subchapter 1.1



## **1. INTRODUCTION**

### **1.1. Background**

Countries globally have been consistently improving road safety for their residents. Data has shown improvements in road fatalities. For example, 73% of thirty OECD member countries recorded a reduction in road fatalities in 2019, with Sweden with the highest reduction of 21.6% (International Transport Forum, 2020). The success is still unsatisfactory because, in the case of road safety in EU member states, the impressive improvement (36% road fatalities reduction) is still below the goal (50% reduction) from 2010 to 2020 (European Commission, 2021). Several regions outside Europe even showed an increase in road fatalities, e.g., Africa, Eastern Mediterranean, and South-East Asia (World Health Organization, 2018). At a global level, the United Nations (UN) General Assembly targets the reduction of road fatalities and injuries by at least 50% from 2021 to 2030 (World Health Organization, 2021), which means that there are still more actions that should be taken in terms of road safety.

It is now well established that road safety problems are viewed holistically. Several countries have been applying an approach to improve all aspects of making their road safer. A well-known example of such an approach is the Safe System approach, which is also the foundation for taking action for the Global Plan for the Decade of Action for Road Safety 2021 – 2030 (World Health Organization, 2021). It is based on a belief that road safety is the responsibility of all stakeholders to eliminate the number of crashes leading to severe injuries and death (International Transport Forum, 2016).

Human is vulnerable to force of a certain extent in a crash; a collision with a vehicle at the speed of 60 km/h results in an almost 100% fatality rate (Wramborg, 2005, as cited in International Transport Forum, 2008). On the other hand, there is no perfect world with humans never making intentional or unintentional mistakes. Protecting human is the core of the Safe System approach, and it requires stakeholders from various work focuses whose work are contributive to road safety (see FIGURE 1). These stakeholders might come from the engineering sector, e.g., builders, designers, and operators, in the enforcement sector, e.g., legislators and enforcers, or in the education sector, e.g., researchers and educators.

The stakeholders mentioned earlier indicate that road safety is a collaborative process of the 3Es: engineering, enforcement, and education. Morimoto et al. (2021) suggested that the collaboration of these aspects results in an optimal solution for road safety. Road safety education (RSE) should be complemented with improvements in road infrastructure and enforcement (Leung et al., 2021). Improvement in infrastructure, e.g., pedestrian facilities and safety road features, and the regulation, e.g., speed limits and vehicle restrictions, improve safety perceptions and ultimately increase active travel (Smith et al., 2020; Wilson et al., 2018). RSE is exceptionally beneficial for low- and middle-income countries, where road safety aspects require improvements (Treviño-Siller et al., 2017). However, in terms of effect evaluation, it can be challenging to see the effect of RSE independent from the other two aspects on a long-term basis (Raftery & Wundersitz, 2011).

In the domain of elementary and secondary education, Raftery & Wundersitz (2011) divide RSE into five categories based on its strategies:

- Indirect or holistic approaches

This approach looks at road safety issues deep into the underlying factors, such as cognitive-behavioural skills, substance use, and challenges the target group faces. A programme can be

organised by conducting seminars, group discussions, and other forms requiring active participation. An example of the programme is the Reduce Risk Increase Student Knowledge (RRISK), held in New South Wales, Australia, since the mid-1990s. RRISK focuses on substance use, i.e., alcohol, cannabis, ecstasy, and amphetamines, in connection to risky driving among high school students.

- One-time interventions

An RSE programme is considered a one-time intervention when organised in one short session in cooperation with a particular stakeholder, including police, non-government organizations (NGOs), and the ministry of transportation. The stakeholder gives a presentation or demonstration related to the topic; for example, the police might give a short presentation to students about traffic signs and rules and the importance of obeying traffic rules.

- Driver training

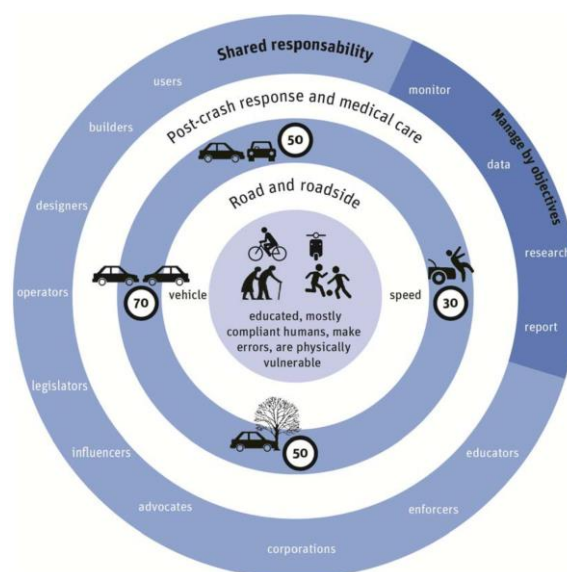
Driver training focuses on developing specific skills necessary for driving. It is different from driver education which covers broader topics, i.e., knowledge, attitudinal, and behavioural. A typical driver training programme combines both theoretical and practical sessions.

- Curriculum or cross-curricula based

In this strategy, RSE is integrated into the school curriculum within existing subjects or in an independent subject. This strategy has been employed in many countries with range of programme set-up possibilities.

- Multi-modal

Multi-modal strategy requires collaboration between education and other strategies. For example, a school that offers RSE improves its facilities related to road safety. The teachers can instruct students to use such facilities. Therefore, combining theoretical and practical sessions is necessary when applying this strategy.



**FIGURE 1 Conceptualisation of the Safe System (International Transport Forum, 2016)**

Meanwhile, the children's vulnerability on the road is considered an urgent problem by the World Health Organization (WHO). WHO includes road traffic injuries in the eighth rank among the nine health-related problems, and it ranks first in causing death for people aged 5 – 29 years (World Health Organization, 2018). The FIA Foundation, in cooperation with United Nations Children's Fund (UNICEF), estimates that 500 children of age 5 – 19 years die every day in traffic crashes (Silverman & Billingsley, 2015). Further, the authors showed that the risk is twice greater in low and middle-income countries than in high-income countries despite fewer motorised vehicles.

It is interesting to consider that traffic crashes are preventable by applying a good system such as the Safe System approach. While the worst-consequences-possible traffic crashes involve motorised vehicles, in a broader sense, road safety is also related to active transportation, which requires physical activities, e.g., walking and cycling. The low speed of these activities reduces the possibility of serious injuries, as previously mentioned. Moreover, these activities benefit human health, albeit very small when it is not done in the long term (Schauder & Foley, 2015). On the other hand, Younkin et al. (2021) found that the increase in participation in walking and cycling is more beneficial to human health than the increase in intensity, which requires engineering and enforcement interventions to improve the facilities of active road users.

That is why the topic of active school travel (AST) should be getting more attention. It is not so popular in large countries, especially where road infrastructure is constantly improved with little progress on public transportation. Studies in New Zealand have expressed this concern (Ikeda et al., 2019). Parents do not encourage their children to walk to school at a great distance from home, and if the convenience of travelling is compromised (Ikeda et al., 2019; Smith et al., 2020). Parents in New Zealand encourage their children to walk to school for health reasons. On the other hand, children feel that a busy road and vehicle gas danger their safety and wellbeing (Smith et al., 2020).

Therefore, RSE focusing on children is essential so that children can have the necessary competency of road safety since they are young, even with a minimum experience as independent road users. It is effective when given from a young age (Alonso et al., 2018; Dragutinovic & Twisk, 2006) to raise traffic safety awareness and knowledge of good road safety culture (Hatfield et al., 2019; Morimoto et al., 2021), leading the motivation in doing a behaviour (Treviño-Siller et al., 2017; Yen et al., 2019).

## **1.2. Route2School Education**

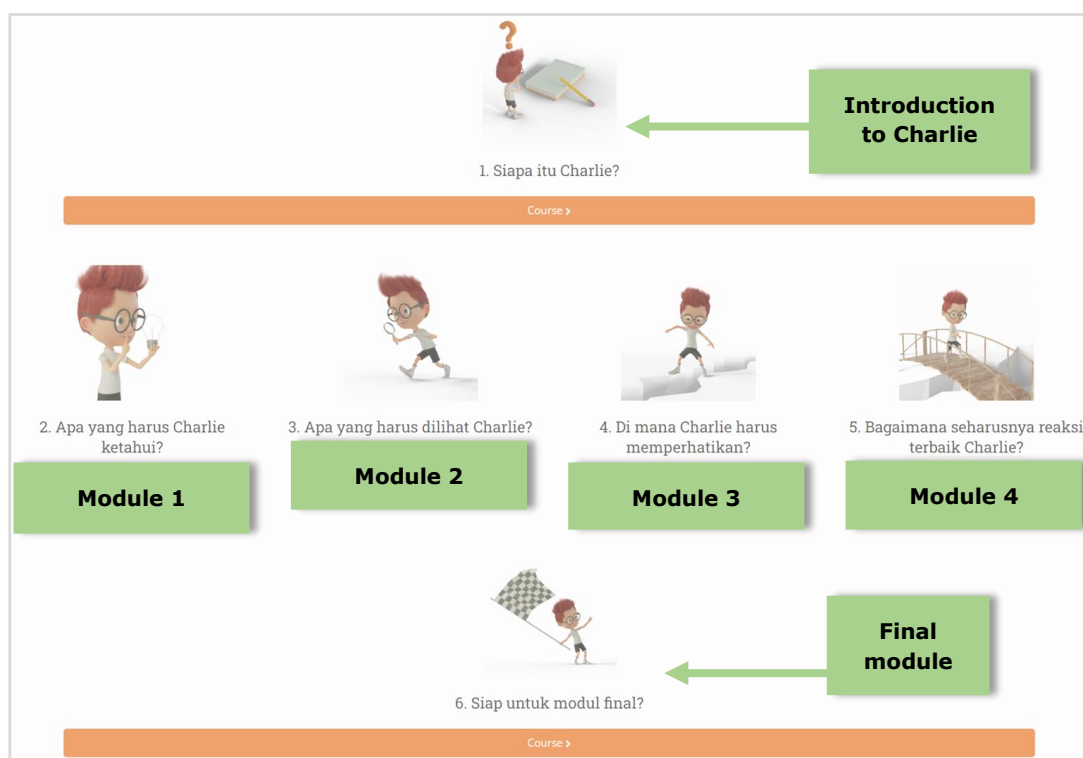
As explained in the introduction, it is clear that RSE has been implemented at schools to introduce students to how they should behave on the road, both in theoretical and practical forms. The theoretical method aims to give knowledge of, e.g., road features and regulations, typically in traditional learning in class. However, Riaz et al. (2019) indicated that the learning arrangement is considered boring for students. As a result, the transfer of knowledge cannot be done effectively. Meanwhile, the practical form lets students experience and get the exposure to road safety skills. The practical method should precede theoretical training for the education of students' in the early years (Dragutinovic & Twisk, 2006).

Another way to educate students theoretically is by applying gamified education, which increases students' motivation and engagement (Lee & Hammer, 2011; Riaz et al., 2019). In contrast to the traditional learning process, gamified education can be incorporated with fun perks, e.g.,



rewards, animations, or description videos. As a result, Lee & Hammer (2011) found that students are willing to actively participate even when encountering complex tasks.

The Transportation Research Institute (IMOB) in Belgium developed a gamified road safety education programme known as the Route2School (R2S) Education in children's road safety. It contains four modules, each with a specific theme, i.e., knowledge of traffic rules and regulations, situation awareness and risk detection, and risk management when encountering a traffic hazard (Riaz et al., 2019). Each module has two sub-modules containing ten questions for the familiar situation and ten questions from the unfamiliar situation. Further, a final module contains 20 questions presented in the previous modules. Thus, students are required to complete 100 questions to complete the programme. FIGURE 2 shows the main page of R2S Education Indonesia and the general contents of the programme.

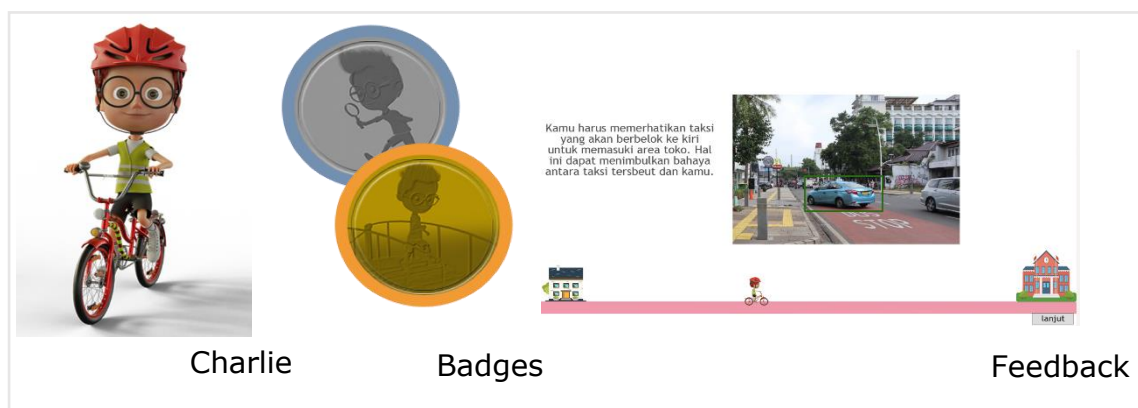


**FIGURE 2** Main page of R2S Education Indonesia

A typical question format is presented for each module. The first module is related to knowledge of traffic rules and regulations; thus, students need to interpret the meaning of a particular traffic sign, road marking, or other road attributes. The second module is related to situation awareness. Students pay attention to a picture of a traffic situation and then select the identified aspects from a list. Then, the risk detection as a focus for module three requires students to identify a possible risk that might happen in a scenario given for each question. Finally, the risk management as a focus for module four asks students to assess the most appropriate reaction when encountering a traffic hazard.

As a gamification programme for children, features incorporated in R2S Education reflect children's interests and preferences (see FIGURE 3). R2S Education introduces Charlie as the main character in a cartoon who is relatable to students since he is also a fellow student. Together with the participant, or rather, with the participant's aid, Charlie learns road safety by choosing the correct answers throughout the programme. Then, badges and scores motivate students to perform well in each task and reach higher levels. For every question in the modules, students can review the feedback to know the correct responses and the reason behind them. An optional incentive to complete the programme can be given to encourage participation.

The programme has been tested on students in Belgium (Riaz et al., 2019), Vietnam (Pham, 2019), Indonesia (Putri, 2020), and Palestine (Mayaleh, 2021), which aimed to analyse the students' effect evaluation on the programme. Additionally, a similar purpose was evaluated by teachers in Putri (2020) and by both teachers and Palestinian decision-makers in Mayaleh (2021). The research result showed that students were motivated and participative throughout the programme. Further, the students also evaluated the programme positively. A different set of questions are provided for every study location. The children are likely to encounter a traffic situation in familiar situations, while the experience can help them react safely in unfamiliar situations (Riaz et al., 2019).



**FIGURE 3 Gamification elements of R2S Education**

### 1.3. Research area

The R2S Education is a tailor-made gamification programme depending on where target users are located. Each question contains a picture showing a road situation in a particular location familiar or unfamiliar to the users. This research focused on the road situation in Jakarta and Bogor City, Indonesia. Jakarta is set as a familiar situation, whereas Bogor is considered unfamiliar to the users.

Jakarta is the capital city of Indonesia, with a population of 10.5 million in 2020 (BPS-Statistics of DKI Jakarta Province, 2021), occupying a land area of 664,01 km<sup>2</sup>. With such numbers, it can be expected that the transport activity is dynamic and problematic. TABLE 1 summarises the number of workers from Jakarta travelling between home and work to another city daily (commuter workers), within Jakarta daily (stayer workers), and to another city but going home every week or every month (circular workers). The data shows that three of fourth workers travel within Jakarta. Considering the

number of 3.3 million passenger cars and 16 million motorcycles in 2020 (BPS-Statistics of DKI Jakarta Province, 2021), it explains why the city suffers from daily traffic jams.

**TABLE 1 Daily mobility of workers from Jakarta in 2019 and 2020**

		Commuter workers	Stayer workers	Circular workers	Total
2019	Total	1,088,597	3,720,566	43,786	4,852,949
	%	22.43	76.67	0.9	100
2020	Total	803,856	3,807,491	47,904	4,659,251
	%	17.25	81.72	1.03	100

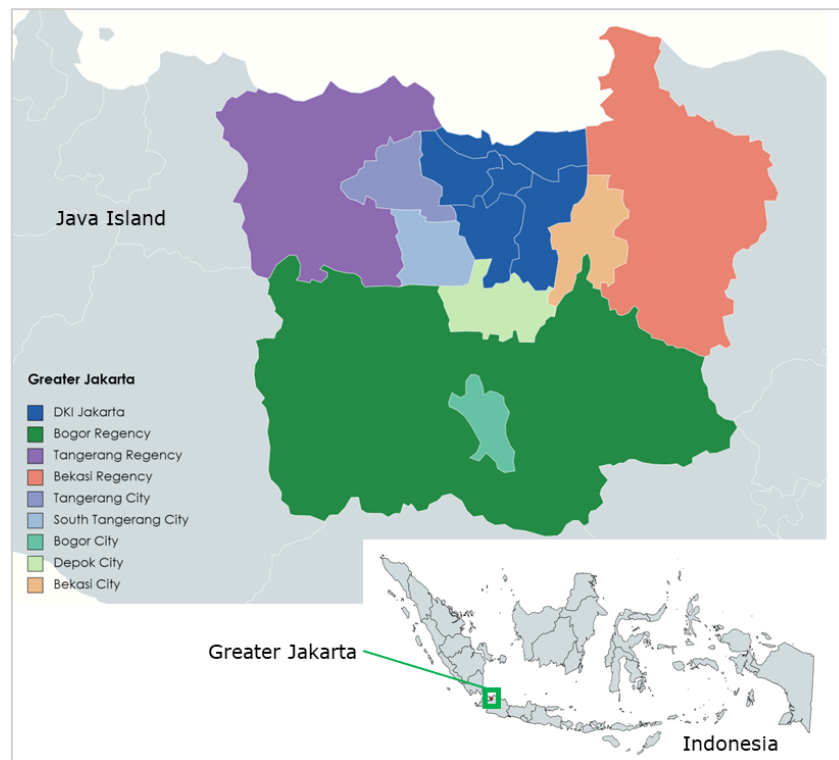
(Adapted from: BPS-Statistics, 2021)

Moreover, Jakarta is the core city of the Jakarta metropolitan area or Greater Jakarta, where people from its other nine administration divisions commute daily to Jakarta, particularly to South Jakarta (BPS-Statistics, 2019). A survey conducted by BPS-Statistics (2019) regarding commuting in Greater Jakarta revealed that 72% of commuters opted for private vehicles over public transport, with six out of 10 commuters riding private motorcycles. What is striking from the results is the unwillingness to make a modal shift to public transport, reaching 92% of respondents. The highlighted barriers to using public transport are long travel duration (37%) and impracticability due to the need for transfer between two or more transport modes (35%).

In order to ease the congestion and promote the use of public transport, the government, both at the national and local levels, has been introducing mass public transport. As of 2021, Greater Jakarta has been served with commuter lines, bus rapid transit (Transjakarta), and metro (MRT Jakarta). More developments for new routes of the aforementioned public transport and new public transport modes are in progress. Moreover, the metropolitan area is also supported by smaller-scale (online) transportation services, i.e., conventional and online taxis, minibuses, and online taxi motorcycles, alongside the growing popularity of bicycles and walking.

Jakarta is keeping up with the improvement of pedestrian and cyclist facilities with the fast-growing public transportation system. This improvement is more prominent as the first metro system in Indonesia, MRT Jakarta, began operating in 2019. The notable non-motorised vehicle facilities improvements are, among others, the increased quality and width of pedestrian walks, the installation of safer and more attractive crossing facilities, and the increase in the number of bicycle lanes. These facilities accommodate the general and vulnerable users, i.e., people with limited abilities, the elderly, and young people.

Meanwhile, Bogor City is one of the satellite cities within Greater Jakarta (see FIGURE 4). It is home to a population of 1 million, which occupies 118.5 km<sup>2</sup> (BPS-Statistics of Bogor Municipality, 2021). A high daily commute is anticipated due to its location in the southern part of Jakarta, where the central business district (CBD) is concentrated. It is well-served with commuter lines and bus rapid transit (BRT), which transport workers to other parts of the metropolitan area daily.



**FIGURE 4 Greater Jakarta administrative divisions (Credit: mapchart.net)**

#### **1.4. Problem statement**

There is a contrast between R2S Education as a gamification programme and the traditional learning process at school, i.e., lecture and work sessions. Not all teachers, particularly in Indonesia, are proficient in technology and apply it in their work. The Ministry of Education of the Republic of Indonesia realised the skill's importance by facilitating the teachers' information, communication, and technology (ICT) training (Ministry of Communication and Information Technology of Republic of Indonesia, 2016). Moreover, the COVID-19 pandemic inevitably forced teachers to break the old habit of teaching with the aid of technology.

However, gamification programme is still new or even unheard of in Indonesia. Then, road safety education for students is not yet integrated into the national school curriculum, although the integration model has been designed (Supandi et al., 2017). The R2S Education is, therefore, a combination of two unfamiliar aspects for the Indonesian education system. Meanwhile, the three studies concerning R2S Education (see Subchapter 1.2) focused on analysing the effect evaluation of the R2S Education implementation. Thus, very little attention has been paid to the support in implementing the programme. Knowing the supporting aspects is essential to integrating the R2S Education in the school program widely.

#### **1.5. Objectives**

The main aim of this thesis is to analyse the extent of Indonesian schools, students, and government support for R2S Education. In-depth, it explores the underlying factors of whether or not the target groups support the programme. Moreover, it compares the difference in support between

governmental and non-governmental schools. Several parameters are considered, i.e., human resources (trainers, organisers, skills), infrastructure and technology, willingness to pay, external support and programme set-up.

### **1.6. Research questions**

The main research question is formulated as follows: “To what extent do Indonesian schools, students, and government support the prospect of R2S Education implementation?”. The following are the five subquestions that support the main research question.

1. What is the current road safety education at schools?
2. What aspects might hinder the successful implementation of road safety education at schools?
3. What is the stakeholders’ evaluation of R2S Education?
4. How does the support for R2S Education differ between government schools and non-government schools?
5. What is the relationship between the support for R2S Education from schools, students, and the government?

### **1.7. Thesis structure**

FIGURE 5 shows the research process in answering the research questions. Research planning was conducted to understand the underlying problems and identify the main objective of the research. The initial literature review conducted during this phase was further elaborated on and presented in Chapter 2. Furthermore, the research planning included the plan to conduct and analyse data. They are described in Chapter 3, focusing on the research participants, four data collected for the research, i.e., pre- and post- interviews with schools, post-experiment survey after conducting an experiment with R2S Education, and an interview with the government. Further, this chapter contains an overview of the data analysis, including the mixed method research.

The remaining chapters focus on making sense of the analysis results. These results are presented in Chapter 4, while Chapter 5 discusses them in-depth and relates them to existing literature. Meanwhile, Chapter 6 provides practical implications. Chapters 7 and 8 describe the limitations of the thesis and conclusions, respectively.

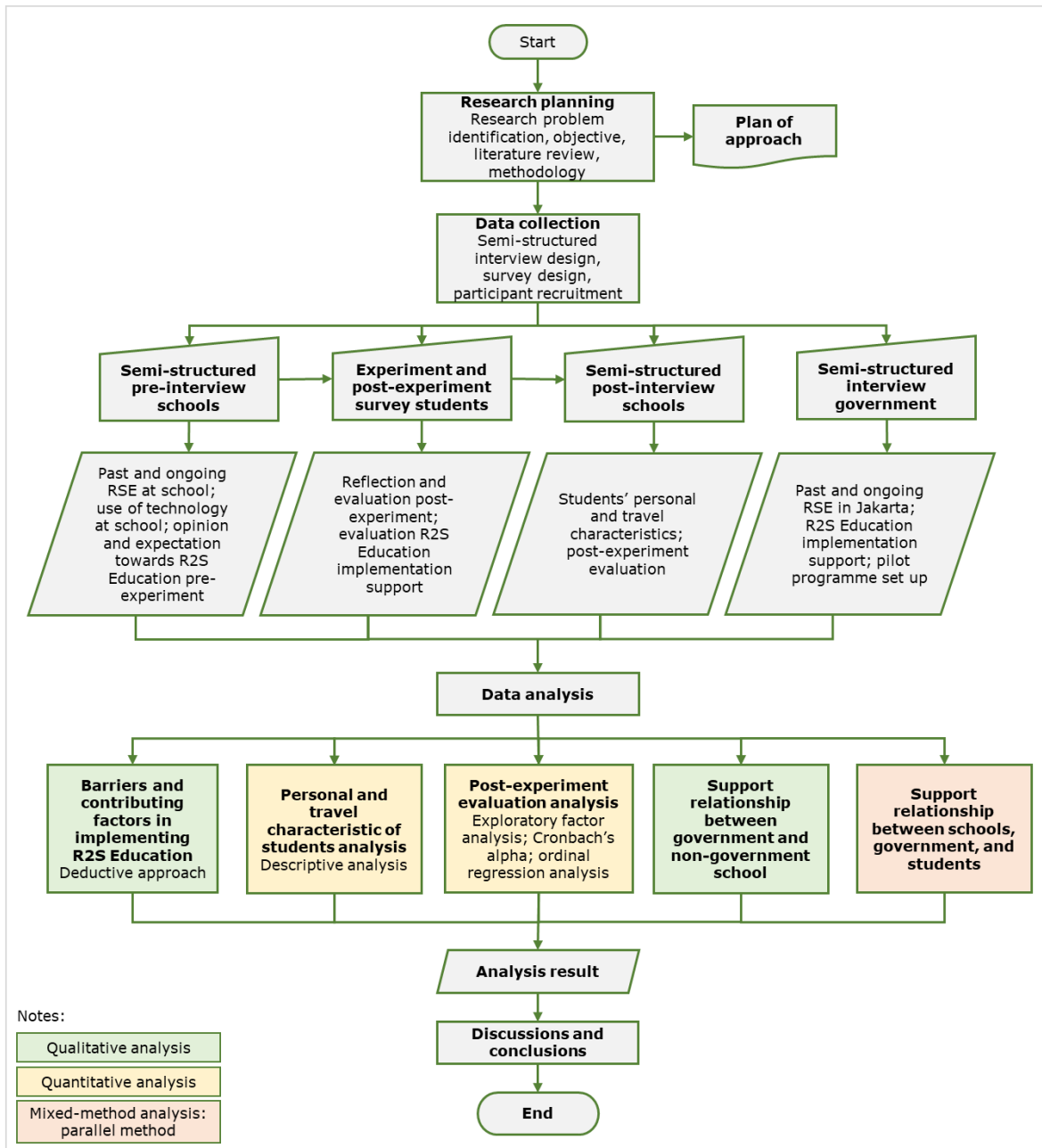


FIGURE 5 Research process



## **2. LITERATURE REVIEW**

### **2.1. Children's participation in road traffic**

Children have limited roles on the road when they are not legally allowed to drive or ride motorised vehicles. Independently, they can take a role as pedestrians or cyclists. However, close supervision from adults is required and even preferred to lead them to safely commute to a specific destination (Alonso et al., 2016). Travelling while being accompanied by adults increases children's happiness level (Leung & Loo, 2017), but the guidance and dependency result in less opportunity to assess the road situation independently.

On top of children's dependency on road traffic previously indicated, children are also considered as vulnerable road users by the lack of task capability alongside the elderly and people with disability and by the inadequacy of protective shell when taking a role as cyclist or pedestrian (SWOV, 2012). Barton et al. (2012) revealed that younger and male children are less able to make their own decisions and identify risks in the road traffic situation. This finding is contrary to Leung et al. (2021), who found that age positively correlates with decision-making regardless of gender. Despite this, their independence level shall increase as they age (Leung & Loo, 2017) and increase in AST (Ikeda et al., 2019; Wilson et al., 2018).

AST involves children as cyclists and pedestrians in road traffic. These transport modes are of slower speeds and give more leniency for children in commuting independently than the higher-speed motorised vehicles. Although AST concerns children's mobility, parents' perceptions also impact the behaviour (Lin et al., 2017; Wilson et al., 2018). In Canada, Wilson et al. found that parents have more barriers to AST in terms of time and journey comfortability when they need to take the children to school and then go to work. Additionally, distance negatively correlates to children's independent mobility in New Zealand and Australia, resulting in parents' preference for taking their children to school (Lin et al., 2017; VicHealth, 2015).

Despite the barriers and possibilities, children must at the very least be given road safety education (Aghdam et al., 2020). Parents are the first to educate their children on road safety both intentionally and unintentionally, i.e., children observe and copy their parents' behaviour. Parents influence their children's road safety behaviour through observational learning (Alonso et al., 2018; Muir et al., 2017); thus, they should be actively involved in their children's RSE. However, further investigation should be conducted about which method is more effective in this matter (O'Toole & Christie, 2019). To complete this informal RSE, it should be given as formal education at school.

### **2.2. Implementation and support for road safety education**

Dragutinovic & Twisk (2006) reported that several European countries, alongside Australia and New Zealand, have been conducting formal RSE at schools. In general, these countries give opportunities for schools to set up the details for the programme, which are related to lesson frequency, evaluation, the need for expert trainers and training manuals, and specially allocated budget for the programme. In addition, RSE can be provided in an independent session unrelated to existing subjects or integrated into existing subjects and school activities (Raftery & Wundersitz, 2011).

Independent RSE sessions typically involve stakeholders outside the school (external stakeholders). An example of this setting from Indonesia is the active involvement of the Indonesian



National Police, as they are responsible for implementing RSE in general (Law Number 22 Year 2009 on Road Traffic and Transportation, 2009). As a result, many related programmes were organised by or in cooperation with the institution. Anwar (2014) listed several road safety activities in Indonesia aimed at students, including the inauguration of student representatives as the traffic safety pioneers in 2013 and road safety campaigns for students organised by police departments or organisations related to transportation. These examples suggest that a formal RSE might not be included in the school programme but rather relatively short and occasional sessions.

The Indonesian National Plan on Road Safety 2011 – 2035 (Directorate General of Land Transportation Indonesia, 2011) named the Indonesian Ministry of Education to manage the formal and informal RSE with support from the Indonesian National Police, the Ministry of Transportation, and the Ministry of Manpower. The Ministry of Education is responsible for elementary education up to secondary education. The plan indicates the necessity of children participating in compulsory education to receive RSE at schools. It is also indicated in the ASEAN Regional Road Safety Strategy report that a discussion was made in Indonesia to set up the programme in the elementary and secondary schools (ASEAN, 2016).

Regarding programme design, a formal RSE can be more effective when designed according to the target group's maturity, experience, and exposure (Assailly, 2017) and the topic covered (Aghdam et al., 2020). That is to say that people can relate to the knowledge they receive when it is delivered in a way suitable for their age. On the other hand, while children possess knowledge on behaving when crossing a road correctly, they might not apply it correctly due to their tendency to be impulsive and distracted and lack understanding (Dragutinovic & Twisk, 2006). The authors also argue that adolescents need more than just road safety knowledge to eventually change their behaviour while understanding it correctly.

