

## Measuring sustainable communication in education

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### Abstract

*Although aspects of sustainability in communication such as nonviolence are discussed from time to time, hardly any theoretical basement with an empirical validation can be found. In the broadest sense, sustainability refers to the ability to maintain or support a process continuously over time. This paper asks for the theoretical approach that helps to understand the challenges of teaching in schools of diverse societies (2) and explains some core aspects of the ongoing research on sustainability and communication (3). After that, this paper presents the research question this project tried to answer (4) and explains the used instruments, the data, and some of the most relevant outcomes of this study (5). Finally, some conclusions describe the opportunities and threats of sustainable communication for teacher education.*

*The outcome of this paper is that a specific theory of sustainable communication is missing. Furthermore, the results of the empirical investigation show that intercultural communication, non-violent communication, cooperation, problem solving and, reflection are statistically related as constructs and predictors of sustainable communication. Also, the teaching experience of the participants in the sample is a significant predictor of the sustainable communication.*

**Keywords:** sustainability; communication; nonviolence; collaboration; problem solving

### 1. Introduction

Although aspects of sustainability in communication such as nonviolence are discussed from time to time (classical: Rosenberg, 2015), hardly any theoretical basement with an empirical validation can be found. But some sources discuss sustainability and communication as different terms with some interrelations. This is not an enormous surprise since communication and sustainability are highly relevant for societies in the 21<sup>st</sup> century because of societal diversity and inclusion or general crises like the Covid-19 pandemic or climate change.

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## 2. Literature Review: What We Know About Sustainable Communication Already

In the broadest sense, sustainability refers to the ability to maintain or support a process continuously over time. Sustainability of resources and lifestyle is increasingly crucial regarding climate change education and shortages of resources such as raw material, energy, biodiversity, etc. (Hernández-Ramos, Perna, Cáceres-Jensen, & Rodríguez-Becerra, 2021). Here, especially the interdependencies of ecological, societal, and economic systems generate many different perspectives on sustainability and sustainable development (Danaher, Wu, & Hewson, 2021; regarding cultural perspectives in Thailand schools Saemee & Nomnian, 2021).

The 21<sup>st</sup> century society is characterised by polarisation and diversity, a fact that should be observed in education systems around the world. Sir Ken Robinson observes that ‘The more complex the world becomes, the more creative we need to be to meet its challenges’ (In the preface to Robinson, 2011). Unfortunately, the educational system has not always adjusted its methods to align with the needs of society. The 21<sup>st</sup> century education should be about giving all the students a chance to attain their educational potential, to succeed in their future life. Society and the educational system have to see diversity not as a problem but as an asset, from which everybody can benefit. For this, we must tackle the nowadays problems in schools regarding inequities based on the socio-economic backgrounds, ethnic origins, language, religion, gender, and sexual orientation of the students.

In this polarised society dealing with students, parents, and colleagues with different backgrounds can be sometimes challenging. The school systems have to recognize this challenge, in order to support and encourage all the students regardless of their backgrounds. There is a need for a deeper understanding of the needs of teachers in dealing with diversity. Hence, teachers need competencies to deal with these differences in students, social networks, teaching units, and society in general. By this, the quality of communication needed in recent schools needs to be long-lasting in terms of social interactions, including differences, and prevent exclusion and violence. In other words: sustainability of social interactions is needed in schools. Based on different scientific sources, as shown below, we decided to call these competencies related to communication, focusing on empathy, respect, social cohesion, shared meaning, and solution-orientation in environmental, social, economic, and political perspectives, “sustainable communication.”

### 2.1 Sustainability

Communication in a sustainable way is a complex process that includes different components, like intercultural communication, nonviolent communication, reflection on one’s own communication, conflict resolution and problem solving related to communication and cooperation. In this regard, students’ knowledge may often be limited (Yuan, Yu, & Wu, 2021) as well as the teachers’ (Santamaría-Cárdaba, Martins, & Sousa, 2021) and the organizational knowledge of schools (Nakidien, Singh, & Sayed,

2021). But communication is essential to act in social connections with the challenges of these developments (Hernández-Ramos, Perna, Cáceres-Jensen, & Rodríguez-Becerra, 2021). Less is known about the sustainability of communication itself. Sometimes authors or companies address the *communication of sustainability*, e.g., when referring to sustainability in company goals “to disclose information on the way they operate and manage social and environmental challenges” (European Union, no date) or as a measurable form of interaction (European Association of Communication Directors, 2021). Thus, there is a knowledge gap regarding the *sustainability of communication* because only some of the single elements of sustainable communication can be found.

