Effectiveness of Online Multimedia Courses for Improving Children's Self-regulation Through Social-Emotional Learning

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Abstract. This study determined the effectiveness of an online multimedia social-emotional learning (SEL) course through quantitative analyses (with respect to interaction, trust attachment, competitive hostility, and conflict dominance) and qualitative interviews. In total, 17 fourth-grade students from the same class participated. Their data were analyzed using nonparametric tests in SPSS 22.0, and the children were interviewed about how they regulated their emotions and interacted with their peers. According to the quantitative results, after the SEL course, students exhibited improvement in the positive aspects of their interpersonal relationships (with respect to interaction and trust attachment) but not the negative aspects (with respect to competitive hostility and conflict dominance). The interviews indicated that the students were more emotionally aware and had better relationships with their peers after the SEL course. In general, the results indicate the effectiveness of online multimedia SEL courses.

Keywords: Online multimedia course · Self-regulation · Social Emotional Learning · E-learning

1 Introduction

Social-emotional learning (SEL) is a process that involves the student's knowledge, attitudes, and skills; the aim in SEL is for the student to be able to manage their emotions, feel and demonstrate empathy toward others, establish and maintain supportive relationships, and achieve personal and collective goals. The Collaborative for Academic, Social, and Emotional Learning (CASEL) identifies five core competencies that SEL must develop [1]:

1. Self-awareness: The ability to understand one's own emotions, thoughts, and values and how they influence behavior across contexts.
2. Self-management: The ability to manage one's emotions, thoughts, and behaviors effectively in different situations and to achieve one's goals and aspirations.

3. Social awareness: The ability to understand the perspectives of and empathize with others, including those from diverse backgrounds, cultures, and contexts.
4. Relationship skills: The ability to establish and maintain healthy and supportive relationships and to effectively navigate settings involving diverse individuals and groups.
5. Responsible decision making: The ability to make caring and constructive choices about how one behaves and interacts with others in a variety of situations.
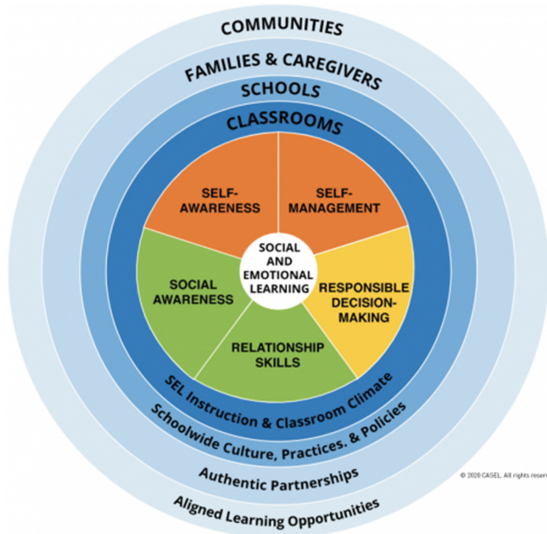

Fig. 1. CASEL (https://drc.casel.org/what-is-sel%20%20/).

The CASEL action framework also emphasizes that SEL occurs outside the classroom, in the family and community [2]. Durlak, Weissberg, Dymnicki, Taylor, and Schellinger [3] reported that relative to students who did not, students who participated in SEL courses had better academic performance and classroom behavior; were more capable of managing depression; and had a better attitude toward themselves, others, and their school. Taylor, Oberle, Durlak, and Weissberg [4] observed that the influence of SEL lasted long after students had attended classes on the subject. Specifically, at 18 years after their last SEL course, students who had taken SEL courses learned, behaved, and handled emotional distress better than their peers who had not; they were also less likely to abuse drugs.

Digital learning involves using the Internet to help students learn better [5]. E-learning allows students to freely choose when and where to engage in learning, and it can be flexibly adapted to any learning plan [6]. Bryant, Campbell, and Kerr [7] demonstrated that a technology-centric flexible learning course provided an effective learning environment for students. Dawson, Ven, and Gunter [8] investigated lower-grade students with emotional behavior disorder; they found that the students had better reading

accuracy when reading from a computer and when the teacher read to them than when reading a physical book on their own. In general, computers helped these children with emotional behavior disorder learn better and afforded them the convenience to learn whenever they wished to, without the constraint of a timetable.