Hence, their experience and exposure to the related road safety situation are also crucial. By combining theoretical and practical methods, children build their confidence in performing the correct behaviour (Hatfield et al., 2019) and apply what they learn at school in the actual traffic situation (Riaz et al., 2019). The practical method, such as training, is essential to know how the knowledge should be applied correctly (Arlinghaus & Johnston, 2018).

In developing RSE, the programme-makers should also understand to what extent the target group defines obstacles or dangerous aspects in the traffic situation (Dragutinovic & Twisk, 2006). It is best to understand it from the children's point of view, as their views of and the ability to identify perceived danger are different from that of adults (Barton et al., 2012; Treviño-Siller et al., 2017).

Another significant aspect of formal RSE is that a competent trainer who will guide and supervise the students has a vital role in a successful programme (Aghdam et al., 2020; Assailly, 2017). A reliable and trustworthy trainer with convincing arguments positively influences the attitude change (Raftery & Wundersitz, 2011). In practice, as is the case in Eastern European countries, a special teacher or expert is not assigned for this role; however, a training manual could be provided (Dragutinovic & Twisk, 2006). Supervising the trainer supervision done by other stakeholders is vital to ensure the high quality of the transfer of knowledge (Assailly, 2017).

The formal RSE needs external support from the government and the parents. Government supports the programme by providing the budget to conduct the programme and the necessary training (Alonso et al., 2016) and by integrating the programme into the school curriculum (Aghdam et

al., 2020). The budget is undoubtedly an essential factor when considering implementing the programme. It is related to providing proper infrastructure, e.g., technology and physical facilities (Aghdam et al., 2020). Their availability is essential, especially for the gamified platform as the R2S Education. Meanwhile, integrating RSE into the school curriculum ensures a long-term learning process. Constant and continuous practice retains the skill (Hatfield et al., 2019; Raftery & Wundersitz, 2011).

Children can quickly grasp what has been taught to them when delivered from someone they are familiar and comfortable with, including parents. They are the top source of knowledge for children regarding RSE, followed by the school (Alonso et al., 2018; Dragutinovic & Twisk, 2006; Muir et al., 2017). In Norway, for example, traffic clubs have been established since the 1960s to encourage parents' involvement in the children's RSE (Dragutinovic & Twisk, 2006). Therefore, parents' role in RSE is essential as well. Alonso et al. (2016) explained that the best result could be obtained when both schools and parents participate, as they positively affect the children's road safety education. On the other hand, the parents' misbehaviour as drivers can negatively influence the children as children learn by observing their parents (Elliott, 1999 as cited in Muir et al., 2017).

Evaluating RSE is essential to assess its effectiveness and seek improvements (Raftery & Wundersitz, 2011). Its effectiveness should be evaluated based on its ultimate goal of reducing traffic crashes (Dragutinovic & Twisk, 2006). However, Assailly (2017) argued that obtaining the number of traffic crash data to evaluate RSE effectiveness is difficult. It requires a huge population and a long duration to conduct the evaluation. Assailly suggests that other components, i.e., safety performance indicators and psychological antecedents of risky behaviours, are low in rarity level but can help understand the RSE benefits. Dragutinovic & Twisk (2016) also realised the limitation of road crash data and proposed an alternative evaluation based on the clear performance objectives of the programme.

### **2.3. Theory of planned behaviour**

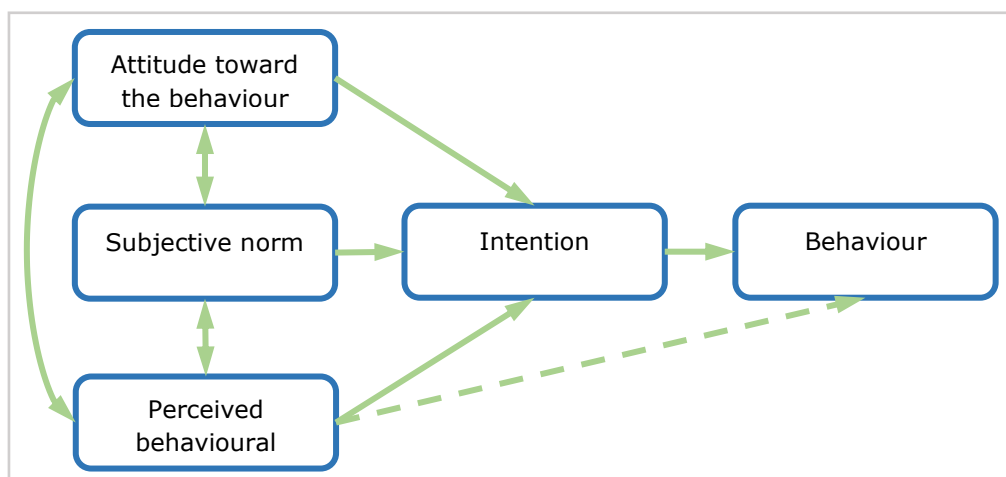
According to Ajzen (1991), the theory of planned behaviour (TPB) is rooted in the theory of reason action with a central factor of human's intention in performing a particular behaviour. The intention is influenced by internal factors, e.g., the willingness to do a particular behaviour and how much effort a person is willing to invest in it, and external factors, e.g., time, money, skill, and cooperation of others. A stronger intention results in a higher chance of performing a behaviour.

Armitage & Conner (2001) explained that subjective norms come from external factors, e.g., spouse and peers, that can influence behaviour intention. Meanwhile, the attitude needs an internal understanding to evaluate whether there is a positive or negative affiliation towards a certain behaviour. Both determinants are the fuel of an intention of a particular behaviour. Further, Ajzen (1991) defines perceived behavioural control as "... people's perception of the ease or difficulty of performing the behavio[u]r of interest." As shown in FIGURE 6, perceived behavioural control contributes to the intention and directly links to behaviour. Therefore, implementation of behaviour does not always need intention if supported by perceived behavioural control. A person may be motivated to do an activity of his choice and, therefore, has an intention to do it. Perceived behavioural control can influence this intention. However, perceived behavioural control also has the power to either directly support or oppose the behaviour.

TPB has been extensively referred to in the domain of transportation. TPB allows a deeper understanding of the influencing attributes of why people behave or choose to do a certain way. With the discovery of the most important and influencing determinant, the follow-up intervention can be accurate. Neto et al. (2020) used TPB to understand the influencing determinants in the walking behaviour of people in three Brazilian cities. It is found that perceived behavioural control, intention, and attitude are essential factors in understanding Brazilians' walking behaviour. Thus, Brazilian road authorities might focus on the abovementioned factors in their walking intervention. However, TPB may fail to bring positive effects after the intervention, as in research conducted by Williams et al. (2015) about walking intervention. However, it is suggested that the failure is due to the intervention not being done correctly.

With the combination of individual motivation and external constraints, TPB is suitable for studies related to AST (Murtagh et al., 2012). The research conducted by Murtagh et al. correlated the TPB components and understood their importance concerning AST. The research concluded that perceived behavioural control in AST is an independent contributor to intention but does not directly link to behaviour. Williams et al. (2015) also found that perceived behavioural control is essential in promoting walking, contributing to intention. This result is not readily applicable to other research, as Ajzen (1991) states that the components' importance varies across behaviours and situations. Moreover, the result slightly deviates from Ajzen's TPB.

Research related to TPB is based on subjective data, leading to unreliable results. Nevertheless, Armitage & Conner (2001) prove its efficacy. Furthermore, in many published studies, Armitage and Conner found that subjective norm is the least influential determinant in supporting an intention. However, it might be due to a low number of measurements.



**FIGURE 6 Theory of planned behaviour (Ajzen, 1991)**

#### **2.4. Government and non-government schools**

The common and fundamental perception of public and school is that it involves bigger scale aspects than private school, e.g., more school options, more students acceptance, more school personnel, and its dependence on the government's involvement in the school operation (Marlow, 2000). On a negative note, public school is generally associated with poor quality of education (Joshi, 2020; Marlow,

2000). However, some public schools have a reputation for providing the best quality, resulting in high competitiveness of admission (Joko et al., 2020).

Meanwhile, the practice of privatising public schools has been done globally. Kim (2018) reported that the practice is done in Seoul, South Korea, converting government-subsidised private schools into independent private schools. In general, private school has the autonomy to operate independently from the control of the government, e.g., decisions related to the school personnel, curriculum or school expenditures. As a private school holds a more extensive autonomy, there can be a more significant private-public school performance gap (Delprato & Chudgar, 2018).

It is generally believed that private school students score better than public school students. That is not merely due to the type of school because the students' background, e.g., wealth, access to books, and high parental education, also influences the high-quality outcome of private school students (Delprato & Chudgar, 2018; Joko et al., 2020). Furthermore, private schools practice the entry examination, which minimises the number of low-performing students (Joshi, 2020). Contrary to popular belief, Akmal et al. (2019) found that it is possible to have less or no difference between learning in private and public schools. That is more evident in favourite public schools, where some characteristics are shared with the typical private schools, e.g., applying the entry examination, requiring more school fees than the other public school, and little constraint in parents' decision-making due to distance from home to school (Joko et al., 2020).

While the term public schools indicate the link between the schools and the government, private schools are often associated with schools that demand high school fees. However, it is not always the case. A number of research regarding low-fee private schools have been conducted in low- and middle-income countries (Akmal et al., 2019), breaking prejudice against private schools in school fees.

Therefore, Heyneman & Stern (2014) opted to use non-government schools instead of private schools to break the prejudice and retain their autonomy from the government. That is true for Indonesia, as many non-government schools apply relatively low school fees. Further, the report stated that the non-government schools are affiliated with particular individuals, organisations, NGOs, or religious organisations. In Indonesia, Heyneman and Stern found that 90% of the non-government schools are affiliated with a particular religion. Along with the religious affiliation, these schools remain popular as they accommodate the lack of public schools in rural areas or the students whose examination scores are not high enough to be accepted at the government schools. With so many possibilities on why parents send their children to non-government schools, it can be said that students in private schools are not placed randomly but by choice (Delprato & Chudgar, 2018). It contrasts with the practice of the zoning system commonly found in public schools, which restricts parents from putting their children in the desired school.

## **2.5. Gamification programme**

Gamification programme has been widely used in educating people about non-game contexts (Harris & Crone, 2021). It is characterised by voluntary participation and a high engagement level (Yen et al., 2019). Engagement is essential in maintaining task performance and commitment (Hosseini et al., 2022). The study conducted by Hosseini et al. proved that the gamification programme brings positive

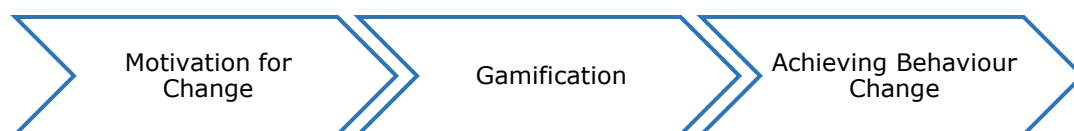
results in the engagement, leading to a higher quality performance compared to no gamification programme.

The main attracting point of the gamification programme is that game elements are designed according to the target group's preferences. Children might need cartoons and animations to keep them in the programme, while adult users might need a simple and easy-to-navigate interface. Extrinsic motivation is an important consideration when designing a gamification programme. For example, Harris & Crone (2021) conducted a study in the United Kingdom with Beat the Street, an active-based gamification programme. In that case, extrinsic motivations are presented with selecting the study area along a popular tourist route which encourages participation, collective reward through points after completing a task, and social influence through peers and family.

However, a gamification programme can be beneficial even without extrinsic motivation if it is supported by great intrinsic motivation, e.g., topic preference to the users and willingness to learn (Hosseini et al., 2022). Additionally, the overall experience and supportive environment are crucial because the traditional method as applied in the school, for example, has similar properties to the programme, e.g., reward in the form of grades and level up by being promoted to the higher grade level. However, it does not bring the same output (Lee & Hammer, 2011).

Research relating to gamification programmes applied pre- and post-intervention analysis to see the effect evaluation of the programme, as in Harris & Crone (2021). A gamification programme study conducted by Harris & Crone (2021) required active travel, i.e., walking, of the participants, and the result showed an actual improvement after intervention. Meanwhile, gamification that aims to increase knowledge and requires less physical activity, e.g., board games, rarely contributes to a change of behaviour (Douglas & Brauer, 2021). Knowledge can explain the reason for changing a behaviour, but it is not powerful enough to change it (Arlinghaus & Johnston, 2018).

Thus, gamification programs with physical and practical activity have a higher chance to work better if the ultimate goal is to change behaviour. However, there is no guarantee that the intervention can intrinsically motivate behaviour change (Yen et al., 2019). FIGURE 7 shows that gamification alone is inadequate in changing a behaviour. Instead, intrinsic motivation for change is required. Gamification is a bridge to behaviour change by extrinsically motivating a new behaviour. Thus, intrinsic motivation is vital in behavioural change (Hatfield et al., 2019).



**FIGURE 7 Gamification procedure (Yen et al., 2019)**

### 3. METHODOLOGY

#### 3.1. Participants

The targeted participants in this study were recruited from junior high schools in Jakarta, reflecting on Jakarta as a familiar situation within the Indonesian version of R2S Education. The schools and their students are the appropriate target group to participate in this research. They have less perception that the main cartoon character of R2S Education, i.e., Charlie, is childish compared to high school students. Further, they are more capable of working independently than elementary school students.

The Ministry of Education Indonesia (n.d.) recorded that there are 337 government junior high schools (lower secondary schools) with 217,742 students and 798 non-government junior high schools with 155,117 students in Jakarta in the academic year 2019/2020. The high number of students in government schools is reasonable as those schools accept more students per year than non-government schools. Nevertheless, the data shows a high demand for both schools.

Regarding the education system in Indonesia as a whole, the Government of Republic of Indonesia Regulation Number 47 Year 2008 on Compulsory Education (2008) stipulates that children in Indonesia of age six years (only if the school capacity allows) to 15 years must receive compulsory education. It requires nine years of study in:

1. Elementary school for six years at a *Sekolah Dasar* (Indonesian term for elementary school), a Ministry of Religious Affairs Indonesia-affiliated *Madrasah Ibtidayah*, or other types of school of a similar level
2. Junior high school for three years at *Sekolah Menengah Pertama* (Indonesian term for junior high school), a Ministry of Religious Affairs Indonesia-affiliated *Madrasah Tsanawiyah*, or other types of school of a similar level

Therefore, junior high school is the final part of compulsory education in Indonesia. The Indonesian government has submitted an appeal to change the compulsory education duration to 12 years, which would include high school or school of a similar level as a part of compulsory education. In that case, students up to 18 years would have to complete compulsory education. However, it was unsuccessful (Decision Number 92/PUU-XII/2014, 2014). Nevertheless, actions are taken to nudge citizens to complete the 12-year education, e.g., employing a school zoning system (Ministry of Education Republic of Indonesia, 2018).

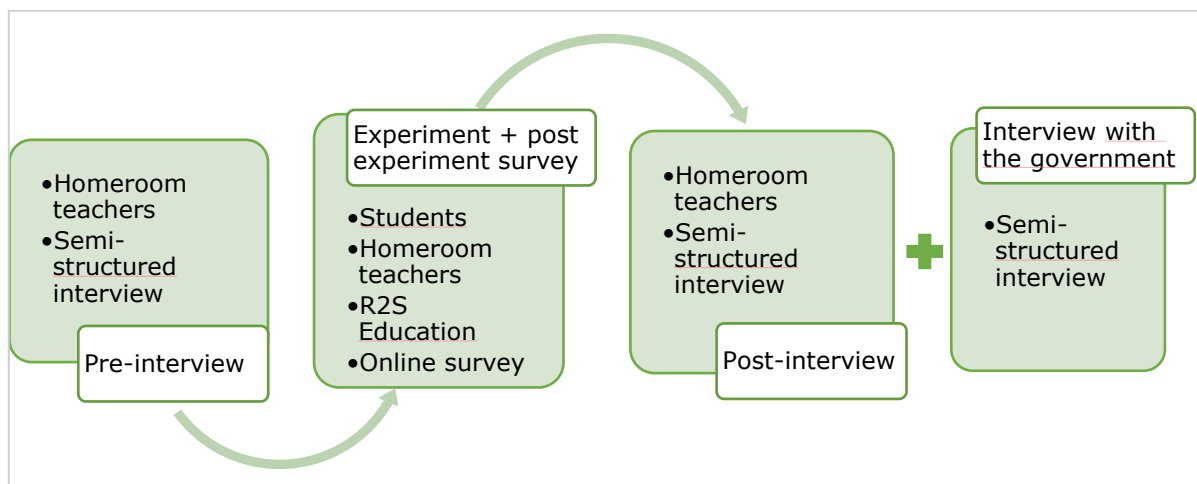
With the stipulated age range, junior high school students are not privileged to have their driving license. It is in accordance with Law Number 22 Year 2009 on Road Traffic and Transportation (2009) that permits persons of age 17 years and above to possess a driving or riding license in class A for passenger cars, class C for motorcycles, or class D for special vehicles for people with disability. In addition to age, the law requires proof of being physically and psychologically healthy with medical and psychological tests, respectively. It is also mandatory to take theoretical and practical tests to obtain the license.

For this research, one government and one non-government junior high school in South Jakarta participated in the study. Each school nominated two classes, which obtained four teachers as the respondents for the pre- and post-semi-structured interviews. They are the homeroom teachers for each class and have an extensive understanding of the students' learning behaviour and the knowledge of road safety education in their school.

In the government school, 34 students from two grade 7 classes tried out the programme, and 31 completed the online post-experiment survey. They are of age between 11 and 13 years old. Meanwhile, 23 students in grades 8 and 9 in the non-government schools tried out the programme. Seventeen of the participating students completed the online survey. The grade 8 students are between 13 and 15 years old, while grade 9 students are between 14 and 16 years old. As all student participants are below 17 years old, they are not permitted to have a driving or riding license.

### 3.2. Data collection

The research data collection process is divided into four main activities (see FIGURE 8). The process at each school began with a pre-interview with the homeroom teachers of the participating classes (see Subchapter 3.2.1). The experiment and the post-experiment survey involved both students and teachers (see Subchapters 3.2.2). Then, the final step was the post-interview with the homeroom teachers (see Subchapter 3.2.1). Meanwhile, the interview with the government was conducted separately (see Subchapter 3.2.3).



**FIGURE 8** Data collection process

#### 3.2.1. Pre- and post-interviews with schools

Interviews were conducted with the school teachers of the respective school. The pre-interview was conducted before commencing the experiment to collect data for subquestions 1, 2, and 3, while the post-interview aims to collect data for subquestions 4 and 5. The respondents should have a vast knowledge of the topic to provide substantive answers (Saldaña, 2011). As discussed in Subchapter 3.1, teachers possess the suggested quality. Additionally, the respondents were informed that the interviews would be recorded. On average, each interview with schools spent 30 minutes long.

Alongside the post-interview and interview with the government, the pre-interview is considered a semi-structured interview. The advantage of this approach is that the questions and focus can be determined beforehand (Whiting, 2008) to address all research questions. The responses are not restricted to particular options as opposed to structured interviews or surveys (Azungah, 2018). Furthermore, it allows the interviewer to follow up on the response and observe nonverbal

communications, e.g., intonation, silence and facial expression, which is usually done in unstructured interviews (Kallio et al., 2016; Simons, 2014; Whiting, 2008).

However, there are certain drawbacks associated with using the semi-structured interview. Although both schools were given the same set of questions, the interviews resulted in some topics not being discussed deeply in a particular interview or not being discussed at all during that session. Since the data collection for both schools was conducted in the same period, there was no strict rule on which interview was conducted first. As a result, the interviewee had the opportunity to gain insight into what was discussed in the other interview. The new, related topics could be presented when necessary.

The pre-interview explored the school's past or ongoing programme related to RSE at school and its challenges. Probing allowed a deeper understanding of the programme execution and external and internal influence based on the response. Then, as R2S Education is an online-based programme, it is essential to discuss the use of the computer or other digital hardware at school. In the latter part of the interview, respondents were asked about their opinion and expectations of the gamification process and R2S Education before beginning the experiment.

Meanwhile, the post-interview served as an opportunity to reflect on what had happened during the experiment. Probing questions are similar to the ones in the pre-interview. The respondents were asked to think about the challenges in the programme execution and how they are solved. Regarding the support of R2S Education, respondents gave their opinion of the school's readiness and factors that can influence the decision to implement the programme.

### *3.2.2. Experiment with R2S Education and post-experiment survey*

The experiment was principally conducted in November – December 2021, with an additional session in January 2022. During the first survey period in 2021, the school semester was almost ended, and both students and teachers from both schools were busy preparing for the end semester evaluation. Therefore, an additional experiment session was conducted for the non-government school in mid-January 2022.

Before commencing the programme, students were given a short presentation about the gamification programme and R2S Education in general. They were also given information about the experiment's practicalities, including that they would be given a souvenir (hand sanitiser) after completing the whole programme. Giving a souvenir did not only aim to engage students' participation but also was a way of appreciating their effort in completing the programme. This activity was done both at school and online. Students were given a deadline of one week to complete the modules, and they were instructed to ask the teacher when they encountered any problem. They were given the freedom in the location and time to work on the programme. This method was practical because students did not go to school every day when the experiment was conducted. Further, two separate online meetings were conducted so that students could complete the modules together with their peers under the teacher's direct guidance.

A similar experiment with R2S Education has been conducted previously by Putri (2020). While the previous study investigated R2S Education effect evaluation, the experiment in this research aims to introduce the programme to the schools, which can help the teachers discuss the support in



implementing the programme in the interviews. Therefore, the teachers were asked to encourage the students to be proactive throughout the process. The teacher can also participate in the programme and monitor the students' progress and scores.

As students were already used to the online learning system, there was no significant problem in creating an account with their email addresses. This issue was noted in Putri (2020) because the research was conducted at the beginning of the COVID-19 pandemic. Nevertheless, the apparent issue arose as the students used their mobile phones to familiarise themselves with the programme. It was mainly faced by the government school students since the presentation and registration process was conducted at school, and they were not prepared to bring a laptop. In that case, some immediate solutions were given, i.e., changing the browser display to desktop-view and completing the programme by using a laptop.

As a part of the experiment, the views from students' point-of-view were collected through an online post-experiment survey (see Appendix 6). The quantitative approach offers an effective way of collecting survey data from the students so that each student respondent's opinion is recorded. It was done after completing the programme. This survey was prepared with Qualtrics. The students were asked to choose to complete it either in Indonesian or English. The survey is anonymous, and students were able to agree or disagree with the consent form.

The first part of the questions was related to the personal characteristics regarding their age, gender, and school profile, i.e., grade and type of school. Regarding which city student lives in, students could choose other than Jakarta and Bogor as they may live in other parts of Greater Jakarta. Further, there were some questions about their travelling characteristics to school before and after the pandemic. The survey also requested the data on whether students possess a driving license, have been required to pay fines or have been involved in traffic crashes. Considering what has been explained in Subchapter 3.1, it was assumed that no student possesses a driving license.

The second part of the survey focused on the evaluation of R2S Education. A total of fourteen statements were presented for the five-point Likert scale questions, i.e., strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, and strongly agree. Five questions were related to the theory of planned behaviour (see TABLE 2) to know how relatable the knowledge from R2S Education with students' daily life. Eight questions focused on evaluating the programme, i.e., content, difficulty level, frequency, programme set-up, reward, and guidance. The final question let the students assess whether they support R2S Education implementation in their school, i.e. "The programme should be implemented at my school."

**TABLE 2 Questions related to theory of planned behaviour in the survey**

Theory of planned behaviour	Likert scale question
Attitude toward behaviour	The programme contents will be useful in my daily life.
Subjective norm	The situations in the programme are familiar to me.
Perceived behavioural control	The programme contents are easily applicable in real life.
Intention	I will apply the knowledge I got from the programme.
Past behaviour	I have applied the knowledge even before the programme is executed.

Finally, there were open-ended questions related to the problems the students and the class encountered during the experiment. The open-ended questions gained insight into students' opinions of the questions and were unrestricted to answer options. The responses were considered qualitative data, which were analysed separately from the quantitative data of the survey. Students also gave their overall scores (1 being extremely dissatisfied to 10 being Extremely satisfied) and additional comments on R2S Education.

### *3.2.3. Interview with government*

Interview with the government supports the findings obtained from the schools. Since schools in Jakarta participated in the research, the interview involved the DKI Jakarta Provincial Education Office (it will be referred to as Education Office henceforth). A significant advantage of selecting this institution is the higher chance to conduct the interview and it understands the condition of education in Jakarta better than the institution at a higher level.

The 40-minute interview was conducted in mid-April 2022, involving a representative from the Education Office. As mentioned in Subchapter 3.2.1, the interview was semi-structured and audio-recorded. Questions were related to subquestions 1, 2, and 3 (see Appendix 5). The questions and possible probing were taken from the interviews in schools, including support and practicalities regarding programmes set up from the government's perspective. A significant problem with the prepared questions was that these questions did not reflect the role of government in the education system. However, due to the flexibility of the semi-structured interview, it was possible to modify the main questions while still considering the essential and relevant aspects to be discussed in the interview.

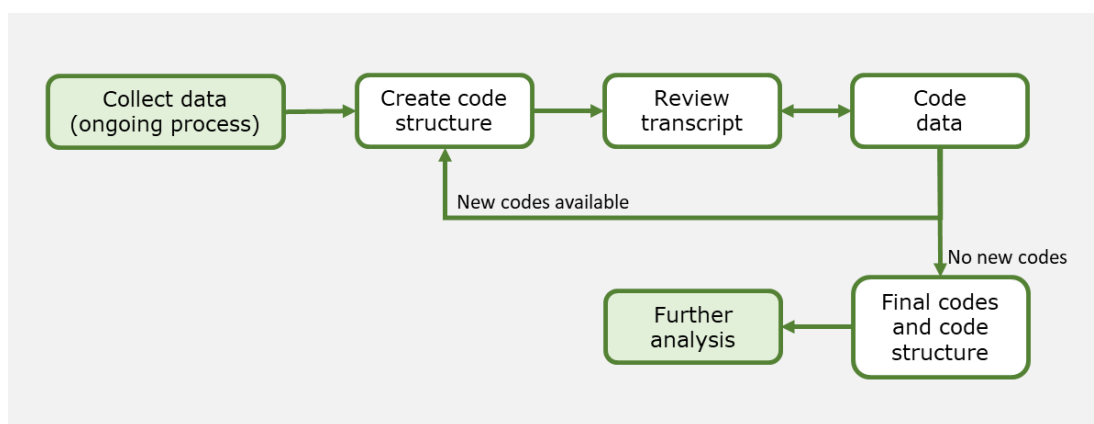
## **3.3. Analysis**

The research questions stated in Subchapter 1.6 intuitively call for a qualitative research method, i.e., conducting interviews with schools and the government. On the other hand, obtaining the data from students is more efficient through an online survey with mainly close-ended questions, which can be considered a quantitative research method. Johnson and Turner (2003, as cited in Hesse-Biber & Johnson, 2015) define the combination of both methods as the mixed method. This method allows the opportunity to explore complementary questions that can gain an overall view of a problem, add depth to the research, and support the findings through different perspectives (Hesse-Biber & Johnson, 2015; Shorten & Smith, 2017).

### *3.3.1. Interview – qualitative research*

The qualitative research aims to understand a particular phenomenon in-depth based on human experience (Azungah, 2018; Bradley et al., 2007), as what is aimed for this research, specifically regarding the schools' support for the R2S Education. Analysing qualitative data is best done as the data are available, although that does not mean that both processes finish simultaneously (Merriam & Tisdell, 2015). The integrated process ensures a less overwhelming situation considering the amount of data.

FIGURE 9 illustrates the master's thesis analysis process with a deductive approach. The analysis began by creating a code structure based on the existing literature, allowing insight into what can be expected in the data. As the data became available, the next step was to review transcripts to understand the content without coding them directly, and after that, start generating codes. It was an iterative process, requiring the process to go back and forth to revise the codes and code structure and re-review the transcripts. The initial code structure was adjusted based on the findings rather than forcing the codes to the existing structure (Bradley et al., 2007). The process ended when there was no new code generated, resulting in the final list of codes. These codes were grouped, reflecting the themes that can answer the research questions. Further analysis was related to comparing and relating all data. The amount of data and back-and-forth process required a computer-assisted data analysis programme, i.e., NVivo, to manage and analyse data effectively.



**FIGURE 9 Qualitative research analysis process for master's thesis (Bradley et al., 2007)**

The initial codes were derived from the literature review conducted in Chapter 2. The first step was to translate the information in the literature review into codes that could represent the theme without reviewing the coded transcripts. Each code had a specific idea. The next step was to combine codes with similar themes under main themes, reflecting research questions 1, 2, and 3. TABLE 3 shows the initial codes to be tested against the qualitative data.

As explained in Subchapter 3.2, five semi-structured interviews have been conducted for this research in cooperation with three institutions, i.e., a government school, a non-government school, and Education Office as the government. TABLE 4 lists the interviewees that participated in a particular interview session and how they are indicated in the following chapters. To review the complete interview dialogues, the transcriptions are available in Appendix 1 to 5.

All interviews for this research were conducted in Indonesian. Thus, it was necessary to translate the Indonesian transcriptions into English. Several main challenges encountered while translating the transcription were translating the words for emphasis, the number of nouns, and completing the sentence structure. There were few Indonesian words for emphasis recorded in the original transcription. However, the same word for emphasis in Indonesian can be translated differently into English when said in different intonation and emotions. Therefore, relistening to the recordings was necessary to avoid translating the wrong intonation and emotion.

In an oral format, especially in an informal setting, Indonesian speakers do not usually pay extra attention to mentioning the correct number of nouns compared to the written format. For example, the Indonesian word “*dia*” is literally translated as “he or she” in English. However, depending on the context, it can be used as an alternative word for “they”. The counterpart is generally able to understand it based on the context. The strategy in the previous paragraph was also used to produce an accurate translation. Moreover, there were many occasions that the translation process required completing the sentence structure, i.e., mainly adding a subject in the sentence. It should be noted that these sentences already have a complete meaning and hence lower chance of misinterpreting the missing words, in contrast to the (un)intentional incomplete sentences. In the case of the latter type, the issue was indicated in the transcript.