To qualify students in primary and secondary education for further scientific investigation of challenges in natural science, new curricula are developed and implemented. Goals are the better engagement of the students in the lessons, the longer-lasting learning effects, and their development of critical thinking (Aceska, 2016). In doing so, a deeper understanding of sustainable development is intended.

Using information and communication technology (ICT) helps achieve sustainability of learning and administrative processes (Pais, Pedro, & Santos, 2016). These platforms and courses gain empathy and awareness of social cohesion as well as economic issues through interaction in forms of global education (Szobonya & Roche, 2021). Furthermore, they reflect ideas of sustainability in global contexts of knowledge, culture, and economy (Fonseca, Julian, Hulme, De Lurdes Martins, & Brautlacht, 2021). Teaching and learning become more dynamic and effective in students’ motivation and quality of outcomes (Ramazanoglu & Toytok, 2021).

However, it also must be said that using ICT requires special professional and technical skills to participate in these learning processes and the communities, where shared meaning is essential (Coffield, et al., 2021; see also 2.3). Therefore, further education and training are crucial. The issue arises that the gender bias in ICT often is still huge, and the gender digital divide needs to be closed to achieve justice and sustainability (Ancheta-Arrabal, Pulido-Montes, & Carvajal-Mardones, 2021).

Another issue is the question of infrastructure in ICT-based education: “the new practice of online learning does not seem a sustainable model of learning in the current situation because many students, particularly from remote rural villages, still do not have access to digital devices and the internet.” (Paudyal & Rana, 2021, p. 1012) Although the cited paper deals with experiences from Nepal and by this from a country with specifically (not) developed infrastructure, the question of infrastructure and access needs to be discussed in general for every place where ICT-based education shall be sustainable. The authors require intense support from the universities, but societal reliability in providing relevant infrastructure also seems to be required.

To establish community-related enterprises and education programs, a “learning laboratory” in the social spaces can be implemented to deal with social issues in a sustainable form (Intrator & Siegel, 2010). Thus, sustainability in urban contexts is not only a question of individuals but also of social spaces and their networks.

In sustainable education, recognition is vital: “For sustainable personal development, the assessment of education and learning is an obligatory condition in terms of recognition.” (Yaman Ortas, 2021, p. 186) This means that in social networks such as communities and social spaces in general, good chances are given to get recognition from within the social network one belongs.

Especially regarding ICT, new forms of interaction between actor groups such as experts, professionals, academics, practitioners, and students have become established. Thus, community building is crucial for sustainable learning (Nanjundaswamy, Baskaran, & Leela, 2021).

Another quality of community education is described concerning local wisdom. This unique perspective leads to different forms of local-based knowledge management processes: “1) knowledge identification; 2) knowledge creation and acquisition; 3) knowledge organization; 4) knowledge codification and refinement; 5) knowledge access; 6) knowledge sharing; and 7) learning.” (Intem, Phuwanatwichit, Sarobol, & Wannapaisan, 2021, p. 38) Here, local knowledge and general support are combined to generate sustainability in educating for local knowledge and relation.

## **2.2 Communication**

Communication is vital for belonging in schools in general (Hamm, Bragdon, McLoughlin, Massfeller, & Hamm, 2021), mainly when non-deficit oriented because communication is broadly estimated as necessary for “understanding, social unity, and peace” (Şeker, 2021, p. 326; referring to Çelikkaya et al.). This is particularly important for the interaction of immigrant students and other students in school (Kabataş, 2021).

### **2.2.1 Social and Emotional Learning Competencies**

Prior academic outcomes and demographic characteristics best predict the academic effort, but nearly not by social and emotional learning competencies. On the other hand, communication between students, parents, and teachers is needed to minimize academic failures, avoid exclusion experiences (Kabataş, 2021), and improve school experiences (Kautz, et al., 2021).

### **2.2.2. Intercultural communication**

Today’s world, this “global village” like McLuhan (1962) called it, is rapidly changing, becoming increasingly global and multicultural. This fact requires progressively complex skills and competencies from everybody. The role of the educational institutions is to accommodate the needs of the ‘new’ society, by learning the required skills and competencies.

