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Efficacy of Systemic SEL Intervention 'acSELerate' on Students' SEL Development: Evidence from a Field Study

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Abstract: *This study evaluates the effectiveness of a systemic SEL intervention – acSELerate on development of student Social and Emotional Learning (SEL) competencies. A non-equivalent randomized design was used to conduct the study in the Kasturba Gandhi Balika Vidyalaya (henceforth KGBV) of Vikarabad district, Telangana, India. KGBV schools provide educational facilities for girls (from grade 6-10) belonging to backward classes, minorities and to families that are considered below the poverty line in the blocks that are considered backward in educational aspects. The teachers of these schools were provided SEL capacity building through the 'Lead Well' program for their own well-being and to equip them in implementation of the SEL curriculum in their respective classrooms. This curriculum was implemented by the teachers for the duration of one academic year. The schools where teachers implemented the curriculum became part of the intervention group (Intervention group refers to the schools which delivered the SEL curriculum to students & comparison group refers to schools which did not deliver the curriculum). Following the completion of the intervention, an end-line assessment was administered to both the comparison and intervention groups. Analysis of the data showed a significant improvement in levels of all students' SEL competencies namely, self-awareness, self-management, social awareness, relationship skills & responsible decision making) in intervention group. The study concluded that the acSELerate program is effective in enhancing the SEL competencies of students.*

Keywords: *acSELerate; Learning Curve Foundation; SEL; Social and Emotional Learning; Student SEL; Systemic SEL approach.*

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1. Introduction

The quality of education in India is traditionally measured based on levels of educational attainment and improvement in test scores. The discourse on education in the Indian context has largely been around academic achievement and foundational learning. The Sustainable Development Goal 4.7 of UNESCO identifies the need to also look beyond the academic purposes of education and focus on the importance of delivering Social Emotional Learning (Henceforth SEL) thereby equipping children to be more emotionally balanced, responsible and make informed choices. But, with a recent understanding that cognitive achievement and social-emotional learning are strongly interdependent and correlated (Duckworth& Seligman, 2005), the focus of the Education policies in India over the past few decades have been shifting from looking at success as a sheer academic excellence to a holistic development, as academic excellence alone does not ensure success and happiness in life. The National Curriculum Framework (2005) introduced life skills education and integrated it within the teaching practices and content of other subjects. However, life skills education was not given due importance for being considered as a subject by itself. The National Educational Policy (2020) (henceforth NEP) identified basic development of the cognitive skills is not sufficient but development of social - emotional skills in students is necessary for holistic development. It suggested evaluation methods that de-emphasize rote learning and progress more towards effective use of the evaluation process by teachers, students and parents. The review of research studies shows limited evidence about SEL being taught in schools and notices very less evidence-based research and documentation (Shinde, 2017).

2. SEL programs as Intervention

A number of research studies have proven that SEL programs that are implemented by teachers improve the development of social-emotional competencies (Durlak et al., 2011; Sklad et al., 2012; Wigelsworth et al., 2016). A meta-analysis of 213 studies of SEL in schools (Durlak & Weissberg, 2011) indicated students who receive high quality SEL instruction demonstrated better academic performance, displayed improved behaviors, maintained meaningful relationships and reduced behavior issues.

In the Indian context, as emphasized by the National Curriculum Framework (2005), CBSE (2005) had initiated life skills education as a component of the curricula through Continuous and comprehensive

evaluation for grades 6-10. CBSE has also created life skill manuals for teachers who teach grades 6,7 & 8. These manuals and programs are in alignment with 10 core life skills identified by WHO but this program could not be accessed by students studying in all sectors of schools. Currently, there is no traction seen around the implementation and impact of this program.

2.1. acSELerate – Learning Curve Foundation's Systemic SEL Intervention

With research proving immense benefits of implementing SEL programs in mainstream education, research shows that programs containing SAFE features promote social-emotional competencies and other positive outcomes (Durlak et al., 2010). In Instructional processes, SAFE refers to **i)** step-by-step training, **ii)** active forms of learning **iii)** focus on social and emotional skill development and **iv)** explicit SEL goals.

