

Is animal-assisted intervention effective in improving the perceived difficulties of Hong Kong students with special educational needs in mainstream schools?

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Abstract: This study investigated the effectiveness of an animal-assisted intervention (AAI) program on the personal and social difficulties of Hong Kong students with special educational need (SEN). Thirty-five teachers were invited to participate and finally identified three challenges faced by SEN students: self-regulation, social inclusion, and self-esteem. After that, an AAI program was implemented to investigate its effectiveness on tackling these three challenges. Thirty-two SEN students from a local secondary school were recruited with the mean age of 12.97. The study used a pre-test/post-test design, with participants completing a short questionnaire before and after the intervention of AAI. The Chinese Version of Rosenberg Self-Esteem Scale (RSES) measure self-esteem; the social inclusion subscale of The Perceptions of Inclusion Questionnaire (PIQ) measure social inclusion while Self-Regulation Questionnaire measure self-regulation. Paired sample t-test was deployed to examine the effectiveness of the intervention. Student participants demonstrated significant increases in self-esteem and social inclusion while slight increase in self-regulation. These findings suggest that AAI may be a feasible way to enhance the health and well-being of SEN students. Future studies with a larger and more diverse sample size, and the inclusion of the perspectives of SEN students can enhance the reliability and generalizability of the findings.

Keywords: animal-assisted intervention, special educational needs, self-esteem, social inclusion, self-regulation.

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I. Introduction

Special educational needs (SEN) encompasses a diverse group of children with various physical, cognitive, and socio-emotional disabilities or challenges, as well as unique strengths and resources that necessitate differing levels of specialized educational support and assistance (Squires, 2012; Vehmas, 2010; Wilson, 2002). In Hong Kong, nine categories of SEN have been identified, including (1) Intellectual Disability; (2) Autism Spectrum Disorder (ASD); (3) Attention Deficit/Hyperactivity Disorder (ADHD); (4) Specific Learning Difficulties (SpLD); (5) Speech and Language Impairment; (6) Mental Illness; (7) Physical Disability; (8) Visual Impairment; and (9) Hearing Impairment (Research Office, 2022). With growing societal awareness of SEN and improvements in identification methods, the number of reported SEN students has been increasing over the years. In the 2023-24 academic year, there were 64,220 SEN students enrolled in public sector primary and secondary schools in Hong Kong, marking a doubling in numbers over the past decade (Legislative Council Panel on Education, 2024).

In Hong Kong, the education system for SEN students follows a dual-track approach. Students with more severe or multiple disabilities attend aided special schools that provide intensive support services. As of the 2023-24 school year, there are 63 aided special

schools in Hong Kong catering to a total of 8,818 students (Education Bureau, 2025a). On the other hand, the Integrated Education (IE) Policy in Hong Kong aims to integrate students with milder disabilities of SEN into ordinary schools. This policy allows these students to receive education in mainstream schools (Research Office, 2022). The goal of IE is to create an inclusive environment where students with SEN can learn and socialize with their typically developing peers.

Public sector ordinary schools in Hong Kong require additional manpower and resources to successfully implement IE. This includes roles such as Special Educational Needs Coordinators (SENCOs), Special Educational Needs Support Teachers (SENSTs), and support through initiatives like the Learning Support Grant and Grant for Supporting Non-Chinese Speaking Students with Special Educational Needs. These resources enable schools to effectively utilize school-based and community resources to provide comprehensive and flexible services for SEN students. Furthermore, the Education Bureau (EDB) offers professional support to schools, including services like educational psychology and speech therapy. In the 2022-23 financial year, the EDB's expenditure on IE amounted to around \$3.7 billion, increase of 147% compared to the 2017-18 financial year (Hong Kong Special Administrative Region Government, 2023b). This reflects the government's commitment to

providing necessary resources and support for the successful implementation of IE.