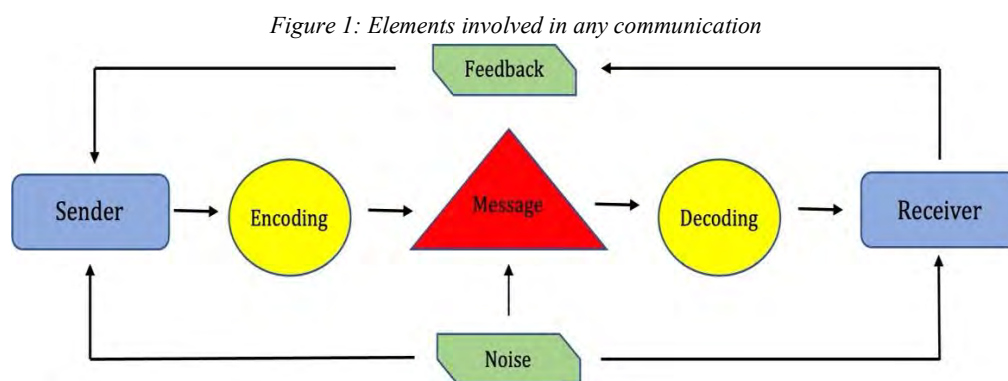
The term “intercultural communication” was first used by the anthropologist Edward T. Hall in his book *The silent language* (1959) and nowadays is part of various disciplines like cultural anthropology, psychology, social psychology, communication science, linguistics, political science, historical science, cultural geography, and economics

(Maletzke, 1996), each discipline looking at the phenomenon of 'intercultural communication' from its own point of view.

Culture is always a collective phenomenon, since it is shared, at least in part, with people who live or have lived in the same social environment. Culture is often described as an iceberg whose foundations are values, and above the surface are attitudes, behaviour, communication, manners, artefacts (Schein, 2003). These values and attitudes are internalised during socialisation and are therefore often not conscious. Hall compares culture with “a giant, extraordinary complex, subtle computer”, in which “programs guide the actions and responses of human being in every walk of life”. This complex process “requires attention to everything people do to survive, advance in the world, and gain satisfaction from life” (Hall, 1990, p. 3).

Communication and culture are directly related to each other because communication is part of culture. Hall goes one step further and claims “Culture is communication and communication is culture” (Hall, 1959, p. 186). It is therefore a question of which cultural factors influence our communication and how we can deal with them.

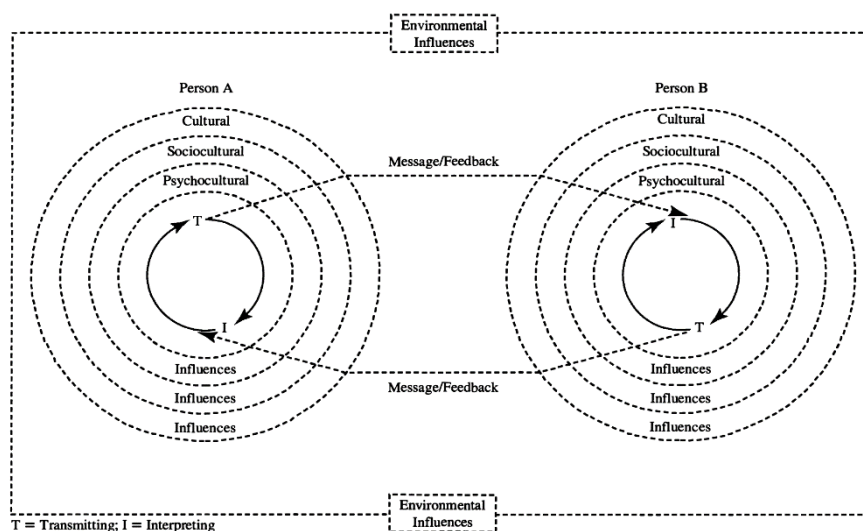
Communication is mostly defined as a process in which information is transmitted from a sender to a receiver. There are four elements involved in any communication: (a) a sender or source who (b) encodes a message which is then transmitted over (c) a channel to (d) a receiver who decodes the message.



Looking at this model we might believe that communication is a simple, one-way process and that the messages are sent and received without reference to the environment and the sequence of past and anticipated future events. But communication is a two-way dynamic process and relies to some extent on the shared social knowledge of sender and receiver. Messages are usually meaningful only within a given, well-defined social setting. Gudykunst & Kim (1997) highlight the fact that encoding (“transmitting”) and decoding (“interpreting”) of the communicative message is an interactive process influenced by cultural, sociocultural, psychocultural and situational factors. By drawing the circles and the box with dashed lines they indicate “that the elements affect, and are affected by, the other elements” (Gudykunst & Kim, 1997, p. 44) and that the communicative environment is not isolated, but an open system instead. Every time people communicate,

they are simultaneously engaged in transmitting and interpreting of messages, they interpret incoming stimuli at the same time as they are transmitting messages, that indicates that “communication is not static” (Gudykunst & Kim, 1997, p. 46). This model sees communication as a concept of interaction and can be used to describe abnormalities in communication with people from different cultures.