In consonance with this, the systemic SEL approach –acSELerate of Learning Curve Foundation encompasses all SAFE features with the mission being – enabling education systems to adopt, effectively implement & assess SEL in mainstream education practice *(iii & iv)*.

- SEL capacity building program for teachers to promote their well-being, support and development (training imparted in phases -*i*)
- Grade specific SEL Curricula for classrooms (activities designed for hands-on-learning for students – *i& ii*)
- School processes & policies to aid in promoting SEL among stakeholders
- Parent engagement to support SEL development in children
- Assessment tools to evaluate effectiveness of the program.

3. Methodology

3.1. The intervention

This study was conducted during the academic year 2019-20 at schools of Vikarabad district in Telangana, India. The intervention 'acSELerate' was implemented for grades 6-9. As a part of the intervention program, the SEL capacity building program- Lead Well was provided to teachers of all 18 KGBV schools in the district for their well-being and also in implementing the SEL curricula for students in their classrooms for the duration of a year. Teachers were also provided with timely support and feedback for ensuring effective implementation.

During the capacity building program, initially teachers were oriented towards SEL for a shorter duration of 40-60 minutes. In the sessions, they were provided with age-specific lesson plans along with a detailed structure to facilitate SEL. Each school was provided with the SEL toolkit that enabled teachers to implement the sessions effectively and build an overall social-emotional environment in the classroom. The resources provided include a school SEL guidebook, a teacher handbook (with detailed lesson plans for grades 6-9), message posters to be used in the classroom, student rewards- badges, stickers and posters, and the affirmation cards.

Each session was planned for 45 minutes duration with following phases: Check-in (to help students to focus), Introduction (teacher explains about the session and sets the context), Engage (teacher provides instructions in simple words about the activity) and Connect with life (helps children to connect their learning from the session to their life and teachers look for red flags to address) and close the session by summarizing with a reinforcement.

Since the schools were closed due to Covid-19, all schools were not able to provide the complete data. Schools that provided the complete data were considered for the study. 4 KGBV schools implemented the student SEL curriculum in their classrooms whereas other 4 schools could not leverage this into classroom implementation for different reasons. The schools wherein the SEL curriculum was implemented were considered the Intervention group (teachers =16, students = 784) & the schools which did not implement the student curriculum were considered the comparison group (teachers = 15, students =752) for this study. Baseline assessment was carried out prior to the implementation of SEL curriculum and following the completion of the intervention. At the end of the academic year, an end-line assessment was administered in both groups. The differences in the baseline and end line scores were calculated to understand the effectiveness of the SEL curriculum in developing the SEL competencies in students.

3.2. Purpose of the study

The total numbers of students were 784 in the Intervention group & 752 comparison group. Of these, complete data of 584 & 614 students were obtained respectively (the completion rate was affected due to the shut-down of schools due to Covid-19 & switching to digital mode for data collection). The study employs a non-equivalent comparison group design as random assignment of the sample into the groups is not done.

Current study tests 'whether implementing intervention - acSELerate helps in developing SEL competencies of the students'.

3.3. Research Objective

1. To understand the effectiveness of the systemic SEL intervention - acSELerate in improving student SEL competency levels.

Research Hypotheses:

$H_0^{1.1}$: There is no significant difference between the baseline & end-line scores of SEL competency levels in students of Comparison group

$H_0^{1.2}$: There is no significant difference between the baseline & end-line scores of SEL competency levels in students of Intervention group

$H_0^{1.3}$: There is no significant difference between the levels of student SEL competency in the comparison group and Intervention group prior to implementation of the SEL curriculum.

$H_0^{1.4}$: There is no significant difference between the student SEL competency levels in the Comparison group and Intervention group after the implementation of the SEL curriculum.

4. Assessment Measures

The students were assessed on their SEL competencies at both baseline and end-line using a rating scale (Likert type range 1-5) with items based on 5 SEL competencies. Teachers marked the scores for students' demonstration of SEL competencies based on their observation and interaction with all students in their respective classrooms. The baseline data collection was done in the offline mode. The endline data collection was done in the online mode since schools were shut due to COVID. The rating scale was shared online on KoBo platform with teachers. The data thus gathered were used for analysis.

