Climate Change in Linguistic Schoolscapes: Patterns and Language Use

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Abstract. In educational settings, one effort to mitigate effects of climate change is through the display of Linguistic Landscapes (LLs). The signage can bring about changes and contribute to good practices to avert and reduce the impact of climate change (CC). Therefore, this study aims to find out the sign patterns and to describe the language use in the LLs related to CC. This study documented 351 signs in four senior high schools in Kebumen, Central Java, Indonesia, which were then qualitatively portrayed. To reveal the language used in LSs related to CC, the data were classified based on language patterns. The findings of the study show that the sign patterns applied in CC LSs are monolingual and bilingual patterns involving Indonesian, English, French, and Javanese with Indonesian as the dominant language, English and French as foreign languages, and Javanese as the leased used language. Meanwhile, in terms of language use related to CC Indonesian is used as communication and translation function to deliver CC messages, English and French are used as media to learn languages and to deliver international topics related to CC, and Javanese is used to maintain both its language and the environment. This study has shown that LSs to some extent contribute to the community's adaptation and mitigation to climate change by lowering the impact and cause of the crisis.

Keywords: *Climate Change, Linguistic Landscape, Linguistic Schoolscape, Language Use*

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INTRODUCTION

This study investigates the implementation of climate change education in Linguistic schoolscapes. Linguistic landscape (LL) shows a new perspective for studying multilingualism in human society (Lu et al., 2020). The functions of LL are information and symbolic functions (Landry & Bourhis, 1997). It provides information about the language culture, ideology, users' personality and language practice of the place where it is displayed (Muriungi & Mudogo, 2021). In this study, we argue that linguistic landscape, while maintaining its multilingual nature, is effective to address the climate change issue through its mitigating and adapting roles.

LL shows the vitality of language. It is associated with the intensity of use and existence of a language as a tool to communicate an idea for a certain purpose. A language can be said to have a high level of vitality if it has many speakers and variations in its use (Kemendikbud, 2020). It means that the more speakers a language has, the higher its vitality level and vice versa. Language policy by the government also influences the frequency of language use with the aim of creating high vitality and strength of a language (Sumarlam et al., 2021). In LL, the use of language with high vitality aims to ensure that the ideas conveyed can be effectively communicated (Andriyanti, 2019).

Climate change (CC) has an impact on the environment and social aspects. According to IPCC (2022), the environmental impacts include an increased mean temperature in most land and ocean regions, hot extremes in most inhabited regions, heavy precipitation in several regions, and the probability of drought and precipitation deficits in some regions. Meanwhile, in the social aspect, CC are experienced by vulnerable groups such as farmers and fishermen because they depend on climatic conditions. Changes in seasons, temperatures, as well as wind and rain patterns in agriculture can affect cropping patterns, increase the spread of pests, and cause crop failure (Aldrian et al., 2011). In the marine and fisheries sector, those changes can cause changes in types and locations of fishing, failure at sea, fishing cultivation patterns and decreased salt production (Aldrian et al., 2011). These cause economic instability and loss of livelihoods for those who work in agriculture and fisheries. In addition, the indirect impact is also felt by the poor. CC can cause high rates of infectious diseases such as diarrhea and cholera (IPCC, 2022). If this occurs, with the limited funds they have, it will be difficult for them to access health information and services. Therefore, efforts to prevent or reduce the impacts arising from CC from various parties, including the government, schools, the general public, and other parties are really needed.

Figure 1 is the concept of mitigation and adaptation on climate change. This figure illustrates a linkage of cause and effect between climate change and human society. The yellow arrows show the cycle of cause and effect among the four quadrants, while the blue arrow indicates the societal response to climate change impacts. Based on the figure, climate change is caused by social-economic and development paths activities including activities of economic growth, technology, population and governance. These activities increase the level of GHG emissions namely carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), and aerosols in the atmosphere. The long-term accumulation of emissions and concentration leads

to the change of global climate with temperature rise leading to the rise of sea-level, the change of precipitation, and droughts and floods. The phenomena of climate change impacts on human and natural systems including food, water resources, ecosystems, biodiversity, human settlement and human health. Furthermore, indirectly climate change also impacts on social-economic and development paths. Through the illustration, it means that the mitigation of climate change is tackled by reducing the accumulation of GHG emissions. Meanwhile, adaptation to climate change can be done by adjusting life in a changing climate with the purpose of reducing the negative impacts of climate change. With this concept of climate change, LSs in this study are going to be investigated.