**TABLE 3 Initial codes for qualitative analysis**

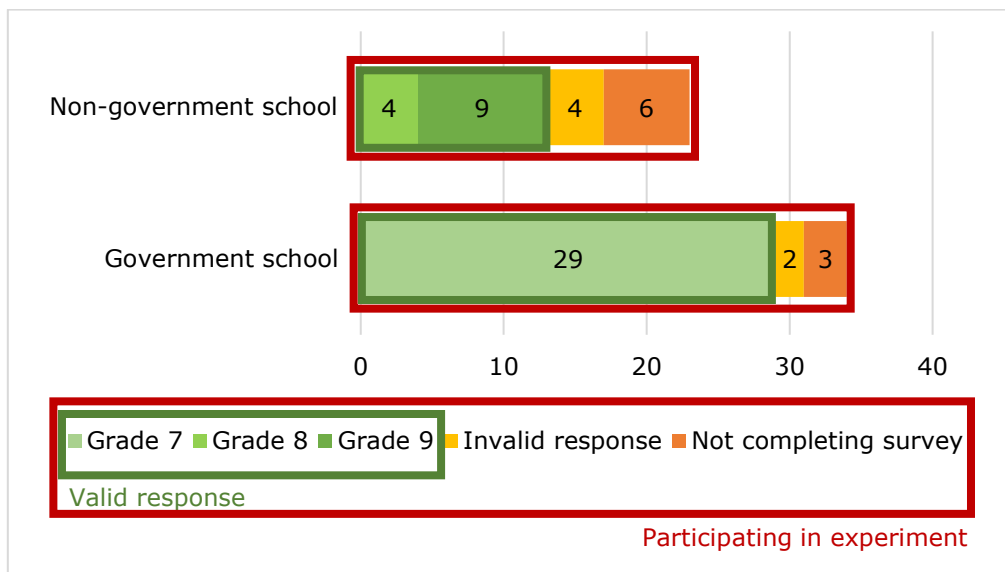
1. Barriers to implementing R2S Education	
• Dependency of external stakeholders in formal RSE	• Negative attitude in RSE
• Dependency of government schools on government	• Technology infrastructure availability
• Dependency of non-government schools on school's affiliation	• Students on RSE
• Bad road safety culture from parents	○ Age restrictions in driving motorised vehicles
• Barriers from parents in AST	○ Lack of knowledge and skills
• Distance discourages AST	○ Low task capability
• Lack of implementation in real life	○ Students' characteristics hinder behavioural change
2. Future benefits of R2S Education	
• Continuous RSE retains skills and knowledge	• Improving students' well-being
• High engagement and motivation level	• Theory with practice leads to behavioural change
• High-quality performance with gamified programme	• Theory with practice promotes behavioural change

**TABLE 4 Summary of interviewees**

No	Alias	Affiliation	Interview contribution	Year
1	Teacher GS 1	Government school	Pre-interview government school	2021
2	Teacher GS 2	Government school	Post-interview government school	2021
3	Teacher NGS 1	Non-government school	Pre- and post-interview government school	2021
4	Teacher NGS 2	Non-government school	Pre- and post-interview government school	2021
5	Education Office interviewee	DKI Jakarta Provincial Education Office	Interview government	2022

### 3.3.2. Online survey – quantitative research

The purpose of conducting the online survey is to know which aspects contribute to the support for R2S Education from students' perspectives. The analysis process was conducted with SPSS. The descriptive statistic was first to be conducted, which summarised the data. The initial screening of quantitative data resulted in a final valid response. As shown in FIGURE 10, not all students who participated in the experiment (N=57) participated or fully completed the post-experiment survey. A total of 42 data was fully completed and then used for the analysis. The yellow bar indicates responses recorded in the database but not fully completed. The orange bar shows the number of students who did not participate in the survey despite participating in the experiment.



**FIGURE 10 Overview of students' participation in the research**

Since this research applies a parallel method, the evaluation questions included in the survey were not grouped in a specific theme. In this case, exploratory factor analysis was conducted in order to know if some questions are related to each other and can be included in a specific underlying factor. Grouping variables into several factors is beneficial in understanding the difference between the underlying factors and similarities between variables included in each factor (Cudeck, 2000). For this research, obtaining factors representing each evaluation question helped relate quantitative findings from students with the qualitative results.

Several important outputs generated from exploratory factor analysis should be paid attention to. The extraction or communality score ( $r^2$ ) should be at least 0.7 to be considered ideal in adequately explaining 50% of the variance in a factor (Beavers et al., 2013). Beavers et al. also consider the value from the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) test to explain the degree of common variance in a factor, with a minimum recommended value of 0.7. Then, the eigenvalue and the scree plot show the number of factors that explain the relationship between the variables. To support the findings, Cronbach's alpha test was conducted for each factor to assess its internal consistency. The value ranging from 0.7 – 0.9 is considered acceptable (Tavakol & Dennick, 2011).

The exploratory factor analysis did not consider the question: “The programme should be implemented at my school” because it was regarded as a concluding question, summarising students’ support in implementing R2S Education. It is revealed in the exploratory factor analysis that implementation support is a factor of several evaluating variables. In order to investigate which of those variables explains the support significantly and to what degree their support is, the ordinal regression was performed considering that the dependent variable, i.e. the previous question, is an ordinal data. In that analysis, students’ personal and travelling characteristics, i.e., age, gender, type of school, and whether they have participated in offline class during the pandemic, were included as independent variables.

### 3.3.3. *Mixed method research*

Shorten and Smith (2017) list four types of mixed method research based on their process. The first type is called explanatory sequential, which focuses on collecting and analysing quantitative data, and qualitative data and analysis shall support the findings from the former type. In contrast, exploratory sequential research begins with qualitative data to explore the possibilities of the research focus. Quantitative data aims to test and verify the qualitative findings. Meanwhile, data collection and analysis can be done concurrently through a parallel method. After analysing both data separately, the findings will be integrated to explain the research questions. Finally, the nested method is used when one single data collection process combines both research methods. One of them is the primary method, and the other is embedded to support the former. When the research is mainly based on qualitative data and supported by quantitative data, it can be classified as qualitatively driven (QUAL + quan) mixed method research. Conversely, quantitatively driven (QUAN + qual) research is mainly based on quantitative data and is supported by qualitative data.

The parallel method was used in this research, namely conducting qualitative research on schools and government and quantitative research on students concurrently. However, this research considered the qualitative findings dominant and the quantitative findings complementary to the former. It is due to evidence from existing literature that schools and the government are more involved in implementing RSE than students. Furthermore, the quantitative research on students was classified as a nested quantitatively driven method because several open-ended or qualitative questions were provided in the online survey to give students the freedom to express their thoughts on each of those questions.

Using two research methods, a point of integration should be determined to mix all findings. According to Schoonenboom and Johnson (2017), it is essential in mixed method research. Morse and Niehaus (2009, as cited in Schoonenboom and Johnson, 2017) explain that the integration can be done in two ways: by jointly displaying both sets of data, where a qualitative data is quantified or vice versa, and by discussing and making a conclusion of two separately-analysed data.



## 4. RESULTS

### 4.1. Final thematic framework of qualitative analysis

TABLE 5 Final thematic framework of qualitative analysis

1. Barriers to implementing R2S Education	
<ul style="list-style-type: none"> <li>• Bad road safety culture in the society (3)</li> <li>• Depending on external stakeholders' initiation in RSE (6)</li> <li>• Getting challenges related to online learning due to pandemic (7)</li> <li>• Human resource readiness at school (4)</li> <li>• Lack and slow implementation in real life (10)</li> <li>• Limitation of funding outside of government (2)</li> <li>• Needing approval from the school's affiliating foundation (3)</li> </ul>	<ul style="list-style-type: none"> <li>• Readiness and safety issues in technology infrastructure (3)</li> <li>• RSE is not a priority in curriculum and regulation (11)</li> <li>• Situations at school hinder the implementation (5)</li> <li>• Students' characteristics               <ul style="list-style-type: none"> <li>○ Dependency on external motivation and influence (2)</li> <li>○ Easy to be bored with heavy and repetitive tasks (6)</li> <li>○ Lack of discipline and responsibility (5)</li> </ul> </li> </ul>
2. Factors contributing to successful R2S Education implementation	
<ul style="list-style-type: none"> <li>• <u>Benefits of R2S Education</u> <ul style="list-style-type: none"> <li>○ Benefits for the community on a larger scale (9)</li> <li>○ Increasing students' knowledge, awareness, and skills (11)</li> <li>○ Leading to behavioural change (5)</li> </ul> </li> <li>• <u>Programme set up and content</u> <ul style="list-style-type: none"> <li>○ A combination between theory and practice (5)</li> <li>○ Compact, simple, and not monotonous programme (7)</li> <li>○ Content appropriate to the target group's profile and characteristics (3)</li> <li>○ Content paying attention to norms and culture (1)</li> </ul> </li> <li>• <u>Implementation prospects in schools</u> <ul style="list-style-type: none"> <li>○ Communication and marketing (4)</li> <li>○ Good and timely budget plan for a new programme at school (5)</li> <li>○ The government provides a budget for RSE (2)</li> <li>○ Having a competent teacher or trainer (7)</li> <li>○ Road infrastructure supports RSE (3)</li> <li>○ Support from the school's internal stakeholders (8)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>○ Parents participate and get the benefit (5)</li> <li>○ Promote high engagement and motivation level (8)</li> <li>○ Implementing the programme with familiar technology (7)</li> <li>○ Possibility of integrating RSE in school subjects (10)</li> <li>○ Possibility of offline meetings and group work (6)</li> <li>○ Initiation and willingness from the school (8)</li> <li>○ Including RSE in the school curriculum to have a recurring programme (8)               <ul style="list-style-type: none"> <li>- Government initiate the pilot programme (2)</li> <li>- Selecting the best school for a pilot programme (4)</li> <li>- The need for collaboration (4)</li> </ul> </li> </ul>

All interviews were coded into one framework because all stakeholders are related to each other in terms of work scope and area, i.e., education for junior high school students in Jakarta. Two or all stakeholders often discussed the same topic during the interviews. For this reason, creating a separate code of a similar idea for different stakeholders is redundant and challenging to be analysed further.



Furthermore, a semi-structured interview allows interview participants, including the interviewer, to explore topics beyond the prepared questions. In the case of this research, topics related to post-experiment interviews were also discussed during the pre-experiment interviews and vice versa. Therefore, the final framework does not differentiate whether the code evidence was obtained from either interview.

The final thematic framework is divided into two main themes (see TABLE 5). The first final theme (later will be addressed as the first theme) is kept the same as in TABLE 3, reflecting the current RSE at schools (research question 1), which is not a part of the school's curriculum. This theme also addresses research question 2, i.e., understanding aspects that hinder RSE implementation. Meanwhile, the second final theme (later will be addressed as the second theme) is more significant in terms of scope to house the second initial theme, i.e., future benefits of R2S Education, and two new subthemes. Addressing research question 3, the theme reflects schools' expectations for R2S Education. The subthemes represent the ideal conditions to implement R2S Education which is not fully manifested in the society. They are something that the programme-makers can control, although collaboration is required from the related stakeholders in the implementation phase.

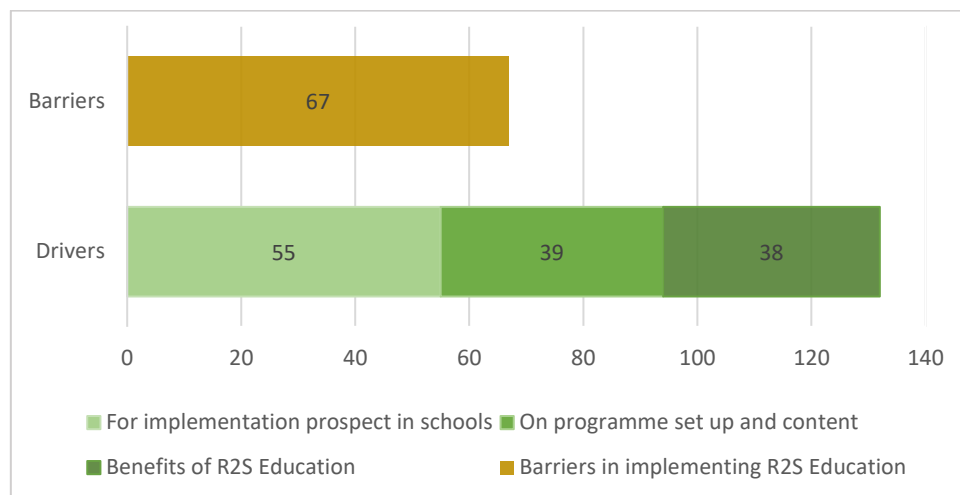
Undoubtedly, the final codes are more specific to the research than those in the initial codes, although several similarities occur. The first theme is related to the dependency of external stakeholders, dependency on the school's affiliating foundation for non-government schools, and lack and slow implementation in real life. Several initial codes are specified into one or more final codes, e.g., further specifying the initial code of "students' characteristics hinder behavioural change" into three final subcodes. On the other hand, there was no specific discussion related to AST regarding barriers from parents and distance, which was discussed in the existing literature.

In contrast to the first theme, more new codes are listed in the second theme because of the focused discussion concerning R2S Education. Nevertheless, codes related to the future benefits of R2S Education can be compared. The direct benefits of R2S Education for students are included in the second theme, leading to behavioural change. However, there was no discussion related to improving students' well-being which is a result of conducting active mobility as pedestrians. On the other hand, R2S Education requires parents' involvement as one of the stakeholders to participate in the programme setup and as the beneficiaries.

The graph in FIGURE 11 summarises the total number of references for each code theme in TABLE 5. The word "drivers" refers to the successful implementation of contributing factors. From the graph, it is apparent that topics related to barriers were discussed more than the three topics related to drivers when considered individually. However, the interviews discussed more topics about the drivers than barriers in general. Regarding the drivers, there is a contrast in number between the discussion about implementation prospects in schools and the other two topics. This topic concerns schools and the government as the stakeholders responsible for the actions included. Therefore, it is suggested that the interviewees focused more on their resources in connection with the research.

The qualitative analysis also identifies the more dominant codes. The grey-highlighted codes in TABLE 5 are the three most referred topics mentioned by the respondents for each theme. Thus, they suggest the importance of the topics for schools and government as respondents. These highlighted codes do not concern a single stakeholder in the context of R2S Education only. What can be clearly seen in TABLE 6 is that each code is mainly a responsibility of one different stakeholder but

generally affect schools and students. In contrast, the code “benefits for the community on a larger scale” requires all stakeholders’ collaboration to benefit the whole society, including schools and students.



**FIGURE 11 Total number of references for each code theme**

**TABLE 6 Corresponding and affected stakeholders of the most referred codes**

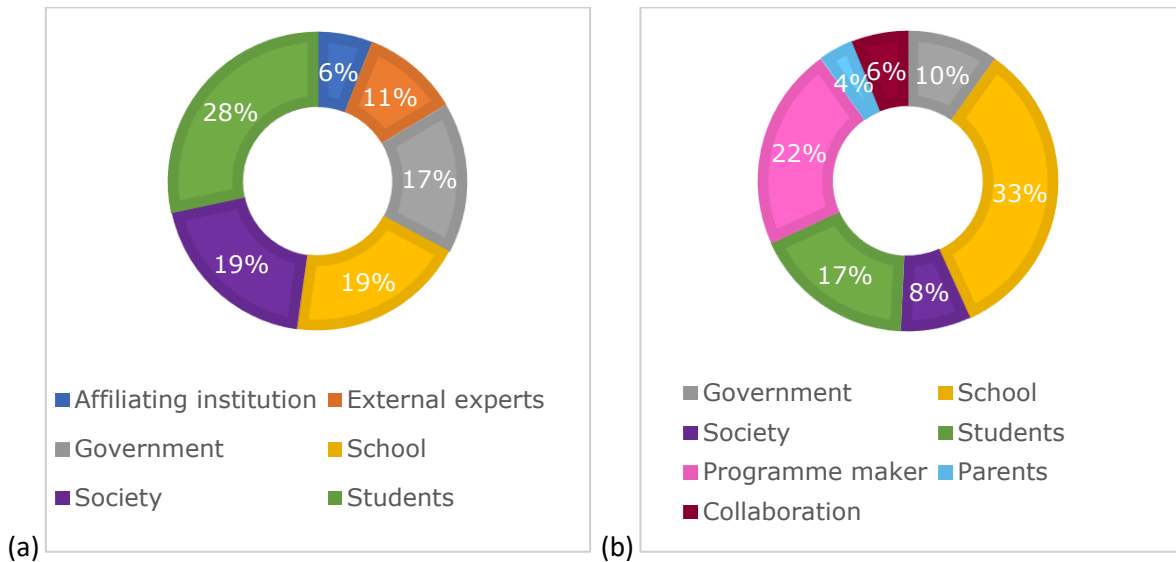
Codes	Stakeholders	
	Corresponding	Affected
<b>1. Barriers to implementing R2S Education</b>		
• RSE is not a priority in curriculum and regulation	Government	School
• Lack and slow implementation in real life	Society	Students
• Getting challenges related to online learning due to pandemic	N/A	School and students
<b>2. Factors contributing to successful R2S Education implementation</b>		
<u>Benefits of R2S Education</u>		
• Increasing students' knowledge, awareness, and skills	Programme maker	Students
• Benefits for the community on a larger scale	All stakeholders	Society
• Promote high engagement and motivation level	Programme maker	Students
<u>Programme set up and content</u>		
• Possibility of integrating RSE in school subjects	School	School and students
• Compact, simple, and not monotonous programme	Programme maker	Students
• Implementing the programme with familiar technology	Programme maker	School and students
<u>Implementation prospects in schools</u>		
• Initiation and willingness from the school	School	Students
• Including RSE in the school curriculum to have a recurring programme	Government	School
• Support from school internal stakeholders	School	School and students

Regarding stakeholders on a broader scale, FIGURE 12 shows the main stakeholders for each theme in TABLE 5. The percentage is obtained from the number of references related to a particular stakeholder. Students have the highest contribution as the barrier (28%), but it contrasts with the contributing stakeholders of the three most referred codes shown in TABLE 6. This inconsistency is due to the differentiation of codes related to students, resulting in an understanding that each code is less referred than the three most referred codes. On the other hand, the role of schools, followed by the programme maker, is vital in the successful implementation of R2S Education. That is also reflected in TABLE 6, where the school's contribution is as significant as the programme maker's.

Moreover, it can be suggested that overcoming barriers concerning students, school, and society and optimising the support from the school, programme maker, and students can increase R2S Education implementation prospects. Indeed, that would not be wise to neglect the less influential stakeholders, such as the government. Both types of schools consider the government as the catalyst in implementing R2S Education. That is manifested in the interview that government acts as both hindering and driving stakeholders, respectively,

“If the curriculum from the [Education] Office does not contain knowledge over traffic rules, then there is no [such topic in the school subjects]” (Teacher GS 2, 2021).

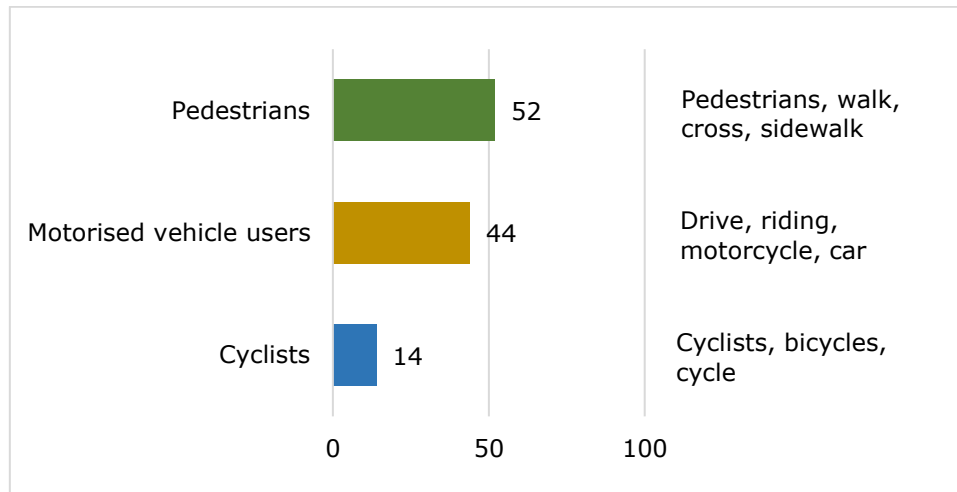
“When it is from the government, it is definitely included in the subjects immediately” (Teacher NGS 2, 2021).



**FIGURE 12 Stakeholders' contribution as: (a) barrier and (b) driver in R2S Education implementation prospect**

An analysis was conducted to determine which type of road users were discussed during the interviews. It is presented in a graph as shown in FIGURE 13. The words associated with each road user represent other words similar to them, e.g., “walk” also represents “walked” and “walking”. Moreover, the words “riding” associated with the bicycle were excluded to keep its association exclusively with

the motorcycle. Those omitted words were mentioned together with “bicycles”, which were included in the analysis. The graph shows that the interviews similarly focused on pedestrians as R2S Education. However, there is almost a balance between discussing pedestrians and motorized vehicle users. Moreover, cyclists were mentioned together with pedestrians in general.



**FIGURE 13** Word count for road users mentioned in interviews

#### 4.2. Barriers to implementing R2S Education

There are 13 codes explaining the barriers to implementing R2S Education at schools. These barriers are actual conditions that are faced in implementing RSE at schools in general. In other words, they originate from outside R2S Education and are deeply rooted in society. Despite the focus on R2S Education, several barriers generally apply to RSE. That is due to the lack of RSE in schools, as Teacher NGS 1 (2021) said: “From the beginning of this school, we do not have a programme on road safety, considering that we follow the curriculum. There is no such a program in the curriculum”, hence a blurred distinction of discussions between RSE and R2S Education. Those barriers are fundamental in enabling all forms of learning methods, including gamified-based programmes, in delivering the topic of road safety to students. It is also reflected in TABLE 5, where the three most referred topics related to barriers are generally related to RSE.

The condition that RSE is not included in Jakarta's curriculum is considered the main hindrance to implementing RSE for both schools and the government. Interestingly, there is a sign of dependency between schools and government and even between two government bodies. The schools explained that the lack of RSE resulted from the absence of such a topic in the curriculum. The government argued that there is no a particular barrier which causes this absence, saying that,

“Indeed, we do not really have concerns about that direction, to the point of making a special regulation for road safety, because we also think that other offices have also handled it. However, there is no special [attention] for that from the Education Office” (Education Office interviewee, 2022).

While the curriculum is the government's responsibility, the schools have several programmes outside the core subjects that are more important than RSE, such as academics, sports, and art

competitions. Since schools are given the freedom to initiate a programme that is beneficial for students, the Education Office interviewee (2022) thought that RSE "... should [have existed], but ... it is not prioritised at school". On the other hand, making priorities is not only done by the school alone because the government can also be involved. It is reflected in the removal of a school subject named PLKJ (*Pendidikan Lingkungan Kehidupan Jakarta* - Education of Jakarta Environment), which covered the topic of roads and traffic signs in Jakarta. The subject was considered "... not important anymore [because] the children are considered [able to know] Jakarta themselves" (Teacher GS 2, 2021).

The two schools revealed that the past RSE was held a few times. It was not in the form of an independent school subject, but it was given in cooperation with external stakeholders, e.g., the police, or integrated into an existing school subject. Since the former requires the involvement of bodies or organizations outside the school, it results in a dependency on those stakeholders. Police were often mentioned as the external stakeholders, particularly teachers from government schools, because of the past RSE activity with the police.

Perhaps, road safety behaviour in society is the most interesting topic to point out in the theme due to its indirect connection to R2S Education. All interview stakeholders pointed out the lack and slow implementation of being pedestrians and giving priority to pedestrians in real life because of the preference for motorised vehicles. On the other hand, all students in Jakarta, including high school students qualified to have a driving license, are prohibited from driving to school alone (Education Office interviewee, 2022). This restriction does not shift the transport mode from school to walking. As R2S Education focuses on students' role as pedestrians, there is a mismatch between the programme content and the real-life behaviour. Teacher GS 1 (2021) pointed out this issue, saying that "...they only know [the theory] but are not aware of it yet. [They] know the rules, but [they] have not done it yet." Moreover, society might not entirely support a good traffic safety culture for pedestrians unless there are formal rules that oblige people to do so (Teacher NGS 2, 2021).

Significant barriers to R2S Education implementation in the schools are related to the readiness of human and technology resources and the current state of the school, which can be related to students' characteristics. The discussion regarding how schools have human resources and technology infrastructure limitations was unavoidable since R2S Education is done digitally. The school learning process during the pandemic, which had been going on for almost two years when the interviews at schools were conducted, helped interviewees reflect on how teachers and students deal with the new learning system. Teachers have difficulties adapting to the new system, and this adaptation should happen fast so that students can study despite the circumstances. Similar to students who have different learning paces, teachers also face the same conditions,

"... frankly speaking, for this kind of thing, the old teachers need time, right? Fast learners can understand it fast. However, for the slower ones—we have experienced it before—the teacher has been taught repeatedly, but if he does not understand, what can we do about it?" (Teacher NGS 1, 2021)

Not only regarding human resources, but the technology infrastructure readiness is also essential to implementing R2S Education. It is mainly related to internet data and connection, specifically when students were required to learn from home. During the experiment, not all students could complete the programme at school. Thus, they needed to rely on the internet at home. However,

even when they are able to go to school, there might be a risk of getting their laptop stolen, and the school might have difficulties setting up the technology infrastructure (Teacher GS 1, 2021).

The challenges related to technology infrastructure were particularly relevant during the data collection because the pandemic still impacted schools. The restriction in conducting the learning process at school obliged students to have limited face-to-face interaction with their peers and have more online school sessions. Teacher GS 2 (2021) noticed the impact of this learning system on students' engagement levels, saying that,

“If the children go to school, ah, that is really easy, because the happiness can be shown. At this time, there is no happy face. When they are at school, they keep silent, even when being informed of something, because [they] have not gone to school for a long time.”

Teachers also noticed a decrease in students' engagement level in the online learning system due to the need to make new accounts for any new learning platform. Besides the publicly available online programmes, schools might innovate and develop their own programmes. When such a programme was introduced in NGS School, it was shown that students were reluctant to subscribe to it because they had repeatedly signed up on many programmes beforehand (Teacher NGS 1, 2021).

Additionally, the requirement of students to participate individually in R2S Education is viewed negatively. Regularly engaging with students daily, teachers understand that junior high school students lack discipline and responsibility. The individual learning setting from R2S Education contrasts with the students' preference for working in groups to solve the questions in each module. Furthermore, it was pointed out that the number of modules in the programme decreases students' performance even further, except when being promised a concrete extrinsic motivation, e.g., an additional score for their school subject, after performing the tasks. The quotes supporting these challenges are,

“When it is done together, it will not seem to take a long time, just like me and Teacher NGS 2 [answering the questions together]. When it is done alone, the children sometimes just want to go home so that it is done, because although it is in the form of a game, since there are several modules—we have four modules, right?—[this fact] can perhaps make the children not to answer [the questions] at all later on” (Teacher NGS 1, 2021).

“Well, I was obliged to say the other day: “Children, the ones who complete the programme get additional score.” Ah, all of them are motivated. That is the key, with the score” (Teacher GS 2, 2021).

Apart from schools and students, external stakeholders directly involved with schools can hinder R2S Education implementation. On the one hand, government schools in Jakarta receive funds from the government to conduct activities at their school, i.e., the BOP fund (Bantuan Operasional Pendidikan – Educational Operational Assistance), which is provided by the local government. Then, the BOS fund (Bantuan Operasional Sekolah – School Operational Assistance) is provided by the national government. Thus, it is not allowed to collect money from the public and parents (Education Office interviewee, 2022). On the other hand, for instance, a laptop is sometimes necessary for students when participating in online learning in case it is impossible to use a smartphone. Teacher GS

1 (2021) mentioned that providing such hardware might be challenging for some parents during the pandemic. Meanwhile, non-government schools in Indonesia are often affiliated with a foundation that results in the latter institution's involvement in the schools' decision-making process. Its involvement is vital when the schools wish to conduct a particular activity not instructed by the government (Teacher NGS 2, 2021).

### **4.3. Contributing factors in R2S Education implementation**

Despite the barriers elaborated in Subchapter 4.2, interviewees mentioned more contributing factors to successfully implementing R2S Education (see FIGURE 11). They are divided into three themes, i.e., benefits of R2S Education, implementation prospects in schools, and programme set-up and content. The codes included in these themes represented schools' evaluation after conducting the experiment. Moreover, in overall, schools and the government reflected their current situation in identifying contributing factors in R2S Education implementation.

#### *4.3.1. Benefits of R2S Education*

All interviewees shared the idea that the main positive impact of R2S Education is the increase in students' knowledge, awareness, and skills. The questions related to Bogor as the unfamiliar situation are also highlighted by Teacher NGS 1 (2021) and Teacher NGS 2 (2021) that students are able to learn about the differences between two road situations through the programme. Moreover, there is an essential link between road safety knowledge taught in school and real-life implementation, including the potential consequences. Students who learn road safety are believed to have a good road safety culture, which helps them be prepared when involved in a traffic conflict (Teacher NGS 1, 2021).

“In the end, there are messages that must be conveyed to the children, namely how to drive or ride [well and safely] and also how to use cellphones in an orderly or good manner. Because if both are operated simultaneously, the consequences will be as exemplified. It can cause loss of life or property” (Teacher GS 1, 2021).

R2S Education as a gamified-based programme was evaluated positively regarding its ability to promote high engagement and motivation level of junior high school students. Despite the students' hindering characteristics explained in Subchapter 4.2, Teacher GS 2 (2021) commented that “the [students] have no problem, no complain, because the content is what the children more prefer, there is Charlie, more colourful and alive and not only texts.” Indeed, its status as a game-like programme with interesting features motivates the students and “... makes it easier for the children to understand quickly” (Teacher GS 1, 2021).

On a larger scale, the community can benefit from R2S Education, or RSE in general, when it is integrated into the school curriculum. Education Office interviewee (2022) felt that introducing RSE at schools can promote the awareness of RSE in the community. Being a road user, Teacher NGS 2 (2021) thought that R2S Education “... remind[s] us, the teachers, back as road users, both pedestrians and motorists, that [we] need to pay attention to each other in order to be orderly. So, we can understand [the rules] as the motorists and pedestrians or anyone who uses the road.”

#### 4.3.2. Programme set up and content

Benefits that students, and eventually the community, shall receive from R2S Education when programme-makers consider the desired qualities from schools and government for the programme. TABLE 5 shows that the possibility of integrating RSE in school subjects is the most important aspect for the stakeholders. In the past, RSE was inserted in Education of Jakarta Environment and Sports subjects in GS School and NGS School, respectively (Teacher GS 2, 2021 and Teacher NGS 1, 2021), making the possibility of integrating the topic into a school subject more feasible than creating an independent school subject.

Moreover, Teacher GS 1 (2021) also mentioned that there had been a meeting between several institutions, e.g., the Ministry of Education, police, and schools, to discuss the integration of RSE into Civic Education subject. This subject focuses on how students behave in society according to the norm and culture in Indonesia. The Education Office interviewee (2022) pointed out the importance of making a new school programme that conforms to those aspects. In RSE,

“there is a link in the PPKn [*Pendidikan Pancasila dan Kewarganegaraan* – Civic Education] subject. It means [that it is] a link related to learning the norm. So this norm is related to what if [you] do not wear a helmet, [if] there is a sanction. Well, [within the subject] there, it is linked and explained” (Teacher GS 1, 2021).

Being a theoretical-focused programme, R2S Education provides no practical sessions where the students can apply what they have already learned in an actual situation. Both schools pointed out this shortcoming because teachers felt that the students could learn firsthand how the theory they learned in class can be implemented on the road with their peers, which encourages active learning (Teacher GS 2, 2021; Teacher NGS 2, 2021). For example, Teacher NGS 1 (2021) explained that the RSE offered in NGS School during the Sports subject was given first in the form of theory. Students and the teacher practised together by crossing the road on a zebra crossing and identifying traffic signs they learned beforehand.

