BeEmotional-Techie

Social and Emotional Learning and Technology: A report on research and best practices

BeEmotional-Techie
Bridges between emotional learning and technology

Erasmus+

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Welcome!

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2. Social and Emotional Learning (SEL) and Technology

By Susana Fonseca

Social and Emotional Learning (SEL) supported by technology amounts to an innovative challenge in the education field from kindergarten to high school.
Regardless of the discussion around the negative impact of using technology, our approach and focus is on the potential and positive impact and enhancement for SEL and learning.
Interaction between the fields of human emotion and learning and digital technology represents a topic of major interest, both nowadays and into the near future.

Within the Be Emotional-Techie project, by deploying SEL and technology, which also promotes wellbeing and academic success, our vision is to prepare today's students for the future in order to impact positively on individuals, families, organizations and society in general.

2.1   SEL

The present report overviews the current state of SEL research and practice with a particular focus on European countries.

What is SEL?

The answer to this question is neither easy nor simple. This complexity is based on different factors, such as the different terms applied to the concept of promoting and developing social and emotional skills, the variation across cultures and geographies, and the lack of consensus over any definition of social and emotional learning (SEL).
As regards the different terms, those common in the literature are "social and emotional learning", "social and emotional education", "social and emotional competencies", "social and emotional skills", "soft skills", and "non-cognitive skills".

One of the mostly frequently used terms, "social and emotional learning", emerged in the USA in 1994 and with this designation since then spread by the Collaborative for Academic, Social, and Emotional Learning (CASEL, 2020).

As we stated above, one of the definitions of SEL most commonly used refers to this as the process through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understanding and managing emotions, setting and achieving positive goals, feeling and showing empathy for others, establishing and maintaining positive relationships, and making responsible decisions (Collaborative for Academic, Social, and Emotional Learning [CASEL], 2005).

Another term commonly applied is "social and emotional skills" as used by the Organisation for Economic Co-operation and Development (OECD, 2015) in their work.
The term "social and emotional education" (SEE) is common in Europe (Cefai et al., 2018), deployed in particular by the NESET network of researchers that advise the European Commission on the social dimensions of education and training.

2.1

Furthermore, the SEE definition also refers to the educational process by which an individual develops social and emotional competences for personal, social and academic growth and development through curricular, embedded, relational and contextual approaches (Cefai et al., 2018).

In the Be Emotional-Techie project, and in the present report, the term we adopt is SEL in keeping with the focus and centrality we wish to place on students and the development of their learning processes. However, the SEE designation can be considered more comprehensive.

From our point of view, SEL represents a process. Any process implies a method, a set of sequential actions with an objective. Thus, SEL is a lifelong approach to the development of competencies. These competencies, which can be learned, are the skills, abilities or knowledge that are appropriately applied in a particular situation, such as to demonstrate empathy or to manage our emotions. We highlight the importance of including these three keywords in the SEL definition: i) process, ii) development, and iii) competencies.

Therefore, the SEL definition must involve two important dimensions: a) acquire, learn or develop, and b) apply or use.

> ## Social and Emotional Learning (SEL)
>
> **The process of developing social and emotional competencies for positive adjustment.**

Within the scope of this project, we understand that Social and Emotional Learning (SEL) is the process of developing social and emotional competencies for positive adjustment.

Concerning the keyword process, in the school context, in accordance with the definition of SEL presented, there is the need to take into consideration that both dimensions – learn or develop and apply or use - are part of a joint process in which one dimension cannot be isolated from the other. This means that the acquisition of a skill per se is not enough, the process of learning how to deploy that skill in an appropriate way and behavior, i.e., its application, is crucial. It is this dimension of appropriate use that differentiates skills (abilities or behaviors) from competencies. We can say that a person has a competency when she/he uses a skill adequately to a specific situation and context.

We will now focus on development, another important keyword in the SEL definition. The approach to development highlights the importance of considering the changes that occur at the biological, physical, neurological, cognitive, social and emotional levels during distinct developmental phases. The development of children and young people can be conceptualized and more easily comprehended from a human bioecological perspective (Bronfenbrenner, 1977).