Figure 2: Communication as a concept of interaction (Source: Gudykunst & Kim 1997, 45)



When communicating with people from different cultures we may experience uncertainty and anxiety. To manage those feelings people should be conscious and mindful about their communication, so Gudykunst & Kim (1997), especially because much of our communication behaviour is habitual. Langer (1989, cit. in Gudykunst & Kim, 1997) isolates three characteristics of mindfulness: (1) creating new categories, (2) being open to new information, and (3) being aware of more than one perspective. Paying attention to these conditions contributes to effective communication with every member of the society.

The goal of intercultural communication is, among other things, to know and to understand the norms, symbols, values, and facts which are important for both communication partners and to include them in the communication in order to be able to create a dialogue on an equal level.

### 2.2.3 Organizational Communication in Schools

Organizational communication in schools is a multidimensional construct, remarkably related to job satisfaction. The most critical aspects of corporate communication are “openness between principal and staff as well as supportive, directive, and democratic communication” (De Nobile & Bilgin, 2022, p. 13). Here, powerlessness and empathy are of the same importance for organizations as for instruction (Mathis, 2021) and open a perspective on the communication of emotions that notices, connects, and responds to

the other individuals (Miller, 2007). Furthermore, organizational communication is essential to optimize inclusive policies within the educational system (Tonegawa, 2022).

#### 2.2.4 Counselling in Schools

Recent research shows that “multicultural counselling competence” in school counsellors is not widely developed in the investigated schools (Shi & Carey, 2021). Here, the question of multilingualism and translanguaging (as the tactical use of the linguistic repertoire) is essential and needs to be considered for identity building and social justice (Fuertes Gutiérrez, 2021). This question of social justice also rises when communication in ICT-based education settings is thought of. Pre-service teachers need competencies of – again – critical thinking to give impulses for social justice learning within the classroom: “The hope is that this exposure to educational uses for ICTs will create a mindset that makes both preservice and, thus, in-service teachers more amenable to incorporating technology into their classrooms in ways that interrogate inequities and foster advocacy in and for marginalized populations.” (Shelby-Caffey, 2021, p. 38)

#### 2.3 Nonviolent communication

The concept of Nonviolent Communication (NVC) goes back to the American psychologist, mediator, author, and teacher Marshall B. Rosenberg, who – by his own admission – brought together and systematised various sources and perspectives on the subject from the early 1960s. His own violent experiences in childhood and youth, which he had in Detroit with discrimination based on religious and ethnic affiliation, shaped him and motivated him in finding an efficient way to communicate. As a psychologist, he pursued a basic idea: if you want to create peace, you not only have to pay attention to what you say – but also how. Rosenberg therefore developed the concept of “Nonviolent Communication” (Rosenberg, 2015). It assumes that most interpersonal conflicts are caused by our judgemental language and the fact that we communicate our needs incorrectly in dialogues. In his book “Nonviolent Communication” he explains how focusing on people’s underlying needs and making observations instead of judgments can revolutionise the way you interact with anybody.

The NVC is based on the following assumptions:

- **All human beings share the same needs.** It is the strategies we use to meet these needs that differ. Using different strategies can lead to conflicts, not the needs.
- **Every human action basically wants to fulfil its own need.** Because our feelings are directly related to our needs, we feel in a certain way (happy, satisfied, sad, scared etc.) when needs are met or not met.
- **All human actions are motivated by a desire to meet needs.** Although people try to find ways in meeting their needs without harming others, they do not always recognize a path for this. So, any kind of violence is a tragic expression of unmet needs.

- **All human beings have the capacity for compassion.** People instinctively enjoy helping others as long as they can do so voluntarily.
- **Cooperation can meet everyone's needs.** Through competition, the needs of the individual are met while the other party suffers.
- **Communication and healthy peaceful relationships only work when there is true empathy.** Through dialogue and connection, we can meet more people's needs more peacefully.
- **All human beings have the capacity to grow and change.**

In the concept of Nonviolent communication, it is important to express yourself honestly and to listen to your communication partner honestly. The four elements of NVC are: observation, feelings, needs and requests.