Conducting a combination of theory and practical sessions for RSE for junior high school students is believed to be suitable for their maturity compared to younger elementary school students (Teacher NGS 1, 2021; Teacher NGS 2, 2021). However, this means having an offline learning session at school is necessary. Teachers of both schools mentioned the desire for an offline meeting, which is understandable considering the lack of face-to-face interaction in class during the pandemic. Furthermore, another key point is the possibility of group work with peers. R2S Education requires making an individual account and thus working individually to participate in R2S Education. Students considered this boring because they had less chance to work with their friends (Teacher GS 2, 2021).

Both schools also give further evaluation regarding the structure of R2S Education. As explained in Subchapter 1.2, there are 100 questions to be answered by students divided into four specific-themed modules and one final module. The number of modules was considered a burden for students because they perceived the programme as consisting of five separate tasks. In that case, there is a demand for a more simple and concise programme to avoid students feeling demotivated (Teacher GS 2, 2021; Teacher NGS 1, 2021). A representative comment regarding this issue is the following,

“Thus, within one module, be it with 80 questions but the Jakarta [questions] are included, as well as Bogor, but in one module. So, people say: ‘It is only one module, it is not that much’” (Teacher GS 2, 2021).



Using familiar gadgets and online programmes is also an essential aspect for the schools. The use of technology in class was not extensive before the pandemic. In comparison, students in GS School could use their smartphones when they needed to find information that was not available in a textbook during the class (Teacher GS 1, 2021). Meanwhile, students in NGS School were not allowed to use any gadgets because they already had their textbooks (Teacher NGS 1, 2021). Reflecting the ongoing online learning system during the data collection period, students mainly used their smartphones when learning at home and at school. They might be reluctant and scared to bring their laptop to school “...because it is not safe on the trip [due to thieves]” (Teacher GS 1, 2021).

Throughout the data collection process, most students were observed to use an Android smartphone compared to an iOS smartphone. However, the exact number of users for both types was not counted. A significant issue regarding smartphone use while participating in R2S Education was related to the difficulties in accessing the modules. Notably, it occurred when the students were required to read the video instruction at the beginning of the module. Despite the issue, the use of smartphones was evaluated as more convenient because,

“At school, in general, the children bring smartphones. They already have a zoom link on their smartphone [for online classes]” (Teacher GS 1, 2021).

“Sometimes, we give assignments and quizzes using smartphones in the class. Moreover, we must minimise the physical contacts. The work is also done online” (Teacher NGS 2, 2021).

### *4.3.3. Implementation prospects in schools*

Subchapters 4.3.1 and 4.3.2 discussed the factors which require particular attention from programme-makers (see also TABLE 6). This subchapter focuses on how schools and the government prepare themselves to implement RSE and, particularly, R2S Education at schools. Previously identified as a barrier, all interviewees highlighted the importance of including RSE in the curriculum. It is an important step to include the topic in schools, either independently or integrated into an existing subject, and to set it as a recurring programme (Teacher GS 1, 2021; Teacher NGS 2, 2021). That condition also helps a fast implementation process, as Teacher NGS 2 (2021) said: “When it is from the government, it is definitely included into the subjects immediately.” However, there should be an awareness and concern from all stakeholders, including road users, to promote the addition of RSE in the school curriculum (Education Office interviewee, 2022).

Before the government plans to include a new regulation that affects schools, the Education Office interviewee (2022) explained that the government might initiate a pilot programme where several schools will be selected to participate and evaluate the programme. These schools are chosen based on their readiness in terms of human resources so that meaningful outcomes and recommendations can emerge. As a result, other schools are motivated to support and adopt the programme in their schools. Conducting a pilot programme is a part of a long process of collaboration involving various stakeholders who are directly and indirectly involved in the programme’s objective. Regarding RSE, they might include government institutions, schools, NGOs and experts.

When the RSE is a part of the curriculum, schools have the freedom to design the details in executing the programme (Education Office interviewee, 2022). The examples of the unconventional

learning process, i.e., not in the form of a lecture or traditional learning in the classroom, that the teachers of both schools gave indicated the initiation and willingness from the school and teachers. Teacher GS 2 (2021) added a sightseeing session in Old Town Jakarta to complement the theoretical lecture in class. Students in NGS School did a project-based activity where they needed to complete a certain task and explain their results during a presentation (Teacher NGS 2, 2021). The school, particularly the school headmaster, needs to approve such activities. For example, Teacher NGS 2 (2021) explained that when an activity not derived from the government wants to be implemented in NGS School, this activity will be discussed and determined in an annual programme meeting and the school headmaster or the school foundation as well.

Therefore, gaining support from the school's internal stakeholders is important in introducing a new programme such as R2S Education. Previously, it was mentioned that the stakeholders include the school headmaster and the school's foundation. Teacher GS 2 (2021) mentioned that the involvement of vice principals and a committee of parents is also important. Indeed, not every school requires the same group of stakeholders because NGS School does not have a committee (Teacher NGS 1, 2021), and GS School does not operate under a school foundation. Nevertheless, both schools consider internal support crucial because,

“... it concerns the children who go to this school. For all things that we want to present to the children, the internal support definitely has an influence. Otherwise, it cannot be executed, you know” (Teacher GS 2, 2021).

Another aspect to consider in gaining internal support is including the programme in the annual meeting so that the school can discuss the budget and schedule. A timely budget plan ensures a thorough discussion that helps secure the internal stakeholder's support (Teacher GS 2, 2021) while evaluating the school's ability to fund the new and existing programmes (Teacher NGS 1, 2021). On the other hand, the school needs to discuss whether a teacher can be assigned to deliver RSE to students. Teachers from both schools believed junior high school students still need guidance in working on their assignments involving interaction and group work. In NGS School, for example, the teacher did not receive special training to give RSE because the information can be found through books, the internet, or based on real-life experience. Another option is to invite a competent external stakeholder to a seminar.

The availability of good road infrastructure also influences implementation prospects in schools. Notably, it is related to pedestrian facilities because of the focus of R2S Education on students' role as pedestrians. Education Office interviewee (2022) reported that the Provincial Government of DKI Jakarta has been redesigning pedestrian facilities for all road users that help improve road safety.

While all mentioned aspects in this subchapter are related to schools and government, the involvement of programme-makers is considered necessary by schools. Schools should be convinced by the programme's purpose, benefits, and set-up (Teacher GS 1, 2021; Teacher NGS 1, 2021).

#### **4.4. Students' post-experiment evaluation**

This subchapter focuses on quantitative findings from the post-experiment survey completed by students as a part of mixed method research conducted for this study. TABLE 7 shows the descriptive statistics regarding the mean, proportions, and frequency of personal characteristics of the valid

respondents. There is a balance proportion of male and female respondents with an average age of 13.1 (SD = 1.13). As shown in FIGURE 10, just over two-thirds of the respondents (69%) studied in the government school, explaining the high proportion of Grade 7 students. All respondents from both schools reside in Jakarta. Furthermore, it is shown that almost half of students went to school to study rather than participate in an online class. The majority of students have attended offline classes within six months prior to the data collection period.

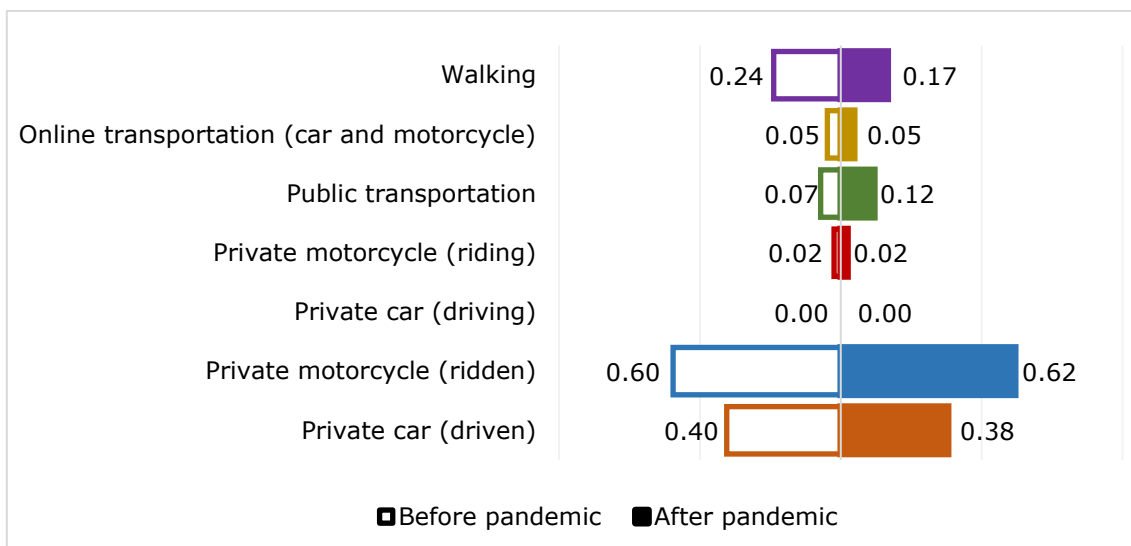
The most striking result to emerge from the data is that 14% of students (age 12 – 13 years) reported possessing a license for driving a car, riding a motorcycle, or both despite not being qualified to obtain a driving or riding license due to their age. Among those who indicated possessing a driving license, one respondent reported the experience of getting fines due to red-light running and not using a seat belt, indicating the occurrence while driving a car. Furthermore, when asked whether students have been involved in a traffic crash, most of them (88%) indicated no involvement in a traffic crash. Among five respondents who responded yes, the highest consequence is getting minor cuts and bruises, meaning minor injuries.

**TABLE 7 Students characteristics (N=42)**

Variable		Mean/ proportion	Frequency	SD
Gender	Male	0.50		
	Female	0.50		
Age		13.10		1.13
School grade	Grade 7	0.69		
	Grade 8	0.10		
	Grade 9	0.21		
Type of school	Government school	0.69		
	Non-government school	0.31		
Residential area	Jakarta	1.00		
	Bogor	0.00		
	Other	0.00		
Offline class during pandemic	Less than 6 months ago	0.29		
	6-12 months ago	0.12		
	Never went to school during the pandemic	0.19		
	Currently have offline class	0.40		
Driving license	Car	5%		
	Motorcycle	7%		
	Both car and motorcycle	2%		
	None	83%		
Fines	Yes	2%		
	No	14%		
Fines frequency			1	
Reasons fines	Red light running	2%		
	Not using helmet	0%		
	Not using seat-belt	2%		
	Odd-even policy	0%		
	Driving or riding along the busway	0%		
Traffic crash	Yes	12%		
	No	88%		
Traffic crash frequency			5	
Consequences traffic crash	Monetary loss due to repairing the damage	2%		
	Minor cuts or bruises	5%		
	Serious injuries leading to hospitalisation	2%		

FIGURE 14 shows how students went to school before and after the COVID-19 pandemic. Similar to the findings described in Subchapter 4.2, it is clear that there is a high preference of adults in taking students to school by motorcycle (60% before and 62% after pandemic) and car (40% before and 38% after pandemic). Reflecting on students’ residential areas in Jakarta, it is not surprising that walking is the third most frequent transport mode for students. This finding is essential in the case of R2S Education because the content is still relevant to students despite the evidence of high use of motorised vehicles.

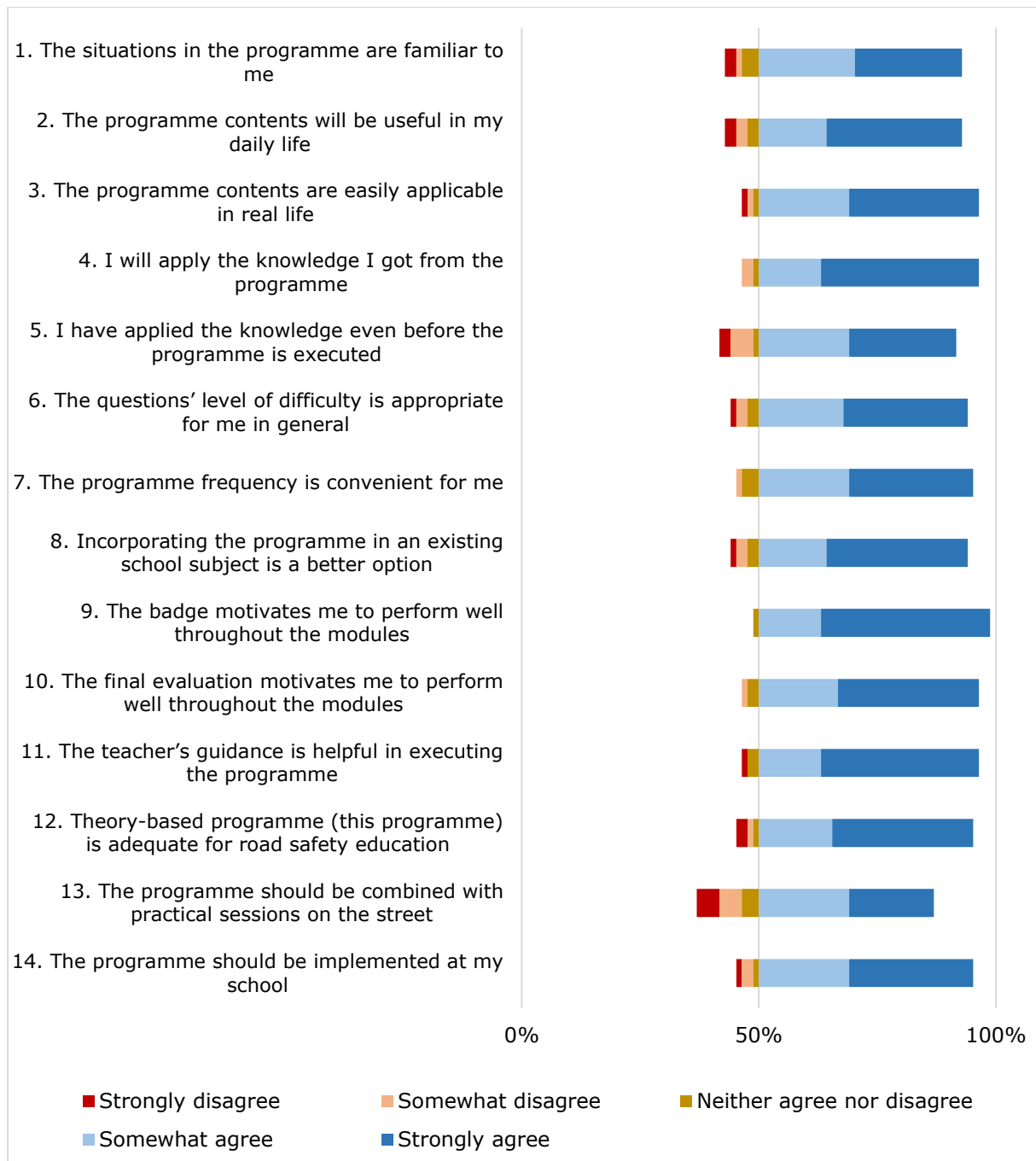
Furthermore, two interesting findings are found in FIGURE 14. There is a decrease of 7% of students walking to school after the pandemic (17%). Meanwhile, it is seen that the use of public transport increases by 5% after the pandemic. Perhaps, the most surprising result is that 0.2% of students ride their own motorcycles before and after the pandemic. This finding suggests students' ability to ride motorcycles from a young age, which might explain why some students reported possessing a driving or riding license.



**FIGURE 14 Students' transport mode to school before and after the pandemic**

The survey also required respondents to evaluate their experience in completing R2S Education. Fourteen five-point Likert scale questions were presented, where 1 represents a strong disagreement with the statement and 5 represents a strong agreement with the statement. The score summary presented in FIGURE 15 shows the proportion spread of responses for each question. It is apparent from the graph that the majority of responses are either somewhat agree or strongly disagree regardless of the question.

Nevertheless, some questions showed a high proportion of negative scores, i.e., score 1 (strongly disagree) until score 3 (neither agree nor disagree). An example of such output is shown in question 13, where one-fourth of the students (26%) do not wish for a combination between theory and practical for R2S Education. The score explains why most students prefer only a theory-based RSE (question 12). Then, although most students have applied the knowledge included in R2S Education in their daily lives (question 5), 17% of students were unsure or even disagreed that they have applied it.



**FIGURE 15** Score proportion of survey evaluation questions

A lower agreement is also shown in questions 1 and 2 related to the usefulness and familiarity of the programme. That is a remarkable result considering that the programme contains questions about the road situation in Jakarta, where all respondents live. A possible explanation for this result may be because the situations presented in the questions focus on the CBD of Jakarta, which is not located near the students' schools. Questions related to cases in Bogor, which is an unfamiliar situation for the students, may also explain the findings. However, the programme's success is evident in question 4, showing that almost all students are willing to apply the knowledge and feel that it is easily applicable in their daily lives (question 3).

The evaluation regarding the programme's content and set-up results in an excellent outcome because the related questions are scored higher on average. First, more than half of the respondents strongly agree that the questions' difficulty level is appropriate for them (question 6). They also find that the programme frequency is convenient, i.e. giving the freedom to students to complete the programme according to their pace (question 7). Similar to what teachers thought regarding the need for guidance for junior high school students, 93% of students believe that teachers' guidance helps them execute the programme (question 11). Particularly, two-thirds of students strongly agree with this statement.

Furthermore, the score evaluations regarding badges (question 9) and final evaluation (question 10) are higher than other questions, but more interpretation can be drawn from these results. For students, there is clear evidence that extrinsic motivation influences their engagement level and motivation to perform well in the programme (a total of 98% for scores 4 and 5). Specifically, it is proved by no strong and minor disagreement for the statement. Containing questions that have been asked in the four previous modules, the final evaluation included in R2S Education represents the intrinsic motivation of the willingness to perform well in the programme. Meanwhile, it also can represent extrinsic motivation if the students wish to obtain a better score than their friends. With a total of agreeing scores of 93%, it can be inferred that intrinsic motivation is less influential than extrinsic motivation regarding R2S Education.

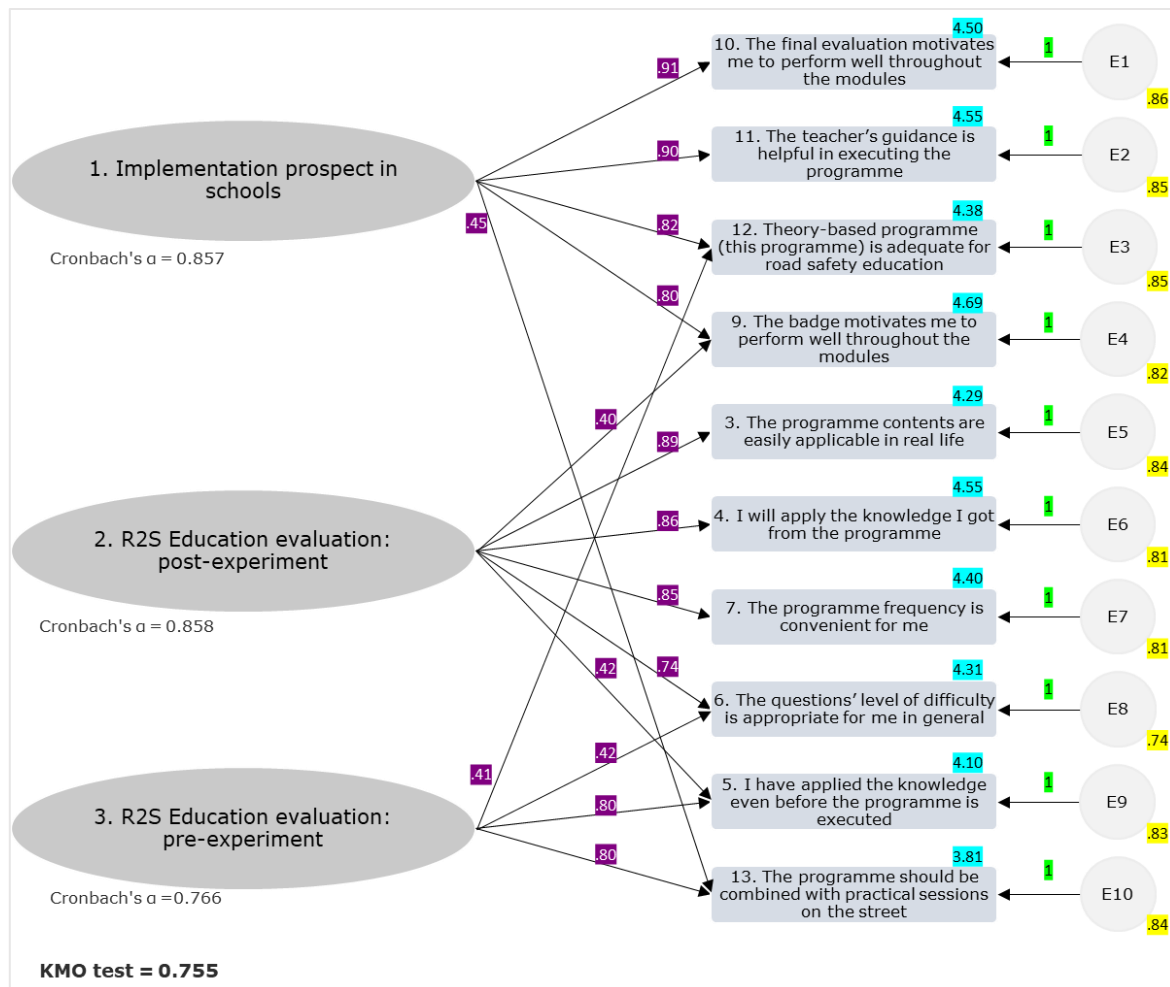
R2S Education was performed by students independently from an existing school subject. Most students (88%) think it is better to integrate R2S Education into an existing school subject (question 8). With all components being evaluated regarding the programme, question 14 summed up students' support of the implementation of R2S Education, with 90% of students supporting the statement.

As mentioned in Subchapter 3.3.2, exploratory factor analysis was used to group the evaluation questions, except for question 14. The initial investigation resulted in an extraction or communality score ( $r^2$ )  $<0.7$  for questions 1, 2, and 8. Consequently, those questions were excluded in the second analysis, resulting in ten questions being analysed. The KMO test produced a value of 0.755, which can be interpreted that the variables have a middling degree of measuring the common variance in a factor. The eigenvalue and scree plot shows that three factors can explain the relationship between the ten questions.

The three factors and their associated variables are presented in a path diagram (see FIGURE 16). Cronbach's alpha test proved the internal consistency of each factor. The numbers highlighted in purple are the factor loadings that represent the correlation between a factor and a particular variable. A threshold was applied to exclude correlation  $<0.30$ . The numbers highlighted in blue are the average score of each variable the students gave. Meanwhile, the numbers highlighted in green and yellow explain the initial and extraction score, respectively.

The variables included in each factor help explain which aspects are essential for students concerning the factor. The first factor represents the implementation prospect in schools, specifically related to intrinsic and extrinsic motivations, i.e., final evaluation and badge, teacher's guidance, the adequacy of R2S Education as a theory-based programme, and, to a smaller extent, a combination of theory and practical sessions for R2S Education. Considering an exclusive theory-based programme and a combination of theory and practical sessions in one factor is somewhat counterintuitive because

they are two different learning settings. However, it is shown in the diagram that there is a higher correlation for the theory-based programme than the combination one. This finding may explain a stronger relationship between the implementation prospect and the first setting than the second setting. Furthermore, a higher average score in the first setting may suggest that it represents the factor better than the second one.



**FIGURE 16** Path diagram of the exploratory factor analysis

Meanwhile, two other factors relate to R2S Education evaluation with the students' behaviour pre- and post-experiment. Regarding the behaviour post-experiment, four dominant aspects are identified. Students are willing to apply the knowledge from R2S Education because it is easily applicable in real life, the programme frequency is convenient, and the questions' difficulty is appropriate for them. The badge offered in the programme and their experience in applying the knowledge also contributed to their future behaviour, albeit less powerful than the other four aspects mentioned earlier.

On the other hand, the evaluation is also related to students' experience pre-experiment, i.e., the experience that students had regarding the knowledge in the past, preference in combining the programme with a practical session, questions' level of difficulty, and the adequacy of maintaining R2S

Education as the theory-based programme. Applying the reasoning in the first factor, combining the programme with practical sessions correlates more strongly with students' evaluation when considering their pre-experiment behaviour.

Question 14, i.e., "the programme should be implemented at my school", is related to the factor regarding the implementation prospect of R2S Education in schools. The ordinal regression analysis was performed for the factor, which is coded as F1, and students' personal and travelling characteristics. The overall fitting information for the model is given in TABLE 8. The p-value of  $\leq 0.05$  in the model fitting information shows that the model shows significant improvement over the intercept only model. Statistically non-significant value in the goodness-of-fit test means that the model fits the data, which in the case of this model, only one p-value meets the assumption. Further, the Nagelkerke pseudo r-square shows that the model explains 51.1% of the variance in the dependent variable. Finally, the p-value in the test of parallel lines should be  $\geq 0.5$ , which means the model improves the model fit.

As it is known that the model is suitable for further interpretation, TABLE 9 can be used to see the relationship between the dependent and independent variables. With a p-value  $\leq 0.5$ , F1 is statistically significant in explaining its relationship with Q14. It means that aspects related to the factor, i.e., the final evaluation, teacher's guidance, exclusive theory-based programme, and badge, increase the likelihood of supporting the implementation of R2S Education by 5.529 times. Another way to interpret this finding is that since those aspects are the characteristics of R2S Education, omitting one or more of these aspects might decrease the implementation support of R2S Education in Indonesia. Furthermore, the table also shows that no students' characteristics are significant in explaining the likelihood of the implementation support. Thus, this finding suggests that students support R2S Education implementation based on the programme's characteristics mentioned previously rather than their personal characteristics.

**TABLE 8 Overall fitting indices for the ordinal regression model**

<b>Model Fitting Information</b>				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	86.463			
Final	61.688	24.775	10	0.006
<b>Goodness-of-Fit</b>				
	Chi-Square	df	Sig.	
Pearson	1804.587	134	0.000	
Deviance	61.688	134	1.000	
<b>Pseudo R-Square</b>				
Cox and Snell	0.446			
Nagelkerke	0.511			
McFadden	0.287			
<b>Test of Parallel Lines</b>				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	61.688			
General	48,031b	13,657c	30	0.995



**TABLE 9 Parameter estimates of ordinal regression model**

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval		
							Lower Bound	Odds ratio	Upper Bound
Threshold	[Q14 = 1]	-5.578	1.936	8.304	1	0.004	-9.371	0.004	-1.784
	[Q14 = 2]	-4.038	1.610	6.289	1	0.012	-7.194	0.018	-0.882
	[Q14 = 3]	-3.345	1.519	4.851	1	0.028	-6.322	0.035	-0.368
	[Q14 = 4]	0.719	1.207	0.355	1	0.551	-1.645	2.053	3.084
Location	F1	1.710	0.523	10.701	1	0.001	0.685	5.529	2.735
	[Age=11]	-3.627	2.994	1.468	1	0.226	-9.495	0.027	2.241
	[Age =12]	-1.337	2.208	0.366	1	0.545	-5.665	0.263	2.992
	[Age =13]	-1.102	1.928	0.327	1	0.568	-4.881	0.332	2.677
	[Age =14]	-0.007	1.555	0.000	1	0.996	-3.055	0.993	3.041
	[Age =15]	0 <sup>a</sup>			0				
	[Male=0]	-0.760	0.876	0.754	1	0.385	-2.476	0.468	0.956
	[Female=1]	0 <sup>a</sup>			0				
	[Gov school=0]	1.891	1.719	1.210	1	0.271	-1.479	6.629	5.261
	[Non-gov school=1]	0 <sup>a</sup>			0				
	[Offline class <6 months ago=1]	0.526	0.949	0.307	1	0.579	-1.333	1.692	2.385
	[Offline class 6 – 12 months ago=2]	1.084	1.334	0.660	1	0.416	-1.531	2.958	3.700
	[Never have offline class=3]	2.285	1.394	2.688	1	0.101	-0.446	9.825	5.016
	[Currently have offline class=4]	0 <sup>a</sup>			0				

Link function: Logit.

a: Reference category

In addition to quantitative findings, the post-experiment survey also required students to recall the challenges they encountered while executing the programme and how they were solved. Students reported that the difficulties were related to the difficulties in displaying the questions due to smartphones, internet connections, and mobile data. The first challenge was solved by changing the browser display to desktop-view. The second and third challenges were solved by providing extra data and moving to another location with a better internet connection. On the other hand, most students felt that no apparent challenge was encountered because they understood how to execute the programme and realised the importance of this programme in their daily life. Each student also gave a conclusive score for R2S Education on a scale of 1 (extremely dissatisfied) to 10 (extremely satisfied). With an average score of 8.83 (SD = 1.68), it can be concluded that students evaluated the programme positively.

#### **4.5. Support relationship between government and non-government schools**

This research involved government and non-government schools in understanding their views about the implementation prospect of R2S Education. The previous subchapters in Chapter 4 include views

from each school that can concur with or contradict each other. This subchapter gives the details of those concurring and contradicting aspects.

Using NVivo’s word frequency query, the interview transcriptions from the two schools were analysed. Both pre- and post-experiment interviews were analysed for each school because of the overlapping discussion during both sessions (see Subchapter 4.1). The default setting was kept, i.e., displaying 1000 most frequent words with a minimum of three letters, and the text match level was set to group words with the same stem. Using the word cloud analysis visualisation, FIGURE 17a and 17b show that the most frequent words for both schools, indicated by bigger font size than the other words, are generally similar. Both schools frequently mentioned school, government, and teacher during the interviews, indicating the significant importance of the relationship between stakeholders.

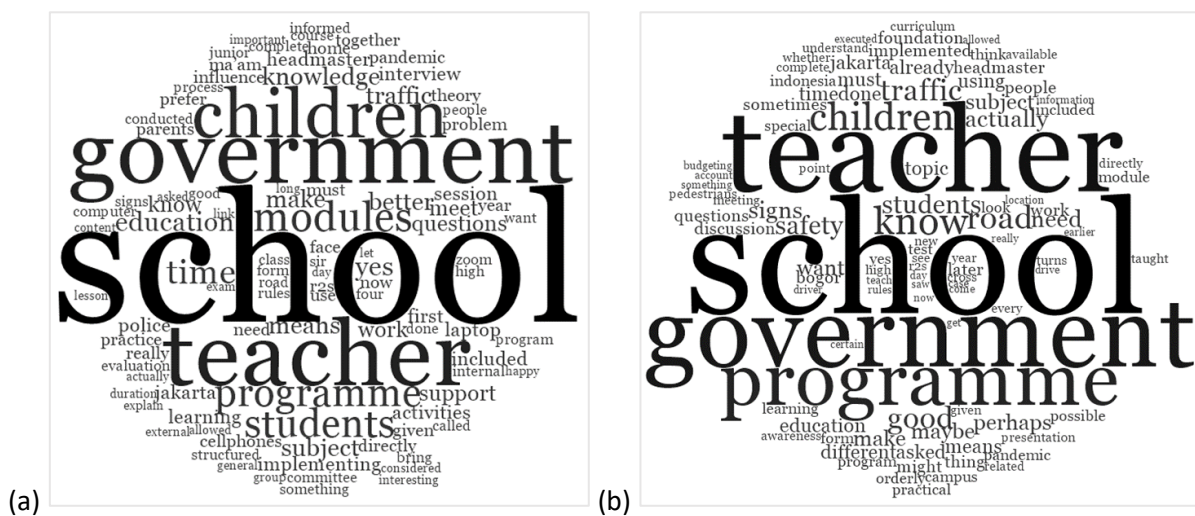


FIGURE 17 Words frequency query for: (a) government school and (b) non-government school

TABLE 10 – 11 are given to identify the ten most frequent words in FIGURE 17 in detail. The words “children” and “students” refer to the same stakeholder; however, they were mentioned interchangeably. Interestingly, these tables contain co-occurring words and how they relate to the frequent words, obtained with cluster analysis in NVivo. Most of the words co-occurred with each other for both schools. For example, “school” co-occurs with “teacher” for both schools, but “government” co-occurs with “children” for government school and “programme” for non-government school.