2.1 Bronfenbrenner's ecological model emphasizes that development should be studied in its ecological context (Bronfenbrenner, 1986). To this end, he developed the bioecological system theory which encompasses four principal components and their dynamic, interactive relationships: (1) Process (the importance of the process, as already mentioned), the interaction between an organism and its environment called proximal processes; (2) Person, biopsychological characteristics including personal and behavioural style; (3) Context, the environment in terms of nested systems which include the family, the school and the neighborhood; and (4) Time, the periods in which processes take place, including developmental stages and changes that occur at puberty (Bronfenbrenner & Morris, 1998)..

In this theory, human development occurs in a set of overlapping ecological systems and focuses on an individual's relationship with in his/her social context (Bronfenbrenner, 1979). All these systems cooperate to influence what a person becomes as he/she develops. Bronfenbrenner (1979) suggests that an individual develops within a context or ecology.

In the present project, the principal context to consider is the school but not exclusively. According to this model, we also include the student (Person) surrounded by microsystems (e.g., student–family, student–peers, student–school and student–neighborhood) and the relationship between the student and each of the contexts (Process). Other systems are also involved (Context), e.g., the relationship between the school and the family, the school and the community (known as the mesosystem), the community social networks (known as the exosystem), and the culture, norms, lifestyles, political and educational systems (known as the macrosystem). The macrosystem is of particular interest due to the different partners involved in the project, which will allow for the addressing of cultural factors. The development of a student will also be influenced by the chronosystem or temporal changes (Time), such as school entry, moving school, puberty).

Based on this theory, SEL can be seen as a fundamental process that affects the positive ecological development of children and young people.

Next, our attention goes to the competencies, the third crucial keyword in our definition of SEL. In order to help systematize the different terms and definitions, the concept of social and emotional competence can be grouped in two domains: intrapersonal and interpersonal competencies (Domitrovich et al., 2017) or Self and Others (Cefai et al., 2018). It now seems important to us, as we already differentiate skill from competency, to clarify the difference between competency and competence. A competence implies an evaluative judgment, by oneself or by observers, regarding the adequacy of performance. This idea of competence as an evaluation is used for social competence (McFall, 1982).

Returning to the competencies, firstly, the CASEL framework proposes the development of five core SEL competencies (CASEL, 2003), such as Self-awareness, Social awareness, Responsible decision making, Self-management, and Relationship management. Both self-awareness and self-management are intrapersonal and social awareness and relationship management are interpersonal. In each category, a set of skills can be detailed to provide exemplification:

○ Self-awareness includes identifying and recognizing emotions; accurate self-perception, recognizing strengths, needs, and values; self-efficacy; and spirituality;

○ Social awareness consists of perspective-taking; empathy; appreciating diversity; and respect for others;

○ Responsible decision making involves problem identification and situation analysis; problem solving; evaluation and reflection; personal, moral, and ethical responsibility;

○ Self-management incorporates impulse control and stress management; self-motivation and discipline; goal setting and organizational skills;

○ Relationship management embraces communication, social engagement, and building relationships; working cooperatively; negotiation, refusal, and conflict management; help seeking and providing.

2.1 Secondly, another framework (Cefai et al., 2018) suggests four categories, based on two domains (self and others) and on two dimensions (awareness and management): self-awareness, self-management, social awareness, and social management.

Thirdly, the OECD proposes a framework for social and emotional skills (OECD, 2015), which presents three categories: achieving goals (responsibility, persistence and perseverance, locus of control, self-efficacy), working with others (extraversion, sociability, adaptability) and managing emotions (reactivity, mood, self-confidence, self-esteem). On page 35 of the report, the OECD defines social and emotional skills as "individual capacities that can be (a) manifested in consistent patterns of thoughts, feelings and behaviours, (b) developed through formal and informal learning experiences, and (c) important drivers of socioeconomic outcomes throughout the individual's life". More recently, the OECD selected a set of social and emotional skills for their study on social and emotional skills, based on the Big Five personality dimensions (Chernyshenko et al., 2018): Task performance (conscientiousness) includes skills as achievement orientation, responsibility, self-control, and persistence; Emotional regulation (emotional stability) includes stress resistance, optimism, and emotional control; Collaboration (agreeableness) includes empathy, trust and co-operation; Open-mindedness (openness to experience) includes curiosity, tolerance and creativity; Engagement with others (extraversion) includes sociability, assertiveness and energy; and Compound skills includes self-efficacy, critical thinking/independence, self-reflection/meta-cognition.