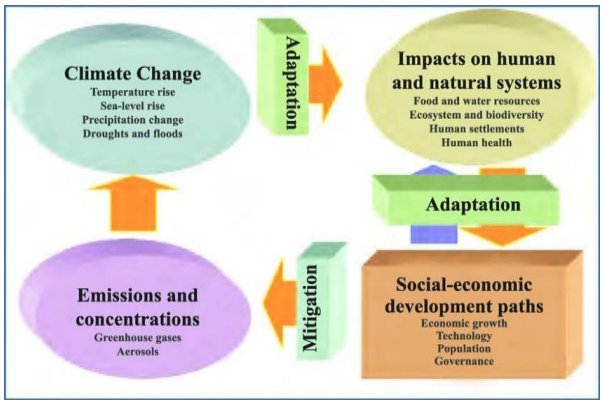

Figure 1. Framework of mitigation and adaptation of climate change (adopted from IPCC 2001)

The Indonesian government in facing the threat of CC makes policies in Law number 32 of 2009 concerning Environmental Protection and Management. In the considering section, it states that increasing global warming has resulted in CC thereby exacerbating the decline in the quality of the environment. Therefore, it is necessary to protect and manage the environment. The law on Environmental Protection and Management is in accordance with the mandate of the 1945 Constitution article 28 (h) which states that every citizen has the right to be able to live in prosperity, physically and mentally, to have a place to live, and to get a good and healthy environment. This indicates that the government is concerned about environmental issues that can affect the survival of its citizens.

Considering such efforts by the government, Linguistic Landscapes (LLs) can be an appropriate tool to gauge the school's efforts in preventing CC in educational settings. High temperature, air pollution, and students' social-economic background have a relationship with students' learning outcome. The report from Global Education Monitoring (2020) mentions that an average increase of school year temperatures of about 1.8°C will lower learning outcomes by 1%, as do 6 days above 32.2°C. Regarding air pollution, a study from Zhang et al. (2018) states that the exposure to air pollution in the long-term can reduce cognitive performance of people. The significance of CO_2 influences both teachers and students' academic

performance (Jia et al., 2021). Furthermore, students with low social-economic status have low engagement and achievement (Tomaszewski et al., 2020).

Education plays a significant role in coping with the climate disaster (Bonilla & Quesada, 2024). Moreover, LL in the school environment, the so-called linguistic schoolscape (LS), can be seen as a medium for teaching values and building habits (Gorter & Cenoz, 2015). In other words, to promote good messages related to CC, LSs displayed in its surroundings can be the case. In the school, students are taught to protect the environment such as planting trees, reducing plastic bags, waste management and other good environmental actions (Husen et al., 2022). On the other hand, students are also taught social values such as helping one another, showing empathy, and creating warmth in situations (Hidayati et al., 2020). These good practices of environmental and social messages avert and reduce the impact of CC.

Studies regarding LL in Indonesian education settings are still underexplored, particularly in relation to CC. The study regarding environmental issues had been done by Setiawati et al. (2020). In that study, the researchers aimed to investigate the ecological LL through environmental posters. The study by Setiawati et al. (2020) did not discuss environmental issues to CC. They just discussed environmental topics in LSs such as finding the meaning of socio-ecological poster text and the use of those posters to strengthen the nation's characters. Meanwhile, the LL research about language patterns in LSs had been done by Andriyanti (2019). This study discussed sign patterns and representation in LSs generally. Andriyanti (2019) did not connect both sign patterns and representation with CC topics. Other LL researches that had been carried out in educational settings include food and nutrition (Harbon & Halimi, 2019) and LSs as language learning media (Riadi & Warti, 2021). To the best of our understanding, no such study about sign patterns and language use addresses the issue of CC in LSs. Consequently, this present study intends to add one more side, specifically about the sign patterns used and language used in LSs related to CC.

This study deals with the schools in Kebumen, Central Java, Indonesia. This location is close to the coast. In addition, Agriculture and Food Service of Kebumen (2022) states that its agricultural land area reaches 94,646.39 hectares out of a total area of 128,111.50 hectares. Furthermore, according to Statistics of Kebumen Regency (2023), farmers in general, including fishermen, are the second largest of people's professions in Kebumen. These facts show that there are many professions of farmers and fishermen. Both professions are greatly affected by CC (Aldrian et al., 2011). This implies that Kebumen can be categorized as a region that is prone to CC impacts. Lastly, all of the schools investigated are Adiwiyata schools. This program is to realize the environmental culture both physics and attitude of the school community (Febriani et al., 2020). It means that basic habits to prevent CC have already been promoted and instilled.