Moreover, the two co-occurred words can indicate their relationship, i.e., between stakeholders, programme set up, and behaviour. For both schools, stakeholder relationships are important, particularly between school and teacher. Then, there is a difference in the relationship with the government, where there occurs a stakeholder relationship between government and children for government school and programme set up the relationship between government and a programme.

Another interesting observation is the order of relationships, where both schools considered stakeholder relationships the most important, followed by the programme set-up and behaviour. Nevertheless, the relationship identification shows a contrasting attention point between the

government and non-government schools. The government school emphasises the programme set-up and content along with stakeholders. In other words, more attention is given related to programme implementation. Meanwhile, the non-government school emphasised more on behaviour; hence related to the effect evaluation of a programme.

**TABLE 10 Word frequency overview of government school**

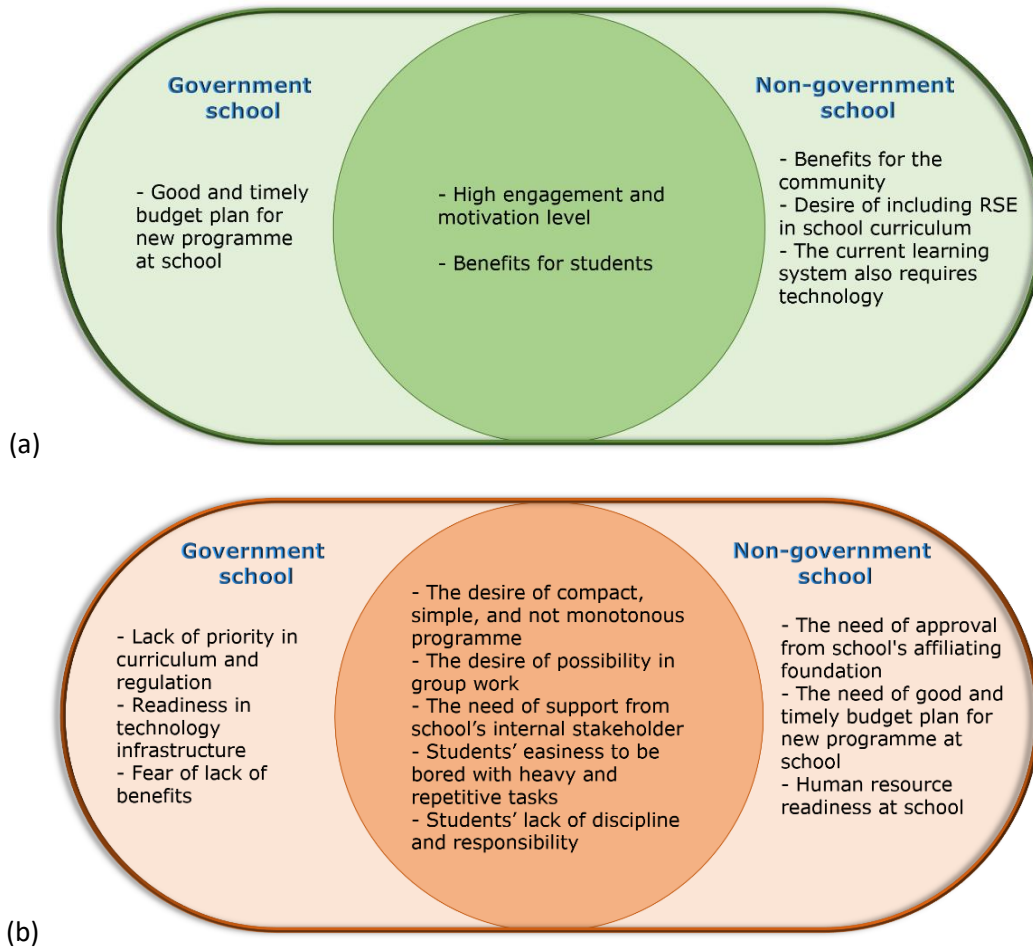
No	Word	Weighted percentage (%)	Similar words	Co-occurring word	Relationship
1	School	6,13	School	Teacher	Stakeholder
2	Teacher	3,06	Teacher, teachers	School	Stakeholder
3	Government	3,02	Government	Children	Stakeholder
4	Children	2,20	Children	Government	Stakeholder
5	Modules	1,24	Modul, module, modules	Programme	Programme set up
6	Programme	1,19	Programme, programmes	Modules	Programme set up
7	Students	1,14	Student, students, students'	Time	Programme set up
8	Time	0,96	Time	Students	Programme set up
9	Yes	0,78	Yes	Better	Behaviour
10	Education	0,73	Education	Police	Programme set up

**TABLE 11 Word frequency overview of non-government school**

No	Word	Weighted percentage (%)	Similar words	Co-occurring word	Relationship
1	School	5,47	School, schools	Teacher	Stakeholder
2	Teacher	4,08	Teacher, teachers	School	Stakeholder
3	Government	3,42	Government	Programme	Programme set up
4	Programme	2,46	Programme, programmes	Government	Programme set up
5	Know	1,22	Know, knowing, knows	Children	Behaviour
6	Children	1,17	Children	Know	Behaviour
7	Road	0,94	Road	Students	Behaviour
8	Good	0,91	Good	Need	Behaviour
9	Traffic	0,91	Traffic	Want	Behaviour
10	Students	0,76	Student, students	Road	Behaviour

Besides the analyses with word frequency, the support relationship between the two schools can be analysed from the final thematic framework in TABLE 5. FIGURE 18 summarises the differences and similarities of supporting and restricting factors to implementing R2S Education at schools. If these two factors are associated with SWOT analysis, then supporting factors represent the strengths and opportunities while restricting factors represent the weaknesses and threats. Those factors are included in either factor group based on the general sentiment related to them.

Regarding the supporting factors, both schools agree that the benefit of R2S Education as a gamified programme and the benefits students get from the programme are considered supporting factors. Moreover, the government school thought there should be a good and timely budget plan to include the programme at school. In contrast, the non-government school mentioned the benefit for the community and the current and desired conditions which support the implementation.



**FIGURE 18 (a) Supporting and (b) restricting factors for government and non-government schools**

It is interesting to point out that there are more restricting factors identified by both schools. The common restricting factors are mostly related to students concerning R2S Education post-evaluation and their behaviour in general. Both schools also found their desires for a compact programme and the possibility of working in a group for R2S Education as threats that can restrict the implementation. Furthermore, the need for support from the school principal and other internal stakeholders is crucial in approving the programme.

Another interesting finding is that the current and desired conditions of RSE are formulated as supporting factors by the non-government school, while they are considered restricting factors by the government school. Conversely, discussions related to a good and timely budget plan indicated a restriction for the non-government school. Additionally, the government school mentioned the fear of lack of benefits and the non-government school concerned about human resource readiness at school.

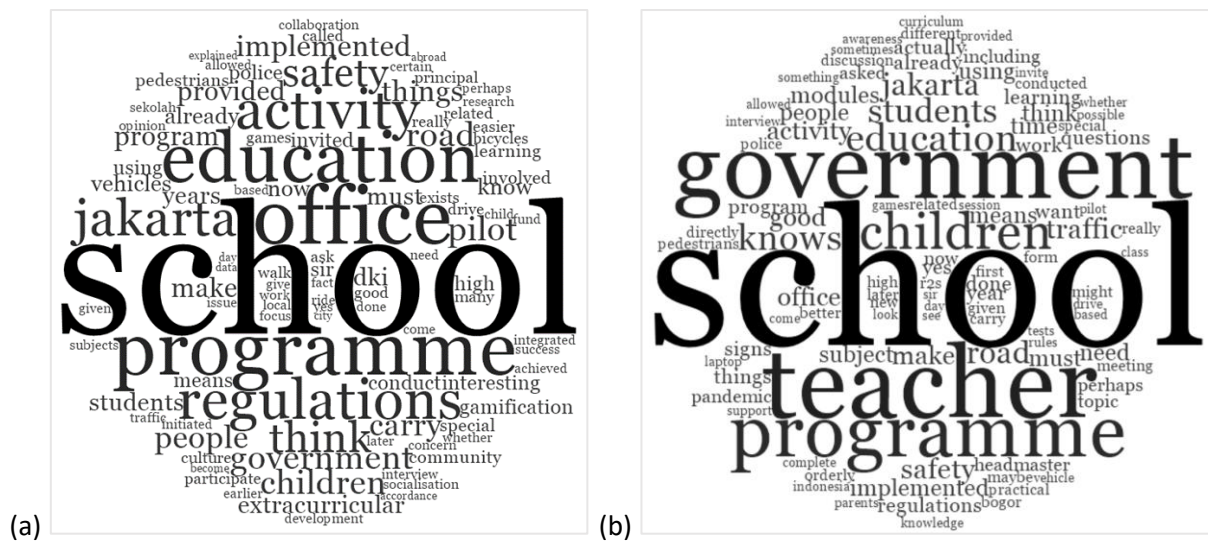
#### **4.6. Support relationship between government, schools, and students**

Previously, Subchapter 4.5 presented the support relationship between government and non-government schools. This subchapter presents how the three stakeholders, i.e., government, schools, and students, are related to each other regarding their support of R2S Education. Being qualitative

data, analysis results for government and schools are presented together. The quantitative findings from students are presented separately, which will be compared and related to the qualitative findings.

Focusing on the relationship between government and schools, a similar manner is applied to execute words frequency query for the government (see FIGURE 19a) and all institutions (see FIGURE 19b). The details of frequent words for both analyses are given in TABLE 12 – 13. Due to the inadequacy of query items in government interview transcription, the cluster analysis could not be performed. Instead, an analysis was added for all interview transcriptions of the three institutions which aims compare the relationship between frequent words for all institutions and each institution.

The cluster analysis for all institutions resulted in more elaborated co-occurring words than those for government and non-government schools. TABLE 13 shows the dominance of programme set-up as the relationship between co-occurring words. Nevertheless, relationships concerning stakeholders are also identified, i.e., between government and teacher, and regarding behaviour.



**FIGURE 19** Words frequency query for: (a) government and (b) all institutions

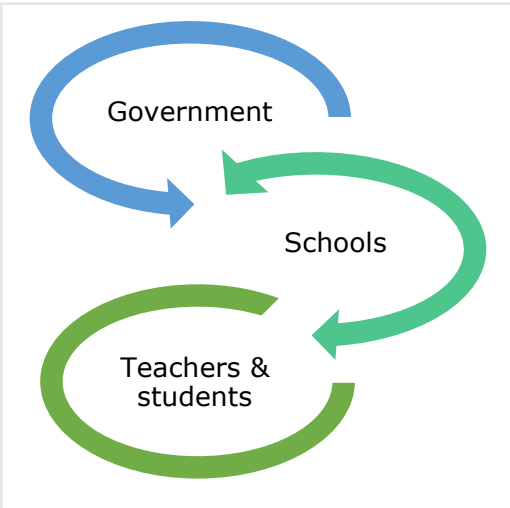
**TABLE 12** Word frequency overview of government

No	Word	Weighted percentage (%)	Similar words
1	School	5,91	School, schools, schools'
2	Office	2,52	Office, offices
3	Programme	2,41	Programme, programmes
4	Education	2,25	Education, educational
5	Regulations	1,75	Regulated, regulation, regulations, regulators
6	Activity	1,70	Actively, activities, activity
7	Jakarta	1,59	Jakarta
8	Think	1,26	Think
9	Safety	1,20	Safety
10	Government	0,99	Government

**TABLE 13 Word frequency overview of all institutions**

No	Word	Weighted percentage (%)	Similar words	Co-occurring word	Relationship
1	School	5,76	School, schools, schools'	Make	Programme set up
2	Teacher	2,87	Teacher, teachers	Include, government	Stakeholder
3	Government	2,75	Government	Teacher, include	Stakeholder
4	Programme	2,10	Programme, programmes	Bogor, test, done, discussion	Programme set up
5	Children	1,39	Children	Time, session	Programme set up
6	Education	0,98	Education, educational, educators	Activity, carry, provided, regulations	Programme set up
7	Knows	0,90	Know, knowing, knows	Want, see	Behaviour
8	Students	0,84	Student, students, students'	Means, given	Programme set up
9	Road	0,78	Road, roads	Using, learning	Programme set up
10	Jakarta	0,74	Jakarta	Really,	Programme set up

FIGURE 20 obtained by comparing the stakeholders mentioned by each stakeholder (see TABLE 13). The arrows indicate the focus of each institution towards a particular stakeholder during the interviews. It is apparent that the government’s interest focuses only on schools since it has a role in making regulations with the least responsibility in transforming them into actual programmes compared to schools (Education Office interviewee, 2022). On the other hand, schools are related to the government and the people included in the schools, i.e., teachers and students.



**FIGURE 20 Relationship between stakeholders**

Regarding R2S Education, the quantitative findings revealed that students considered intrinsic and extrinsic motivation, teacher’s guidance, and programme set-up as crucial aspects to the implementation success. For schools, both motivations are considered the supporting factor since they increase students’ engagement and motivation level, which shall benefit students in terms of their

willingness to learn new knowledge. The teacher's guidance is related to the human resource in delivering the topic, which is considered a restricting factor. Programme set-up, particularly theory-based, is also considered a barrier to implementing R2S Education. Schools elaborated it further with the desire for a compact, simple, and not a monotonous programme with the possibility of conducting group work.

The change of behaviour is also an important topic that emerged from the discussion with both schools, especially regarding how the programme should contribute to students' understanding of good road safety behaviour, which can promote the behaviour in their daily life. The factor analysis shows that there are more evaluation aspects regarding R2S Education and its effect post-experiment than the pre-experiment. That suggests that effect evaluation and retaining the desirable behaviour is important for both schools and students.

## **5. DISCUSSION**

Serious attentions from WHO and UNICEF regarding children's vulnerability in road crashes indicate that it is a global issue in which all countries should take action. Children's limited role and lack of experience in traffic participation should not hinder providing road safety education to children. Road safety education should be a lifelong learning process because road users are the teachers for others in behaving on the road (Aghdam et al., 2020).

Ensuring the continuity of providing RSE for children is done through integrating the topic at schools. Several publications included in Subchapter 2.2 have shown many ways to set up such a programme, for example, traditional learning sessions, a combination of theoretical with practical sessions, involvement of external stakeholders, and involvement of parents. This research focuses on the implementation prospect of RSE in the form of a gamification programme called R2S Education in Indonesia. This combination of qualitative and quantitative research aims to know the underlying factors of why schools, government, and students support or do not support the programme implementation.

The qualitative analysis groups the research findings into two themes, i.e., barriers and contributing factors in implementing R2S Education, while the quantitative analysis adds depths to understand the qualitative findings. The two themes in the following subchapters consider findings from all stakeholders. Therefore, discussion related to quantitative results concerning students is not presented separately. Evaluation and improvement aspects given by all stakeholders generate two scenarios that can be considered in increasing R2S Education implementation support in Indonesia.

### **5.1. Barriers to implementing R2S Education**

The results related to barriers have less relation to R2S Education than RSE in general. It may be explained by the fact that there is a lack of implementation of RSE in Jakarta and Indonesia in general. All interviewees pointed out the lack of focus on this topic in the curriculum as the leading cause while demonstrating the dependency with other institutions in implementing RSE. This result seems to suggest that barriers focusing on R2S Education might be more identified when the research area has more experience conducting RSE formally at schools.

The lack of priority and importance of RSE in the school curriculum resulted in minimum RSE-related activities. In comparison, in Australia and New Zealand, RSE activities were conducted regularly despite the lack of importance of RSE in their national curriculum (Dragutinovic & Twisk, 2006). While that benefits students as the main target group, both countries indicated that there might be negative implications for the programme's sustainability since there is no security in the budget from the government, and there might be no distinct goals to be achieved due to a lack of evaluation.

In contrast to existing literature, there is no evidence of parents causing barriers to implementing R2S Education. Instead, it focuses on road safety behaviour in society. A possible explanation is that there is a great emphasis within Indonesian culture on collectivism (Kuntoro et al., 2017), which means a preference to conform to the norm in society rather than a unique norm that might be shaped in each family. However, caution must be applied with small sample size and similar research area. The findings might not represent Indonesia's society as a whole due to the variety of cultures and values of each ethnicity or location.



Nevertheless, road safety culture in Indonesia is still lacking. Concerning motorised vehicle users, World Health Organization (2018) reported that despite good enforcement (score 8 out of 10), only 71% of motorcycle users wear helmets, while 69% of car passengers, mainly front seat passengers, use a seatbelt. Motorised vehicle users do not prioritise pedestrians and cyclists in general due to the dominant use of these vehicles in society. In contrast to transport mode use in Europe, many motorised vehicle users in Indonesia do not walk or cycle as much as they drive their vehicles. It is evident in the transport mode share of students to the school that there is a contrast between motorised vehicles use with active mobility. Treviño-Siller et al. (2017) found that external factors, e.g., behavioural influence from adults and transportation mode, hinder them from applying the knowledge. This influence is crucial for young students because of a higher dependency on adults and the environment in making a decision or applying a particular behaviour than adults. Although the intention of behaviour change supported by a positive attitude can be high, as revealed in the quantitative findings, students might be discouraged in implementing active mobility due to negative perceptions from these external factors.

Hosseini et al. (2022) found that the users' topic preference is crucial in reaping the benefits of the gamification programme. Based on the qualitative findings, motorised vehicle users were mentioned almost as frequently as pedestrians despite the interview focus on pedestrians. There are two possible explanations for this finding. On the one hand, there seems to be a preference in relating RSE to motorised vehicle users because of the preference for the transport mode in society. On the other hand, it may suggest that RSE related to pedestrians also covers the topic related to other transport users. The low proportion of students walking to school may indicate the lack of relevancy of the R2S Education topic with their travelling characteristic, suggesting that the first argument explains the finding better.

In addressing this issue, a possible solution is to shift the content topic from road safety of pedestrians to students as potential new drivers. An example of such a programme is the UK's Safe Drive Stay Alive programme. It aims to educate new and pre-drivers about their vulnerability and consequences on the road by showing videos about the reconstruction of fatal road crashes due to common causes of a crash involving young drivers (Poulter & McKenna, 2010). Choosing the main character in the programme is vital because students might not relate to the RSE programme if the character is older (Bojesen & Rayce, 2020), thus, decreasing the possibility of changing behaviour.

The use of technology in R2S Education raised a discussion related to teachers' skills in applying technology in class, but research publications on formal RSE generally do not discuss this issue. There are three possible explanations for this contrast. First, several countries which provide RSE to students opt for a more traditional approach, e.g., theory-based learning in class or conducting real-life practical sessions (Dragutinovic & Twisk, 2006). Consequently, issues and opportunities related to RSE with technology might not be discussed at all. Second, the online learning process during the pandemic and R2S Education set-up helped the interviewees better relate to the discussion. Finally, teachers in particular evaluated human resources in their own school and the relationship between age and easiness of adapting to technology.

In terms of motivation, reward in the gamification programme is affiliated with extrinsic and intrinsic motivation (Yen et al., 2019). Students were informed that virtual badges, an extrinsic motivation within R2S Education, can be obtained to prove their performance in completing each module. In addition to that, a reward as extrinsic motivation is known by participants as an

appreciation of performing and participating in the programme. Thus, it is clear that extrinsic motivation is present and understood by students. The quantitative findings also show the badge's significant influence on performing well in the programme. However, teachers from both schools noticed that students were demotivated as part of their characteristics. Although Lepper et al. (1973, as cited in Yen et al., 2019) argued that the absence of reward as extrinsic motivation demotivates participation, current research suggests that demotivation can happen even when extrinsic motivation is evident. It is certain for a target group that views reward as a critical aspect, e.g., children. The effect of extrinsic motivation that the users receive cannot be generalised based on its type. That is certainly true in the case of raising the motivation of a group of student participants by giving additional scores in one of their subjects if they are fully participating in the programme.

Finally, the common RSE activities that schools in Indonesia have set up generally were in the form of one-time interventions involving an external stakeholder. For example, practical sessions for road safety education have been conducted in the form of competition in crossing a road safely and the young police programme (Anwar, 2014). These activities increase children's motivation while providing rewards, i.e., winning prizes and pride of being selected as young police. However, one-time intervention is inadequate to promote students' behaviour change in road safety. Poulter and McKenna (2010) concluded that there was a decreasing students' intention to maintain good behaviour five months after the experiment with the Safe Drive Stay Alive programme.

## **5.2. Contributing factors in R2S Education implementation**

As explained in Subchapter 4.1, the contributing factors are more extended compared to the initial thematic framework due to the focused discussion on R2S Education. Teachers identified the benefits of R2S Education in increasing knowledge, awareness, and skills, which contribute to a good road safety culture within the society. This finding is consistent with that of Arlinghaus and Johnston (2018), who consider the three elements and self-efficacy essential in changing a behaviour. On the contrary, Yen et al. (2019) argued that there should be an intrinsic motivation to change a behaviour successfully. To put it another way, the authors suggested that no change shall occur despite possessing the elements mentioned above in one's self. Therefore, working towards positive attitudes should be an essential consideration in developing RSE (Alonso et al., 2018).

The main two evaluation aspects of R2S Education are the lack of opportunity to conduct practical sessions in addition to theoretical ones and the lack of opportunity for students to have group work in completing the programme. Combining theory and practice can hinder the programme from being perceived as monotonous, increasing engagement. On the contrary, students incline more toward a pure theory-based programme rather than combining the programme with a practical session. This preference is one of the prominent aspects that support R2S Education implementation prospects for students. While the reason for this preference is unknown, it seems that it might be related to teachers' suggestion that students are demotivated with heavy tasks. After all, practical learning requires knowing and understanding a topic, which is the main point of a theory-based programme and applying the knowledge in a particular situation.

Both schools' interviewees believe that group work is a suitable learning situation for junior high school students. Learning with peers with interactive methods motivates children to be engaged in the activity and curious to seek new knowledge (Barton et al., 2012). Group work lessens the

workload that students have in completing a task because it is divided among the group members. Thus, it can increase their responsibility and motivation in executing the task while decreasing the perception of being given a heavy task.

Then, remarks were given related to the programme's structure and accessibility with familiar technology. Previous research regarding R2S Education (Mayaleh, 2021; Pham, 2019; Putri, 2020; Riaz et al., 2019) did not discuss the significant influence of displaying questions in four separated modules against including all questions in one module. This topic emerged due to the different setting of conducting the experiment, where the previous research asked teachers and students to work on one module in one session. In this research, students were given the freedom to complete the whole programme, particularly in terms of time. Through the difference in experiment execution, this research offers insight into how junior high school students perceive the programme, which can be identified through their discussion with the teachers. While negative evaluation was given for how the modules are presented, the programme frequency is considered satisfactory according to the students based on the post-experiment survey result.

The evaluation aspects mentioned previously aim to improve R2S Education as a compact, simple, and not monotonous programme. Considering students' profiles and characteristics for the programme content might be beneficial. In addition to demotivation and other negative traits, teachers noticed a point related to students' reluctance to make a new account for executing a new programme, which can hinder students from being engaged in the programme. However, it was not indicated by the students themselves. The ordinal regression analysis revealed that students' profiles, related to age, gender, type of school, and whether they have attended offline class at school during the pandemic, did not influence their implementation support. These findings suggest that a positive support implementation prospect, i.e., including the programme as one of the schools' activities, does not apply directly to the motivation in executing the programme. Particularly regarding age, the result disagrees with the finding of Alonso et al. (2018) that age influences attitudes towards road safety.

Meanwhile, teachers focused on the need for guidance in learning road safety topics, especially for junior high school students. It is strongly correlated with implementation prospects, according to students. Teachers believed they should be competent in delivering the programme and preparing the material by themselves because there is no training related to RSE in the current situation. The lack of such activity resulted in a little discussion regarding training for teachers, which is an aspect discussed by Alonso et al. (2016). The lack of attention to formal RSE at schools and the orientation of linking RSE with the involvement of expert external stakeholders may have something to do with that finding. Another possible explanation for this is that there is a perception of training as an activity organized formally, which has been done for core school subjects, such as math and science. Thus, independent training through manuals, which has been provided for teachers in Croatia and the Czech Republic (Dragutinovic & Twisk, 2006), might not be considered an urgent topic for all institutions.

The recurring issue related to smartphone use in working on R2S Education, as mentioned in Putri (2020), is also identified in this research. The teachers of both schools mentioned smartphones when they provided examples of their students using technology during the learning sessions. It suggests the schools' preference in applying a learning platform that can be accessed conveniently with smartphones. Indeed, this cannot be generalised to all junior high school grades, because one

teacher commented on grade 9 students' importance of using other hardware, i.e., laptops, in conducting final exams.

### **5.3. Support relationship between government and non-government schools**

One of the objectives of this research is to see the similarities and differences between two types of schools, i.e., government and non-government schools, for R2S Education implementation. Although being different in terms of, among others, administration and funding, ultimately, they share the same views in the preference of executing a programme which has added value to their students. Understanding the characteristics of their students, the schools also consider the feasibility of a programme from students' point of view and the future benefits they will get after receiving the education.

The relationship priority for stakeholders between school, teacher, and government shows little difference for both schools, especially for the relationship with the government. As non-government schools are understood to have less dependence on the government (Kim, 2018), the outcome is surprising. However, it is consistent with that of the Education Office interviewee (2022), who stated that regulations stipulated by the government apply to all types of schools.

On the other hand, there is a noticeable difference in proportion and attention for the programme set-up and behaviour. While it may explain how important each relationship is to a particular school, it is essential to bear in mind the possible bias during the interviews. The semi-structured interview allowed interviewees' freedom to elaborate their views and, simultaneously, gave room for interviewers to inquire about a specific relevant topic to be discussed in-depth. Therefore, during the two interviews, there might be a tendency to focus on a particular topic, i.e., programme set-up in the government school and behaviour in the non-government school.

### **5.4. Support relationship between government, schools, and students**

Words frequency query analysis for all institutions showed a different outcome than the analyses performed for the schools. Considering government in the analysis might explain why there is a tendency to focus on programme set-up and the dominant focus of this topic during interviews for the government school. Programme set-up in which the government is actively involved is related to budget and curriculum, reflecting the findings of Alonso et al. (2016) and Aghdam et al. (2020).

The relationship between government, schools and teachers and students, as shown in FIGURE 20, reflects the common perception of these stakeholders. Naturally, as the government is responsible for higher scale regulations than schools, there is little connection between the institutions and individual members of a school. Instead, government collaborate with schools through its policy and then schools will plan and execute it through a particular programme. Therefore, it explains why the relationship arrows concerning schools have two directions to government and teachers and students because they act as a bridge between the two groups.

Thus, it can be suggested that the school should be the stakeholder who initiates the change actively. Since schools are directly linked to students and emphasise students' education needs and

characteristics, these considerations may need to be made clear to the government. All the more, schools link what government, teachers, and students desire in the education system.

## **6. PRACTICAL IMPLICATIONS**

### **6.1. Proposed improvements for R2S Education Indonesia**

Teacher interviewees suggested several improvements for programme-makers that can increase implementation support of R2S Education. Moreover, aspects important for students in supporting the programme are also identified. R2S Education can be improved by considering both sets of ideas. As specified in Subchapter 4.5, schools highly consider students' characteristics, interests and the future benefits that can be gained in executing a particular programme at schools. Therefore, accommodating students' interests in improving R2S Education can also positively affect schools.

Subchapter 4.4 lists four essential aspects of R2S Education that contribute to students' support, i.e., final evaluation, theory-based programme, badge, and teacher's guidance. In that case, the improvement should maintain these aspects, although enhancing their impact is recommended. No contradiction is identified regarding the final evaluation and badge during teacher interviews. However, they suggested conducting a group work where students can discuss a problem with their friends and provide its solution in an engaging situation. Moreover, R2S Education guides students in understanding the most suitable action for each issue presented in the modules. The programme can be improved by providing a manual for teachers, which is helpful to assist the students when they want to discuss a certain topic in the programme further.

Additionally, teachers suggested simplifying the modules, i.e., reducing the number of modules. The research findings also identify the lack of relevancy of the programme with travel characteristics in the society. To address this issue, it is possible to focus on the topic related to motorised vehicle users. In that case, R2S Education shall aim to give knowledge to students as pre-drivers. Two possible scenarios for the programme's improvement are generated by considering all of those aspects. The first scenario focuses on improving the programme's structure, and the second scenario focuses on improving the programme's content and theme.

#### *6.1.1. Scenario 1 – module integration and group work*

In scenario 1, R2S Education still maintains its focus on providing knowledge for students as pedestrians. Thus, all improvement points are considered except changing the focus to motorised vehicle users or pre-drivers. TABLE 14 shows that the improved programme shall combine two modules into one integrated module while using the same questions in the current version. The reason for having two new modules instead of one is to make it reasonable to maintain the final evaluation in the programme. Thus, the first module focuses on knowing and interpreting the road situation, and the second focuses on identifying a hazard and assessing the most suitable reaction to address it. Indeed, the new version restricts the identification of the effect evaluation of each of the four themes, but reducing the number of modules can improve students' motivation levels.