Seeking to integrate the competencies in the developmental approach, the competence is acquired through the development of skills learnt by context- and cultural-related experiences with others (Lau & Wu, 2012). In line with this, we can argue that the person can learn specific competencies by interpersonal and social interactions.

In the Be Emotional-Techie project, we will adopt an integrative proposal, taking into consideration the literature on both the fields of social competence and emotional competence. Social and emotional competence are closely interconnected.

The following models are references to consider.
In the field of social competence, the social competence prism model (Rose-Krasnor, 1997) is a multilevel framework incorporating theoretical, index and skills levels of analyses. The quadripartite model of social competence proposed by Felner and colleagues (Felner et al., 1990) presents four core elements of competence, not limited to social interactions but across multiple domains of functioning, namely:

1. Cognitive skills and abilities for cultural and social knowledge that includes as examples academic skills and abilities, decision-making ability, processing of information;

2. Behavioural skills comprehend the knowledge and the ability to execute behavioural responses, such as assertiveness, perspective taking, conversation skills, negotiation;

3. Emotional competencies involve coping and affective regulation;

4. Motivational and expectancy sets refer to value structure, moral development and sense of efficacy and control.

The social learning theory (Bandura, 1986) proposes that imitation, reinforcement and modelling influences children's social learning. This theory includes the notion of self-efficacy, which is related to self-awareness and social awareness.

2.1 In the field of emotional competence, Saarni's work is fundamental. She defines emotional competence as the functional capacity wherein a human can reach their goals after an emotional-eliciting encounter and argues that emotional competence is contextually anchored in social meaning (Saarni, 1999). She proposes eight skills as components of emotional competence:

- being aware of one's own emotions,
- discerning and understanding others' emotions,
- using the vocabulary of emotion and expressions,
- having the capacity for empathic involvement,
- differentiating internal, subjective emotional experience from external, emotional expression,
- coping adaptively with aversive emotions and distressing circumstances,
- being aware of emotional communication within relationships, and
- possessing the capacity for emotional self-efficacy.

In another proposal, emotional competence comprises three components: emotional expressiveness, emotion knowledge, and emotion regulation (Denham et al., 2003).

More recently, increasing attention has been given to emotion comprehension, that embraces emotion knowledge. As an example, the Test of Emotion Comprehension (Pons & Harris, 2000) assesses nine components of emotional understanding.

Finally, we will look at positive adjustment, the last two important keywords in the SEL definition. The term adjustment can serve as a process or as an outcome.
Through SEL, children and young people are able to define and achieve positive goals, feel and demonstrate empathy for others, establish and maintain positive relationships.

On page 2 of the paper "Social-emotional competence: An essential factor for promoting positive adjustment and reducing risk in school children" (Domitrovich et al., 2017), the authors argue that intrapersonal skills (e.g., realistic goal setting, positive mindsets, self-control, emotion regulation, and coping strategies) are those that are needed for globally effective functioning as an individual, whereas interpersonal skills (e.g., listening, communication, perspective taking, negotiation, and social problem solving) are those that are needed to interact successfully with others.

Another paper (Lau & Wu, 2012) comments on emotional competence as a good predictor of one's sense of subjective well-being.

Why is SEL important?

Based on the scientific literature, we can state that children who become skilled at SEL improve their relationships with others and also enhance their academic success. The efficiency of the SEL process in emotional outcomes increases whenever taking place with young children in early childhood classrooms. SEL is also an effective way of reaching young children and youth who are most vulnerable (e.g., problem behavior). Several studies have demonstrated the positive impact of SEL programs. The outcomes most referred to (Durlak et al., 2011) are cognitive, affective, and social skills (e.g., identifying and recognizing emotions, empathy, goal setting, perspective taking, interpersonal problem solving, conflict resolution, decision making), positive attitudes toward self and others (e.g., self-perceptions such as self-esteem, self- concept, and self-efficacy, school bonding such as attitudes toward school and teachers, and pro-social beliefs about violence, helping others, social justice, and drug use), positive social behaviors (e.g., getting along with others), conduct problems (e.g., disruptive class behavior, noncompliance, aggression, bullying, school suspensions, and delinquent act), emotional distress (e.g., depression, anxiety, stress, or social withdrawal), and academic performance (including standardized reading or maths achievement test scores and school grades).