4.1. Data Analysis

For the statistical analysis, the raw data was first inspected and missing scores were identified on these assessments. Based on this, the final number of students in the Intervention group was 584 and the comparison group was 614.

The data collected through the baseline and end-line assessment were put to statistical analysis using the SPSS. Along with descriptive statistics, 2 tailed-independent samples t-test was used to assess the significance in the improvement in SEL competency levels of students in both Comparison and Intervention groups.

5. Findings

Analysis of the data related to student SEL competencies in both Comparison and Intervention group:

Table 1: Baseline & end line mean scores of SEL competencies in Comparison and Intervention group

Student SEL competencies	Comparison group		Intervention group	
	Baseline score	**End-line score**	**Baseline score**	**End-line score**
Self-awareness	2.50	2.52	2.37	3.45
Self-management	2.54	2.37	2.39	3.50
Social awareness	2.36	2.49	2.40	3.52
Relationship skills	2.49	2.44	2.43	3.45
Responsible decision making	2.43	2.47	2.52	3.55

Source: Author's own conception

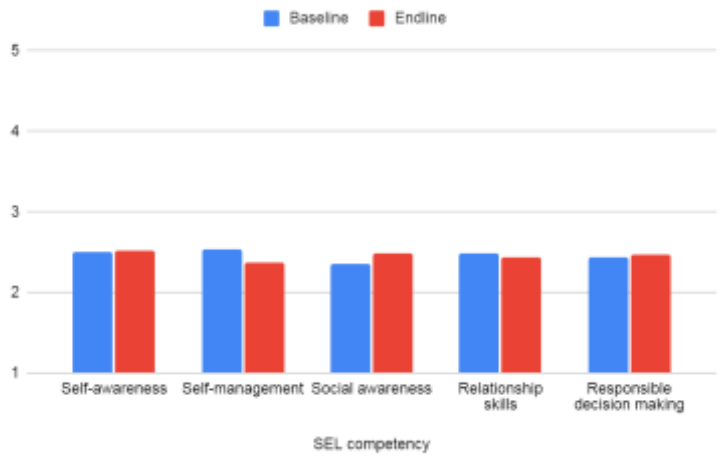


Figure 1: *Baseline & End-line mean scores of students' SEL competencies of Comparison group*
Source: Author's own conception

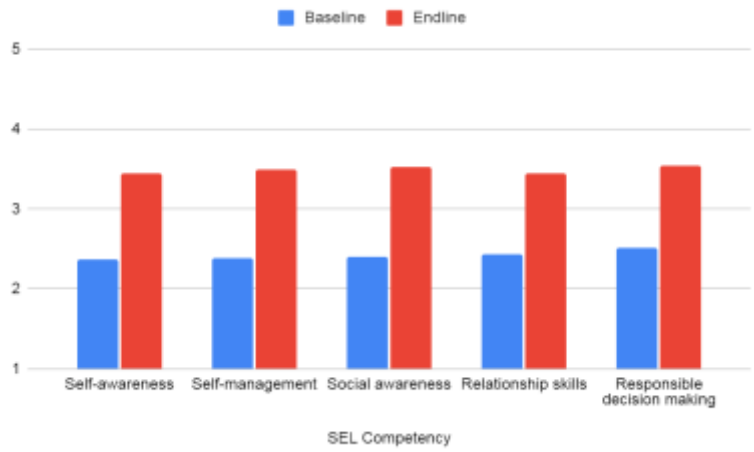


Figure 2: *Baseline & End-line mean scores of students' SEL competencies of Intervention group*
Source: Author's own conception

The data from table 1 shows an improvement in mean scores across all competencies in both Intervention group and the Comparison group, whereas the mean scores tend to have increased more in the Intervention group. Whether the increase in the mean scores is significant is tested using independent samples t-test in the later section.