- **Observation:** At the beginning there is the perception and description of the situation, without any interpretation. It is important to communicate our observations without judgement or evaluation.
- **Feeling:** Only then should emotions be felt and named in words. A distinction must be made between thoughts and feelings.
- **Need:** A need can be identified from the feeling. At this point we say what needs are behind these feelings.
- **Requests:** If the need is clearly identified, a request should arise from it. The request should be positive and specific.

Non-violent communication is a form of interaction based on mutual respect and mutual appreciation. It can contribute to encouraging self-responsibility for one's own contribution to school life. Students and teachers, but also parents and stakeholders are equally important for a successful school life. Nonviolent communication helps them to formulate their own feelings and needs in conflicts. In this way, they are more likely to avoid assigning blame and refrain from making diagnoses. A constructive handling of conflicts and heterogeneity can become possible. School can strengthen children, young people, and adults - a strength that does not lead to mutual injuries, but to non-violent interaction with one another.

Many researches on NVC were conducted during the last years<sup>2</sup>. All show that using NVC the participants express themselves without criticising or blaming the others (Brascomb, 2011), they are aware of the needs and feelings of others (Nash, 2007) and understand emotions better and manage conflicts (Nosek & Durán, 2017).

## 2.4 Cooperation

The Partnership for 21<sup>st</sup> Century Skills has identified collaboration as one of several key skills (OECD PISA Collaborative Problem Solving Expert Working Group, 2013; Trilling &

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<sup>2</sup> Lee, C. A., Kessler, C. M., Varon, D., Martinowitz, U., Heim, M., Rosenberg, M., & Molho, P. (1998), Cox, E., & Dannahy, P. (2005), Rose, L. (2006), Kasumagic, L. (2008), Agnew, E. N. (2012), Baesler, E. J., & Lauricella, S. (2014), Nosek, M., Gifford, E., & Kober, B. (2014), Museux, A.-C., Dumont, S., Careau, E., & Milot, É. (2016), Nosek, M., & Durán, M. (2017), Terepyschyi, S., Khomenko, H. (2019) - to name just a few of them.



Fadel, 2009). Although cooperation has been shown to bring more quality to the classroom and greater job satisfaction, many teachers are working mostly alone. Cooperation means that resources can be used, and a wide range of potential can be developed. Cooperation determines the collegial working relationship between the teachers, shapes the trusting relationship between teachers and students as well as the relationships with parents and partners outside of school. According to the Partnership for 21st Century Skills collaboration is one of several learning and innovation skills necessary for post-secondary education and workforce success.

Until now, the classic “one-person model” has been applied: “one class, one subject, one topic, one goal, one level, one tempo, one method, one grade and (of course) one teacher” (Schley 1998, p. 114). Nowadays in order to deal with the challenges that schools face this needs teamwork and a cooperative activation of all resources and potentials. But cooperation is no automatism, it must be learned, because it is a vital skill.

Roschelle and Teasley (1995, p. 70) define collaboration as “coordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of a problem”. So, cooperation is a key skill for problem solving. The partners have to engage in activities in a coordinated effort to solve the joint problem. By cooperating the participants can explain their understanding to each other and to elaborate and reorganise their knowledge (Van Boxtel, et al., 2000).

According to Dillenbourg (1999, p. 1) collaborative learning is “a situation in which two or more people learn or attempt to learn something together”. That involves not only studying together for a period of time as a “biological and/or cultural process” (Dillenbourg, 1999, p. 4) or in a smaller group for a test but also “learning from collaborative work, which refers to the lifelong acquisition of expertise within a professional community” (Dillenbourg, 1999, p. 4). When interacting with other people one important aspect is negotiability. Teachers and students have to learn that they cannot impose their own opinion on others, but on the contrary they must work with each other and talk to each other for the common goal. For this they have to explain and justify their position and give reasons for it. Collaborative learning encourages the ability to communicate constructively and interact with the partners in prosocial ways, starting from the premise that the contribution of every member of the team is valuable.

## **2.5 Conflict resolution and problem solving related to communication**

Collaborative learning is an important factor for other skills like critical thinking (Bailin et al., 1999; Heyman, 2008; Nelson, 1994; Thayer-Bacon, 2000) and conflict and problem solving (Halpern, 1998; Willingham, 2007).