2.1   SEL Benefits:

- SEL competencies
- Attitudes toward self and others
- Positive social behavior
- Academic performance

- Conduct problems
- Emotional distress

The results of meta-analysis conducted to review several school-based programs, revealed a positive impact on enhancing students' social and emotional learning (Durlak et al., 2011). The findings from the SEL participants - students – from kindergarten to high school –, after intervention and compared to controls, demonstrated better SEL skills, attitudes, positive social behavior and academic performance, and fewer conduct problems and lower emotional distress. In the same study, the follow-up effect sizes, at least six months after the intervention, remained significant for all the six outcomes referred above.

Looking at the data in greater detail (Durlak et al., 2011), we find that regarding positive social behavior, it is very interesting to see that the results of this outcome are still higher when the data are from other sources (parent, teacher, observer, school records) and not self-reported by students. Furthermore, as regards SEL skills, the lower the mean age of participant students and the longer the duration of the program, the greater are the results of the SEL skills. Additionally, academic success can be improved by 11% when the control group participates in an SEL program.

The benefits of SEL are highlighted by several authors (Cefai et al., 2018; Durlak et al., 2011; Greenberg et al., 2017; Mahoney et al., 2018; Oberle et al., 2016; Weare & Nind, 2011; World Economic Forum, 2016) and they refer to the enhancement of social and emotional competencies, the improvement of prosocial behavior and positive attitudes and behaviors toward self and others and school, decreases in conduct and emotional problems, better academic performance, and well-being.

Some of these authors (e.g., (Mahoney et al., 2018) make a distinction between short-term outcomes (positive attitudes toward self and others) and long-term outcomes (positive behavior, academic success, mental health).

Furthermore, these positive impacts and evidence of the benefits of SEL have been reported across various countries, cultural contexts and socio-economic backgrounds (Cefai et al., 2018; Greenberg et al., 2017; Taylor et al., 2017; World Economic Forum, 2016).

Nevertheless, recent meta-analysis to clarify the effectiveness of interventions adopting a whole school approach to enhancing social and emotional development (Goldberg et al., 2019), concludes that the intervention effects, at post-intervention, were significant only for social and emotional adjustment (social or emotional skills, and attitudes toward self and others), behavioural adjustment (positive social behavior, conduct problems, victimization, and risky behavior), and internalizing symptoms (reducing psychopathology, such as depression and anxiety, and also feelings of wellbeing). The effect for school performance (academic achievement, for example reading achievement scores or the teacher rated academic competence) did not attain significance. This finding in particular, there is no impact from the intervention on academic performance, runs contrary to the already reported result from another meta-analysis (Durlak et al., 2011) , which refers to an 11% gain in academic success.

However, SEL is not important only for students, there is also evidence that SEL brings benefits for teachers (Cefai et al., 2018; Oberle et al., 2016). Some examples are the decrease of time spent on classroom management and stress levels, and improvements in their skills, level of teaching efficacy, confidence, personal accomplishment, and job satisfaction.

In keeping with the literature review, we can conclude that the benefits of SEL are greater success in school and in everyday life.

2.1 | Promoting SEL in schools

The role of schools in promoting SEL is a key factor for the academic success of children (Zins et al., 2007) but also for their success in life. Schools must adopt a whole-school approach that has returned evidence of being effective for SEL (Goldberg et al., 2019). This approach considers the individual, the classroom and the school level of actions, and according to the World Health Organization, students, teachers, parents and the wider school community are also engaged (World Health Organization, 1997).

A framework for integrating SEL (Cefai et al., 2018) proposes eight key components:

- Curriculum - SEL needs integrating into the curriculum.

- Climate - Approach to SEL where social and emotional competences are acquired through skills instructions in a classroom and whole-school climate.

- Early intervention - SEL implemented in early school years (e.g., kindergarten) is more effective.

- Targeted interventions - SEL as a universal intervention program is effective for all children and young people. However, children at risk may benefit from targeted interventions, that include students, parents and teachers, who actively participate in the process.

- Student voices - Students play an active role in the planning, implementation, monitoring, and evaluation of SEL programs, both at the classroom and whole-school level.