To support teachers in implementing IE, a professional learning (PL) program is provided (Sin, 2004, p. 106). Since 2007, the Education University of Hong Kong (formerly the Hong Kong Institute of Education) has been commissioned by the EDB to conduct basic courses on Catering for Diverse Learning Needs (30 hours) and thematic courses on specific types of needs like ASD and AD/HD (60 hours) over a three-year period. The training program accommodated 600 to 1200 teachers annually. As part of the government's five-year teacher professional development framework, it was planned that approximately 10% of teachers in each school would complete the basic 30-hour course (Education Bureau, 2007, p. 2). The percentage of teachers who have received 30 hours training increased to 41.4% in the 2021-22 academic year, over 60% than that of 2011-12 (Research Office, 2022). This increase in specialized training for teachers demonstrates the government's commitment to enhancing teacher competency in supporting diverse learning needs.

It is evident that the Hong Kong government has made significant efforts to provide additional manpower and resources to support students with SEN. However, Hong Kong SEN students continue to experience pressure and anxiety in both their social and academic lives (Chan et al., 2023; Chan, 2002; Wong-Ratcliff & Ho, 2011). A study conducted by Centre for Special Educational Needs and Inclusive Education (2012) found that 26% of SEN students reported being bullied, and 31% were teased by their peers (p. 92). This environment leaves SEN students feeling emotionally vulnerable and insecure, leading to peer mistreatment (Buhs et al., 2006, p. 9), and subsequently impacting their psychological and behavioral well-being (Lui et al., 2017, p. 626).

Hong Kong Christian Service conducted a survey in 2023 on Social and Emotional Support for SEN Children Adapting to Primary School (UCA News Reporter, 2023). They interviewed 347 parents of SEN children and 158 professionals serving such children, including principals, teachers, social workers, and therapists, and found that SEN students encountered numerous challenges. The top three difficulties identified were "not being able to calmly resolve disputes with classmates", "not being able to stay calm when teased", and "not being able to stay calm when disagreeing with others". Regarding learning attitudes, the three most common challenges were "not being able to keep up with learning", "not being able to answer the teacher's questions in class" and "not being able to concentrate in class". The survey highlighted the diverse difficulties faced by SEN students in Hong Kong.

In addition to the support provided by schools and

teachers, studies have shown that various interventions can be beneficial for helping SEN students address their challenges. Research has demonstrated the effectiveness of behavioral treatment in enhancing social functioning and reducing psychopathology in students with ADHD (Babinski et al., 2020). Cognitive behavioural therapy, mindful yoga and positive psychology interventions have been found to significantly improve the well-being of SEN students in Hong Kong (Chan et al., 2023). Classroom physical activity breaks have been shown to be valuable in improving the behavioral difficulties of SEN students (Chesnaïs et al., 2023). Existing literature also supports the effectiveness of self-regulated strategy development in enhancing the writing skills of students with emotional and behavioral disorders (Ennis & Jolivet, 2014). Additionally, art therapy programs have been found to have a significant impact on reducing anxiety and promoting empathy and pro-social behavior (Lavric & Soponar, 2023).

Identifying the specific difficulties and challenges faced by students with SEN is crucial before implementing any interventions to support them effectively. Understanding the individual needs and circumstances of each student is essential in developing targeted and tailored interventions to address their difficulties. By conducting Study 1, researchers and educators can gather valuable insights into the unique challenges experienced by SEN students. This foundational research serves as a basis for designing and implementing interventions that are evidence-based and responsive to the specific needs of SEN students.

II. Study 1

Introduction

To address the needs of SEN students, Hong Kong schools are recommended to establish a Student Support Team (SST) led by SENCO who is responsible for coordinating, planning, implementing, and reviewing the support provided to SEN students. The SST typically includes key personnel such as the principal, vice-principal(s), SENCO, SENSTs, School-based Speech Therapist, teaching assistant(s) (TA) for SEN students, curriculum development leader/ senior teacher(s), guidance master/ mistress and school social worker(s) (Education Bureau, 2025c). By leveraging the expertise and collaboration of the SST members, schools can assist SEN students in overcoming their challenges, reaching their learning potential based on their abilities, and achieving growth at various stages of development (Education Bureau, 2025d).

