

Empowering Social Skills through Contextual-Cooperative Learning with Smart App Creator: A Model for Inclusive Digital Education

Rendy Wikrama Wardana¹, Fitri April Yanti², Afrizal Mayub³, Elza Heryensi⁴, Rinda Fitri Handayani⁵, Noorzana Khamis⁶

^{1,2,3,4,5}Universitas Bengkulu, Indonesia

⁶Universiti Teknologi Malaysia, Malaysia

Corresponding author email: rendywardana@unib.ac.id

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ABSTRACT:

Inclusive education in the digital era necessitates adaptive learning approaches to foster life skills development among students with special needs. This study aims to describe how contextual-cooperative learning integrated with Smart App Creator (SAC) enhances the social life skills of students with special needs in Indonesian junior high schools. A qualitative research design using a case study method was employed, involving students with special needs and their accompanying teachers as key informants. Data were obtained through in-depth interviews, direct observations, and document analysis. The findings reveal that students developed essential life skills, including communication, teamwork, self-confidence, and social interaction. These improvements were supported by an inclusive school climate, active family engagement, and consistent mentoring from accompanying teachers. The integration of SAC significantly contributed to student motivation and participation by offering interactive, adaptable digital learning experiences tailored to diverse abilities. This study presents a approach by embedding digital content creation tools within cooperative learning strategies specifically for inclusive settings. The practical implication highlights how SAC facilitates personalized and engaging instruction, which is crucial in addressing the learning needs of diverse student populations.

Keywords: Contextual learning, Educational technology, Life skills, Social activities, Special needs.

1. Introduction

Science learning for students with special needs serves not only to improve cognitive and motor abilities, but also to develop social and emotional skills through adaptive, inclusive, and individualized approaches (Sujatmika et al.,

2024). In this regard, the implementation of contextual-cooperative learning is considered effective in providing meaningful learning experiences rooted in students' daily lives, while simultaneously encouraging peer collaboration. Contextual learning enables teachers to connect

scientific concepts with real-life applications (Dewi & Primayana, 2019), whereas cooperative strategies promote social interaction and active engagement tailored to each student's developmental level. The teacher's role as a facilitator remains central in ensuring accessibility and participation, especially for learners with diverse needs (Tsou et al., 2024; Martínez-Álvarez, 2017).

One critical aspect that demands further attention in inclusive education is the development of social competencies in students with special needs (Wardhani et al., 2022). These competencies—such as interaction, cooperation, sharing, and relationship-building—are essential for successful adaptation in both academic and societal contexts (Mukuka & Tatira, 2024). However, social limitations often challenge students with special needs, who may struggle with communication and peer engagement, resulting in social exclusion and limited friendship networks compared to their typically developing peers (Ugalde et al., 2021; Haller et al., 2022; Spivakovsky et al., 2023). Accordingly, learning strategies that incorporate direct social experiences such as group projects, peer interaction, and educational games are crucial to strengthen students' social confidence and inclusion (Jdia, 2021; Duka et al., 2024; Maddalon et al., 2024).

At the global level, inclusive education faces the persistent challenge of identifying effective instructional approaches that support the holistic development of students with special needs (Ainscow, 2020b; Ainscow, 2020a; Mansour et al., 2025). Although the Indonesian education system continues to expand inclusive practices under the *Merdeka Belajar* framework (Wan et al., 2024), there remains a substantial gap in the integration of educational technology tailored for this learner group (Handayani et al., 2023). Digital tools such as Smart App Creator (SAC) have demonstrated potential to support differentiated instruction and adaptive learning environments (Kedrova, 2016), yet research on their application in inclusive settings, particularly in enhancing students' social skills, is limited.

Several studies have explored the use of technology for students with special needs. Evidence shows that (1) educational technology facilitates not only academic understanding but also social engagement (Fionita Winda & Ely Nurjannah, 2024); (2) platforms like SAC improve interactivity, motivation, collaboration, and self-confidence (Supriyadi et al., 2024; Puspitasari et al., 2022); (3) differentiated technology-assisted learning benefits diverse learners (Che & Ip, 2024; Bondie et al., 2019); and (4) contextual learning delivered through digital platforms enhances conceptual depth (Nursaadah et al., 2019). However, these findings are largely fragmented and do not specifically address how SAC can be embedded within contextual-cooperative learning frameworks to improve the *social activities* of students with special needs in Indonesian junior high schools.