In an attempt to discern multilingualism in addressing a climate catastrophe, this study aims to find out the sign patterns in the linguistic schoolscapes and to describe the language use in the LLs related to CC. The use of particular language in LLs shows the motivations of sign makers (Andriyanti, 2019). One with a positive attitude and perception toward a language is likely to use that language. It means the

successfulness of delivering messages of CC through LSs influenced by the language use in LSs. The result of the study can be useful for education authorities to promote CC through signs by considering the use of language to deliver messages of CC.

RESEARCH METHOD

This qualitative study utilized documentation techniques to collect the data both inside and outside classrooms. The particular location where LL was placed gave the readers different context to construct the meaning (Riadi & Warti, 2021). The unit of analysis of the study was any written text in spatially definable frame (Backhaus, 2006). In order to analyze LL in a particular place effectively, every signage was considered (Lu et al., 2020). Consequently, every single unit of LSs was counted as a datum regardless of its size.

The data were collected from four schools in the secondary level. Sequentially, it was coded as S1, S2, S3, and S4. The availability of many LSs in the school environment was the main factor why these schools were chosen as the research location. A total of 351 LLs from four schools were collected by using a digital camera from a smartphone. In this study, the textual data were the primary data while the context data such as pictures, colors, and size of LSs are secondary data. The data were in the form of verbal-visual information. All data collected had got permission by the authorized. The validity of data was checked twice to measure that there was no data recorded twice or more (Andriyanti, 2019). In presenting the data, a coding system was used to indicate the school as the data source and the datum number, for instance, S1/10 meant that the data presented was the data taken from School 1 and data number 10.

The method of analysis of the data used Miles and Huberman (1994). It includes data reduction, data display, and conclusion drawing. At the level of data reduction, the researchers chose and classified data based on the data location and the topic related CC issues. For instance, the first datum from School 1 was coded S1/1. At this stage, it was applied CC framework by IPCC (2001). The concept of IPCC (2001) provides complete causes, impacts, and ways to overcome CC in one framework. This helped researchers to analyze data according to research objectives more easily. After that, data was analyzed based on the use of the language in the LSs. The use of language was used to classified the sign patterns whether it was monolingual, bilingual, or multilingual. Monolingual LSs indicated the language existing in LSs related to CC and bilingual and multilingual LSs indicated the combination of language in LSs related to CC. Meanwhile, to calculate the frequency of sign patterns, language combination, and language use, it utilized SPSS 25. After that, data were displayed in the form of a table to be explained in the detailed description. Lastly, the researchers made a conclusion to answer research questions.

RESULT AND DISCUSSION

This part presents the result and discussion of the patterns of the sign and the use of language in LSs related to CC.

The total LSs related to CC used to answer the research questions are 131 LSs out of 351 LSs. It means that 220 LSs are not related to CC. A total of 58, 17, 28, and 28

of LSs are sequentially from S1, S2, S3, and S4. Based on data obtained, these LSs are written in several languages, namely Indonesian, English, French, and Javanese. Table 1 is distribution of LSs related to CC based on schools where data are taken.

Table 1. Distribution of Data Based on School

No.	School Code	Number of Data	Range of Data
1	S1	58	Data 1 – 58
2	S2	17	Data 59 – 75
3	S3	28	Data 76 – 103
4	S4	28	Data 104 – 131
Total		131	

Sign patterns

As shown in Table 2 about the sign patterns and the number of frequencies, to communicate the idea about CC in LSs, there are two sign patterns. These patterns are monolingual and bilingual. There are no multilingual signs used to deliver messages about CC.

Table 2. The Sign Patterns and The Number of Frequencies

No	School Code	Language Patterns	Number of Frequency	Total	Example
1.	S1	Monolingual	42		Hijau itu indah hijau itu sehat (S1/12)
		Bilingual	16	58	Simpanlah sampah pada tempatnya (put rubbish in the proper place) (S1/19)
2.	S2	Monolingual	15		Selamatkan bumi kurangi emisi CO^2 (S2/5)
		Bilingual	2	17	Stop; matikan mesin jam 07.00 s/d 15.15 WIB (S2/8)
3.	S3	Monolingual	22		Green & clean school (S3/10)
		Bilingual	6	28	Kelola sampah dengan 3R budayakan reduce, reuse, recycle (S3/20)
4.	S4	Monolingual	19		Jangan lupa matikan lampu (S4/3)
		Bilingual	9	28	Speak out! Stop bullying Jangan hanya diam; Berdirilah bersatu melawan bullying; Buat sekolahmu menjadi zona bebas perundungan (S4/27)
Total		Monolingual Bilingual	98 (74%) 33 (25.2%)	131	

The monolingual patterns are the highest of the number of frequencies. It is 98 (74.8%) occurrences. Meanwhile, the occurrences of bilingual patterns are 33 (25.2%) frequencies. Both monolingual and bilingual patterns can be found in all schools as shown in Table 3.