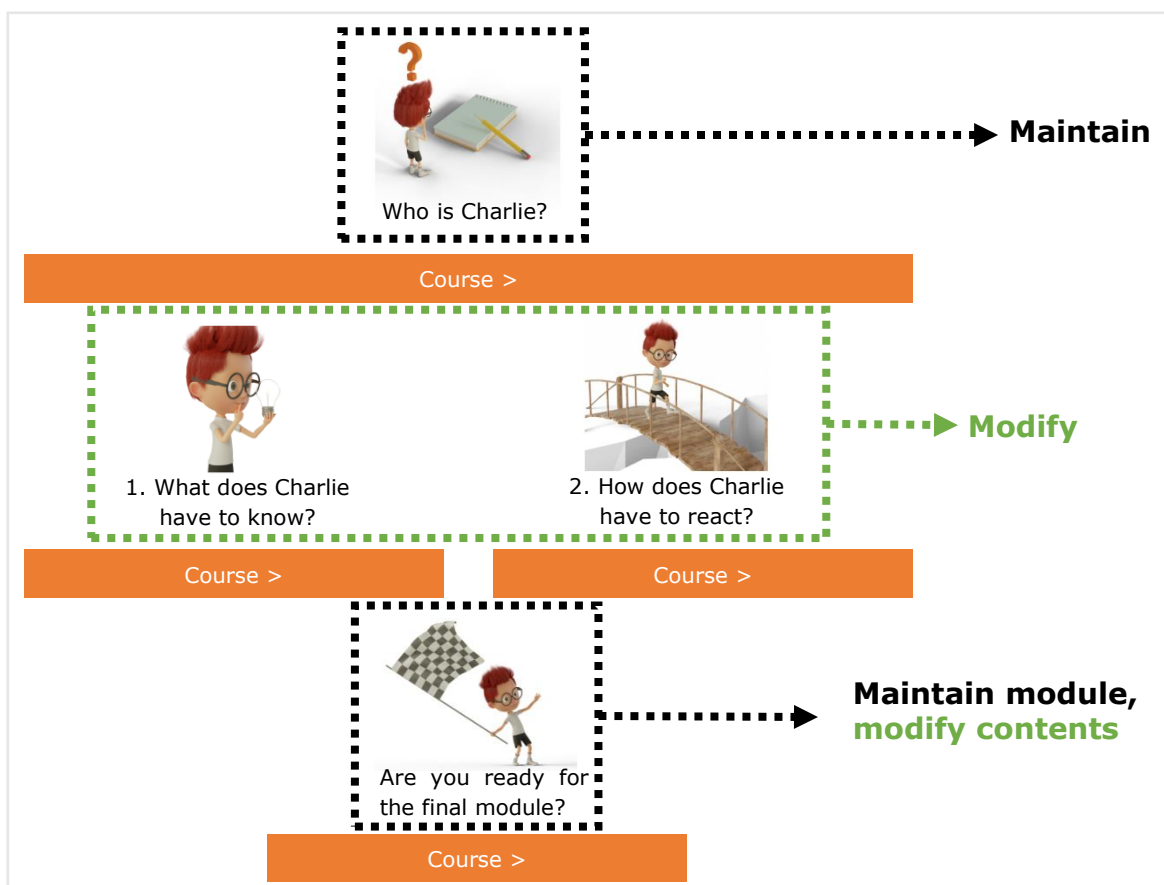
Contradictory to the current setting as an individual-based programme, this scenario identifies which module which can be improved to allow group work. Since group work encourages discussion of a problem, it can be applied in modules 1 and 4. In the first new module, students can work individually to identify notable aspects of a situation. Then, they can discuss what the situation means for pedestrians in a group. Similarly, students can work individually in the second new module to identify a potential risk that pedestrians might face in a particular situation and then discuss it in the group to assess the reaction which is safe for pedestrians and other road users. Since multiple

responses can be generated from the group discussion, it is essential to provide a manual for teachers to help guide students in obtaining the most appropriate solutions.

The proposed structure of the main page of R2S Education is shown in FIGURE 21. Charlie is evaluated positively by teachers due to his contribution to maintaining students’ motivation and engagement levels. Therefore, the introduction to Charlie should be maintained. As previously explained, four modules are combined into two modules. That allows final evaluation to be maintained in the programme. The final evaluation can be done individually to assess students’ comprehension.

**TABLE 14 Content overview of the current and new R2S Education**

Current module	New module	Question	Action
1 – Knowledge on traffic rules and regulations	1 – Knowledge on traffic rules and regulations and	What does Charlie have to know?	Understand and interpret
2 – Situation awareness	situation awareness	What does Charlie have to look at?	Identify
3 – Risk detection	2 – Risk detection and management	Where does Charlie have to pay attention to?	Identify
4 – Risk management		How does Charlie have to react?	Assess



**FIGURE 21 Proposed structure of R2S Education for scenario 1**

### 6.1.2. Scenario 2 – R2S Education focusing on motorised vehicle users

Compared to scenario 1, the improvement for scenario 2 is easier to be executed because the programme-makers do not need to change the programme's structure. Instead of pedestrians, the programme in scenario 2 focuses on motorised vehicle users. Therefore, Charlie should portray a young teenager who will be a driver soon, and he needs the students' help understanding the traffic. To prevent promoting students in using motorised vehicles illegally, the questions should be formulated to help Charlie, who is learning to drive a car, in a particular situation instead of performing the action themselves.

Questions included in the current version should be assessed whether they are relevant to the new topic, i.e., related to motorised vehicle users. That also includes assessing the pictures in the questions. These pictures should depict the situation where students will be when they drive a car or ride a motorcycle, i.e., on the road. FIGURE 22 presents examples of pictures included in the current version (in module 1) that are still not relevant for scenario 2. FIGURE 22a guides students to interpret the meaning of the red traffic light that they see while walking on a pedestrian path. The question can still be relevant for scenario 2 if the picture is taken from the driver's position and Charlie is set to be learning to drive a car and encounter the situation. Meanwhile, FIGURE 22b indicates the questions related to pedestrians. In this case, both picture and question should be replaced.

It is also possible to integrate the improvement in scenario 1 into scenario 2, which results in a completely different programme. However, limiting the improvement for this scenario in terms of the topic helps compare the implementation prospect between the current version and each of the new scenarios. The comparison with scenario 2 can investigate which topic is more relevant and preferred by the government, schools, and students.



FIGURE 22 Pictures that are not relevant for scenario 2 (Putri, 2020)

## 6.2. Practical implications for government and schools

Based on findings and discussion elaborated in previous chapters, several recommendations for government and schools can be given. Stakeholders are aware of the importance of providing RSE to students, yet the implementation is not done sustainably. The lack of priority of RSE in the curriculum demotivates schools in conducting such a programme. As the bridge between students and the government, schools should be more active in regularly conducting the RSE programme to show its relevance to students. The government should formalise the programme in the curriculum and



regulations to point out that there is a responsibility and commitment that all stakeholders need to have in implementing RSE at schools.

RSE for students is not only related to government, schools, and the students themselves, but also the society. It is widely known and proved in this research that Indonesian people are inclined less to walk, which is the focus of R2S Education. Aside from the programme, walking is beneficial for society, including students, to promote an active lifestyle that positively affects health. Teachers and students as a part of society should contribute to promoting RSE related to walking to motivate the whole community. At the same time, the government should continuously provide the necessary infrastructure improvement, education, and enforcement to enhance road safety for pedestrians.

## **7. LIMITATIONS AND FUTURE RESEARCH**

Since the research was limited to schools in Jakarta, it was not possible to generalise the research findings to other cities in Indonesia. Notwithstanding the relatively limited sample, the research offers valuable insights into the aspects that support stakeholders of R2S Education and how significant they are compared to other aspects. Further research needs to be carried out in a city with different characteristics to see whether location influence those aspects. On the other hand, carrying out a study in a different city or country with similar characteristics can help validate this research's findings.

An issue that was not addressed in this study in-depth was whether there is a significant contribution in including two types of situations, i.e., familiar situation (Jakarta) and unfamiliar situation (Bogor), in the implementation prospect of R2S Education. Moreover, there was no distinct differentiation in evaluating each module, which represents a specific objective. A greater focus on these aspects could produce interesting findings in understanding the influence of programme content on the implementation prospect.

As qualitative data is associated with subjectivity, there might be less confidence in concluding the analysis than the quantitative one. Although not apparent in this research, there will be no in-depth discussion during the interviews with the school representatives and the government if the interviewees do not have substantial knowledge of the topic. Furthermore, discussion topics not mentioned in one school might be relevant, but the interviewee did not mention them. As a result, it was interpreted as a lack of importance in those topics when it might not be the case.

Further, the data collection estimated period will be at the end of the semester. Students and teachers will focus more on the end semester evaluation during that time, hence the non-optimal data collection process. Moreover, students did not always attend offline sessions, resulting in difficulty monitoring the experiment. The quantitative analysis result includes the findings related to possessing any driving license despite students' age. These findings might be due to a lack of understanding while answering the questions, or it might be a fact given by the students. Further investigation should concern this topic.

This research recommends two improvement scenarios for increasing the support for R2S Education. Future research can benefit from these findings in investigating the effect evaluation of executing the new scenarios and understanding their implementation support.



## **8. CONCLUSIONS**

This research aimed to understand the extent to which the government school, the non-government school, students, and the government in Indonesia support R2S Education implementation. It is related to the past and current RSE conducted at schools, the challenges encountered, and each stakeholder's evaluation of R2S Education. A combination of quantitative and quantitative research, i.e., parallel mixed method research, was applied to meet the research objectives and relate each stakeholder's support.

There is a relationship between government, schools, and students concerning this research. Schools are revealed to be a link between government and students that can help promote and maintain each stakeholder's interests. Schools are given freedom within the relevant curriculum and regulation in designing and executing a programme. However, the main challenge of the past, current and future RSE is revealed to be the lack of priority of RSE in the curriculum. Regarding R2S Education, it is found that both types of schools share the same importance in their students' characteristics and future development. That would mean considering the aspects of the programme that students think can result in positive support in the programme implementation. Accommodating the aspects of a programme in great detail is not within the government's scope of work since it focuses on making larger-scale decisions that affect schools. Thus, it emphasises the importance of schools to create a good balance in implementing a programme that is in line with the government's stipulated regulations and satisfies students' interests.

R2S Education has been tested and evaluated in schools across several countries, proving its positive impacts on students after executing the programme. This research contributes to understanding the programme's implementation support. While it confirms the relationship between the positive support and several aspects of the programme, some parts should be improved. Two scenarios of improvements were provided to guide the programme-makers in making the programme more relevant to the users.

The lack of traffic participation experience should not hinder road safety education for children. Road safety education should be a lifelong learning process because road users are the teachers for others in behaving on the road. It calls attention to include RSE as a programme conducted at schools. R2S Education is proven to be supported by the stakeholders to provide a formal RSE for students, but work in all aspects should be done to improve the programme and increase its support.



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**APPENDICES****Appendix 1. Pre-interview transcription with Government School GS Jakarta**

- Irene First of all, I would like to thank you for taking the time to conduct this interview. To facilitate the data analysis process, I will record this interview audio starting from now on (RECORD ON). Alright, let's begin this interview. Can you tell us about the road safety education program that was held at the school?
- Teacher GS 1 What do you mean?
- Irene So, was there any program regarding road safety that has been held at school?
- Teacher GS 1 Yes, the policewoman or the policeman came to us. There is police [station] here. Then [they] provide some kind of education or insight with the children about safety, about traffic rules, from leaving to returning home. [They] cannot be reckless. Then [the topic are] also about motorised vehicles, that junior high school students are not allowed to ride motorcycles to school, how [is the correct or safe way when] they have to go home, then [they] must have a vehicle certificate [driving or riding license]. Then also how to use the crossing. That was what was given by the police officers. Thus, socialization has been conducted.
- Irene So it is an occasional one, right, sir?
- Teacher GS 1 Yes, [it is] not often, only scheduled by them. But that was before the pandemic. After this pandemic, there is no news yet, because it is not allowed to meet face-to-face. [Socialization was carried out] because the phenomenon is seen in children nowadays. Junior high school students, [who are] not 17 years old yet, have ridden motorcycles, and then they make gangs on the roads.
- Irene Is the [road safety education] method only theory or practice, or a combination, sir?
- Teacher GS 1 The method is theoretical, in the form of lectures. They explained the positive and negative benefits or impacts, including the children's efforts, encouraging [them] to be able to carry out traffic manners in an orderly and correct manner. Also, there is a link in the PPKn [Pendidikan Pancasila dan Kewarganegaraan – Civic Education] subject. It means [that it is] a link related to learning the norm. So this norm is related to what if [you] do not wear a helmet, [if] there is a sanction. Well, [within the subject] there, it is linked and explained.
- Irene Regarding the socialisation with the police, is there any target students who have to join?
- Teacher GS 1 Oh, no, that was just [for students] in general, during the Monday [flag] ceremony.
- Irene Oh. So [it was for] all students?
- Teacher GS 1 Uh-uh, so all students are asked to be on one field, not in the class, no, so all [students attended].

- Irene According to the school, how is the road safety socialisation activity that has been carried out?
- Teacher GS 1 Actually, the activity that has been done is still lacking. Perhaps it is necessary to increase the frequency of the socialization process so that the children's awareness occurs more quickly. Because they only know [the theory] but are not aware of it yet. [They] know the rules, but [they] have not done it yet. Further, especially after the pandemic is over, it is definitely needed, too. After all, the explanation of these traffic rules is really important.
- Irene Does that mean a practical method is also needed, sir?
- Teacher GS 1 It is necessary because, in the method, there is also an insertion in learning. So, it is included in the education [system]. So it is synchronized in school subjects, especially PPKn.
- Irene To synchronize with those subjects, what is the process usually, sir?
- Teacher GS 1 There is a syllabus for it. So, the police work with the Ministry of Education and Culture to add it to the RPP [Rencana Pelaksanaan Pembelajaran – lesson plan] or the lesson plan so that it is related to the traffic rules. [The procedure is] available. Thus, [there are from] the Ministry of Education and Culture itself, or the police themselves, [or specifically] from the NTMC [National Traffic Management Center Indonesian National Police]; I was once invited [in the event]. There, they sat together to make some kind of [inaudible – xx] so that these traffic rules are included in the lesson. For example, someone is driving, then holds a cellphone, and then he picks up a call and answers. After that, an accident happened. Well, [from this] accident, what the consequences are, what kind of victims there are. Well, in the end, there are messages that must be conveyed to the children, namely how to drive or ride [well and safely] and also how to use cellphones in an orderly or good manner. Because if both are operated simultaneously, the consequences will be as exemplified. It can cause loss of life or property.
- Irene For school lessons in general, for example, math or computer lessons. [Regarding] the teaching and learning process with computers before COVID-19, did students bring their laptops or—?
- Teacher GS 1 Before COVID-19, the children brought cellphones. But, if they were not learning [where it is necessary] to use cellphones, there was a box to store cellphones provided [to store those cellphones]. But children do not use cellphones carelessly. For example, while learning mathematics, they do not need cellphones. So, the cellphones are collected in front; there are boxes in each class. Then, if the learning requires sources, for example, from the internet, of course, it will be used or distributed to children.
- Irene How about a laptop?
- Teacher GS 1 At school, in general, the children bring smartphones. They already have a zoom link on their smartphone [for online classes].
- Irene What if they need to do a presentation—?

- Teacher GS 1 Oh, [with the] laptop. But because of the current pandemic situation, the parents do not have any money. Because we [as] homeroom teacher 7th grade [hears the children's condition]. The 9th graders indeed have to have a laptop because they will soon be taking their exams using a laptop. But everyone uses a laptop in general because PTS [Penilaian Tengah Semester – mid-term evaluation] uses a laptop from home. If [they] take a gojek and bring a laptop to school, [they are] a little bit scared because it is not safe on the trip [due to thieves].
- Irene Now, regarding the gamification-based program that you have read briefly. Do you have a few questions first? So at a glance, the game-based program contains content that fits the purpose of the creator. So, for example, for specific content, there is a purpose, and there is a target group. For instance, for children, it is given features that can motivate children to participate in these activities. So, for example—
- Teacher GS 1 —Desirable behavior.
- Irene Yes. For example, [it is] provided with animation, a reward, in the form of a badge, and also feedback. Thus, what do you think about the implementation of this gamification-based program?
- Teacher GS 1 Well, it means that it makes it easier for the children to understand quickly. Because the education is combined with entertainment. Children nowadays, indeed, in the digital age, must be given [Inaudible – xx], so it is not monotonous.
- Irene Then, if, for example, this program is to be implemented in school, at Government School GS, what is the process for implementing it?
- Teacher GS 1 Now for the implementation matter, of course, we have to look first at the abilities of the children themselves, the abilities of the school itself, [as] it is our job to prepare the installation tools. We will adjust it later for [inaudible – xx], because this is not possible [to be implemented] directly.
- Irene For the last question, what are your expectations regarding the program that will be tested on children [R2S Education]?
- Teacher GS 1 Well, of course, [there should be a] socialisation first, [explaining] the benefits to children, what the obstacles will be, and what targets you want. The children must understand [about it]. Because if there is no benefit later on, he also lacks interest, and the support of the parents may also be lacking.
- Irene Thank you, sir, [for the] time.
- Teacher GS 1 You're welcome, ma'am. Thank you.



## **Appendix 2. Post-interview transcription with Government School GS Jakarta**

- Irene We will start the interview. First question, how is your evaluation of R2S Education in general?
- Teacher GS 2 [It is] good, [it] reopens the children's knowledge that the knowledge about traffic signs is important as it is a part of their daily life, you know. Moreover, now that they are starting the offline learning session [at school] again, the knowledge is important for them.
- Irene And then, how is it with the content, ma'am?
- Teacher GS 2 The content is good. The children have no problem, no complain, because the content is what the children more prefer, there is Charlie, more colorful and alive and not only texts. That is what make them interested. I asked the children in [class] 7G the other time: "How is it, children?" "Yes, ma'am [it is] interesting." Thus, they are happy because it is in the form of a game. However, perhaps they need to concentrate during completing [the programme]; therefore, it is indeed better if [it is] done at school, together.
- Irene It means that interaction between teacher and students is needed as well, right, to—
- Teacher GS 2 Absolutely, it must. Since they are still in junior high school level, there has to be a guide at school. It is like an exam, they bring laptop. So, there has to be an interaction, which [question] is difficult [can be discussed] at that time. It is troublesome by waiting like this, because when [they are] at home, they have other activities which sometimes [make their concentration] split. There must be an interaction between teacher and students, moreover regarding this R2S knowledge.
- Irene And what about the duration?
- Teacher GS 2 The duration is enough. It is not like an exam that when it is past the deadline, it is gone. It is not like that, right? It can be resumed the next day.
- Irene In the current setting, they are given a duration to work on their own, for example week to complete. If it is compared with them working one modul per one session, thus then it is finished by the fifth session, which one is better?
- Teacher GS 2 What do you mean?
- Irene For instance, now they are free [to complete the modules] any time. If it is divided per session with a structured duration, is the structured one better or the one when it is up to them?
- Teacher GS 2 In my opinion, it is better structured with the children, so we meet [and work on it]. So, we can meet in zoom [meeting], [the module] can be done there, guided by Irene. So, they [work] directly from handphone, but apparently, it can be done individually. If [it is] structured, that one day with this one module link, like that. This is for the second module [and so on]; it is more orderly since with junior high school students,



we still have to [incomplete sentence –xx], the awareness for this [discipline] is not yet [optimum]. Structured is better, actually.

Irene But with structured, you mean together?

Teacher GS 2 Structured and together, for junior high school students level. For example, on Monday in a particular time: "let's complete the module together". Well, it is possible [like that]. But if we let them be: "okay, the duration is until this time", well that's it. It is like when working on assignment with a certain deadline, [it is] not done. But when we make them that today is the deadline like that, whether we do it in google meeting or others, it is better for them than they have to be waited. Thus, there must be a guide [when working] together at that time. It is indeed preferable when class 7A and 7G [are invited in] one zoom meeting and work. "[complete] one module, ok, or two modules because it is only 30 minutes. The following modules for the next session." Like that.

Irene According to you, is the programme up to the expectation or not?

Teacher GS 2 Um, no, in my opinion, because [it is] in the form of theory. Unless the children is invited once for sightseeing: "This is what is called yellow lane." If it is only pictures, they just see it. They prefer action, directly learning by doing so they see it directly [in its real form], or Irene brings examples [from the] pictures. [But,] it is better when the go directly [to the location], just like when I went to the Kota Tua [Jakarta Old Town], we cannot only explain. When I was asked to teach PLKJ subject, Pendidikan Lingkungan Kehidupan Jakarta [Education of Jakarta Environment], [I] cannot only explain from the book or video. "Let's do a sightseeing." Then, we did a sightseeing by Transjakarta [BRT] to Kota Tua. "This is Kota Tua, and so on, and so on." They see it directly.

Irene So, it should be with practice, right?

Teacher GS 2 Yes. There is a practice session when it comes to them, then it can be up to expectation.

Irene Theory and practice at the same time.

Teacher GS 2 Yes. That has been the model, you know. Moreover with the new curriculum, there should be a practice session later on, by project. So, there is a problem solving [skills] to be given to the children. This is [Mr.] Nadiem [Makarim]'s new programme.

Irene Then, is there any apparent event during the implementation, for example is there any problem experienced by the children or the teacher?

Teacher GS 2 While completing [the modules], right? Absolutely yes. So, the problem for them is usually internet quota, right? Then, the [internet] network there is not good, just like the other day during the final term evaluation, this student has already had quota but the network hanged unexpectedly. Therefore, he could not submit the exam. The second one is because [they] work at home, there must be a lot of disturbance, either the parents call [them to do something] or other stuffs while they concentrate. That is why it is indeed better [to work] together at school, there would be no disturbance. With such method, we can reach 50 people.

Irene So, how is the problem solved?

Teacher GS 2 It is necessary to meet at school. Face-to-face is better than speaking in zoom and [giving] info. They are lazy to type, even to read. But if we meet, we urge: "Children, bring your laptop. Today we learn module 1,2; or from handphone." That is why Teacher GS 1 gave a place in the computer room as well at that time. "Ma'am, why was it not conducted here at that time?" "But she said it is flexible, sir." "It could be here, I could help." The screen is also available there. That is what is suggested the other time. However, because the time is flexible, so it is allowed [to work on the programme] at home. Thus, the word "allow" for this research make it hard for the execution, as it is in the form of survey. It is better to meet offline. That is the problem that I observed.

Irene How is your evaluation on the readiness of the programme implementation at school based on the experiment?

Teacher GS 2 Because it is still covid [period], and then the school's readiness in connecting with this programme, right?

Irene Yes.

Teacher GS 2 Okay, for now considering the pandemic and school can not be held, and that [the programme] is considered by school as knowledge that can be obtained from home. Thus, the school has no readiness in this case, except there is a school topic or syllabus about [incomplete sentence—xx]. In the past, the subject is called PLKJ. It learns about [among others] traffic signs. Now, none, except when there is an initiative like when the police came the other time. He brought symbols: "Children, this sign means no stopping, okay, remember it for the ones who ride motorcycle." There is an initiative from the police about traffic. But there is no initiative from the school since the school is stuck with the learning programme and others.

Irene Thus, [the programme] does not exist in school subject, does it?

Teacher GS 2 No. Not anymore. It was, in that PLKJ subject, I have been asked to teach that for a year. There, there was a particular chapter about knowledge of roads in Jakarta, well, the traffic signs, how about the people who have poor visibility, the yellow signs.

Irene Is it only theory or with practical?

Teacher GS 2 Only theory. In the past, there was no Youtube video which was more interesting, you know. PLKJ has been removed four years ago. It was only theory. Then, for the recreation location, Kota Tua, well, we went there and it was an initiative from the teacher in cooperation with the school.

Irene Why was it removed?

Teacher GS 2 Because it is not important anymore. The children are considered knowing Jakarta themselves. Thus now added [incomplete sentence—xx]. With the change of rules, the

curriculum changes. Now, there is subject called handicrafts, it is the only replacement. In fact, there will be computer subject again next year.

Irene Oh, that means there is no computer subject this year?

Teacher GS 2 None. It is a programme for next year.

Irene This programme [R2S Education] is a gamification [programme]. Since there will be the computer subject, is it possible to relate [the programme] with the subject?

Teacher GS 2 [Yes,] It is. They need to do practical session with the computer at school after all. Thus a practical session, we relate it directly with the knowledge because it is in the form of game and not theory, and it is colorful. It is indeed interesting, they are happy. Only regarding the time, it is indeed difficult. Then, regarding the realization from the school, well, [there is] not, yet. None, because we focus on the curriculum. If the curriculum from the [Education] Office does not contain knowledge over traffic rules, then there is no [such topic in the school subjects]. There is no subject over traffic, not anymore. It was only in PLKJ.

Irene It means that the external support influence [the decision], right?

Teacher GS 2 Yes. External support. That is true. Thus how the police, especially the police who have come twice [to the school and gave socialization] on how to apply the traffic signs, and then how the children [under] 17 years old cannot ride motorcycle. That was all that was informed. Then, [the children are] not allowed to hangout at night, and the police brought traffic symbols, the shapes: no parking, no stopping. They were informed. About that R2S, it is indeed not yet [included] in any of the school. Therefore, this is the first time through Irene.

Irene From the internal at school, might it be if, for example, [the school] decides that the programme will be conducted or not?

Teacher GS 2 Yes, it can.

Irene With no external intervention?

Teacher GS 2 Yes, it can. You mean that [if] there is this programme and [we want to] follow this up, right?

Irene Yes. Suppose [the school] wants to make a new programme. Then, does only the internal support from the school have influence or not?

Teacher GS 2 Of course it has influence, because it concerns the children who go to this school. For all things that we want to present to the children, the internal support definitely has an influence. Otherwise, it cannot be executed, you know.

Irene So, how is the process within the internal?

Teacher GS 2 Within the internal, at least they contact the vice headmaster for student affairs. Well, [we] apply this, this, or that programme to the student affairs and the school headmaster approves as it is really beneficial for the children without having to study that hard but there is a research already there, it is possible.

- Irene Does the real life applicability one of the influencing or supporting factors in the decision on implementing the programme?
- Teacher GS 2 Of course. The children have more knowledge. It is supported by the school. You know, the children consider the school as the place where they can have all knowledge. When the school supports, then the implementation to the children are really supported. Then, they know and are proud that they know in the future, they can have this knowledge together with their friends. And they can let the other school knows: "Here in my school, there is given a knowledge about R2S, how to use the road and so on." That can be a discussion topic that in Government School GS has conducted such programme and it is supported by the school. Usually in our case, as long as it is approved by the student affairs and the school headmaster, and the committee is ok, through the class coordinators, [then the programme can be] executed.
- Irene What is a committee?
- Teacher GS 2 The committee is a mediator between parents and the teachers, the school.
- Irene Does it means that the parents have influence?
- Teacher GS 2 Of course. The parents have influence.
- Irene In every Government School GS, there is—
- Teacher GS 2 Always a committee. So, they are chosen from each class to mediate all activities for the children, for their development. Between parents and the school. Thus, the parents get info from the committee. The committee consists of lots of people, in fields of [among others] education, religion, social, or knowledge.
- Irene We previously talked about the external and internal supports and then the implementation in the real life. Further, there is one thing about the readiness to fund the programme and the positive effect evaluation. From this four [\*five] aspects, which one has the most influence on the decision to implement the programme, ma'am?
- Teacher GS 2 Effect evaluation has more [importance]. Regarding the support to fund in the school, [thinking –x], I do not know when the programme wants to be included. Usually, in the composition of annual programme, [all programmes] must be included in the school budget activities plan. Well, it is possible, it is called intra-school students organization. There is budget to be included. For the application, for example from a teacher, it is informed to the budget coordinator to be included in the new academic year. That is that, and actually, it is not a problem if it concerns the children's development, given that it is informed long beforehand to the vice headmaster for the student affairs supported by the adviser of the intra-school students organization. And concerning the intra-school students organization, when it comes to the peers, they are more responsive. Moreover, the organization has lots of department: spirituality, education, extracurricular, etc. Actually, there is no problem concerning the fund, provided [that it was informed] long beforehand.

- Irene Thus [the funding] is not really influential, right?
- Teacher GS 2 Yes, not really influential. The external is [incomplete sentence –xx]. The internal is also not really that influential, I think, because all purposes head to the expansion of the students' knowledge. Nowadays, the school budget is not only addressed to the physical building, [but also] the activities for students. That is one of activities that can make them advanced, right?
- Irene Then, which one influences the decision, ma'am?
- Teacher GS 2 The school headmaster.
- Irene Suppose the headmaster disapproves, then—
- Teacher GS 2 All [things] are cancelled. Because [he] has the power at school. No matter how advance we are by going to the Education Office first, they definitely say: "Just report it to the school headmaster. [When the] school headmaster is ok, then it is ok." Because he is the one who is responsible on all activities at school. The key is on the headmaster. The second, well, it is bestowed to the vice headmasters. Well, the vice headmasters shall collaborate with the committee and the intra-school students organization. Finally, it is delivered to the children.
- Irene How is the prospect for R2S at Government School GS?
- Teacher GS 2 The prospect depends on the approach, in my opinion, because the current situation is the situation when the children do not go to school. That makes it difficult. If the children go to school, ah, that is really easy, because the happiness can be shown. At this time, there is no happy face. When they are at school, they keep silent, even when being informed of something, because [they] have not gone to school for a long time. Thus, it can be good [when conducted] in Government School GS, given that the most competent success is when there is a face-to-face session.
- Irene It means after the pandemic, right?
- Teacher GS 2 Yes, it should be really great after the pandemic.
- Irene And is [the prospect] the same for Jakarta?
- Teacher GS 2 Because Jakarta is global, right, we cannot answer it. But R2S is good, you know.
- Irene Last question, is there any additional comment or question that you want to say?
- Teacher GS 2 The comment is, it might be better if the module is not too much. Thus the children said: "Ma'am, I have just [finished] three modules." How about if all is included in one module like when we take an exam. Thus, even with 80 questions in one module, people hear it as one [module only]. It is too much by four [modules]. Thus, within one module, be it with 80 questions but the Jakarta [questions] are included, as well as Bogor, but in one module. So, people say: "It is only one module, it is not that much." Actually, it is four because [the questions are] divided, right, but people are already demotivated upon hearing it: "how many it is, four modules." Well, I was obliged to

say the other day: "Children, the ones who complete the programme get additional score." Ah, all of them are motivated. That is the key, with the score.

Irene That means there is no problem with Jakarta and Bogor as long as it is in one module, right?

Teacher GS 2 Yes, one module. So it is considered as not that much, only one. Then, they prefer if the post-interview is conducted by speaking like this via zoom, not clicking something. One module and then post-interview like this, [they] prefer it as they are fed up with assignments to be sent via email or others. Zoom [meeting] is better.

Irene Is there any remark regarding the final module?

Teacher GS 2 No, it is enough, because the final module, according to the children the other day, is the repetition from the [other] questions. Then I said: "Do not be afraid, you only need to work on it well and it is not evaluated. So then this person or that person has better score? It is not like that. But, it is an overview to compare how your knowledge is on traffic in your age." So, in the future, I suggest to make it in one module, and then via zoom [or verbal interview]. It is more fun, and then we can make an activity like watching [videos], something fun first to make the children happy. Not directly to the questions. We can tell a story first as if we ask the children and they will be provoked to respond. Then we can give the reward.

Irene Thus it is better to converse, right?

Teacher GS 2 Conversing is better, by making a group. For example, a group consists of four people, and they are given one question with a picture as they prefer it. "There is this picture of Charlie walking on the pedestrian walk, think about that." Further, we indeed have to meet at school.

Irene So, they prefer in groups than individual?

Teacher GS 2 Yes. Alone is considered boring, they prefer working in groups. We need to understand that this is junior high school students, right? That is all that I can say for this post-interview. Because this is the first time to have something like this, this R2S. This is something new, but due to pandemic, it is difficult. Even we did not meet face-to-face. Further, there is not much spirit in both teachers and students considering that they are from home.

Irene Very well, thank you for the time, ma'am.

Teacher GS 2 You're welcome.



### **Appendix 3. Pre-interview transcription with Non-Government School NGS Jakarta**

Irene For the first question, has a programme on road safety been conducted at Non-Government School NGS?