Objective 1: To understand the effectiveness of the systemic SEL intervention - acSELerate in improving student SEL competency levels

$H_0^{1.1}$: There is no significant difference between the baseline & end-line scores of SEL competency levels in students of comparison group

Table 2: Results of paired t-test for the baseline and end-line scores of Comparison group

SEL Competency	**Mean**	**S D**	**t-value**	**df**	**sig.**
Self-awareness	.026	1.071	.603	613	.547
Self-management	.170	.936	.4.50	613	.000*
Social awareness	-133	.927	3.54	613	.000*
Relationship skills	.054	1.006	1.32	613	.186

Responsible decision making	.038	.93	1.014	613	.311

Source: Author's own conception

A paired sample t-test was conducted to compare the difference between students' baseline and end-line SEL scores in the comparison group. In regard to social awareness, a significant difference was noticed between the baseline scores (M = 2.36, SD =.998) and end-line scores (M=2.49, SD =.651), t (613) = -3.54, p= .00. These results suggest that over the duration of one year, there is a significant improvement noticed in social awareness and no significant difference in scores were noticed in other competencies – self-awareness, relationship skills & responsible decision making. Hence the null hypothesis is not accepted. It means that there were improvements and declines noticed in the levels of SEL competency during the end-line assessment.

$H_0^{1.2}$: There is no significant difference between the baseline & end-line scores of SEL competency levels in students of Intervention group

Table 3: Results of paired t-test for the baseline and end-line scores of Intervention group

SEL Competency	Mean	S D	t-value	df	sig.
Self-awareness	1.087	1.313	20.01	583	.00*
Self-management	1.108	1.225	21.86	583	.00*
Social awareness	1.113	1.223	21.98	583	.00*
Relationship skills	1.019	1.285	19.15	583	.00*
Responsible decision making	1.026	1.284	19.31	583	.00*

Source: Author's own conception

From table 3, it can be noticed that there is a significant difference between the baseline and end line scores as across p value all the SEL competencies, p=.00 <.05. Hence, the null hypothesis is not accepted at 0.05 level and the alternate hypothesis is accepted. It means there is a significant difference between the baseline and end-line scores of the group indicating the implementation of the SEL curriculum has been effective in significantly improving the levels of SEL competencies in students.

$H_0^{1.3}$: There is no significant difference between the student SEL competency levels in the Intervention group and comparison group prior to implementation of the SEL curriculum.

Table 4: Results of *t-test* of Overall Scores at baseline assessment of comparison and Intervention Groups

SEL competency	Group	No. of students	Mean	S D	t-value	df	Sig.
Self-awareness	Comparison	614	2.50	.972	2.171	1196	.030*
	Intervention	584	2.37	1.103			
Self-management	Comparison	614	2.54	.919	2.702	1196	.007*
	Intervention	584	2.39	1.017			
Social awareness	Comparison	614	2.36	.998	.802	1196	.423
	Intervention	584	2.40	1.084			
Relationship skills	Comparison	614	2.49	1.002	0.967	1196	.334
	Intervention	584	2.43	1.036			
Responsible decision making	Comparison	614	2.43	.922	1.569	1196	.117
	Intervention	584	2.52	1.060			

*Significant at $\alpha = 0.05$

Source: Author's own conception

An independent sample t-test was conducted to compare the student SEL levels between the comparison group and the Intervention group prior to the intervention.

As it can clearly be seen from table 4, the difference between mean scores of both groups at the level of confidence $\alpha = 0.13$ (highest difference mean value between baseline & end-line scores across all competencies). The significant difference between the baseline scores of comparison & Intervention groups was calculated to ensure if both the groups were absolutely equal at the beginning of the study. In order to make sure how

much of an improvement in levels of SEL competencies of the experimental group has occurred, the comparison analysis was performed.

From the analysis, there was a significant difference seen in the levels of self-awareness between the students of comparison group (M = 2.37, SD = 1.103) and intervention group (M=2.50, SD = 0.972), t (1196) = -2.171, p= .03. It is evident that p value is .03 is lesser than .05 and is significant at 0.05 level. Regarding self-management, a significant difference is seen between students of the comparison group (M = 2.54, SD = .919) and Intervention group (M=2.39, SD = 1.017), t (1196) = -2.702, p = .007 is noticed.