Despite growing evidence of the benefits of educational technology, there is a lack of comprehensive studies that combine contextual-cooperative learning with digital platforms such as SAC specifically aimed at enhancing social life skills of students with special needs. Most prior research has either focused on cognitive outcomes or general inclusivity but not on targeted social skills development through interactive, cooperative, and contextual digital learning environments.

This study introduces a pedagogical framework by integrating *Smart App Creator (SAC)* into contextual-cooperative learning to address the social development of students with special needs. Unlike previous research, this study positions SAC not merely as a content delivery tool but as a facilitator of peer interaction, engagement, and social skill-building in inclusive classrooms. This integrative approach reflects a shift toward more holistic, socially responsive, and technology-enhanced inclusive education.

This approach aligns with recent trends in inclusive education, which emphasize the importance of leveraging digital tools not only to support content mastery but also to foster interpersonal competencies and social participation among diverse learners. Studies

have shown that technology-enhanced collaborative environments significantly improve students' communication, empathy, and teamwork skills, especially when learning is contextualized and actively involves peer interaction (Katsaris & Vidakis, 2021; Taranu & Eriksson, 2025). Moreover, digital platforms like COCO-SAC that integrate multimedia elements and interactivity provide scaffolded opportunities for students with special needs to engage in meaningful, low-risk social exchanges, thus reducing anxiety and increasing self-efficacy (D'Elia et al., 2024). This reinforces the view that inclusive pedagogy must move beyond access to content and instead embrace a broader paradigm that values social connectedness and adaptive digital engagement as core components of learning (Clarida et al., 2013; Blum et al., 2015; Schuelka et al., 202; Eslit, 2025). The implementation of SAC within a contextual-cooperative framework, therefore, represents a strategic advancement in designing inclusive learning ecosystems that are both human-centered and technology-enabled.

Building upon these insights, the COCO-SAC framework not only addresses individual student needs but also redefines the role of collaborative learning in inclusive classrooms. By embedding real-world, culturally relevant tasks into digital cooperative settings, students with special needs are empowered to contribute meaningfully to group outcomes, fostering a sense of belonging and shared responsibility (Sholikhati et al., 2021). This transformation is particularly crucial in educational systems that aim to implement equity-driven policies, as it demonstrates that inclusive learning can be both engaging and rigorous when supported by purposeful technology integration (Clarida et al., 2013). Furthermore, COCO-SAC offers a replicable model for schools seeking to bridge the gap between traditional pedagogies and the demands of 21st-century inclusive education. It encourages a paradigm shift from remediation-focused strategies to strength-based, socially enriching learning environments that prioritize dignity, agency, and authentic participation for all learners

(Miller et al., 2020; Fernández-Batanero et al., 2022; Chow et al., 2023; Pérez-Jorge et al., 2024).

The purpose of this study is to explore and describe the implementation of SAC-based contextual-cooperative learning and its effects on the social activities and life skills of students with special needs in Indonesian junior high schools. The study seeks to provide empirical insights that inform the design of technology-supported instructional strategies in inclusive settings, with a focus on promoting collaboration, communication, and social inclusion among diverse learners

2. Methodology

This study employed a qualitative case study approach, which is suitable for exploring in-depth social phenomena, particularly in the context of special education. The research was conducted at SLB B Pembina Palembang, focusing on the social activities of students with moderate intellectual disabilities through contextual-cooperative learning supported by Smart App Creator (SAC). This approach aligns with Creswell (2014) qualitative inquiry model, which seeks to understand meaning from participants' experiences in their natural settings.

The participants in this study consisted of 20 students with moderate intellectual disabilities enrolled in Grade VII, grouped into five cooperative learning groups. The sample size of 20 students and involvement of multiple teachers across three observed learning sessions provided rich, triangulated qualitative data. Although small in number, the homogeneity of the group and focused learning content enabled in-depth exploration and ensured data saturation within the scope of case study research. These students were purposively selected based on their ability to participate in contextual-cooperative learning and their potential responsiveness to SAC-based digital tools. Accompanying special education teachers were also involved as key informants, providing expert reflections on the learning process. The relatively homogenous group allowed for focused observations of social interaction development in an inclusive and controlled environment.