Table 3. Sign Patterns in Monolingual Signs

No	School Code	Monolingual Patterns	Number of Frequency	Total	Example
1.	S1	Indonesian	33	42	Pohon bisa menyerap racun di sekitar kita (S1/8)
		English	9		Clean up green up our school (S1/28); Let's Go Green (S1/22)
2.	S2	Indonesian	15	15	Tanamkan cinta pohon sejak dini (S2/4)
		English	0		-
3.	S3	Indonesian	13	22	Perusakan Lingkungan dapat "merobek" lapisan ozon (S3/12)
		English	9		Save water, save life (S3/1); Green & clean school (S3/10)
4.	S4	Indonesian	17	19	Bila kita ramah terhadap lingkungan, lingkungan pun ramah terhadap kita (S4/10)
		English	2		Reuse reduce recycle (S4/7)
Total		Indonesian	78	98	
		English	20		

Bilingual patterns in LSs related to CC are found in all schools. It is shown in Table 4. Language combinations in these LSs are Indonesian-English, Indonesian-French, and English-Javanese. Indonesian-English patterns are found in all schools. However, the language combinations Indonesian-French and English-Javanese are only found in S1. Indonesian, English, and Javanese are taught in all schools. Meanwhile, French is only taught in S1.

Table 4. Sign Patterns in Bilingual Signs

No	School Code	Bilingual Patterns	Number of Frequency	Total	Example
1.	S1	Indo+Eng	10	16	1,5-2 meter jaga jarak social distance (S1/51)
		Indo+French	5		Gardez nettoyage! Jagalah kebersihan! (S1/22)
		Eng+Java	1		Let’s save our geopark! Ora ngapak ora kepenak (S1/33)

2.	S2	Indo+Eng	2	2	Stop; matikan mesin jam 07.00 s/d 15.15 WIB (S2/8)
		Indo+French	0		-
		Eng+Java	0		-
3.	S3	Indo+Eng	6	6	Saving the world; Selamatkan bumi (S3/21)
		Indo+French	0		-
		Eng+Java	0		-
4.	S4	Indo+Eng	9	9	Stop kekerasan di sekolah perundungan kekerasan perlakuan buruk diskriminasi (S4/25)
		Indo+French	0		-
		Eng+Java	0		-
Total		Indo+Eng	27	33	
		Indo+French	5		
		Eng+Java	1		

Indonesian is the most dominant language that appears in LSs related to CC. In the monolingual patterns, there are only two languages, namely Indonesian and English. With a total of 78 frequencies, Indonesian becomes the first rank over English with a total of 20 frequencies. All schools have both monolingual patterns except school S2. This school only has monolingual Indonesian CC signs.

Javanese is the lowest frequency of language used. Javanese is a local language in Central Java. Although this language is taught in all schools, it only appears once in bilingual patterns of CC signs.

The language use related to CC

The language use to promote messages about CC is described by using language patterns applied in LSs. As mentioned earlier, the pictures recorded to answer this research question are based on the framework of CC proposed by IPCC (2001) because it provides complete causes, impacts, and ways to overcome CC. It can help eliminating which LSs are used and are not to answer research questions. These are the following the language use related to CC in monolingual and bilingual patterns.

The language use related CC in the monolingual signs

There are two languages that appear in monolingual signs conveying CC. These languages are Indonesian and English. Both languages are taught in those four schools.

Indonesian becomes the most frequented language used in monolingual CC signs. In this case, according to Kemendikbud (2020), Indonesian has high vitality to communicate ideas about CC in LSs because it has high intensity of use. It is understandable as this language is the official language used in teaching and learning processes in all schools. By using Indonesian, promoting ideas about CC is considered effective because everyone in the school environment understands this language. It

provides a highly informative image (Ardhian et al., 2023). It indicates that the role of Indonesian in CC LSs is used as communication function because it is understandable by everyone.