Considering the aforementioned context, in the present study, we evaluated how much an online multimedia teaching program improved self-regulation in children as part of SEL.

2 Method

In this study, we used two TV programs, "When We Are Together" [9] and "Children Together+" [10] from Da Ai TV Station in Taiwan, because they helped cultivate the five SEL competencies, doing so through games and discussion.

2.1 Participants

This study's participants were 17 fourth-grade students (5 boys and 12 girls, mean age = 10 years). They were in the same class and were enrolled in a music class for musically talented students.

2.2 Procedure

The study implemented a 40-min online multimedia SEL course over 8 weeks. In the course, students viewed videos online and teachers discussed with students about how to manage emotions.

3 Measurement

This study administered the Peer Adaptation Scale [11] before and after the 8-week course to analyze the effectiveness of the SEL course. The scale has 43 items over two dimensions: the positive relationship dimension, comprising the subscales interaction and trust attachment, and the negative relationship dimension, comprising the subscales competitive hostility and conflict dominance (four subscales in total).

4 Result

4.1 Quantitative Analysis

In this study, nonparametric tests were conducted to compare the pretest and posttest results with respect to the four subscales and two dimensions. The means and standard deviations of the data are reported in Table 1.

Table 1. Descriptive statistics of pretest and posttest results for the peer adaptation Scale (N = 17)

Subscale	Pretest M(SD)	Posttest M(SD)	Z-value
Interaction	41.94(6.35)	45.00(4.34)	−2.01*
Trust attachment	39.18(5.74)	42.00(5.40)	−2.16*
Positive relationship	**80.18(11.93)**	**87.00(9.37)**	**−2.36***
Competitive hostility	20.24(5.37)	20.35(5.44)	−0.23
Conflict dominance	16.88(3.52)	16.18(4.52)	−0.63
Negative relationship	**37.12(8.14)**	**36.53(8.47)**	**−0.06**

$^{*}p < .05,$ $^{**}p < .01$

With respect to the subscales, students obtained higher scores for the interaction subscale at the posttest (mean [M] = 45.00, standard deviation [SD] = 4.34) than at the pretest (M = 41.84, SD = 6.35), and this difference was also present in a test of interaction (Z = − 2.01, p = 0.45). Similarly, students obtained higher scores for the trust attachment subscale at the posttest (M = 42.00, SD = 5.40) than at the pretest (M = 39.18, SD = 5.74); this difference was significant (Z = − 2.16, p = 0.03). However, the posttest and pretest scores did not significantly differ with respect to the competitive hostility subscale (posttest: M = 20.35, SD = 5.44; pretest: M = 20.24, SD = 5.37) or conflict dominance subscale (posttest: M = 16.18, SD = 4.52; pretest: M = 16.88, SD = 3.52).

With respect to the dimensions, students received higher scores for the positive relationship dimension at the posttest (M = 87.00, SD = 9.37) than at the pretest (M = 80.18, SD = 11.93); this difference was significant (Z = − 2.36, p = 0.018). However, the posttest and pretest scores did not significantly differ with respect to the negative relationship dimension (posttest: M = 36.53, SD = 8.47; pretest: M = 37.12, SD = 8.14).

The Wilcoxon signed-rank test was conducted (Table 2). With respect to the interaction subscale, nine (M rank = 7.17) and three (M rank = 4.50) students scored higher and lower, respectively, at the posttest than at the pretest. Regarding the trust attachment subscale, 13 (M rank = 9.38) and 4 (M rank = 7.75) students scored higher and lower, respectively, at the posttest than at the pretest. Thus, with respect to the positive relationship dimension, 12 (M rank = 9.46) and 4 (M rank = 5.63) students scored higher and lower at the posttest, respectively, than at the pretest.