A literature review was conducted to identify twelve potential difficulties (shown in Table 1) that SEN students may encounter. These difficulties serve as valuable insights for developing targeted interventions and support strategies to address the specific needs of

SEN students in Hong Kong.

Table 1
Twelves difficulties identified from literature reviews

	Difficulty	Definition
1	empathy	The ability to understand another person's feelings and their meanings (Kalisch, 1973)
2	anxiety	An uneasy feeling that leads to physical and mental reactions due to uncertain future thoughts (Xi, 2020)
3	depression	A prolonged depressed mood or loss of interest in activities (World Health Organization, 2023)
4	self-concept	A person's perception of himself (Shavelson et al., 1976)
5	self-esteem	A person's self-evaluation and feelings of self-worth (Rosenberg, 1965)
6	self-regulation	The process of managing thoughts, behaviors, and emotions to achieve goals (Schunk & Zimmerman, 1994)
7	social inclusion	Access to community resources, relationships, and a sense of belonging (Cobigo et al., 2012)
8	social interaction	Situations where two or more people respond to each other's behavior (German & Robbins, 2020)
9	social pressures	External factors that create uniformity in group behavior (Chapelain et al., 2015)
10	peer relationship	Interpersonal relationships formed through peer interactions (La Greca & Harrison, 2005; Wang & Hu, 2021)
11	peer problem	Issues related to childhood conditions and diagnoses (Fabiano et al., 2010)
12	peer acceptance	Being well-liked by peers, measured by preferences for play partners or friends (De Bruyn et al., 2010)

In Hong Kong, each public sector primary and secondary school has a SENCO and SENSTs responsible for assisting the principal and vice-principal(s) in implementing IE (Education Bureau, 2025b). The Education Bureau also provides regular teaching positions for Special Educational Needs Support Teachers to support schools in effectively implementing the IE policy (Hong Kong Special Administrative Region Government, 2023a). Given that SENCOs, SENSTs, guidance masters/mistresses,

and school social workers are part of the SST, and teachers with prior experience working with SEN students, they are assumed to have a better understanding of the challenges faced by SEN students. Therefore, these school staff members are invited to participate in Study 1.

Methodology

Design

The study design involved conducting a literature review to identify key items, from which twelve challenges were derived. Participants were then invited to complete a brief 5-minute online survey to provide their perspectives on the difficulties encountered by students with SEN.

Participants

Participants for the online survey were recruited using purposive sampling to target individuals involved in supporting children with SEN. Participants were invited to share the survey link within the researchers' professional networks. The expertise of the participants was crucial as the survey aimed to capture the perspectives of these experts on the challenges faced by SEN students. The inclusion criteria for Study 1 were: (a) participants being members of the SST or qualified teachers in local Hong Kong schools, and (b) having experience working with students with SEN. A total of 35 participants were successfully recruited for the study. 21 were members of the SST, comprising 8 SENCOs, 7 members of school counseling committees, and 6 social workers. Additionally, 14 participants were qualified teachers with prior experience working with SEN students.

Measure

Participants were presented with two questions: one regarding their positions and the other eliciting their perspectives on the challenges faced by SEN students. To assess their views on the difficulties encountered by SEN students, participants were asked to identify the top five challenges out of 12 difficulties identified through literature search that they believed these students were facing.

Result

The top three difficulties identified were self-regulation, social inclusion, and self-esteem. Among the participants, 65.7% considered self-regulation to be the most significant challenge faced by SEN students. Social inclusion and self-esteem are the second and third top perceived difficulties of SEN students.

Discussion

The analysis of the survey data indicated that the top three difficulties identified among students with SEN were related to self-regulation, social inclusion, and self-esteem. The reasons for the challenges in these domains will be further discussed below.