- Staff competence and wellbeing - SEL, using a whole-school approach, takes into account the teachers', staff', and parents' competences and wellbeing. Teacher education and mentoring is also considered.

- Parental collaboration - Engaging parents is a SEL goal, where they are perceived as active and collaborative partners.

- Quality implementation and adaptation - SEL programme effectiveness is dependent on quality criteria, such as the needs analysis of the context, planning, monitoring, sustainability, and culturally responsive adaptation.

In the school setting, explicit instruction of SEL competencies (Durlak et al., 2011; Herman & Collins, 2018) is one of the steps that schools should take to implement SEL. Several studies point that SEL competencies need to be explicitly taught, delivered over time, from preschool through higher education (Oberle et al., 2016). But furthermore, the continual rehearsal and practice of these skills, in the school, family and community, with peers, teachers, parents and administrators, will give students the opportunity to apply them, across contexts, and thereby generalize the SEL competencies. The explicit instruction is usually proposed in stand-alone programs presented during or after school.

Another essential step includes the integration of SEL into the curriculum (Herman & Collins, 2018). The curriculum also needs to consider a SAFE strategy (Cefai et al., 2018).

The SEL programs that followed and used the four training procedures or the four SAFE practices – Sequenced, Active, Focused, and Explicit (see https://casel.org/what-is-sel/approaches/) – related to skill development, and interventions without implementation problems - e.g., when staff failed to conduct certain parts of the intervention or unexpected developments altered the execution of the program - demonstrated significant effects for all the six outcomes analyzed in the meta-analysis (Durlak et al., 2011). Based on these results, the authors concluded that SEL programs must be well-designed (SAFE practices) and well-conducted or well-executed (without any implementation problems).

2.1

An additional measure reflects the creation of a SEL supportive environment (Durlak et al., 2011; Herman & Collins, 2018). One of the facilitators factors for implementing SEL programmes in schools is the commitment of the whole school community (Cefai et al., 2018).

A different action that allows all staff to engage is the training provided (Herman & Collins, 2018) to build the expertise and knowledge for promoting SEL. The training for teachers includes initial training and ongoing support.

Another determinant step is the involvement of families and the community (Herman & Collins, 2018). Engaging with parents is essential to achieving SEL goals. Parents also develop their own social and emotional competencies and wellbeing. However, top-down approaches to engaging parents and the community are not efficient (Cefai et al., 2018). These strategies can include newsletters, meetings, take-home materials.

Thus, schools must adopt strategies to engage parents, such as sharing responsibilities, and participation in learning activities. In a meta-analysis including 45 studies (Goldberg et al., 2019), the results showed that one of the intervention characteristics of the whole school interventions that returns a significant impact on the social and emotional adjustment of participants is the inclusion of a community component.

From the variety of programs available, only a few offer continuous and comprehensive approaches that address all core SEL competencies.

The best SEL programs, because they demonstrated evidence of their efficiency, feature the following most relevant characteristics (Zins et al., 2007):

- Implemented progressively, according to each year of schooling
- School climate
- Lessons with developmentally appropriate contents
- Teaching specific social and emotional skills.

Those skills vary across programs (e.g., (CASEL, 2003; Zins et al., 2007), for example:

- Self-management
- Self-awareness
- Social awareness
- Decision making
- Relationship skills
- Empathy
- Perspective taking
- Cooperation

The Wisconsin three SEL domains, from pre-kindergarten to adulthood (Herman & Collins, 2018) include: emotional development, self-concept, and social competence. This proposal incorporates the five CASEL domains. The 24 competencies are presented in grade bands.

A comparison between 213 school-based universal interventions to promote SEL (Durlak et al., 2011) concludes that 56% were delivered to elementary-school students (kindergarten to fifth grade), 31% included students from grade 6 to 8, and only 13% involved grade 9 to 12 students. Additionally, 53% of SEL programs were classroom-based and delivered by teachers, 77% of the programs lasted less than one year, and the median number of sessions was 24.