Figure 2. Monolingual Indonesian Sign about Waste (S3/18)

LS shown in Figure 2 is an example of CC signs in Indonesia. The sign says *GERAKAN SEMUT [SEJENAK MEMUNGUT]; sejenak memungut sampah pada jam pertama; sejenak memungut sampah pada jam terakhir; SETIAP HARI* (literally translated as *ANT MOVEMENT [A MOMENT OF PICKING UP] a moment to pick up the waste at the first hour; a moment to pick up the waste at the last hour; EVERY DAY*). This sign could be found on the wall of some school corridors where many people can easily reach the sign. *SEMUT*, ant in English, is an acronym of *SEJENAK MEMUNGUT*. The use of an acronym aims to optimize communication (Ibrahzim, 1989). Hence, the icon drawn in the sign is an ant. Green as the dominant color in the sign strengthens the message about a clean and green environment as a mitigation to today's climate. In Figure 2, the words *SETIAP HARI* emphasizes that this movement is carried out regularly every day.

Waste is an environmental problem that still cannot be handled properly. According to Sony (2016), waste contributes to increasing GHG because untreated waste produces CH4 and CO2. He argues that it generates 50 kg of CH4 in every ton of waste. However, public awareness of the waste problem is still low. Waste is often found in various places, such as strewn on the road, in river bodies, coastal areas, and at sea (Herdiansyah et al., 2021). The signage in Figure 3 is a LS containing an invitation to protect the environment by picking up waste and then disposing of it in its place. The sign can awaken the community, especially teachers and students, to raise awareness to build a habit of disposing of waste in its place. Through this movement, a simple action to protect the environment by disposing of waste in its place is attempted.

Figure 3. Monolingual Indonesian CC sign about Maintaining Health (S1/53)

Figure 3 is a monolingual Indonesian CC LS that contains maintaining health. The sign is written *LANGKAH CUCI TANGAN YANG BENAR* (literally translated as *STEPS FOR PROPER WASHING HAND*). In writing, the words *LANGKAH* or *STEPS* and *BENAR* or *PROPER* are in bold from the others. This shows an emphasis on how to do the right steps in washing hands. Next, the steps for how to wash hands properly are conveyed using pictures accompanied by the sequence number. The pictures clearly illustrate how to wash hands properly so that the reader can clearly see and follow how to do it. Furthermore, it was posted on the wall near the sink. It is expected that target readers who will use the sink can directly practice how to wash their hands properly.

Washing hands is one of the adaptations to CC that can be done to deal with the threat of CC. CC contributes to health issues including contributing to the spread of infectious diseases (Charnley et al., 2022). In Indonesia, in 2021, cases of infectious diseases such as diarrhea reached 22.18% or around 818,687 cases that had been found from the target of 3,690,984 toddlers with diarrhea (Kemenkes, 2022). Therefore, in dealing with the threat of spreading infectious diseases, one of the efforts of the Indonesian Ministry of Health is to promote the washing hands with soap program (Kemenkes, 2020). This is in line with Figure 3. The figure educates the school community to practice washing hands properly. It effectively kills germs, bacteria, and viruses (Kemenkes, 2020). The result of study by Charnley et al. (2022) shows that not washing hands before eating is a significant factor of the infection of cholera. In addition, washing hands with soap can decrease the transmission of diarrheal diseases by around 30% (Rokom, 2021).

Another example of monolingual Indonesian CC signs is shown in Figure 4. It says *TANAMKAN CINTA POHON SEJAK DINI* (literally translated as *INSTILL A LOVE FOR TREES FROM AN EARLY AGE*). This sign was posted on the wall of the outside classroom that can be seen by many people. Emphasizing the words *SEJAK DINI* or *EARLY AGE* by giving a different color from the other words gives an emotional impression that loving trees as an action of mitigations toward CC must be instilled as early as possible. Suryani and Seto (2020) states that the learning process teaching students to love the environment should be instilled from an early age as the foundation in the learning process. At this age, the formation of behavior is more

visible and easier (Rudiyanto et al., 2021). Furthermore, to strengthen the message of the sign, the background used is in the form of trees with green color.

Figure 4. Monolingual Indonesian sign about Planting Trees (S2/4)

Trees have functions for environmental sustainability, particularly to prevent the effects of global warming and CC. Besides being known as O2 producers, trees make an important contribution to the absorption of CO2. In the process of photosynthesis, trees bind CO2 and release O2 to produce carbohydrates and food reserves for growth metabolism and development (Abdillah et al., 2023). It means that the more trees planted, the more CO2 is bound. Through Figure 4, it is expected that people who love trees from an early age will continue the habit of loving trees into adulthood by planting and caring for trees. Thus, CC can be controlled.