With respect to the competitive hostility subscale, eight (M rank = 6.69) and six (M rank = 8.58) students scored higher and lower, respectively, at the posttest than at the pretest. Regarding the conflict dominance subscale, nine (M rank = 7.89) and six (M rank = 8.17) students scored higher and lower, respectively, at the posttest than at the pretest. Thus, with respect to the negative relationship dimension, eight (M rank = 9.06) and eight (M rank = 7.94) students scored higher and lower, respectively, at the posttest than at the pretest.

Table 2. Wilcoxon signed-rank test ($N = 17$)

Subscale	Ranks	N	Mean rank	Sum of ranks
Interaction	Negative ranks	3	4.50	13.50
	Positive ranks	9	7.17	64.50
	Ties	5		
Trust attachment	Negative ranks	4	7.75	31.00
	Positive ranks	13	9.38	122.00
	Ties	0		
Positive relationship	**Negative ranks**	**4**	**5.63**	**22.50**
	Positive ranks	**12**	**9.46**	**113.50**
	Ties	**1**		
Competitive hostility	Negative ranks	6	8.58	51.50
	Positive ranks	8	6.69	53.50
	Ties	3		
Conflict dominance	Negative ranks	6	8.17	49.00
	Positive ranks	9	7.89	71.00
	Ties	2		
Negative relationship	**Negative ranks**	**8**	**7.94**	**63.50**
	Positive ranks	**8**	**9.06**	**72.50**
	Ties	**1**		

4.2 Qualitative Analysis

After they had undergone the online multimedia SEL course, the students were interviewed regarding how they manage their emotions and interact with others. The interview helped students reflect on the differences between various methods of emotional regulation and approaches to peer interaction.

The students stated the following regarding breathing deeply as a means to calmly regulate their emotions, which they learned in the SEL course.

- *Deep breathing is a good way, because it helps me regulate my emotions. Chatting is also a good method, because I can forget about bad things. (S01)*
- *I take a deep breath and calm myself down, and I focus on doing things that I like to do. (S08)*
- *When I get angry, I think about it for 6 s before doing something. (S17)*
- *The students also stated that they interacted more with their peers after attending the SEL course.*
- *I learned to use empathy to communicate with my classmates. Being able to empathize with others makes others feel better, and it also helps me have better interpersonal relationships. (S03)*

– *I learned how to be aware of the emotions of myself and others, which improves my relationships with others. (S05)*

In general, after the SEL course, the students had learned the emotional regulation technique of deep breathing and felt that they had better interpersonal relationships.

5   Discussion

This study explored the improvements in students' interpersonal relationships and emotional regulation ability after an online multimedia SEL course. According to the quantitative results, the course was associated with an improvement in the positive aspects of interpersonal relationships (specifically, interaction and trust attachment) but not with improvement in the negative aspects of interpersonal relationships (specifically, competitive hostility and conflict dominance). We surmise that this lack of improvement was due to the participants being musically talented students who had weekly music tests and who played in an orchestra; this resulted in a competitive environment.

According to the qualitative results, the students gradually became more aware of their emotions during the 8-week course. They acted less on impulse and learned how to breathe deeply and calm down when agitated. In the class, acts of reciprocal altruism became more frequent in addition to positive, empathetic interactions overall. Thus, the results indicate that the online multimedia SEL course is effective.

5.1   Theoretical Implications

This study used a novel, online multimedia approach to SEL courses. An online multimedia format enables students to construct ideas and provide feedback. This study focused on student-centered e-learning and emphasized self-directed emotional regulation and development.

5.2   Practical Implications

Teachers should adopt online multimedia approaches to SEL, especially considering how distance learning has become the norm during the COVID-19 pandemic and how it has the inherent advantages of being accessible anytime and anywhere. The online multimedia SEL course implemented in this study enhanced the positive aspects of the students' interpersonal relationships. However, the courses did not lessen the negative aspects of the students' interpersonal relationships. Future studies can devise approaches to address such an imbalance by, for example, implementing an SEL course over a longer period.

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