2.1

Another important issue revealed by a comparison of studies with successful SEL programs is the school staff. According to the meta-analysis results (Durlak et al., 2011), the classroom-based, administered by regular classroom teachers, program intervention format was effective in six outcomes (improved SEL skills, attitudes, positive social behavior, academic performance, and reduced conduct problems, emotional distress), but when delivered by non-school personnel (e.g., university researchers or outside consultants), the effectiveness decreases to three outcomes (improved SEL skills, attitudes, and reduced conduct problems), and the multi-component programs (usually supplemented teacher intervention classroom activities with a parent component and/or school wide initiatives) delivered by school staff were effective in four outcomes (improved attitudes, academic performance, and reduced conduct problems, emotional distress). A very interesting result from which it seems important to highlight how "Student academic performance significantly improved only when school personnel conducted the intervention" (Durlak et al., 2011, pp. 10).

This characteristic was also achieved in other studies that demonstrate the importance of the way the program is implemented.

The quality of implementation (Goldberg et al., 2019) plays a decisive role in achieving the desired goals and results of the interventions. The quality of SEL implementation (Cefai et al., 2018) considers school planning and implementation, teacher preparation and support, addressing the diversity of students and contexts, and balancing the adaptation of programmes with fidelity.
From all the information presented and all the results achieved in the various studies, we can conclude that to implement SEL programs in schools, the intervention features that the best and most efficient results have incorporated are the following:

1 The structured intervention program should be delivered by the school staff.

2 Classroom-based SEL programs is one mandatory component of the intervention format.

3 Opportunities to promote the social and emotional competencies: self-awareness, self-management, emotion regulation, empathy, cooperation, communication and responsible decision making.

2.2 SEL through technologies

Based on the research available, there is the evidence to endorse positive results when applying technologies to pedagogical approaches to support learning.
The use of interactive technologies demonstrated very interesting results in the promotion of specific behaviors, such as empathy, and playing videogames for purposes other than mere entertainment (called serious games) has already proven to be an exceptional tool for learning and a way of training how to apply the skills in the real world (Raminhos, Carvalhosa et al., 2015).

Nevertheless, more rigorous research is needed in Europe. Such research can offer data and evidence able to define, support and guide European Union policies and practices for the promotion of SEL through technologies.

A second-order meta-analysis about the impact of technology on learning (Tamim et al., 2011) found a significant positive effect size supporting the utilization of technology in formal academic contexts when compared to more traditional means of instruction such as technology free.

In the same study, when considering the primary purpose of technology usage, the results revealed that support for instruction (e.g., the use of word processors and simulations) was significantly higher than direct instruction (e.g., computer-assisted instruction and computer-based instruction.

> "In other words, the average student in a classroom where technology is used will perform 12 percentile points higher than the average student in the traditional setting that does not use technology to enhance the learning process."

> "The suggestion that one of technology's main strengths may lie in supporting students' efforts to achieve rather than acting as a tool for delivering content."

This research must include more empirical testing to cast light on the specific characteristics of which technologies improve learning (Stern et al., 2015).

However, factors such as goals of instruction pedagogy, teacher effectiveness, subject matter, age level, fidelity of technology implementation may have more powerful influences on effect sizes than the nature of the technology intervention itself (Tamim et al., 2011).

Regarding SEL, several organizations are using technology to support SEL program delivery, in addition to professional development, and to cultivate community (Stern et al., 2015).

Concerning teacher training as a way to impact students, many SEL organizations have deployed webinars, podcasts, video conferencing, online libraries, and discussion boards to support online training, and they also provide teachers with access to online resources and support materials, such as content, lesson plans, online discussion forums, social media, research, assessment tools, teaching tips, best practices and skills-building strategies (Stern et al., 2015).

A smaller number of SEL organizations are using online professional development, online learning communities for teachers and for students with adaptive learning technologies, and SEL-focused online games and mobile apps (Stern et al., 2015).

2.2 The following are some examples, which does not intend to be exhaustive, on the usage of technology to support SEL development:

- Self - Awareness: Mood Meter /https://moodmeterapp.com)

- Self-management: Emodiscovery is a multiplatform online serious game, which evaluates different emotional regulation strategies (Pacella & López-Pérez, 2018).

- Social awareness: Crystals of Kaydor aims at teaching children prosocial behaviors, including recognizing the emotions of others (https://learninggamesnetwork.org/microsites/kaydor/).

- Relationship skills: Game ORIENT aims at educating adolescents about intercultural empathy (Lim et al., 2011)

- Responsible decision making: SIREN project aims at developing a serious game which educates young people on how to resolve conflicts (Berger et al., 2012).