Data were collected through a multi-instrument strategy to ensure triangulation:

Table 1. Instrument, Type, Target, and Purpose Research

Instrument	Type	Target	Purpose
Observation Checklist	Structured	Students in group activities	To record engagement, communication, cooperation
Field Notes	Semi-structured	All activities	To capture natural behaviors, context, and insights
Questionnaire	Closed-ended (Likert scale)	Students (assisted)	To assess students' perception and self-confidence
Interview Guide	Semi-structured	Accompanying teachers	To gather perceptions of student progress

Observations were conducted by four trained observers across three SAC-based learning sessions focusing on the theme "Environmentally Friendly Technology". Questionnaires were administered at the end of each session to capture students' responses, with Likert scales (1–4) adapted for comprehension. Interviews with accompanying teachers (randomly selected) were conducted after each session to gain pedagogical insights.

The data obtained from observations, field notes, questionnaires, and interviews were analyzed through a combination of qualitative content analysis and descriptive statistical analysis to provide a comprehensive understanding of the social activities of students with special needs during contextual-cooperative learning using Smart App Creator (SAC).

Observation and field note data were analyzed using thematic coding. Researchers focused on indicators of social activity, such as verbal and non-verbal communication, group cooperation, turn-taking, initiative in discussions, and student participation. Thematic analysis revealed that throughout the three learning sessions, there was a consistent improvement in students' willingness to engage in group tasks. Initially, students showed hesitation in initiating interactions, but by the third session, students increasingly initiated conversations, asked questions, and demonstrated active roles within their groups.

Observers also noted increased eye contact, physical proximity, and expressions of enjoyment, which were interpreted as indicators of improved social comfort and engagement.

The results of the closed-ended questionnaires, administered at the end of each session, were processed using descriptive statistics. Mean and standard deviation scores were calculated for each item related to students' perception of group learning and their own social skills. The majority of students (75%) reported feeling more comfortable interacting with friends compared to the initial session. These findings indicate that the SAC-based learning design not only captured students' interest but also fostered positive peer interactions.

In addition, interviews with accompanying teachers were analyzed using open coding to identify recurring themes regarding the effectiveness of the learning model. Teachers highlighted three key improvements observed in students: increased verbal expression, better turn-taking during group tasks, and enhanced confidence in approaching peers and teachers. Most teachers (90%) agreed that the interactive nature of SAC contributed significantly to maintaining student engagement and facilitating social behavior. Teachers also noted that students with initially low participation levels began to show initiative and interest in collaborative activities over time.

The convergence of findings from different data sources strengthened the validity of the results. The triangulation of observation, student feedback, and teacher reflection provided strong evidence that the contextual-cooperative learning model supported by SAC effectively promoted social skill development in students with moderate intellectual disabilities

Results

The findings of this study show that the implementation of contextual-cooperative

learning based on Smart App Creator (SAC) significantly improves the social skills of students with special needs at SLB B Pembina Palembang. This improvement is observable across four key domains of social activity: communication, group cooperation, self-confidence, and peer interaction. These results can be seen from the improvement in four important aspects of social activities, namely communication skills, group cooperation, self-confidence, and social interaction with peers, as seen in Figure 1.