On the competency, social awareness, the difference between the scores of comparison group (M = 2.36, SD = .998) and Intervention group (M = 2.4, SD = 1.084), t(1196) = 0.802, p=.423 are not significant as the p value is higher than .05. Similarly, on the competency, relationship skills, the difference between the comparison group (M = 2.49, SD = 1.002) and of intervention group (M = 2.43, SD = 1.036), t(1196) = -0.967,p=.334 is not significant. Even in the responsible decision making competency, the difference between the scores of comparison group (M = 2.43, SD = 0.922) and intervention group (M = 2.52, SD = 1.06), t(1196) = -1.569 ,p=.117 .Since the probability values (p) in the competencies – social awareness, relationship skills and responsible decision making are higher than .05. There is no significant difference seen in the levels of these competencies between the students of comparison and intervention group.

Since there is difference between both the groups in few SEL competencies levels, the null hypothesis stating there is no significant difference between the SEL levels in the students of interventional and comparison group prior to the implementation of the SEL curriculum is not accepted and the alternate hypothesis which states there is a significant difference between the SEL competency levels in students of comparison group and intervention group prior to intervention is accepted.

From the analysis it can be noticed that the 2 competencies vary significantly - self-awareness & self-management whereas in other competencies - social awareness, relationship skills, the students of both groups do not differ significantly and are almost on the same levels as the mean scores do not vary much.

$H_0^{1.4}$: There is no significant difference between the student SEL competency levels in the Intervention group and comparison group after the implementation of the SEL curriculum.

Table 5: Results of *t-test* of Overall Scores at end-line assessment of Comparison and Intervention Groups

SEL competency	Group	No. of students	Mean	S D	t-value	df	sig
Self-awareness	Comparison	614	2.52	.663	18.56	1196	.00**
	Intervention	584	3.45	1.04			
Self-management	Comparison	614	2.37	.606	24.43	1196	.00**
	Intervention	584	3.50	.959			
Social awareness	Comparison	614	2.49	.651	21.09	1196	.00**
	Intervention	584	3.52	1.008			
Relationship skills	Comparison	614	2.44	.614	20.55	1196	.00**
	Intervention	584	3.45	1.050			
Responsible decision making	Comparison	614	2.47	.622	23.51	1196	.00**
	Intervention	584	3.55	.939			

**Significant at $\alpha = 0.01$

Source: Author's own conception

Post the intervention of the SEL curriculum in the intervention group, an independent sample t-test was used to compare the improvement in the student SEL competency levels between the comparison group and the intervention group.

Based on the analysis in table 5, a significant difference observed in levels of all competencies – self-awareness[comparison group (M = 2.52, SD = 0.663) and intervention group (M = 3.45, SD = 1.04), t(1196) = 18.56, p=.00], self-management[comparison group (M = 2.37, SD = 0.606) and intervention group (M = 3.50, SD = .959), t(1196) = 24.43, p=.00], social awareness [comparison group (M = 2.49, SD = 0.651) and intervention group (M = 3.52, SD = 1.008), t(1196) = 21.09, p=.00] , relationship skills [comparison group (M = 2.44, SD = 0.614) and intervention group (M = 3.45, SD = 1.05), t(1196) = 20.55, p=.00] and responsible decision making [comparison group (M = 2.47, SD = 0.622) and intervention group (M = 3.55, SD = .939), t(1196) = 23.51, p=.00].

The mean scores and standard deviation values for intervention group is higher across all competencies as compared to comparison group

meaning, the scores away from the mean is more in students of Intervention group than those of comparison group suggesting the variation is more among students of Intervention group. In order to verify whether the mean difference is true of the population also, the scores were subjected to *t*-test, the *p* values for all competencies are significant at .01 level. This statistically significant difference is in favor of the Intervention group. Hence the null hypothesis is not accepted. It means students of the intervention group and comparison group differ significantly on the levels of SEL competencies in favor of the Intervention group as their mean scores are higher than those in the comparison group. This means the implementation of the SEL curriculum is effective and indicates potential of the curriculum in developing the SEL competencies in students.