The promotion of CC is also found in English signs. Unlike monolingual Indonesian signs that can be found in all schools, monolingual English signs are only found in S1, S3, and S4. According to Sumarlam et al. (2021) that the use of English in signs indicates that the message delivered tends to be international messages. Because there are CC signs in English, it indicates that CC topics are international messages. Furthermore, in Indonesia, English is considered as foreign language so that there are many people do not master English. Therefore, the use of English in monolingual signs tends to be short and popular messages as shown in Figure 5 and 6.

Figure 5 is a CC sign in monolingual English It was located on the wall of the school corridor toward the canteen. This position allows many students as well as teachers to be aware of the sign because the canteen is the place where most students go during breaks. Reduce, Reuse, and Recycle are a principle of managing non-organic waste which is well known as the 3R's. It is depicted by the three arrows chasing each other in a triangle as the symbol of 3R's. Yellow is applied as the background of this sign. Regarding waste management, this color is identical to the non-organic waste bin. Non-organic waste is the target for waste management in 3R's principles.

Disposing of waste in its place is still not enough to overcome the waste problem and its impacts. Although in Figure 2 CC signs about action to dispose of waste are already promoted, it is not enough to solve waste problems. Not all waste can decompose in a short period of time. For example, plastic bags take from 10 to 20 years to decompose (The Ocean Conservancy, 2003). Meanwhile, according to data from Making Oceans Plastic Free (2017), the average plastic waste used in Indonesia reaches 182.7 billion plastic bags per year. A significant number of plastic waste and a long time of decomposition make this problem even more complex. Consequently, through Figure 5 as a mitigation of CC in educational settings, an

education on how to manage waste is considered effective for dealing with difficult waste decomposition such as plastic. Reduce, reuse, and recycle are three basic approaches to responsible waste management, namely reducing, reusing and recycling the plastic waste. By applying this principle, the amount of waste generated can be kept to a minimum so that the production of CH_4, N_2O and CO_2 can be minimized.

Figure 5. Monolingual English CC sign about Waste Management (S4/7)

Next is the example sign of monolingual English CC signs. Figure 6 is about how to prevent the transmission of COVID-19 by keeping our distance from each other. It is written *PLEASE KEEP YOUR DISTANCE; WAIT HERE*. To make communication about keeping distance successful, it is accompanied with a picture of the feet. The sign can be found in front of the door to enter the class. It means that both students and teachers should keep their distance before they enter the classroom by queuing on the sign.

Figure 6. Monolingual English CC sign about COVID-19 (S1/45)

The COVID-19 is one of the real effects of CC. Although this pandemic is caused by a virus coming from the animal, the factors that exacerbate its spread cannot be ignored. CC changes temperature, precipitation, wind, and sunshine which impact on survival, reproduction, and distribution of infectious diseases as well as the availability of their transmission environment (Wu et al., 2016). It can affect interactions between humans, animals and their environment. In the case of COVID-19, the contamination of the COVID-19 virus occurs through the release of nasal mucus, sputum, saliva, and other biological fluids by infected individuals into their surroundings (Geng & Wang, 2023). In Figure 6, the adaptation to COVID-19 as a result of CC can be done by keeping distance. By applying this way, it is expected that there will be no more cases of COVID-19 infecting humans. Nevertheless, the occurrence of

the COVID-19 pandemic has made us aware that CC can cause such a big disaster for the whole world. Therefore, efforts to mitigate CC and preserve ecosystems must be a priority to address future threats that may arise due to CC.

The language use related CC in the bilingual signs

The use of language found in bilingual CC are the combination of Indonesian-English, Indonesian-French, and English-Javanese. The emergence of Indonesian in bilingual signs mostly functions as a translation. The messages of CC in LSs requires high ability to understand it. Moreover, English and French are international languages that are not mastered by everyone. Therefore, the role of Indonesian here is to help communicate the message about CC in LSs so that it can be effectively understood by the target readers. Furthermore, it aims to ensure that there are no mistakes in interpreting it. Meanwhile, the appearance of Javanese in LSs indicates the local culture that exists in the school. The existence of LS which contains CC in Javanese shows that LS not only functions to convey messages about CC but also as a cultural symbol. The following CC LSs in bilingual patterns are Indonesian-English as shown in Figure 7 and 8.