Students with SEN often struggle with **self-regulation**, which refers to the ability to activate and sustain

cognitions, behaviors, and emotions in pursuit of goals (Schunk & Zimmerman, 1994, p. 309). Research by Chesnais et al. (2023) highlights that self-regulation is composed of cognitive, behavioral, and emotional dimensions, with five key variables including on-task behavior, academic productivity, academic accuracy, disruptive behavior, and self-regulation in the social context (Harris et al., 2004).

Studies have shown that SEN students tend to exhibit weaknesses in self-regulation, particularly in terms of behavioral difficulties and challenges in adhering to study schedules. Research by Chesnais et al. (2023, p. 148) indicates that children and adolescents with emotional and behavioral disorders often display high levels of behavioral difficulties, impacting their self-regulation abilities. Additionally, Bakracevic Vukman et al. (2013) found that SEN students may struggle to persevere when faced with challenging subjects and are more likely to give up quickly compared to their peers. These findings underscore the importance of addressing self-regulation challenges in SEN students to support their academic success and overall well-being.

Social inclusion lacks a universally accepted definition due to its complex and multidimensional nature. A systematic review defines it as “the full and fair access to community-based resources and activities, having relationships with family, friends and acquaintances, and having a sense of belonging to a group” (Cobigo et al., 2012). The Department for Education and Skills emphasizes inclusion as fostering a sense of community and collaboration between mainstream and special schools to support students with SEN (Department for Education and Skills, 2021, p. 3). Pijl et al. (2008) introduced an index of social inclusion that includes peer acceptance, friendship, and belonging to cohesive subgroups, which helps assess social participation among SEN students.

Research indicates that SEN students struggle significantly with peer interactions (Bossaert et al., 2013), and are less socially integrated than their typically developing (TD) classmates (Schwab et al., 2015, p. 9). Pijl et al. (2008) found that over 50% of students with behavioral and communication issues experience isolation.

Kavale et al. (1995) reported that 75% of students with learning disabilities (LD) exhibit social skill deficits compared to their TD peers. More recent studies confirm these findings, showing that students with LD have lower social skills (Frostad & Pijl, 2007). More recent studies confirm these findings, showing that students with LD have lower social skills (Schwab et al., 2015). Students with moderate LD experience reduced peer acceptance, fewer friendships, and diminished social interactions, often perceiving themselves as less cooperative and empathetic than their TD counterparts (Avramidis et al., 2022).

Self-esteem refers to a person's self-evaluation including feelings of self-worth (Rosenberg, 1965). Gurney (1988) similarly defines it as "the relative degree of worthiness which people perceive their self-concept to possess" (p. 16).

The Assessment Program for Affective and Social Outcomes (APASO) Manual indicates that students with SEN struggle to gain trust from peers, perceive their teacher-student relationships negatively, and have a lower academic self-concept compared to their peers (Lam & Yeung, 2005). A recent study by Wong-Ratliff and Ho (2011) found that SEN students reported negative experiences in mainstream classrooms and exhibited lower self-esteem. A systematic review by Eccleston et al. (2019) concluded that students with ADHD face interpersonal conflict, stigma, and invalidation, all of which adversely affect their self-esteem.

III. Study 2

After identifying the top three difficulties perceived that Hong Kong SEN students face, we aim to investigate if Animal-Assisted Intervention (AAI) is an effective intervention in addressing these challenges.

Solé et al. (2023) believed that “the inclusive education system generates changes in educational teaching practices and opens the need to implement an innovative methodology to offer more opportunities to the student to participate in an inclusive educational system” (p.17). **Animal-Assisted Interventions (AAI)** are an innovative approach designed to support students with SEN defined as “an intervention that intentionally includes or incorporates animals as part of a therapeutic process” (Fine, 2015, p. 15).