The conflict as a phenomenon has been an omnipresent object of interaction since the beginning of human existence (Moning-Petersen and Petersen, 2013, p. 204). Conflicts exist at all levels: at the macro level (e.g. between states), at the meso level (e.g. conflicts between social groups) and at the micro level (e.g. family conflicts). So, it's utopic to think about a society and a school without conflicts. The important thing is the form of

dealing with conflicts und searching together for a solution, in which all partners must be involved and listened to. In order to be able to deal with the conflict constructively, an "emotional distance" is often necessary. It is therefore advisable to be sensitive to the right point in time when dealing with the conflict.

Communication is the basis for developing relationships and organising societies. Within the group arise relevant communication patterns and codes that every member of the group are familiar with. "These patterns and codes mark group membership and demarcate boundaries of group membership. Using communication to transcend these boundaries becomes the task of conflict resolution." (Ellis & Maoz, 2003, p. 256)

Even more important than the subject of the conflict are its actual causes, and just as with an iceberg, these causes are often very far-reaching and lie hidden beneath the surface and are related to the experiences, hopes and fears of the people involved. When dealing with conflicts we have to take into consideration also the thinking, imagining, perceiving and at the same time feeling and wanting of all partners. At the same time, one must assume that communication is divided into two levels: the factual level and the relationship level, whereby the later plays a very important role in understanding the other. So, relationship conflicts are often behind factual conflicts. To solve a conflict, one has to tackle the conflict and seek dialogue with the other party.

Just like in every society conflicts can also be found in the whole education systems, and they occur at all its system levels. On one hand, they take place between all school stakeholders (e.g. educational authorities, school administrations, parents, associations, teachers, students and the staff employed in the school system) and in the classroom between teachers and students, between teachers and parents, between students. And because conflicts are often inevitable, we have to see conflicts not only as a burden but as an opportunity for bringing about change and advancement. A conflict resolution requires a communicative approach because it can contribute to understanding the nature of the conflict, in order to handle it fairly, creatively, and especially non-violently. An important task of the school would be to sensitise the students to conflicts and strengthen their social and personal skills. The teachers play a major role in this because their behaviour and the use of effective methods of conflict resolution also make it easier to achieve the goal of joint learning and teaching. Also, other factors like the study of history, language, religion, traditions, values and norms of other groups or nations helps in intercultural understanding and problem-solving, but it is only a starting point.

The emergence of conflicts depends primarily on our ability to communicate. The better humans learn to express themselves (their needs, observations, opinions, expectations, etc.) and to communicate to others, the better they will be able to solve conflicts or even avoid them arising.

## **2.6 Reflection about one's own communication**

We live in a society that largely expresses its communication in terms of guilt and problems, rather than needs and solutions. All our interpersonal problems could be solved through more conscious and benevolent communication, maybe even with ourselves. The first step on the way to successful and authentic communication is an honest reflection on your own communication behaviour.

Self-reflection about communication is the ability to step back from one's own communication experience and look at it in a critical, analytical and non-emotional way (Adams, et. al, 2006). The capacity of self-reflection and self-awareness may be a very important aspect for communication, conflict resolution, problem solving and decision making (Boud, et.al, 1985).

Mezirow explains that "critical reflection may be either implicit, as when we mindlessly choose between good and evil because of our assimilated values, or explicit, as when we bring the process of choice into awareness to examine and assess the reason for making a choice." (Mezirow, 1998, p.186).

In education the methods which facilitate self-reflecting should be developed, to enable self-reflection about one's own communication. Schön (1987, 9.89) means that only learning which significantly influences behaviour is self-discovered, self-appropriated learning.

## **3. Research Questions**

As shown in the literature review above (cf. chapter 2), much is known about sustainability and communication. But little is known about sustainable communication, which refers to intercultural communication, non-violent communication, cooperation, problem solving and reflection. Therefore, our investigation's research questions are:

- Are intercultural communication, non-violent communication, cooperation, problem solving and, reflection statistically related as constructs of sustainable communication?
- Are there any predictors for sustainable communication development?

## **4. Purpose of the Study**

The aim of the study is to explore the sustainable communication in schools from Germany and Romania and to identify its possible predictors.