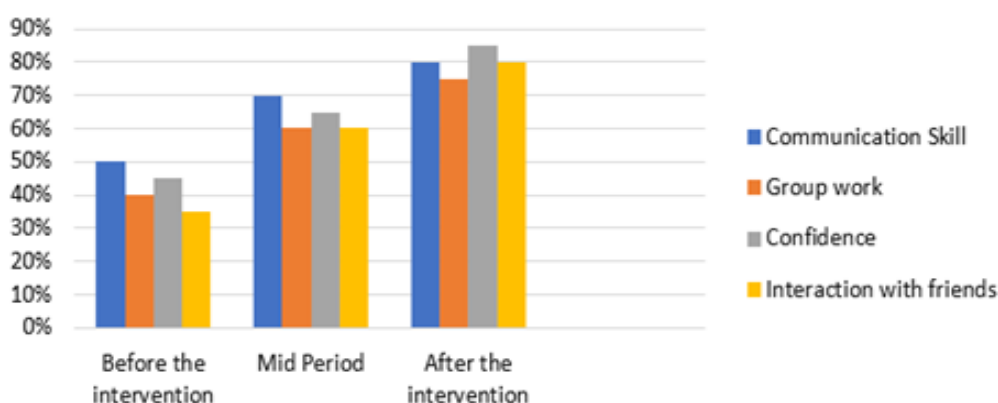


Figure 1. Aspects of Social Activities of SLB Students

Based on the graph in Figure 1, **communication skills** increased from 50% to 80%. At the beginning of the intervention, students were hesitant to express themselves, often relying on gestures or remaining silent. The SAC platform, through features such as simulations, animations, and quizzes, provided visual and auditory stimuli that stimulated verbal interaction. This aligns

with Pebriani et al. (2022) who highlight that media interactivity enhances communication in inclusive settings. The culturally contextualized content in SAC, as noted by Arum & Prasetyo (2019), further empowered students by connecting learning materials with their lived experiences.



Figure 2. Student Activity Mixing Charcoal Powder With Adhesive

Figure 2 shows communication activities between teachers and students. The teacher gives a group assignment to make briquettes. A group of mentally retarded students works together to make briquettes from sawdust. They communicate in various ways, such as using simple sign language, hand gestures, facial expressions, and picture assistance. One student shows how to mix the ingredients by stirring a bowl of charcoal powder and adhesive, while others nod as a sign of understanding, and others ask about what their friends are doing. When proving whether briquettes can produce embers or not. The students are very enthusiastic to try. However, because this experiment is feared to be dangerous for them, the part that lights the match is the teacher, while the students hold the briquettes from their group's work. This activity reflects the principle of contextual learning that emphasizes direct experience and is relevant to students' needs. The importance of a flexible and

adaptive approach is a key element in supporting successful learning for students with special needs (Tsou et al., 2024). In this process, contextual learning is also highlighted in the form of students who contribute to preparing the tools and materials in their environment. This experience is important because it is a learning strategy with environmental insight (Kryukova et al., 2023).

Similarly, group cooperation improved from 40% to 75%. Activities such as making briquettes and liquid organic fertilizer encouraged students to collaborate by assigning roles based on ability. This practical engagement fostered a sense of contribution and mutual reliance elements central to cooperative learning. These results mirror the findings of Bondie et al. (2019) and Hija et al. (2024), which emphasize the importance of teacher scaffolding and role differentiation in enhancing inclusive group dynamics.



Figure 3. Student Group Cooperation in Making Organic Liquid Fertilizer

Other collaborative activities are conducted through the SAC application, such as working on interactive quizzes, encouraging students to share responsibilities and work together more effectively. Teachers play a key role by providing specific directions and facilitating discussions between group members. The role of teachers as facilitators and collaborators to support the success of learning for students with special needs through SAC-based technology.

Discussion

Teachers as facilitators always accompany their students in doing tasks. Then teachers are given various possible responses through instructions that reflect awareness of student differences that

can affect effective learning (Bondie et al., 2019; Park et al., 2021; da Silva et al., 2022; Mustofa, 2024). Teachers who do not understand students' special needs often fail to provide the necessary support, leading to experiences of social disability and limited access to learning for students (Giese et al., 2022; Ghadban et al., 2023).