The use of animals in therapy dates back to the ninth century in Belgium (Morrison, 2007, p. 52). The first scientific journal article related to AAIs, titled “The Mental Hygiene of Owning a Dog,” was published in 1944 in *Mental Hygiene* by sociologist James Bossad, who discussed the beneficial relationships between pets and their owners (Morrison, 2007, p. 52). A 1980 study of 92 cardiac outpatients found that pet ownership was linked to longer life (Friedmann et al., 1980), underscoring the significance of human-animal bond (HAB) and human-animal interaction (HAI) for stress reduction and social support (McNicholas & Collis, 1995; Serpell, 1996; Siegel, 1990).

In 1999, the Delta Society established the term AAI as an umbrella for Animal-Assisted Activities (AAA) and Animal-Assisted Therapy (AAT) under The Standards of Practice for Animal-Assisted Activities and Therapy (Morrison, 2007, p. 53). Numerous studies have demonstrated the health benefits of companion animals (Brelsford et al., 2017, p. 1), including improved emotional stability (Anderson & Olson, 2006; Kogan et al., 1999); and enhanced social skills (O'Haire et al., 2013, 2014; Rodrigo et al., 2018; Tissen et al., 2007). Additionally, HAB/HAI has been shown to reduce

stress (Barker et al., 2016; Fiocco & Hunse, 2017), alleviate anxiety (Crossman et al., 2015; Foerder & Royer, 2021), and increase oxytocin levels (Chen et al., 2021).

The effectiveness of AAI for students with SEN is well-documented. A systematic review by Brelsford et al. (2017) assessed empirical studies on AAI's impact on student behavior and learning, reporting beneficial effects on cognition, social-emotional functioning, motor skills, and physiological arousal. AAI, particularly with dogs, has been shown to enhance engagement, enjoyment, motivation, communication, behavioral regulation, and community participation among children with ASD (London et al., 2020, p. 4492).

Furthermore, incorporating therapy animals has been linked to improvements in social competence, including cognitive abilities, emotional processes, and behavioral skills (Narvekar & Ghani, 2022, p. 1). Case studies by Solé et al. (2023) illustrated a progressive increase in communicative patterns and proactive emotional expressions among SEN students. AAI demonstrates the benefits in cognitive, motor, multisensory, and interactive stimulation with SEN students in an inclusive educational context (p. 17). Overall, AAI effectively improves cognitive abilities, motivation, social-emotional behavior, and enjoyment for SEN students in inclusive educational settings.

Methodology

Participant & recruitment

The participants were recruited in a local secondary school in Hong Kong. The participants are diagnosed with any type of nine types of SEN and study in local public sector secondary school. The criteria may include intellectual disabilities, SpLD, ASD, ADHD, and other developmental disabilities. Participants who do not meet these criteria should be excluded from the study.

The recruitment process was assisted by the Student Guidance Officer (SGO) under the Counselling Committee, who obtained consent from the parents and the participants for data collection. Additionally, participants should have no known allergies or aversions to animals such as cats and dogs. These inclusion criteria were put in place to ensure that the participants were suitable for the intervention and to minimize any potential risks or adverse effects. The participants were also informed that their participation was voluntary and that they could withdraw from the study at any time without penalty. The data collected from the participants were kept confidential and anonymous.

For this study, a total of 32 students with SEN were recruited from a local secondary school in Hong Kong. The majority of the participants were female students (62.5%) with a mean age of 12.97, with a minimum age

of 11 and a maximum age of 15. The participants were from Secondary 1 to Secondary 4.

Table 2

Descriptive information of participants (N = 32)

	N	%
Gender		
Male	12	37.5
Female	20	62.5
Age		
11	1	3.1
12	12	37.5
13	10	31.3
14	5	15.6
15	4	12.5
Education Attainment		
Secondary 1	20	62.5
Secondary 2	7	21.9
Secondary 3	3	9.3
Secondary 4	2	6.3

Study Design and Procedure

The study used a pre-test/post-test design, with participants completing a short questionnaire before and after the intervention. Data analysis was conducted using IBM SPSS Statistics 25. Paired sample t-test was deployed to examine the effectiveness of the intervention.