According to Stern et al. (2015), the potential technology to enhance SEL in the future involves SEL-focused video games and mobile apps, simulation centers (avatars and embodied agents; multimodal sensors, that measure skin conductance, track eye movements, electro-encephalic measurements, facial expression recognition; biofeedback), and current technologies with potential adaptation for SEL (social media sites, texting, digital media cartoons, graphic novels).

Digital technology can support the embedding of learnt skills into other settings in two ways (Slovák & Fitzpatrick, 2015): i) extending the learning support and scaffolding for learners beyond the SEL lessons (e.g., identification of teachable moments, structure to support training as reminders); and, ii) facilitating a wider community of support for learning social and emotional skills (e.g., peer support and parent and teacher involvement).

Therefore, understanding the relationships between emotion, social interactions and technological innovation is indeed a challenge!

2.3   SEL - Tech challenges

In Europe, the European Network for Social and Emotional Competence (ENSEC, 2020) has as its mission the development and promotion of evidence-based practice in social and emotional competence and resilience among students.

In the United States of America, the mission of Collaborative for Academic, Social, and Emotional Learning (CASEL, 2020) is to make evidence-based SEL an integral part of education, from preschool through high school.

Thus, one of the SEL challenges is the partnerships and collaborative work between SEL organizations around the world. Sharing ideas, projects, know-how, best-practices and discussing what we know, what we don't know, and what we want to know can be beneficial for all the students and their social and emotional learning. Partnerships between SEL organizations and other types of organizations are also important, such as higher education institutions, enterprises, local authorities, etc.. Building together the "ecosystem of social and emotional learning and technology", highlights the major actors, factors, contexts, processes that contribute to the success and well-being of children and young people from different geographies and backgrounds.

Figure 1 (below) represents the ecosystem proposed. In the middle are the persons or the actors directly involved in the SEL process, namely students, parents, teachers, school leaders, school staff, professionals working in or with schools, and members of the community surrounding the school context.

In the school context are the key components to implement an SEL framework, namely the active involvement and engagement of all the actors, integration into the curriculum, training and ongoing support for teachers, explicit instruction of SEL competencies, the positive whole-school climate, and the quality implementation of the interventions.

More broadly, in the societal context are the digital technologies and technological innovations, the partnerships between different organizations, the use of social media to communicate and as a support system, and policies that promote and support SEL.
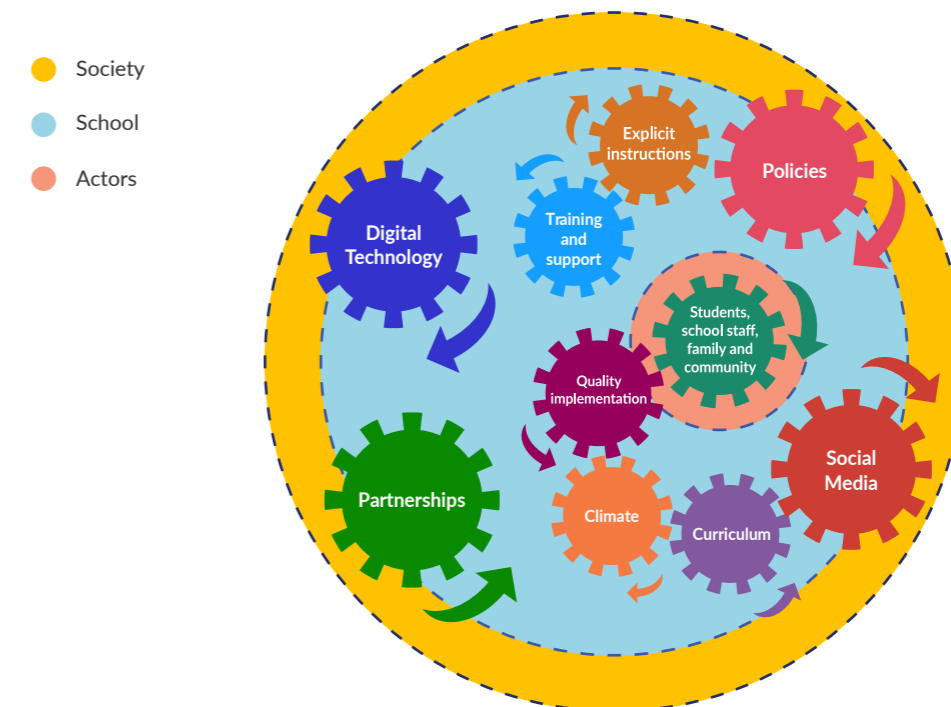
- Society
- School
- Actors