Teacher NGS 1 Regarding the question whether there is a road safety program already in this school, indeed, we do not have such a program. From the beginning of this school, we do not have a programme on road safety, considering that we follow the curriculum. There is no such a program in the curriculum. And even if it is available, it is just incorporated in the school subject. Yesterday, I did do a sounding [to the teachers] that the one who has this [topic] is [the teacher for] PJOK or sports. During this subject, there is one learning topic about road users' safety, where the children are taught to know traffic signs and how to cross the road to be in zebra cross or not; how their safety is while crossing the road. That is what we have in our school, but when asked whether a special program is conducted or not? The answer is no.

Irene It means that only that subject has—

Teacher NGS 1 There is such a topic.

Irene Well, is the topic in the form of theory or practical, ma'am, sir?

Teacher NGS 2 The one that has been carried out by the teacher was in the form of practical. Maybe a theory was given first, about how to do it [the actions], then the children will practice with the teacher. They practice immediately on the road together, perhaps [the teacher] finds the nearest location [from the school] and the traffic signs are visible: a zebra cross or other road facilities are available. Later on, it will be assessed eventually that, oh, this [particular] student has an understanding of road. But indeed as stated by Teacher NGS 1, a special programme for this [road safety] is not available in the school. In fact, I just found out that it exists—

Teacher NGS 1 A programme like this—

Teacher NGS 2 A programme like this. Maybe it is available in other schools. Sometimes, [I] saw [such a program] while commuting to the school, but [I] did not realise what it was in this context. Apparently, why sometimes road in the school is painted red, then there is a safety limit there, we did not know [it before, but] it turns out it has something to do with this [topic]. It's just that there is no such a subject in [Non-Government School NGS] "A" [campus] in particular.

Irene In which class the topic is given, ma'am, sir?

Teacher NGS 1 [Small discussion –xx] Actually, not long ago, all classes receive [this topic] since I remember [it was in] the 8th grade.

Teacher NGS 2 The topic is given in the 8th grade.

Irene Thus in one semester, [the students] receive one practical-based topic in one session?

Teacher NGS 1 Theory [is given] once with practice. For sports, the theory is usually given first, then the practice. Additionally, in our school, the [traffic] cones are available to mark that it



is a parking place. The cones are only located in those spots. It is only not too long ago to think that road safety exists, that there is such a programme. Thus, our school has not specifically created or implemented such a programme.

Irene Has external person or organisation ever come for a socialisation?

Teacher NGS 1 Do you mean [people] outside [the school] come here to conduct a presentation? As far as we work here, there has no activities be held yet regarding road safety.

Teacher NGS 2 Even when it indeed was ever held, it did not come from the outside [the school]. I just remember that traffic signs are taught in the 3rd grade of elementary school. It is taught indeed. As far as I remember, it must be taught in the elementary school; however, elementary school students cannot have a practical session, maybe through video or looking [at the example directly. But, those [who teach the topic] are the regular teachers. We are sure that such materials are available. However, since [I] have been working here, there is no such event which invite people [from external], for example from the Traffic Unit [Indonesian National Police].

Irene Do the teachers who give the topic [to the class] need to have special studies or training?

Teacher NGS 2 Not that we know of. The teacher finds out—

Teacher NGS 1 It is included in the school subject, but the teacher find more info by himself. Thus, we do not have a special training or competency to learn that, for example, as a PE teacher, he should know the traffic sign and road safety. He does have another training, rather, according to the existing teaching material.

Irene Oh, I see.

Teacher NGS 2 Perhaps, do you mean if there is an official and structured training?

Irene Yes

Teacher NGS 2 Oh, there is none. There is no special training for such programme. I think I have never heard about it.

Teacher NGS 1 In fact, in our school, the trainings are for science subjects [inaudible – xx]. But it is true, you know, I have just known that there is [such training] for transportation regarding road safety.

Irene Then, regarding the PE subject, is there any remark from its teacher regarding the things that hinder the successful implementation of the practical session?

Teacher NGS 2 Well, since we remembered that the the session was held quite some time in the past, we did not ask the teacher specifically about—

Teacher NGS 1 Frankly, since we are responsible for our teaching subjects, thus it is teacher's business, right? [laugh –xx]

Teacher NGS 2 So, we have never asked about it specifically. Perhaps due to this session, we just realised: aha, how is the children's comprehension [about the topic], then we might asked about it.

Teacher NGS 1 You mean the feedback to the children, right?

Teacher NGS 2 Because we did not think about it [to that end], we only remember that we saw at that time –

Teacher NGS 1 The practical session outside [the class], right? We asked since we were curious, so the teacher explained. That is all. But I only remember what the teacher has told. [I wonder] what they were doing. "Did you walk and cross the road?" "Oh, that was a lesson about getting to know the traffic signs, to know, for instance, how to cross the road, how to be a good road user." That was all I remember.

Irene Okay, now we move on to the teaching and learning process with laptop or computer. Can you tell how it was done before the pandemic? For example did students or teachers use a laptop or technology—?

Teacher NGS 2 Before the pandemic, the teachers were already equipped with laptop and had prepared themselves for that. It is available and has been prepared. Even that [pointing at projector] existed before the pandemic. We integrate the teaching session with the multimedia. So, the teachers actually have prepared themselves for it. But for students, after the pandemic, must learn more [about the technology] and prepare the necessary devices. Then, before the pandemic, we could already conduct online tests. Perhaps some teachers have tried it. Or maybe completing quizzes. Well, before the pandemic, some teachers have tried the online teaching. But not all teachers. Only the ones who want to utilise it, they learn and find more information about it. But during the pandemic, all of us learn inevitably.

Irene It is a must, right?

Teacher NGS 1 Yes. One more thing. Before the pandemic, as Teacher NGS 2 said, we teachers have all used laptop. Then there are projectors, thus, the children only need to look at the presentation slide. And before the pandemic, the children were not allowed to bring gadgets. So, they learn while sitting, face-to-face. The teacher uses the media and the children listen. Well, not only listening, but doing discussion. But gadgets were not allowed. With the pandemic, the teachers have to develop more skills about technology, eventually.

Irene How about when the need to do a presentation?

Teacher NGS 2 Before or after the pandemic?

Irene Both, sir.

Teacher NGS 2 Before the pandemic, children presented in front of the class. Usually, they bring the PowerPoint files, then they used the teacher's laptop. They brought a flash drive containing the data, then it is just plugged to the teacher [s laptop] for the presentation.

Irene So, they still cannot bring a laptop.

Teacher NGS 1 No. The point is that they cannot bring electronic devices. Even smartphones were not allowed, let alone laptops. Because at that time, we used books, you know. The children also bought books, so we maximize the use of books that have been purchased.

Teacher NGS 2 Now [during the pandemic], the children bring [the gadgets] in the classroom. Sometimes, we give assignments and quizzes using smartphones in the class. Moreover, we must minimise the physical contacts. The work is also done online.

Irene Now, about gamefication programme. According to Teacher NGS 1 and Teacher NGS 2, what do you think about its implementation?

Teacher NGS 1 Talking about games, actually, it is a good programme, but [I] have not thought when asked for opinion in a survey, from what I experienced during the pandemic or from bachelor's or master's students when they work on their thesis, GF (Google Form) is used. And it turns out you do not know what GF is. Well, it has usually been done through GF. But apparently, this is a little bit different, and Irene knows the current development so that it is not always GF, because the children are already bored with GF. Isn't it so, Teacher NGS 2? Maybe, from what I see with this programme, it is made to fill out a survey but not in a boring way. Perhaps then it is made into game. For me, the programme is good. I have not seen it in a whole, but by the way the programme is made and how to complete the questions in the programme [it is good]. Earlier, Teacher NGS 2 explained to the children, while studying they can play it when they get bored a little bit. It is like a game and I think it is interesting. So, so far, not bad.

Irene Suppose a developer wants to make such a programme in other subjects, for example for math. What do you think about it?

Teacher NGS 2 It is a good idea, actually. It is indeed good for this set up, considering that children do have activities with gadgets and digital. I must say, however, our limitations so far is that not all teachers can adapt quickly. So it needs process. We are all users and we need more than 6 months for this change and adaptations. This adaptation process is still going on since it always evolves. There is always something new, right? Thus, when asked if it is [a] good [programme], I believe that it will show a different perspective in education. Regarding the children, if it is for one or two days, it is okay. After that, they may be bored later on with the same pattern. It was like that in the beginning of using Google Form: "whoa, it is good." After 6 months, they responded: "It is Google Form every time!" It applies to the zoom meeting. Nowadays, it becomes a normal thing. There is a positive side to it, indeed. But for us as educators, we need to remind the children often, encouraging them that we have to try to adapt. So, for a game programme like this, if he [the student] just needs to play it with the tools are available, we do not need to set the programme up in depth. So, when the choices [in the programme] are available, and to complete the task, the students only need to choose or move the pictures, the programme might still be feasible.

Teacher NGS 1 Additionally, maybe if they are told to make an account, that is a bit troublesome for them. If it is just like Quizizz, for example, we can play directly. There are more examples where they can directly play. In that case, it is okay to learn while playing. If they are constantly told to make an account, just like Google Form or Google Classroom, well, a programme was made by the school's foundation for students where making account is required. Even for that, some students have not made an account since it is possible for them to think that they always have to make an account everytime. We do not know which direction we will head to in the future. If it is just a game and if it is a once or twice thing, as Teacher NGS 2 said, then it is good. But, in the future, they might be bored with opening new accounts.

Teacher NGS 2 Maybe if we compare it with Europe—although we have never been to Europe [laughs]—but from the story that I heard, well, this is indeed the condition of education in Indonesia. Sometimes the teachers want to make innovation, but we feel that when making a game, we present it in digital form. Actually, the material is available in the book because we are used to learn like this. But it takes time when we should present it in a different form. Thus, maybe from 10 materials, it is already good when we can do make two or three of them like that, we are already grateful for that. The rest may be in presentation slides. It is also due to other demands that must be met by the teachers as well. The preparation takes a longer time, not to mention the time to learn it as well.

Teacher NGS 1 Sorry to say, not all of our teachers are young. Not all, but he [Teacher NGS 2] is obviously [still young]. As for me, it is not that I am outdated, but frankly speaking, for this kind of thing, the old teachers need time, right? Fast learners can understand it fast. However, for the slower ones—we have experienced it before—the teacher has been taught repeatedly, but if he does not understand, what can we do about it? When he was not used to computers before the pandemic, thus that is that.

Teacher NGS 2 For the record, it is somewhat different from the curriculum abroad. I also had a chat with one of the students who asked: “why is there always homeworks and tests, but not assignments or projects but as the assessment?” Well, the curriculum is different, I said. Are there schools in Indonesia that apply such a system? Yes, but not all of them. Perhaps since there are four seasons abroad, students do not go to school when it is in a certain season, only doing projects. When they go back [to school], [they do] presentation, right? Well, in Indonesia, perhaps Irene has experienced it, it more or less like that. Well, will the school aim there in the future? [Yes], there is. We are now, in junior high school, apply project-based activities as well. So, there is evaluation where the children are given certain task. Then, they make a presentation and there will be a final result. Well, we start doing it this year. The evaluation is project-based and the duration takes few months, indeed.

Irene How is the process if, for example, you want to insert a new program at school in a subject? Who should decide whether to or not to continue the project?

Teacher NGS 1 Suppose a program, for example—

- Teacher NGS 2 We take this program [R2S Education] as example because we do not have road safety in [this] school. Then we want to put it [in the education], [reasoning that] it is good for the children. Well, what we observe in our school to this day, it is integrated to the existing subject. So, if there is one, the teacher has core competencies, there are indicators to be achieved, then we will see if that topic is related to which subject. So, where it is related to? [When] it can be put in there, then we put it in the school subject. What about a special discussion, is it possible? For a special one, nothing. Unless, it might be still possible to invite, in the form of seminar or webinar, people who are competent in this field, perhaps from the Traffic Unit, or from the field of road safety that seems to have a formal organisation. In order to be included in the subject, maybe the teacher will see or review again, where it will be included. But is the topic available [in the existing subject]? Well, there should be in the subject. Only if it is discussed in depth or not, we do not know yet.
- Irene It means the coordination is between the teachers and maybe the school headmaster to approve it, right, whether, for example, to include a gamification programme?
- Teacher NGS 2 If this [programme] comes from the government, later it will be delivered by the supervisor. Then later on, the school headmaster will announce it as well. But it is noteworthy that there is indeed an instruction or regulation that regulate it from the government. Like for example, we have Scout. Well there has been a law that oblige every school to organise Scout. If that is indeed a regulation that comes from the government, then later it is the headmaster's authority to convey it and the teachers will execute it. But if it does not come from the government, maybe just in the form of an appeal, well, it could be our awareness from the school. The school headmaster may be the one who gives the appeal: "Let's try to create a program related to road safety." But since we have school principal here, maybe from the foundation: "Non-government School NGS might want to make this program". If it is from the head of campus, then the school principal with inform the school headmaster.
- Irene So, the head of foundation is different from the head of campus, isn't it?
- Teacher NGS 1 Different. So, we have three campuses: here ["A"], at "B", and "C", and there is a head of campus in every campus. We call it "principal", you know, whereas in Indonesian it is translated as kepala sekolah [headmaster or principal], right? Here, we have the head of this campus [school principal], then the school headmaster [for junior high school], then we the teachers. Well, as what Teacher NGS 2 has said, that is the procedure when there is a [new] programme or other activities.
- Teacher NGS 2 When it is from the government, it is definitely included in the subjects immediately. But if it is out of that scope, and if it is within our unit for example that turns out we want to make our own program, then it included in the annual program.
- Teacher NGS 1 It can be in the form of webinars or other activities which allow to invite speaker to provide knowledge.

Irene We previously have mentioned little bit about the expectations of this road safety programme. Do you want to add more points regarding the expectations while the students execute the programme?

Teacher NGS 2 For me, actually, this is basically a good programme and I have searched about it before hand as well. It turns out that it has been handled by the United Nations. Actually, within the United Nations, there is a unit which handles road safety. Thus, it is indeed a good programme, especially in Indonesia with this condition. Maybe when Europeans see Indonesia, [they might say that] there are many [people] who are not [follow the traffic rules] orderly. If you look at the quantity, well, we have ridden the vehicle well, you know. But, do people also have the heart like ours in the traffic? So, in this way, it is actually great to raise people's awareness, because in general, traffic crashes, whether it is pedestrian or cyclist or motorcycle rider or car driver, [happens because] sometimes there is no speed limit. By the zebra cross, [we] should have stopped, but sometimes when it is empty [with no pedestrians who cross] and even the traffic light is red, people still ignore it. I [do it] sometimes. Yes, I admit that sometimes our traffic safety awareness is still lacking. Then, [regarding] the speed limit in the urban area, well we sometimes race against time. The workplace is also quite far from home. It takes an hour from home to work. Not all public transportation has access here [the school] or public transportation does not cover everything. Inevitably, we use our own vehicles. Not to mention there is a fatigue factor while on the road. If it is in other countries, maybe people have to stop every four hours, right, when the driver is driving truck or trailer. In Indonesia, the driver cannot do it when the target has not been reached, he must continue. Safety is also ignored because there are certain targets. Is this important? It is actually important to raise awareness. But back again, if this programme is only for knowledge purpose, well indeed— [incomplete sentence], so everything must be correlated.

Teacher NGS 1 Additionally, if [we] want to have this road safety [-related programme], it must have been instilled to children from the primary education, how you keep your own safety when you walk outside or on the street. From the primary education, they have been informed that these are [traffic] signs. Then, in junior high school, it increases again more than the previous one with practice. In high school [later on can] be in certain form, so that in the end when they get involve in the society later on, they already understand it. And inevitably, they also know the rules so they can be more discipline. But indeed, our society in general, based on what Teacher NGS 2 said earlier, only know the boundaries: oh, [traffic sign with letters] S means that we cannot stop. Oh, for the traffic light, the red light means stop. Then, yellow (light means) be careful or get ready, then green (light) means go. But we just know that because we do not have— [incomplete sentence]. There may be no standard provisions in a sense that even only now it is recently applied, for example, road safety must be with CCTV. Then drivers cannot use cellphone. Then, the ones that do not use seatbelt [will be detected], they are all included in road safety. When it is made like that, [people start] wanting to be orderly. More precisely, [to handle] our people or Indonesian people, [we] must use ultimatums. That is the way to discipline them. Although maybe elsewhere or abroad, they [are discipline] already. But they are more orderly [even] without no

provisions. Like for example in Singapore. If we talk about Singapore, well, [the people] are orderly. Like [another example] Malaysia, I see that it is really orderly, there are some places that are really orderly. Automatically, that kind of thing is not really possible in Indonesia. Suppose, they are just orderly here, [for example] Jalan Sudirman has been installed CCTV, then they are orderly. Just look for the ones who drive on the road that does not have CCTV, well, in the car they might use cellphone. In Singapore, from what I already know, there are rules already, right? Wherever they are and drive to, well, [they do it] orderly. Meanwhile, in Indonesia, well, it is a little bit [what was told] earlier. If there is no compulsion to [behave] like this, they will not [follow the rules]. Hence the awareness that Teacher NGS 2 said, that consciousness without using the rules, they will not [follow the rules]. The self-awareness [occurs] when they have felt that road safety [is important]—hopefully not, God forbid—in the sense of an accident, they just then came to realisation. So [if] looked deeply, it is like that for the people of Indonesia for now. But hopefully, it gets better in the future.

Irene Lastly, is there [more] things that you want to say or ask ?

Teacher NGS 2 From me, actually [I] just realized, that it turns out that it has been a special concern for safety on the road; moreover, [for it] to be included in education, into the educational environment. Well, when I look at my own place, we have not aimed there, maybe even moved as well. This matter is actually unthinkable, where it is a basic thing. When we exit this room and walk [outside], at least we have to be alert and mindful. We should have been able to know that we have walked or even play or joke or whatever, well, sometimes we may be lacking [the alertness and mindfulness]. So, it should be reminded for us, indeed. For children, [it is important for them to] get used to from what Teacher NGS 1 said from the early age, the children has been equipped with those skills. So, when he goes anywhere, he has a good habit in behaving himself; hence, not carelessly. Oh, [for example], that is where the pedestrian bridge located. [He] knows already why they need to cross there, [he] already has his own arguments. Thus, actually, it is something that needs to be instilled from an early age; and indeed now if it is taught at school, it is good when it becomes a structured and recurring program that must be delivered by the school about road safety.

Teacher NGS 1 Additionally, all this time we have been like, for example, why is it when elementary school and junior high school students actually have a private vehicle or at least motorcycle, these students are not allowed to ride motorcycle to school. Apparently the high school students are allowed. Why does it have to be 17 years old? It is never thought why, the reason, all the more tall junior high school students, [they] feel that their feet has reached [the foot rests]. Now what is the difference between the ones who are old enough to have driver's license with the ones with no driver's license? Why should the age of 17 years to be able [incomplete sentence]; or meaning that driving/riding must [be done] with a driver's license and it can be processed at age 17. Well, from there, the children do not know it actually, and I frankly [do not know] as well. When I heard [this topic], [I] have this thought that it is the basic thing in case of the children, right? Surely it is correct that within the family, us as the parents can explain it like that. But, which one is the basic thing? By the presence of this topic, I

finally think this: that children cannot only know how to ride motorcycle, they should know what a certain traffic sign means, if they know the S crossed out sign. From where do they know it? Perhaps by searching [the internet]. Frankly, I never taught my son [about this matter]. And, yes, for elementary school [students], as what Teacher NGS 2 said, they probably know by themselves. But with this thing, I finally think, why should be 17 years old, why children cannot ride a motorcycle to school, what is the difference when the child feels that he can? But it turns out they have to possess a driving license. Why should we possess it, when the ones who possess one are involved in accidents or disobey traffic rules? Meanwhile, the ones who do not have a license can be orderly. Why is that? Finally, it is revealed, the foundation of that. As what I said earlier, when it is taught from the primary education, then we invite a competent speaker in a webinar, perhaps they can explain why you [children] are allowed to drive or ride at age 17. There must be reasons for that, then they finally understand. That is the additional remarks, and this programme is good since it expands the knowledge.





#### **Appendix 4. Post-interview transcription with Non-Government School NGS Jakarta**

Irene We begin the interview now. What is your assessment regarding this programme in general?

Teacher NGS 2 From myself, it is good, the programme is good. We just worked on module 1, already did [the questions for] Bogor and Jakarta. Indeed, for the information in Bogor, since the environment and density are different compared to Jakarta, there are something different. I saw a white circle [for the traffic sign, and also] stripes [of markings]. So, after we try to see [the programme], it is good actually to remind us, the teachers, back as road users, both pedestrians and motorists, that [we] need to pay attention to each other in order to be orderly. So we can understand [the rules] as the motorists and pedestrians or anyone who uses the road.

Irene Well, the goal of the programme is to make [questions with situations] in Jakarta and Bogor. Jakarta is the familiar one, while Bogor is the less familiar. According to you, how is the selection of the locations?

Teacher NGS 1 Oh, well, thank you. For the first question, if according to Teacher NGS 2 [the programme] is good, from me, it is also true. Yes, this programme is good. Earlier, I saw that there were indeed differences between Bogor and Jakarta. For Jakarta, since we are in Jakarta, [we are] really familiar with such signs. They are indeed what we often see, for example a parking sign or a stop sign [which means that we] could not stop there, [the one] with an S crossed out. When [I] saw the difference in Bogor, it is apparent that there are [something different], and it is discussed [in the programme] about the white color as the base [of the traffic sign], and other stuffs. Furthermore, while walking there is [a pole] with two traffic signs—[with] bicycle and pedestrians—and then [we must] walk on the sidewalk, according to the picture. Well, indeed, such [signs in the] pictures are rarely seen in Jakarta, right, Teacher NGS 2? It is more specific in Bogor, it is really informed, for example it is shown [in the picture that there is a sign] when you have to go down the stairs. In Bogor, from what I saw, every changing location is always given a sign. In Jakarta, well, it looks just like that. Are they indeed traffic signs that need to be followed or not, well [incomplete sentence]. The point is [the situation] in Jakarta is more familiar. But the program is good, anyway.

Irene But is the selection of the location appropriate?

Teacher NGS 2 For the location, from what I saw earlier, maybe the one in Bogor is around the Bogor Botanical Gardens. [The signs] are adjusted, I mean it is already appropriate, because I am sure when placing those signs, both the officer of [inaudible – xx] and from the from the Traffic Unit have already taken [the appropriate location] into account. So, if it is said that it is appropriate or not, I as a vehicle user state that it is definitely appropriate, since [the signs] are place by people [who are competent] in this field. Furthermore, it is more complete there [in Bogor]. The [place for] pedestrians is already differentiated: this side is for cyclists, that side is for pedestrians. [The users] only need to apply it. But in terms of completeness, perhaps the one in Bogor is more complete, because maybe the city is not as big as Jakarta. Then, when [I] look at the

situation in Bogor, specifically in that area—the Bogor Botanical Gardens—, it is often utilised by the pedestrians. When you want to speed up there, you only need to remind each other [to not to do that]. But it is good, you know, that there is a separation for pedestrians and cyclists.

Teacher NGS 1 Additionally, the only visible thing in Jakarta is that there is a green lane with bicycle marking, with no additional thing [as the traffic sign in Bogor]. The point is that it is only like that in Jakarta. If it is in Bogor as what we saw, [the signs] are really depicted for cyclists or pedestrians. But it is true what Teacher NGS 2 said, we as traffic users only have to obey or not. But for the placement, as what Teacher NGS 2 said, the location has been taken into account.

Irene Further, regarding the programme execution, the children were told to complete it within deadline. According to Teacher NGS 1 and Teacher NGS 2, is the system already correct with giving a duration to complete the programme?

Teacher NGS 2 Since the purpose is for a survey, it should be given a deadline for a convenience reason. Further, related to the characteristic of this survey which is in an online setting, if it is possible to meet in person and complete the programme in one session, several modules can be completed directly. However, it is hampered as it is done online, because we only trust the children—the respondents—whether they have worked on it or not yet. What we need actually is their understanding, which is the data to be studied. Thus, from what I see, it is appropriate considering the purpose as a research. Only, we cannot control the duration since we [deal] with students. That is where our limitations are.

Irene How about if, for example, the system is set to have a schedule of one module for one day?

Teacher NGS 1 Well, for me, I immediately think about the children who work on the module. It seems that it is good when the purpose is to collect data. Nevertheless, it is true what Teacher NGS 2 said regarding when the children are given time [to complete the programme], but for me it is better to work on the module together. I had this thought with [the questions] in Bogor that the children, after all, only think of finding the easy and practical way. It is true that the pictures in the module are good, but when it is demanded from the children,—the junior high school students—they need to have a guidance in working on it, inevitably. That is perhaps more correct, right, Teacher NGS 2? Suppose we give a deadline, for example one week. In that case, I imagine that children work by themselves without any guidance from us. Inevitably, they [should have] come to the class for a day, then they work on it together; it is more fruitful than when they have to do it by themselves. When Irene said about one day one module, there is no guarantee that students do it, because while it is for the research data, we really understand the children. It is different from high school student, maybe it is still possible [for them to work by themselves]. Since this concerns junior high school students, [they] must have thought that this is only to collect data: “is this that important?” “Gosh, it is boring.” There must be things like that, but it is the reality. Tomorrow when I ask: “have you done the module yet?” Surely, there are students

who have not done it. Only certain children who are willing to be responsible on the given task [do it]. But in this current setting, it is better when we do a zoom meeting: "Let's open and work on this number or that number together." A guidance is a must if we want to have an optimal result.

Teacher NGS 2 Maybe as what Teacher NGS 1 already said, perhaps for typical children at Non-government School, for instance, the correct way is to make a sort of test as what is conducted for making a driver's license. "Students, let's do this module." Thus, when we meet, we do it directly. It is more effective than giving a deadline. Further, the children can complete it at that moment as well. It [the effective method] leans more to be that way. Actually, the current setting is more flexible. Perhaps abroad, [with] children that Teacher NGS 1 described, the responsible one, [the method] is not a problem. [It is okay] maybe for the children with different characteristics than ours in Indonesia. In Indonesia, since the habit or culture is already different, it is hard to control them when they are given a freedom. But if we set them to do it at that moment, instruct them to open [and do] the task, or ask where they encounter problems, and it is made like doing a test, [the data] can be obtained directly, actually.

Teacher NGS 1 Once we leave, it will be done later, but later means, you know [--perhaps will not be finished]. But okay, if it is done this way, we check it first. Then we can make a zoom [meeting] together, so that you can get the optimal results.

Teacher NGS 2 We make a test immediately, period. Because from what I see, it is not a lot, I mean the explanation sentences. It is just whether they understand it or not, it is another issue. But, if they work on it directly, the information whether they really know or not can likely be obtained. It is like when they do a quiz, test, or answering questions. So, yeah, it should be done directly.

Irene Based on the experience at that time when guiding the children [in this programme], are there apparent events happened, or ever heard?

Teacher NGS 2 These children did not ask anything, in fact.

Teacher NGS 1 That is true. Since we know our students so well, so [incomplete sentence]. Perhaps they forgot, I do not know, it is only a perception. Furthermore, at the moment they have the final semester assessment, thus their focus is on that and they have not done this one. But well, if we want to make a zoom meeting after the assessment with a number of students who attended at the last meeting and they are guided and work on the questions on the spot, maybe it is more effective.

Teacher NGS 2 That is why I have asked during a prayer service: "have you done the module yet?". Then, I sent a WhatsApp message to Irene that a student could not access the programme. This student just realised it, although this problem has happened when we did the zoom meeting. I ask him a few days later.

Teacher NGS 1 But [he] did not say anything, right? Well, there you go. There has to be a compulsion from us, and pardon me since frankly, I forgot or missed it because of the focus on every work in the final assessment. So, I forgot to remind them back. And the next time, if we want to conduct [the zoom meeting], we do it with the ones who were present

the last time. For the ones who were not present, well, they do not know what to do. The good [method] is to do a test immediately, you get the result, [the questions] are answered directly through the zoom [meeting] as in the previous time. You know, since even for one module, it consists apparently of questions in Jakarta and Bogor and answering 10 questions [each], right? When it is done together, it will not seem to take a long time, just like me and Teacher NGS 2 [answering the questions together]. When it is done alone, the children sometimes just want to go home so that it is done, because although it is in the form of game, but since there are several modules—we have four modules, right?—[this fact] can perhaps make the children not to answer [the questions] at all later on. But, well, it is better if there is a more simple or concise test.

Irene If, for example, the R2S Education programme wants to be implemented at Non-government School NGS, what might influence the decision to implement this programme?

Teacher NGS 2 [The authority] is actually in the school headmaster.

Teacher NGS 1 If we implement it, of course the school headmaster is involved. When it is from the foundation, well, [the decision is] from the foundation, then the school headmaster [inaudible–xx]. Usually, we [plan the school] programmes in the beginning of the year.

Irene Thus, it is more an internal process, right?

Teacher NGS 1 Yes, it is.

Teacher NGS 2 Unless the institution is from the government. If the government has included [the programme] in the curriculum, it automatically means that we implement that inevitably. But since it is not a specifically stand alone [programme], then the authority comes from the foundation when, for instance, [they] have a programme to be included in the school, for example in "A" [campus]: "there is a new programme, perhaps it can be inserted." Even that should have a consent from the school headmaster, except when [for example] in the Physical Education subject, the programme is indirectly inserted.

Irene Have parents had anything to do with the implementation of a programme?

Teacher NGS 1 In terms of attending the programme, [it is a] yes, but never for the planning phase.

Teacher NGS 2 Which programme do you mean?

Irene For example, this programme is planned to be included [at school]. But then, will there be any influence from the parents as well?

Teacher NGS 2 In relation to Irene's programme, right?

Teacher NGS 1 No, for any programme. You meant, for example, are parents involved when making a school programme, right? No [involvement from them]. But yes for the involvement during the D-day. Thus, in making the activity programme, the parents are not involved. We do not have a committee, so we do not involve parents when making an annual programme.

Irene Further, based on the benefit; for example, the R2S Education programme [with focus] on road safety has certain benefits. Does that affect the decision to implement the programme?

Teacher NGS 2 The result?

Irene From the benefits provided.

Teacher NGS 2 After evaluating, for example this R2S, [it turns out that it is] necessary, like that? Well, it is possible—

Teacher NGS 1 I mean, we only run it. Actually, these programmes have been determined by the foundation, which later on are discussed with the school headmaster to be proposed. When it turns out that in the future there is a new programme, it will be discussed in a meeting. It might be accepted or refused. But how does it look like? We have to know that first. If we want to implement an activity like this, [we need to know] how it will look like later on, the purpose, and the foundation for [implementing] it.

Teacher NGS 2 Because previously, we had a programme related to fire management. Yes, it was done once, even we used a practice room [for that], and the teachers were asked to try one by one. Well, it was done because it was for educational purpose, right? Thus, if [a programme] is proposed and then approved by the school headmaster, it can be included [in the school programme]. Later, it will be determined who will teach the topic and in which subject it is suitable. However, if it is not included in a specific programme, actually, if we refer to the current curriculum—K-13—[R2S Education] can be included in the school subject, but it only acts as an information. It can [be integrated] to PE subject. Well, sometimes with the students, we as the homeroom teachers can talk with them since the current learning system is contextual. Specifically when they learn [something], how do they implement it in the daily life? Thus, while talking, we can also ask them [about it]. But [what I just said] was not for a special programme. For a special programme, it depends on how the proposed topic looks like. Is it possible to be implemented or not? It is, as long as it is allowed.