## **5. Research Methods**

### ***5.1 Participants and procedure***

A number of N = 131 participants was involved in the research conducted, including a number of N = 94 in-service teachers, and a number of N = 36 pre-service teachers. Out of the total number of participants, a number of N = 79 are from Romania, and a number

of  $N = 52$  are from Germany. A slight majority were females (90.2%), 8.3 % were males, and 0.8 did not mention the genre. Mean age was 31.1 years ( $SD = 1.15$ )

The research instruments were applied in the electronic version, using the Google forms, and the participants generally completed the questionnaire in approximately 15 minutes. Participation was voluntary, participants were informed about the confidentiality of any sensitive information and the researchers has obtained informed consent.

Data obtained were statistically analysed using IBM SPSS™ software, and since the research instrument that we used is not standardised, we used a cut-off point of  $-1/+1$  mean standard deviation performed with Visual Binning in SPSS for setting the cut-off points.

### **5.2 Research instruments**

The participants were asked to fill in a survey developed for the purpose of this study. The survey had 31 items designed on a Likert scale with 5 points, where 1 represented strongly disagree and 5 strongly agree. The statements of the scale were designed to assess the sustainable communication through 5 different constructs: intercultural communication, non-violence communication, cooperation, problem-solving regarding the communication process, and reflection.

For measure how accurately our scale taps into the various aspects of the specific constructs that we already mentioned, we consulted 19 independent experts-judges from Universities from Romania, Germany, Belgium, Portugal, Turkey, Spain, and Lithuania. The experts received the scale, in electronic version, and evaluated it considering aspects such as: the relevance of the items, the clarity of the wording, the number of the items. The degree of the agreement between the experts-judges was calculated using *Kendall's W coefficient* = .94 ( $df = 6.00, p > .005$ ). Also, to identify the internal consistency of the scale, we have calculated the *Cronbach's Alpha* = .91. Therefore, taking into consideration the value of Cronbach's Alpha and Kendall's W coefficients, it can be stated that our research instrument is relevant and valid.

### **6. Findings**

In order to identify if the intercultural communication, non-violent communication, cooperation, problem solving, and reflection are statistically related as constructs of sustainable communication, we performed a Pearson Correlation Coefficient and, also a Multiple Regression analyse.

The results showed that some correlations are high and, others of them are medium. But even though not all the correlations are high, we can observe in the Table 1 that all of them are significant ( $p < 0.005$ ). The high correlations that we have found are the correlations between intercultural communication and cooperation ( $r = 0.642, p < 0.005$ ), between nonviolence communication and cooperation ( $r = 0.669, p < 0.005$ ), between problem solving and cooperation ( $r = 0.676, p < 0.005$ ) and between problem solving and

reflection ( $r = 0.609, p < 0.005$ ). Therefore, based on this data we can observe that in three of four cases of high correlations, is strong evidence that the cooperation is laniary related with the others sustainable communications constructs. That means that the higher are the cooperation skills, the higher are the intercultural communications, the non-violence, and the problem-solving skills. Therefore, we can state that cooperation activities can make a significant contribution to schools dealing more effectively and professionally with all the challenges, and thereby improving teaching and learning processes. Of course, the others medium correlations are relevant because they show that there is a statistically significant relationship between sustainable communication constructs.

Table 1: *Persson Correlations of the sustainable communication constructs*

		<i>Intercultural Communication</i>	<i>Nonviolence Communication</i>	<i>Cooperation</i>	<i>Problem Solving</i>	<i>Reflection</i>
Intercultural Communication	Pearson Correlation		.496 <sup>a</sup>	.642 <sup>a</sup>	.511 <sup>a</sup>	.412 <sup>a</sup>
	Sig. (2-tailed)		.000	.000	.000	.000
	N		131	131	131	131
Nonviolence Communication	Pearson Correlation			.669 <sup>a</sup>	.511 <sup>a</sup>	.471 <sup>a</sup>
	Sig. (2-tailed)			.000	.000	.000
	N			131	131	131
Cooperation	Pearson Correlation				.676 <sup>a</sup>	.426 <sup>a</sup>
	Sig. (2-tailed)				.000	.000
	N				131	131
Problem Solving	Pearson Correlation					.609 <sup>a</sup>
	Sig. (2-tailed)					.000
	N					131
Reflection	Pearson Correlation					
	Sig. (2-tailed)					
	N					

As we can observe in the table displayed above, there are significant correlations between all the sustainable communication constructs, but we found also that these constructs are very strong predictors for the sustainable communication development in schools. Therefore, we performed a multiple regression analysis to identify which are the strongest predictors of the sustainable communication.