6. Discussion

This study explored the influence of the systemic SEL intervention - acSELerate on developing the social-emotional learning competencies in students. The central hypothesis was confirmed and a significant improvement was noticed across all SEL competencies post the SEL intervention program. To ensure the effectiveness of the intervention program, an attempt was made to equalize the groups by comparing the baseline scores in both groups that showed both the groups were almost at the same level in most of the competencies. The permission was obtained from the government authorities for the program implementation. The data collection process involved familiarizing school authorities regarding the purpose of the assessment. Necessary consent was obtained from the school and students for participating in the study. Students were also informed that the participation is voluntary and were explained the process of withdrawal from participating in the study without any consequences. They were also assured the collected data would be kept private and would be used only for research purposes. In spite of SEL capacity building program provided to teachers of both the schools, the significant improvement in SEL levels in students was seen in the group where the exclusive SEL curriculum was implemented with high fidelity. This also reiterates the fact that an exclusive SEL program with effective implementation and role of all stakeholders in implementation of the systemic SEL is crucial. These findings agree with prior research suggesting that a rightly designed and implemented SEL program helps in students and adults learn and apply what is learnt in SEL, the skills and attitudes to handle daily tasks and challenges and thereby achieve success in all spheres of life (Domitrovich et al., 2017; Durlak et al., 2011). A number of meta-analysis studies have proved that SEL programs

that were taught by class teachers results in the development of social-emotional competencies (Durlak& Weissberg, 2011; Sklad et al., 2012; Wigelsworth et al.,2016), and another meta-analysis study proved that school-based, universal SEL interventions resulted in notice able improvement in skills, dispositions, pro-social behavior and academic performance (Taylor et al., 2017).

The results also show that programs that aim at improving teachers' SEL and active involvement of teachers in implementing the program resulted in the improved SEL competencies in students. This observation is in consensus with the results of the studies informing that school staff needs to have consistent opportunities to develop their own social-emotional competencies and in build trusting relationships (Collaborative for Academic, Social, and Emotional Learning, 2020). Since a safe, nurturing, and caring environment is required for efficient implementation of SEL, and it depends on the adults, at school, teachers need to have strong SEL skills and cultural competence (Delpit, 2006; Jennings et al., 2019a; 2019b). They need to be committed to SEL to communicate and model appropriate behaviors such as managing stress and frustration, and handling conflicts. Teachers with strong SEL skills are better able to manage their own job requirements and develop a healthy learning environment (Greenberg et al., 2016). This requires enhancing social-emotional competencies of teachers as a part of the foundation of the SEL system (CASEL, 2017; Schonert-Reichl, 2017). Regular opportunities must be provided for school staff to develop SEL skills through professional development (Greenberg & Weissberg, 2018) to support teacher SEL (Jennings et al.,2019b). In this study, this component is imparted through the 'Lead Well' – SEL capacity building program (for teachers) in the acSELerate program. The significant improvement in students' SEL competencies suggests that the acSELerate program is beneficial for teachers and students.

Follow-up assessments are required to study impact of the program on the development of teacher SEL and correlation (or association) studies between teacher and student SEL. To understand the processes involved in development of SEL competencies in a better way, longitudinal studies could be planned. To attribute the total development of SEL competencies in students to the SEL intervention program, randomized experimental designs can be developed and implemented.

7. Conclusion and Implications for practice

The present findings suggest that the impact of the systemic SEL intervention - acSELerate by Learning Curve Foundation on the

development of SEL skills in students is significant and this reassures an evidence-based SEL program can be an essential part of the school education. Hence, equipping schools with evidence-based SEL programs will be beneficial and help students develop skills that help them address challenging situations through their improved SEL skills. This study further demonstrates that classroom teachers can effectively promote the levels of SEL competencies in students. Implications for practice include consistently incorporating support for teaching strategies used by teachers in the program and an ongoing evaluation. Not just limiting the programs to students and teachers, the program needs to actively involve multiple stakeholders in the process which would strengthen the implementation and sustainability of the systemic approach. With this intervention bringing in the benefits that would last for life, India needs to pointedly consider incorporating the SEL program in a systemic manner in the curriculum from pre-school to secondary level.

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