Figure 1. Ecosystem of social and emotional learning and technology

2.3 According to the program Social and Emotional Learning: A Global Synthesis (Salzburg Global Initiative, 2018) – that is part of Salzburg Global Seminar's series on Education for Tomorrow's World, at the global level, the three most frequently cited barriers (or challenges) to SEL relate to teacher preparation, curriculum design, and SEL measurement and assessment.

At Be Emotional-Techie, we believe that learning through technology and play is one key agent to build on social and emotional competencies.

The purpose of the Be Emotional-Techie project is to link research, best practice and innovative learning strategies (play-based learning, peer learning, collaborative learning, and partner learning) with education technology and use technological resources (Internet, multi-media) in order to:

1. Create a platform to support both children and teachers, and other users, to implement the social and emotional learning program, where all outputs produced by the project will be available and including a backoffice for recording the data of all users;

2. Based on a Research report, adapt an "Emotional Competencies" methodology. Training will be provided to teachers and other professionals (e.g., psychologists, school mediators);

3. Develop a cross-national training course for teachers to support platform utilisation and to implement the methodology. A practical implementation manual (e.g., for teachers, psychologists) will be launched;

4. Draft an evaluation protocol, with a qualitative research methodology – focus group – with children, complemented by a quantitative methodology – measurement instruments (e.g., self-report questionnaires);

5. Create a "Emotechie Serious Play" tool to develop and promote social and emotional learning in students from 5 to 14 years old. A children's manual will also be released. A randomized control trial will be performed to evaluate this tool.

2.3 The Emotechie Serious Play tool will incorporate several serious games that support the Social and Emotional Learning (SEL) of children and adolescents.

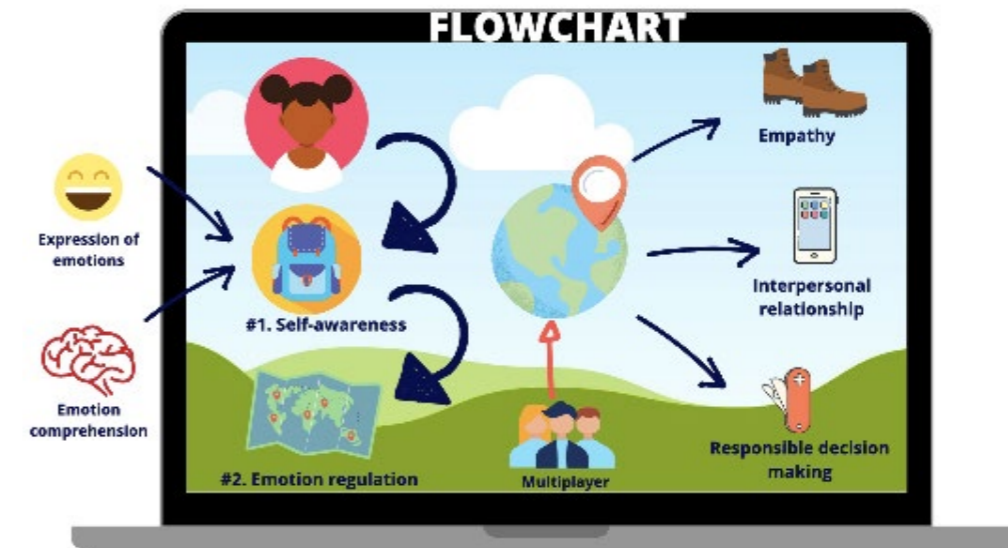The Emotechie Serious Play flowchart is presented below:

Figure 2. Emotechie Serious Play: flowchart

The Emotechie Serious Play tool aims to promote the following social and emotional competencies:

1. Self - awareness

2. Emotion regulation

3. Empathy

4. Interpersonal relationship (including communication and cooperation)

5. Responsible decision making

Through the serious games, these competencies, organized sequentially and with different levels of complexity, are learned and trained by children.