Self-confidence, initially measured at 45%, rose dramatically to 85%. Many students who were previously passive began volunteering to participate, ask questions, and assist peers. These behavioral changes were catalyzed by repetitive success in small tasks and emotional encouragement from teachers and peers. This finding is supported by (Fajrie & Masfuah, 2018),

who argue that gamified, interactive platforms such as SAC contribute positively to self-efficacy in learners with special needs (Buckner et al., 2016; Talbott et al., 2017; Turda, 2021). The development of self-confidence is closely linked to a sense of competence and autonomy, which can be fostered through scaffolded learning experiences and supportive feedback (Edward L. Deci, 1985; Zhang et al., 2024; Allagui, 2024; Triana-Vera & López-Vargas, 2025). Moreover, students with special needs tend to respond positively to learning environments that minimize fear of failure and promote incremental success, particularly when digital tools offer immediate reinforcement (Lynch & Davison, 2024). Studies have shown that interactive media can provide a psychologically safe space for risk-taking and expression, which is crucial for building social-emotional resilience in inclusive classrooms (Hassani & Schwab, 2021; Zarifsanaiey et al., 2022; Liu, 2023). Furthermore, teacher-student emotional bonding and peer support are essential components in shaping positive learning identities and encouraging active participation (Vargas-Madriz & Konishi, 2021; Dai, 2024; George et al., 2024; Parmar et al., 2025). Together, these elements demonstrate that the COCO-SAC learning model not only fosters academic understanding but also creates the emotional conditions necessary for the development of self-confidence in students with special needs.

The most notable increase was in **peer interaction**, which rose from 35% to 80%. Students demonstrated greater empathy and initiative in helping peers during tasks, such as finishing incomplete group work or asking clarifying questions to teachers on behalf of the group. These results are in line with the studies of Roca-Campos et al. (2024) and Mhlongo (2024), which confirm the role of cooperative learning in promoting inclusive peer relationships.

Although the study was conducted on a specific population (moderate intellectual disability), the significant progress observed indicates that digital contextual-cooperative learning models can be broadly effective for similar inclusive education settings. The integration of technology that aligns

with students' daily life and local culture appears to be a key factor in engagement and success.

The findings of this study provide several important implications for the development of inclusive education, particularly for students with special needs. First, the integration of contextual-cooperative learning with digital platforms such as Smart App Creator (SAC) offers a promising strategy to enhance not only academic understanding but also essential social skills such as communication, cooperation, and self-confidence. Teachers can utilize SAC to create adaptive and interactive learning environments that are responsive to individual differences, fostering active engagement and peer collaboration. Secondly, the results support the broader implementation of digital learning tools in inclusive settings, in line with the principles of the Merdeka Belajar curriculum. This suggests that technology can serve as a bridge to overcome barriers in inclusive classrooms, allowing students with intellectual disabilities to access meaningful learning experiences that are relevant to their cultural and social contexts.

Despite its contributions, this study is not without limitations. The research was conducted within a limited context, involving only 20 students with moderate intellectual disabilities at a single special school. As such, the generalizability of the findings to broader populations, including students with other types or levels of disabilities, may be constrained. Additionally, the study was conducted over a relatively short duration, consisting of only three intervention sessions. This limited timeframe may not fully capture the long-term development of social skills or sustainability of student progress. Furthermore, while descriptive statistical analysis supported qualitative findings, more robust inferential statistics could not be applied due to the small sample size, which limits the strength of causal conclusions.

Future research is recommended to expand the scope and depth of investigation into the use of technology-based contextual learning in inclusive settings. Studies involving larger and more diverse samples, including students with different

types of special needs, would provide broader insights and enhance generalizability. Longitudinal studies could also be conducted to observe the sustained impact of SAC-based learning on students' social and academic development over time. In addition, experimental or quasi-experimental designs can be employed to examine the effectiveness of this learning model in a more controlled manner, allowing for stronger causal interpretations. Exploring the role of teacher training and digital literacy in optimizing the implementation of SAC may also offer valuable contributions to inclusive pedagogy.

Conclusion

This study concludes that Contextual-Cooperative Learning based on Smart App Creator (COCO-SAC) effectively enhances the

social skills of students with special needs, namely communication, cooperation, self-confidence, and peer interaction. The success of this approach lies in combining contextual relevance, interactive technology, and teacher facilitation to create inclusive, student-centered learning. From this, a new conceptual model emerges: COCO-SAC as an inclusive digital learning ecosystem that fosters not only academic understanding but also social development. The findings imply the need for broader adoption of technology-based learning in inclusive schools, supported by teacher training, infrastructure, and policy, to ensure long-term impact and sustainability.

Author Declaration

No conflicts of interest

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