Figure 7 is a CC sign in bilingual Indonesian-English. It is written *KAWASAN TANPA ROKOK; Permendikbud No 64 Tahun 2015 Tentang Kawasan Tanpa Rokok di Lingkungan Sekolah; STOP SMOKING* (literally translated as *NON-SMOKING AREA; Permendikbud Number 64 of 2015 about Non-smoking Area in the Schools Environment; STOP SMOKING*). It means smoking is prohibited in the school. It is regulated by Permendikbud Number 64 of 2015 about Non-Smoking Areas. The purpose of the regulation is to create a clean, healthy, and smoke-free school environment. The icon of prohibition in the cigarette near the sentence *KAWASAN TANPA ROKOK* shows that it is not an area supporting smoking. In addition, this sign could be found in strategic places such as in the canteen, school entrance, school front yard, and school field. These areas are easily accessible by many people both the school community and the public. In terms of size, it was in large print so that even from a far distance, one can know what is conveyed.

Figure 7. Bilingual Indonesian-English CC sign about No Smoking (S1/41)

Not smoking is one of ways to help maintain people around us from several health problems and to reduce GHG. Cigarette smoke is not only inhaled by smokers, but also inhaled by their surroundings. The study by Saha et al. (2007) explains that cigarette smoke can cause various diseases such as cardiovascular disease, cancer, chronic obstructive pulmonary disease and death. Besides causing health problems, smoking also contributes to CC. The tobacco industry in every year produces CO_2

more than 84 million tons (WHO, 2022). It means that through Figure 7, the school tries to mitigate the cause of CC by maintaining the health of the school community and reducing the production of GHG.

Figure 8 is an example of bilingual Indonesian-English CC signs as the adaptation of CC effects regarding bullying. It says *SPEAK OUT! STOP BULLYING; JANGAN HANYA DIAM; BERDIRILAH; BERSATU MELAWAN BULLYING; BUAT SEKOLAHMU MENJADI ZONA BEBAS PERUNDUNGAN* (literally translated as *SPEAK OUT! STOP BULLYING; DON'T JUST BE SILENT; STAND UP; TOGETHER AGAINST BULLYING; MAKE YOUR SCHOOL A BULLIES-FREE ZONE*). Like LSs in general, it was installed on the wall of the strategies school corridor where many people can see it. The use of the exclamation mark in the sentence *SPEAK OUT! STOP BULLYING* and the frequent appearance several times of the sign in the same topics indicate the firmness of the school to strictly prohibit bullying. The sentences *SPEAK OUT!* and *JANGAN HANYA DIAM* imply that so far victims of bullying have not had the courage to report the acts of bullying to the relevant parties. Whereas, bullying has serious impacts such as causing emotional disturbances in children and adolescents, worsening their physical, psychological, and social sense of well-being (Shahid et al., 2022). Through this sign, the school tries to prevent bullying and those impacts. The sign invites us to together fight against bullying in the school so that it would be a free zone of bullying.

Indirectly CC also can contribute to the occurrence of bullying. Bullying in the school occurs due to several factors including gender, grade level, ethnicity, socio-economic status, physical features and body build, externalizing behavior, self-esteem, social skills and popularity, and academic achievement (Ahmed et al., 2022). Meanwhile, CC can cause economic instability. It is projected to slow down economic growth and make efforts to reduce poverty even more difficult (Ditjenppi, 2016). It means that students who come from lower social-economic status have a higher rate of being bullied. Kyrrestad et al. (2023) mention that adolescents that perceive their social economy of their family better have a lower chance of being victimized by bullying or cyberbullying.

Figure 8. Bilingual Indonesian-English CC Signs about Bullying (S4/27)

The next is the example of LSs in bilingual Indonesian-French. As mention before, LSs involving French are only found in S1. Meanwhile, S1 is the only school that teaches French as their learning subject. It means that the use of French in LSs related to CC is as media to learn a language and to deliver messages about CC.

Meanwhile, the type of signs in this language use the same method. The signs are delivered in French first then translated in Indonesian as illustrated in Figure 9.

Figure 9 is a bilingual CC LS to urge the school community to save water. It says *Portez assez d'eau!; Gunakan air secukupnya!.* The sign is written in bilingual French-Indonesian conveying the same meaning, *Use enough water!.* This kind of LLs commonly can be found near the faucet which is the source of water. However, in the application of colors, the background and font color are not quite proper. It has the same tone, which is bright. Either the background or the font color should apply a contrast color so that the written message can be read clearly.