Irene Suppose there are four aspects. The previous ones [that we discussed] were the decision from the school headmaster and the foundation, the second one was the benefits before testing the program, hence only the overview. The third one is knowing the real benefit after testing a programme, for example as in R2S Education. And the fourth one is related to willingness to pay. From these four aspects, which one is more dominant in influencing the decision?

Teacher NGS 2 For instance in this school?

Teacher NGS 1 Obviously financial aspect [laugh –xx]

Teacher NGS 2 Well, sometimes, there is a programme which is approved by the school headmaster. But it is questioned again from the foundation, I am sorry that we eventually discuss it. Sometimes, there are special cases related to the budget, although we can run the programme. The recent example, although not from this unit ["A" campus], is about the children who wanted to participate in DBL, the basketball competition. Well, it is

in fact a recurring and annual programme. The teachers have proposed it, and it is possible. And every year, they are not absent [in this competition]. It turns out that when it is proposed, the foundation had other considerations so the school did not participate. In fact, it has been worked on by letting the children to chip in so that they can participate. Eventually [they] needed to follow the foundation's decision. There is a special case like that. So, when asked: "which one has the most influence?" Well, all aspects have.

Irene Thus it depends on—

Teacher NGS 2 The case.

Irene The case. An aspect might be more dominant, right?

Teacher NGS 2 Yes. Perhaps if the school was owned by Teacher NGS 1[laugh –xx], or Teacher NGS 1 is the head of foundation, or a certain man or woman, they might have other considerations. Each foundation or school should have correlated aspects.

Teacher NGS 1 The point is that if every programme wants to be approved or not, it must be budgeted first during the budgeting. Usually, when the leaders do the budgeting, that is where the programmes are included. Then we can know how much is the minimum budget that needs to be spent for a programme. Because for that programme, there should be a source of funds, right? For example, a webinar where a speaker is needed, that is not free, isn't it? Furthermore, when will it be conducted? Another example, Teacher NGS 2 and I inform the school headmaster that there is a good programme with such details. We just need to show or propose it. Later on, the school headmaster evaluate whether it is good or not, and might ask follow up questions, e.g., who will be the speaker? The school headmaster shall budget that, so that it can be discussed during the meeting with the foundation. That is the procedure.

Teacher NGS 2 The procedure is done before every—

Teacher NGS 1 Before every new academic year, [we] definitely manage the budgeting. That is for the year ahead.

Teacher NGS 2 So that is the key whether the programme can be executed or not. But that's if it is a stand alone programme, you know. That is where it is discussed whether it is executed by inviting a speaker or other things. But for the programme that can be inserted [to existing school subjects], [special discussion] was not compulsory. Maybe it will be a request, well, from what has been said earlier. "please try to insert a topic about this one." Like that.

Irene Oh, for example in PE subject, there is a little insertion about road safety?

Teacher NGS 2 Yes. Further, there are those symbols [which are taught] in the 3rd grade of elementary school, right? [The topic] is available in the school subject itself. It might be different when—

Teacher NGS 1 Organising a special webinar which discuss, [for example about] parenting; what it will be discussing about, and so on. Or other topic to discuss, for example, about road safety programme.

Irene Further, the last one, how is the prospect of R2S Education programme implementation at Non-government School school?

Teacher NGS 1 As what has been said earlier, you know, because we do not have a clear picture [about this], the prospect is, well, I will review it a little bit after this [laugh -x]. According to me, well, the programme is good. That is why I said the other time, that why is it only from age 17 years who can ride [motorcycle]? By knowing this programme, [it is] good. But, you know, we have not done something like this. Inevitably, it should be discussed. In terms of the prospect, it is good in this set up. Of course, in the future, it is good in general. But in [this] Non-government School NGS itself, we do not know it yet. We need to explain the budgeting and other things. The point is that in our case, it is not possible to be implemented yet, considering our situation. Perhaps it can be executed in other Non-government School NGS campus, for instance "C" campus, with more number of people and supporting environment. It might be more possible in elementary school. This is something new.

Teacher NGS 2 Actually, [this programme] trains our sensitivity. By teachers, for instance, there might no special discussion at school about learning traffic signs. That is not done exclusively. But suppose [we] do a driving licence test later on. This programme actually is related to that test. Thus, when we look at this programme, for example from the habit point of view, [this programme] build a habit that when there is any sign happened on the road, we do not have to be panic. It is as if [as] we have the SOP [Standard operating procedure], [we] already understand. That is what I understand. Also in building a habit in being orderly in traffic, and as pedestrians. That is good, because, for example, people do not panic when earthquake happens in Japan. They already know what they need to do, perhaps hiding under the table. That is different from us, sometimes when there is a fire, for example, we asked: "where is it happened?" We make fuss of it. Sometimes, the firefighters are cursed when they come: "you are so slow! Where are you all this time?" That is the culture here, that is our point of attention. Sometimes for something that should be the norm,—

Teacher NGS 1 It is not executed. Take traffic crash, for example, [people] wait for the police and they do nothing. Instead, they gather around and take pictures, right. The awareness is still lacking here [in Indonesia]. The other time, Teacher NGS 2 has mentioned that even red light is not obeyed. But, well, back to the programme, it is a good programme. If indeed it wants to be delivered to Non-government School school, it might be possible to execute it in other campus than in this campus.

Teacher NGS 2 Further, it can be inserted in Scouting. Everything is learned there. Is it possible? It is. Even in Scouting, the children learn to know the traffic.

Irene If R2S programme is implemented in schools in Jakarta or Indonesia, do you think that there might be a prospect there?



Teacher NGS 1 The prospect is definitely good.

Teacher NGS 2 Only, the effect can only be reaped after several years.

Teacher NGS 1 Because it turns out that it is a new programme, right, especially in Jakarta.

Teacher NGS 2 Even when we look at the curriculum, the result can only be shown after minimum 10 years. "Oh, the success of K-13 can be seen at least in 2023, how is the output of the generation [who receive education with this curriculum]?" Similarly, I think when R2S is implemented in education, the traffic awareness or in walking might be seen by the decrease of case or the number of traffic crash. But when we saw the other day, in Deddy Corbuzier's podcast, he discussed about Vanessa [Angel—Indonesian public figure who died in a traffic crash in the toll road]. The speaker is the Traffic Director of Police District of East Java [Indonesia]. He really acknowledge that the traffic crash level is indeed decrease by a lot, the graph actually decreases. But it is done with much effort: the infrastructure supports [the change]. And the people's awareness, you know, some aware and some do not. It is quite better, right.

Teacher NGS 1 But if you think about it, if at school, from basic, the children know, then the awareness should be better and the number of traffic crash must decrease. It is because [they] have been taught from little on how to obey the traffic rules.

Irene Is there any questions or remarks that you want to add?

Teacher NGS 1 It is enough from me. It covers everything. I mean, the programme is good and it is not a problem within schools in Jakarta. Moreover, per info in teacher's day, Mr. Nadiem [Makarim, the current minister of education, culture, research, and technology of the Republic of Indonesia] has said to officially launch the new curriculum. Later on, the curriculum will be tested in selected schools. The teachers have more freedom in the teaching [pause for thinking –x], yes in the teaching. However, [the detail of the] curriculum is not known yet. The point is that it is being tested in selected schools. Actually, when there is a new curriculum, perhaps [R2S Education] programme can be inserted, we do not know. After the test, it will be implemented at schools in the new academic year.

Irene Very well, thank you.

## **Appendix 5. Interview transcription with DKI Jakarta Provincial Education Office**

- Irene Thank you for taking the time to do the interview. I have [started] recording the interview to make the data analysis easier. The first question, would you explain about the road safety education program that has been held in Jakarta?
- Education Office interviewee (EOI) Yes, thank you for the opportunity to conduct the interview tonight. Regarding the safety program in Jakarta, it is not yet [conducted] in regulation. I've asked the department that makes regulations. It does not exist right now, only it is integrated into school subjects, for example it exists in PPKN [Civic Education]. It just integrated into the school subject. In terms of regulation, it has never been issued by the DKI Jakarta Provincial Education Office.
- Irene Has a collaboration ever been done with external parties, such as the police, or organizations related to road safety, sir, [initiated] from the government?
- EOI Usually, it is the school that makes cooperation directly, you know. From my experience as a school principal for eight years, we also often invited the police, whether for example for traffic safety, or for other things, for example. However, there is no regulation from the Office yet. It was indeed a programme from the respective schools, in extracurricular activities. So, that is what exists in each school.
- Irene Does that mean that the school has the freedom, sir, in carrying out additional programmes outside the curriculum?
- EOI Yes. Because for the development of children's potential, it is given in terms of extracurricular, you know. So, extracurricular activities are indeed given for the child's self-development, in addition to receiving learning from the academic side. There, while they learn to be in an organization, they also learn about, among others, about traffic safety.
- Irene Earlier, you have explained earlier [that] at school or from the government there is no regulated road safety programme. According to the Education Office, what aspects might hinder the implementation of the program in schools in Jakarta?
- EOI I do not think it is due to obstacles. Indeed, we do not really have concerns about that direction, to the point of making a special regulation for safety, because we also think that other offices have also handled it. However, there is no special [attention] for that from the Education Office. So, what has been done so far is that schools collaborate with related offices, such as the Transportation Office, the police. Each school by its own. And not all schools either, right, as in high school, it is a bit rarely done. But in elementary school, it seems like they learn [about this by organising] child police or teenager police. It exists, right, that little cop [programme]. But indeed, even when I was a school principal in high school, we did not have anything specifically for that. Instead, [it was done] by the integration in the learning, for example how we deliver [the topic]. Moreover, for example in Jakarta, school children are not allowed to drive their own vehicles. How many years has it been? About four, five years. Even if they

are a high school or vocational high school students, [they] are not able to drive the vehicle.

Irene It was already mentioned about elementary and high school. How about junior high school, sir?

EOI Well, it is the same for junior high school, there are still extracurricular activities in that direction as well, for example, there is a programme to study about road safety. It should exist, but as I said earlier, it is not prioritised at school. That is because the tendency of the children to be in the fields of sports, arts, academics, KSN [Kompetisi Sains Nasional - National Science Competition], prepare themselves for competitions, for example, KSN, FLS2N related to art, then KO2SN related to sport. Indeed, for this one thing, I do not think it is really apparent.

Irene Then now we focus on discussing the gamification-based program which I briefly explained last Friday, namely a programme which is in a form of like a game. So, for example, for school children, interesting features are given to motivate them to do or work on the programme. Well, in your opinion, what do you think about the implementation of the program in schools if the gamification-based programme is used?

EOI I think for things like that, it is already very good, you know. And that has been done a lot for activities to relieve boredom by carrying out games. In fact, all extracurricular activities have carried out such activities. The organizations: OSIS [Organisasi Siswa Intra Sekolah – Intra-school Students Organization], extracurricular activities, MPK [Majelis Perwakilan Kelas - Class Representative Assembly] often carry out these things in conducting their activities. Whether it is also in the spiritual activities, be it Muslim or non-Muslim, they carry out programmes like that, with games. That is the era. Children are even happier, they feel less bored. In the past, it seemed that they only received learning in the class. But with this game, there is a game, right? Every child makes interaction so that everyone is actively involved. If so, we really support activities like that. Especially with the technology nowadays, it is what it should be now. Children nowadays call it that zaman now [the era of now], who are literate with IT developments. They can also create it their own, really. They already have their creation and they are the ones who innovate, be creative, in creating what games they do, both using technology and, also the traditional ones. There are very interesting things there, so the teamwork they share in the activity is visible.

Irene Since gamification is in the form of technology, I would like to know whether there were any initiatives from the government to implement or provide technology-based or gamification-based programmes for schools in Jakarta?

EOI We, the Education Office, are the regulators, you know. It means that we do not choose what will be implemented. But the regulations will be translated by the school for them to make a programme plan in their respective schools. So, there is no obligation to do something in a particular way. A regulation must give freedom to schools with regards to rules that are in accordance with our culture, Indonesian culture. That must be kept in mind. So, if asked whether the office determines this

should be carried out in schools with these games, I do not think it is the case. However, we give one regulation earlier for them to carry out activities, especially in regarding MPLS [Masa Pengenalan Lingkungan Sekolah], the Introduction to the School Environment. For example, soon there will be new student admissions, after that there will be MPLS. During the event, the seniors will conduct interesting activities for the new students to join [the extracurricular activities] and get involved. In MPLS, there are a few hours allocated for introducing the extracurriculars. There emerged the children's creativity to innovate which we do not limit, provided that it must be in accordance with the norms, culture, our culture, Indonesia.

Irene Regarding the regulation from the Education Office, does it only apply to government schools or including the non-government schools as well, sir?

EOI In Jakarta, the office is not only for the government [schools]. When we make policies, they must be comprehensive, holistic. They apply for both government and non-government [schools]. [When] we do monitoring, we monitor both of them. In the case of MPLS, then we will make it comprehensively. Our office head will conduct socialization prior to the implementation.

Irene Then regarding the road safety gamification program which is the focus of my thesis called Route2School Education. In your opinion, is there any prospect for it to be implemented in Jakarta?

EOI I think we shall also have good things, you know. Moreover, I have only been in this office for one year. I think what Irene is trying to research here might also try [incomplete sentence –xx]. I have a team in the Student Affairs [Department], they come from various scientific backgrounds: there are IT experts there, there are art experts there, there are people who have doctorates or academics there. So I think this is a good thing too, especially since I am in charge of student affairs. Are we interested or not? Yes, definitely interested. I also mentioned earlier, right, that schools also carry out that [gamification-based programme]. However, indeed, we do not really have concerns about this activity, because, as I said, in Jakarta, children are not allowed to drive vehicles. Activities like this, I think, are positive things and what we should support. Therefore, one day, hopefully, there will be special regulations issued by the office, especially in DKI Jakarta Province. I will later convey to the head of the office, how about we later issue ideas for road safety. So what is expected from this R2S gamification can also be conducted in DKI Jakarta. Perhaps things like this have become a big concern abroad. But we have not yet, it is just integrated into the school subject. In fact, schools may not carry out this activity at all.

Irene Then, what is your assessment considering that R2S Education focuses on students as pedestrians, while perhaps in Indonesia, people are more focused on the use of motorized vehicles? Regarding that matter, how is the [programme's] compatibility with real-life implementation in Indonesia, sir?

EOI For the last few years, the provincial government of DKI Jakarta has provided special lanes for pedestrians. The sidewalks have been improved and designed like the ones abroad. This means that space and infrastructure have been provided not only for

students but also for the entire community. There are also [infrastructure for] bicycles. But, you know, it is not fully facilitated in all parts of DKI Jakarta Province, because as what we see, the roads in Jakarta are narrow, right? That is probably what makes it impossible for us to see [the condition] like in other countries, where almost all roads have been facilitated, there is room for pedestrians. For example, I have been to Singapore, indeed almost all roads have been provided with pedestrian facilities by the government. And the people have become entrenched, many of whom walk and ride bicycles. Well, in Indonesia, it is still not a major cultural thing. But are there [people who walk or cycle]? Yes, there are. However, in general, our children go by a motorised vehicle when they go to school. Moreover, the DKI Jakarta Local Government has a programme in providing school buses. People with low income are also facilitated with yellow school buses here. There are also school buses abroad. DKI Jakarta has also prepared this facility. So if we look at it, there are not too many children who walk from their homes to school, generally accompanied by their parents. Or even if they are with friends, even though they were not allowed to drive vehicles, I still saw children driving motorised vehicles. They will not park at school. However, prior to five years ago, it was official that children could drive a motorised vehicle, then the parking place was provided by the school. Now, no school prepares parking places for children because it is prohibited. But, basically, the R2S Education gamification programme that Irene studied is interesting for one day when there shall be a special regulation about road safety. Thus, all people are aware of things about providing education about road safety. If everyone is aware, then the negative impact of, well, [incomplete sentence – xx]. Because after all, pedestrians must obey the signs that have been determined, they carry out their obligations as pedestrians. Those who walk, walk in their lane, those who ride bicycles, ride bicycles [in their lane]. But if we look at DKI Jakarta, there are a lot of cars with motorbikes, right? In Singapore, we see a lot of cars, motorbikes are rare. Well, that is the uniqueness of the city of Jakarta indeed. Early in the morning, there are a huge amount of motorcycles. So, I think if we apply what Irene is researching starting with early education, for example from elementary, junior high, high school or vocational school, I think this is a positive activity.

Irene Then, if regulations regarding road safety programmes or, in a broader sense, gamification-based, are made by the Education Office, who are the stakeholders that participate in the cooperation to make this regulation?

EOI When making regulations, we have to work together, right, not alone. So, whatever regulations we issue, we must invite various institutions, for example in collaboration with the police or the Transportation Office. Well, there are many of them, the community too, the NGOs as well, the institutions in the community, we invite them all. That is why if we make a regulation when it is still in the process, we usually hold FGD for how, for example, the legal products that we implement are fulfilled. So we are not alone, because after all, we have to collaborate. Especially in this day and age, what is required is how we do a good collaboration with each other, because there is a lot of knowledge. If more people give their opinion, then I think the regulations that we will make will be of higher quality. Furthermore, the implementation will be much easier when many people are involved. So, do not suddenly stipulate a regulation

without involving many people. The more people involved are invited, the easier it will be to carry out the socialisation. After all, a good program without good socialisation will not work well.

Irene Are schools also invited to the FGD, sir?

EOI In FGDs, there are internal [stakeholders], there are external ones. There is a representative from the school, for example, there is the MKKS [Musyawarah Kerja Kepala Sekolah – School Principal Work Meeting]. We invite them to give their opinion, for example, how the regulation that we want to issue is in the public test. So everyone tests, not just our staff in the office. After all, the schools will be the users later on. Thus, before the regulation reaches the schools, they already know from the start even though it has not been stipulated. But at least, they already get the idea: soon there will be regulations that will be implemented in schools. Later on, things that need to be prepared at school will be easier to be implemented. Back to the programme, that gamification, I think it is very suitable for the Student Affairs Department at school. In our office, it is called Peserta Didik dan Pembangunan Karakter [Students and Character Development]. I think it really relates to me, indeed, regarding the implementation when there is a special regulation for it in Jakarta. If the child's safety is guaranteed, parents do not have to worry about their child leaving the house, because all people in Jakarta already grasp the meaning of road safety. So in the long run, education in schools can seep into the community. Eventually, no one will drive the vehicle recklessly.

Irene Was it also discussed in the FGD, for example, whether this discussion about regulation is related with the ability to fund the upcoming programme, sir?

EOI The programmes for DKI Jakarta now is from the local government, right? I think that the capacity of the DKI Jakarta local government is sufficient. We are now, in Jakarta, no longer involve the community with activities held at schools [financially], because there is already a BOP fund [Bantuan Operasional Pendidikan – Educational Operational Assistance] provided by the local government. Then, there is also the BOS fund [Bantuan Operasional Sekolah – School Operational Assistance] provided by the national government. So, I think that the presence of BOS and BOP funds means that children at schools can already carry out activities using these funds. Even if the community is involved, it is okay according to the Ministry of Education and Culture Regulation no. 75, in terms of developing and improving the schools' quality. I do not think that is a problem either, in my opinion. However, DKI Jakarta Province, especially DKI Jakarta Education Office, is no longer allowed to collect money from the public, regardless of the individuals.

Irene Suppose a school wants to implement a pilot program, is a permit needed from the Education Office?

EOI I think that regarding the permit for pilot activities, well, we are actually the ones who do the piloting, not the school. Several years ago, when I was a school principal, we had a programme called Si Pintar [the smart one]. The office determines the piloting. So it is the same as now for the Sekolah Penggerak [Initiator School] programme

initiated by the ministry, it is up to us to decide which schools participate in the pilot programme, not the other way around, that is not how it works. So, there is no need for schools to ask for permission unless there are extracurricular activities, the office will consider whether to allow them. But for pilots like this, we are the ones who do that. We are the ones who called the team from the school, the school principal, then told them about what this program is, what is its purpose, what is the goal, how long does it take, and then there will be an impacting program. Well, if it is called piloting, this year, for example, ten [schools participate]. Next year, it will be 100, right? In the end, all schools participate, provided that the piloting is successful. So it is not the schools that ask for permission unless there are certain activities, for example for extracurricular activities, schools must ask for permission, especially if they are carried out outside the city. But right now, because of the pandemic, no activities are allowed outside the city. But when it comes to programmes, especially when it is generated from the regulation, we are the ones who manage them. In fact, we invite the schools to become the users of the regulation.

Irene                   What are some examples of programs like the one you described that have been or are being implemented, sir?

EOI                    That was what I said, Si Pintar. Before the pandemic, we actually had that programme called Si Pintar, which is how we use online learning or exams. Even my school became the pilot user. It is just that there are no road safety activities, right, only that they are integrated into school subjects, especially Civic Education or extracurricular activities. But it is a bit rare, perhaps not yet [implemented]. I do not know, perhaps in Belgium, it is very, for me, it is a bit different from us. But the point is, there is indeed a local government program specifically for road safety, of course. That is why there is a special sidewalk for pedestrians in the context of pedestrian safety. Moreover, those who ride bicycles are also given the facilities. However, in Jakarta, there are certain days when people ride bicycles, only on Saturdays or Sundays. It is more used abroad, right, that they go to work on bicycles, for example, or they walk. Here, we use a motorised vehicle in general. Even if they take public transportation, they will stop at the side of the road, or for example, if the school is located in an alley, they will walk. Then, there will be fewer vehicles. But whatever it is, the city of Jakarta is dense, right? I think this road safety programme needs to be a concern so that later it emerges as a special regulation that must exist in schools. But what is certain is that the local government programme through the Transportation Office exists. Therefore, all these people are expected to be orderly in traffic. We do have something like that, for example, certain extracurricular programmes contain topics on being orderly in a traffic situation. Or, for example, the police come to school. In Jakarta, there are programmes about prosecutors going to school or the police going to school. They do socialisation. Other example is BNN [Badan Narkotika Nasional - National Narcotics Board] comes to school to socialise about the dangers of drugs, the police come to school telling the children to be orderly in traffic in order to maintain their own safety and protect the safety of others. On the road, it does not concern only about our own safety.

- Irene            Back to your example about Si Pintar, it means that the programme initiated by the Education Office is more about the education system, right, sir? Not focusing on particular school subjects?
- EOI             Yes, that is the system we use for online learning, especially at that time, we use it for exams. All this time, the tests were conducted on paper. It means that Jakarta already knew these things before the pandemic. Or regarding giving homework to children can be done that way. Therefore, parents can also observe the results achieved by their children and there is communication between the school and the child and the parents. Those are examples of regulations that we need so that the school participate in the pilot programme.
- Irene            What are the criteria, sir, that made that particular school is chosen to participate in the pilot programme?
- EOI             For the pilot programme, it must be seen first, starting from the school's culture, how the human resources are, how about the leadership. After all, for a pilot programme, you have to look for the best, right, so that it will be easy [to be conducted, because], piloting is doing something to be an example. We hope that all stakeholders there carry out this activity quickly so that it can easily affect other schools. Therefore, there must be indicators to look at, mainly human resources. There are many kinds of human resources, you know, it can be related to the students, education, and I think, mainly to management. So I think when a few years ago, my school was chosen to do a pilot programme when I was the school principal, it means that my school was a good school. 91% of [the students in] my school are accepted in public universities. In the past, there were still international standard [schools], we were included in that programme. So that was what the Office saw. Now I am in the Office with the current of being involved in making regulations. When there are things like that, we do not merely appoint a school, it is for sure: "What kind of school is this, how will it be if we do it there?" So, it is true what Irene said earlier, there are certain indicators that can support the success of the programme that we are planning so that the goals can be achieved. For us, it is not only the programme that must be achieved but nowadays, we also want it to be achieved in a faster period. If it can be programmed for one year, if possible, it should not take exactly one year. This means that if this programme is successful in one school, it will be easier for us to introduce it to others. In the past, I was often invited to be a guest speaker, after we carried out the successful pilot programme, to other schools, so that the other schools would first be interested in the success. That's right, we were invited to talk about the success in the school. In fact, it is easier for us to socialise it than people who initially socialised it, because we already have the output, with the goals achieved by the school. This is an interesting thing that when we are asked about the programme, we are more relaxed in explaining it. In the pre-pilot programme, the explanation is still abstract, but after the programme, it is no longer an abstract, it is already realised. In fact, he knows what the drawbacks are, what are the most important advantages of the programme. So for schools that participate in the pilot programme, their school principals are definitely given the



opportunity to give a testimony, so that other people become interested in carrying out these activities.

Irene Okay, thank you. Lastly, do you have any additional comments or questions to ask before ending the interview?

EOI I think there is no question from me. I want to say to Irene that at the end of your research, you would provide recommendations to the community, something new so that this research will be really useful for other people. That is what we expect. The data that Irene got from us was not that much, because if there were regulations about this, it would be easier to talk about it. But because it is just only integrated, it is definitely necessary to get more data from schools. My suggestion is to add schools that must be interviewed. Perhaps there are several schools that conduct these activities so that they can provide more inputs and data to be processed in this research.

Irene Thank you for the time.

EOI You're welcome.

## Appendix 6. Post-experiment survey

### Block 1: Welcome & GDPR

My name is Irene Sitohang and welcome to this survey as a part of my Master Thesis about understanding the support of R2S Education implementation in Indonesia.

The survey aims to understand how the support differs between governmental and non-governmental schools and what students and government think about the prospect of R2S Education.

It only takes about 5-7 minutes to complete the survey. There are no right and wrong answers, you just need to answer each question in a honest way.

#### Informed consent

Before starting the survey, please read the information below thoroughly:

- I have read the above information about this study
- I understand the purpose of this study as well as what is expected of me during this study (i.e., giving my honest opinion)
- I understand that my participation in this study is voluntary and that I have the right to discontinue my participation at any time during the intake (by closing the browser window).
- I do not have to give a reason for this and I know that no disadvantage can arise for me.
- I understand that the results of this research may be used for scientific purposes and may be published. My name will not be published and the confidentiality of my data is guaranteed at every stage of the research
- I know that the results of this research will be kept for 5 months, starting from February - June 2022, and will be deleted after this period.
- For questions I know I can contact after my participation: irenefebryana.sitohang@student.uhasselt.be
- For any complaints or other concerns regarding the processing of personal data, I can contact the UHasselt data protection officer: dpo@uhasselt.be
  - o I agree and would like to fill in the survey\*
  - o I disagree and would not like to fill in the survey\*

*If the answer was "I disagree and would not like to fill in the survey", proceed to end of survey*

### Block 2: Demographic questions

1. How old are you?\*

12

13

14

15

\*Other, i.e, \_\_\_\_\_

2. In which grade are you now?\*
    - Grade 7 / 1st grade
    - Grade 8 / 2nd grade
    - Grade 9 / 3rd grade  3. What is your gender?\*
    - Male
    - Female
    - Prefer not to say  4. What type of school do you go to?\*
    - Governmental school
    - Non-governmental school  5. Where do you live?\*
    - Jakarta
    - Bogor
    - \*Other, i.e. \_\_\_\_\_  6. When was the last time you studied at school (offline) during the pandemic?\*
    - Less than 6 months ago
    - 6-12 months ago
    - I never went to school during the pandemic
    - I am currently having offline class  7. With which transportation mode did you go to school most often before the pandemic?\*
- Select max two most frequent transportation modes.
- Private car (to be driven by someone)
  - Private motorcycle (to be ridden by someone)
  - Private car (to drive by yourself)
  - Private motorcycle (to ride by yourself)
  - Public transportation (commuter, bus, MRT, etc)
  - Online transportation services (with car or motorcycle)

- Walking
- \*Other modes, i.e. \_\_\_\_\_

8. With which transportation mode will you go to school most often after the pandemic?\*

Select max two most frequent transportation modes.

- Private car (to be driven by someone)
- Private motorcycle (to be ridden by someone)
- Private car (to drive by yourself)
- Private motorcycle (to ride by yourself)
- Public transportation (commuter, bus, MRT, etc)
- Online transportation services (with car or motorcycle)
- Walking
- \*Other modes, i.e. \_\_\_\_\_

9. Do you have license for driving vehicle(s)? \*

Select all that applies.

- Yes, car
- Yes, motorcycle
- Yes, both car and motorcycle
- No, I don't have any license
- \*Other(s), i.e. \_\_\_\_\_

If the answer was "I don't have any license", proceed to question 13

If the answer was other than "I don't have any license", proceed to question 10

10. Have you received any fine?\*

- Yes
- No

If the answer was "Yes", proceed to question 11

If the answer was "No", proceed to question 13

11. How many times have you received fine(s)?\*

Input only the number.

\_\_\_\_\_

12. Why did you receive the fine(s)?\*

Select all that applies.

- Red light running
- Not using helmet
- Not using seat-belt
- Odd-even policy
- Driving or riding along the busway
- \*Others, i.e. \_\_\_\_\_

13. Have you been involved in traffic crashes?\*

- Yes
- No

If the answer was "Yes", proceed to question 14  
If the answer was "No", proceed to question 16

14. How many times have you been involved in traffic crashes?\*

Input only the number.

\_\_\_\_\_

15. What is the most severe consequences resulted from those traffic crashes?\*

- Monetary loss due to repairing the damage
- Minor cuts or bruises
- Serious injuries leading to hospitalisation
- \*Others, i.e. \_\_\_\_\_

### Block 3: Evaluation

Evaluation on the R2S Education.

Give the most appropriate rating for the following statements. (\*)

1	2	3	4	5
Strongly disagree	Somewhat disagree	Neither nor disagree	agree Somewhat agree	Strongly agree

16. The situations in the programme are familiar to me.
17. The programme contents will be useful in my daily life.
18. The programme contents are easily applicable in real life.
19. I will apply the knowledge I got from the programme.
20. I have applied the knowledge even before the programme is executed.
21. The questions' level of difficulty is appropriate for me in general.
22. The programme frequency is convenient for me.
23. Incorporating the programme in an existing school subject is a better option.
24. The badge motivates me to perform well throughout the modules.
25. The final evaluation motivates me to perform well throughout the modules.
26. The teacher's guidance is helpful in executing the programme.
27. Theory-based programme (this programme) is adequate for road safety education.
28. The programme should be combined with practical sessions on the street.

29. The programme should be implemented at my school.

30. Recall the situation when your class executed the programme.

Were there any significant problems aroused?\*

Yes

No

If the answer was "Yes", proceed to question 31

If the answer was "No", proceed to question 33

31. What is the most apparent problem aroused?\*

\_\_\_\_\_

32. How was it solved?\*

\_\_\_\_\_

Proceed to question 34

33. Why do you think so?\*

\_\_\_\_\_

34. In overall, what score do you give for R2S Education?\*

(Score from 1 (Extremely dissatisfied) to 10 (Extremely satisfied))

34. Please write any additional comments regarding R2S Education below.

\_\_\_\_\_

End of survey