According with the data presented in Table 2, Table 3, and Table 4, we can state that 94% from the variation of the sustainable communication ( $R^2 = 0.94$ ) is determinate by its mains constructs. In our multiple regression a linear relationship was identified between the criterion variable and the predictors ( $F = 499.53, p < 0.005$ ) which means that the teachers who have high levels of sustainable communication, have also a high level of the intercultural communication ( $Beta = 0.26, p < 0.005$ ), of the non-violence communication ( $Beta = 0.30, p < 0.005$ ), of the cooperation ( $Beta = 0.23, p < 0.005$ ), the problem-solving regarding the communication process ( $Beta = 0.40, p < 0.005$ ), and of the reflection ( $Beta = 0.75, p < 0.005$ ).

Table 2: Model Summary for sustainable communication constructs

<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>
.97	.94	.94	.12

Table 3: ANOVA for sustainable communication constructs

	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Regression	28.71	5	7.18	499.53	.000
Residual	1.81	126	.01		
Total	30.52	130			

Table 4: Coefficients for sustainable communication constructs

	<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>	<i>t</i>	<i>Sig.</i>
	<i>B</i>	<i>Std. Error</i>	<i>Beta</i>		
(Constant)	.04	.09	.00	.47	.000
Intercultural Communication	.20	.02	.26	9.24	.000
Nonviolence Communication	.27	.02	.30	10.93	.000
Cooperation	.18	.03	.23	6.45	.000
Problem Solving	.35	.03	.40	13.34	.000
Reflection	.47	.04	.75	12.94	.000

We have shown above that intercultural communication, non-violent communication, cooperation, problem-solving and reflection are strong and significant predictors of the sustainable communication, because they are its main constructs, but could there be other predictors of the sustainable communication development? Considering the data presented in Table 5, Table 6, and Table 7, we can state that 12% from the variation of the sustainable communication ( $R^2 = 0.12$ ) is determinate by teaching experience of the participants. In our multiple regression a linear relationship was identified between the criterion variable and the predictor ( $F = 9.05, p < 0.005$ ) which means that the teachers who have high levels of sustainable communication, have more teaching experience ( $Beta = 0.30, p < 0.005$ ).

In the multiple regression that we performed, we did not find a significative influence of the age on sustainable communication ( $Beta = 0.06, p > 0.005$ ).

Table 5: Model Summary for sustainable communication predictors

<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>
.35	.12	.11	.46

Table 6: ANOVA for sustainable communication predictors

	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Regression	3.78	2	1.89	9.05	.000
Residual	26.74	128	.21		
Total	30.52	130			

Table 7: Coefficients for sustainable communication predictors

	<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>	<i>t</i>	<i>Sig.</i>
	<i>B</i>	<i>Std. Error</i>	<i>Beta</i>		
(Constant)	3.75	.09	.00	43.46	.000
Age	.03	.06	.06	.43	.668
Experience	.07	.03	.30	2.16	.033

## Conclusions

The exploratory study we conducted revealed important information about the sustainable communication constructs. At the same time, the findings showed some interesting correlations and predictors of the sustainable communication in schools.

More specifically, the intercultural communication, non-violent communication, cooperation, problem solving and, reflection are statistically related as constructs and predictors of sustainable communication. Also, the teaching experience of the participants in the sample is a significant predictor of the sustainable communication, more than age. Those findings lead to the conclusion that sustainable communication is a very important skill in schools and for the education field. Our research results are connected with many others research (Muste, 2016; Docherty, 2014; Morreale & Pearson, 2008; Weheba & Abd El Kader, 2007) who place communication in the centre of the teaching and learning process. Being able to communicate plays an essential role in being an effective educator. Teachers require good communication skills to ensure the goal attainment of teaching-learning in schools. Communication in school is more than conveying information, it is about stimulating critical thinking, modifying attitudes, eliminating stereotypes and thus approves to be sustainable.

Our study has some limitations. First, it is limited by the sample that was a convenient one and was quite small, which negatively could influence the generalisations of the results. Another limitation of our study is small number of the research on sustainable communication, and even if we tried to find as many related studies as possible, it is the validity of the construct may be negatively influenced.

Future research should investigate, on a bigger sample, the possible differences between in-service and pre-service teachers regarding the dynamic process of the sustainable communication. Also, we should experimentally investigate which are the factors that could develop the sustainable communication, and its mains constructs, for the in-service and pre-service teachers.

To conclude, we can argue that the development of the sustainable communication is a very complex process, including skills as intercultural communication, non-violent communication, cooperation, problem solving and, reflection, which influence and predict each other.

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