Figure 9. Bilingual Indonesian-French CC Sign about Water Conservation (S1/2)

With the LSs on saving water, it is expected that both people in the school and public who come to the school will be aware that water is important to conserve. This awareness arises because there is a fear that in the future there will be a shortage of quality of water. In this case, CC can impact health and hunger. It causes a decrease in the quality and quantity of water (IPCC, 2022). Hundreds of millions people, especially in developing countries, will experience severe impacts as a result of the various changes that have occurred, particularly the availability of clean water and food production (Ditjenppi, 2016). If the wasteful behavior of using water continues, life in the future could be threatened. Through this sign, the delivery of the message to save water as the adaptation of CC impacts is by locking the faucet accompanied by a picture of a drop of water. It gives a meaning not to waste even a drop of water.

The last is bilingual English-Javanese. Although all schools have Javanese as the subject students learned, this LS is only found in S1. It indicates that Javanese is marginalized language (Andriyanti, 2019; Sumarlam et al., 2021). The sign is located on the wall towards the school library. It is written *LET'S SAVE OUR GEOPARK; ORA NGAPAK ORA KEPENAK.* The use of Javanese shows that the Javanese ethnicity exists in that school. *ORA NGAPAK ORA KEPENAK* which is literally translated as *IF WE DO NOT SPEAK NGAPAK, IT IS NOT COMFORTABLE.* This line is a popular jargon among Javanese people. *"Ngapak"* is one of Javanese accents. It indicates that there is Javanese culture in that school. The picture of students reading a book about geopark with a picture of the earth in the background shows that we have to learn about geopark to preserve the earth. Through Figure 10 both preservation of culture and environment are tried to be communicated.

Figure 10. Bilingual English-Javanese CC Sign about Geopark (S1/33)

Protecting geopark means mitigating climate change. Within the geopark there is environmental heritage such as biodiversity (Setyadi, 2012). It means that biodiversity such as species of plants, animals and environmental ecosystems are preserved if we preserve geoparks. By preserving natural resources, especially plants, the absorption of GHG gas can be maximized.

The findings of this study are in line with Anderson (2010) that schools play a role to mitigate in terms of becoming carbon neutral, to change students' behavior, and to reduce their own ecological footprint. The findings show that LSs for mitigating and adapting of CC use the dominant, foreign, and leased used languages with various topics such as waste management, tree planting, COVID-19, bullying, and smoking bans. The use of different languages in CC LSs conveys different purposes. Indonesian as the dominant language functions as a medium of communication and translation, English and French as foreign languages are used to learn languages and deliver international CC topics, and Javanese as the leased used language is used as a medium of maintaining both its language and the environment. Consequently, through CC LSs as mentioned by Bofferding and Kloser (2015) that education has potential to influence students' understanding of variables and behaviors that influence climate system.

CONCLUSION

In a nutshell, in the education setting, displaying LSs which contain messages about CC can be one of the concrete steps taken by schools to prevent the worse impacts of CC. In this study, the messages of CC in LSs are promoted by using monolingual and bilingual patterns. Multilingual patterns about CC are not found in all schools. Meanwhile, the languages involved include Indonesian, English, French and Javanese. Those languages are subjects learned by students in all schools except the French because it is only learned in S1. It can be concluded that the use of language is not just to promote messages related to CC, but also as a way for students to learn these languages, particularly English and French because it is not their native language.

Indonesian is the dominant language to deliver the messages of CC through signs. The use of this language is effective to communicate CC ideas because it is an

understandable language compared to other languages. The messages in CC signs need high ability to understand the content of CC signs. Furthermore, the use of Indonesian in bilingual patterns mostly functions as translation. Therefore, Indonesian is considered effective and prevents misunderstanding and misinterpretation. In addition, the emergence of Indonesian as a dominant language turns Javanese into the leased used language. Meanwhile, English and French as foreign language is used as a medium to learn language and to deliver international CC topics. In this case, the dominant language, foreign language and the leased used language are utilized to promote messages about CC.

The finding of the study is important for the authorities of education in Indonesia, particularly schools and government, in dealing with CC problems. Although previous studies of LL have discussed environmental topics and language patterns and use, they have not linked it to the CC topics. Meanwhile, this study provides educational authorities with the information about LL in the school related to CC in terms of language patterns and language use used to convey ideas about CC. This study completes the existing gap regarding the study of LL in the school and CC topics. It potentially assists them in the future on how to make campaigns about CC to solve the problem about CC and to reduce the impact of CC. Furthermore, the combination of languages in LSs related to CC can be further developed, such as using a wider variety of languages and using multilingualism. Using this strategy has the potential to attract the attention of the target reader.

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