Animal-assisted intervention details

The intervention involved four weekly sessions of one hour each of AAI. Table 3 (below) shows the activities in the four sessions of AAI. The students participated in the activities with the company of animals (cats and dogs) in every session.

In this study, we use the term “visitation animal” to refer to companion animals that possess suitable characteristics—such as calmness, appropriate behavior, and friendliness—and are trained for public visitation by volunteers (Howell et al., 2022, p. 10). These animals are taken into facilities like hospitals, elderly care centers, and schools to enhance well-being. Notably, their owners do not require specific professional qualifications or registration.

The AAI sessions were conducted by the first author, who has been bringing her cats for AAI for over 10 years and is a qualified teacher with experience working with SEN students. The study's questionnaire assessed self-esteem, self-regulation, and social inclusion. After completing four weekly AAI sessions, participants filled out the same questionnaire again. The collected data were analyzed using descriptive and inferential statistics to evaluate the effectiveness of AAI on the self-esteem, self-regulation, and social inclusion of SEN students in Hong Kong.

Measure

Demographics

Participants were requested to provide their demographic information by answering three simple questions related to gender, age, and school grade level.

Self-esteem

The Chinese version of Rosenberg Self-Esteem Scale (RSES) (Tsang, 1997) was used to measure the participants' self-esteem. The scale consists of 10 items that assess the participants' positive self-regard. Participants rate their level of agreement with each statement on a 4-point Likert scale, with higher scores indicating higher levels of self-esteem. The Cronbach's alpha values were 0.88 in the pre-test and 0.89 in the post-test.

Self-Regulation

Self-Regulation Questionnaire (Bandy & Moore, 2010; Novak & Clayton, 2001) was used to measure self-regulation. This 13-item questionnaire assesses the individual's capacity to regulate negative emotions and disruptive behavior, as well as their ability to establish and achieve goals (Kurtovic et al., 2020). The questionnaire was translated into traditional Chinese and demonstrated acceptable reliability in both the pre-test and post-test, with Cronbach's alpha values of 0.67 and 0.64, respectively.

Social Inclusion

Social inclusion in class subscale of The Perceptions of Inclusion Questionnaire (PIQ) (Venetz et al., 2015) was used to measure the participants' social inclusion. The scale includes 4 items that assess the participants' sense of belonging and social acceptance in their class. Participants rate their level of agreement with each statement on a 4-point Likert scale, with higher scores indicating higher levels of social inclusion. The scale exhibited good reliability with a Cronbach's alpha of 0.83 in the pre-test and 0.92 in the post-test.

Results

Two participants did not complete the post-tests, resulting in incomplete data for analysis. Therefore, data from only 30 participants were used to examine the effectiveness of AAI.

The results showed that AAI had a significant positive impact on self-esteem, self-regulation, and social inclusion of SEN students in Hong Kong. The analysis revealed that the mean scores for self-esteem, self-regulation, and social inclusion significantly increased after the intervention compared to before the intervention. The paired-samples t-tests showed that the differences were statistically significant for social inclusion ($t(29) = -8.374$, $p < 0.001$), self-esteem ($t(29) = -4.791$, $p < 0.001$), and self-regulation ($t(29) = -3.870$, $p < 0.001$).

Table 4

Paired-sample T-test for the change of social inclusion, self-esteem and self-regulation

	Pre-intervention Mean (SD)	Post-intervention Mean (SD)	t	95% CI (lower, upper)
Social Inclusion	2.94 (0.71)	3.38 (0.71)	-4.791***	-0.62, -0.24
Self-esteem	2.57 (0.44)	3.48 (0.58)	-8.374***	-1.13, -0.69
Self-regulation	2.33 (0.38)	2.60 (0.38)	-3.870***	-0.41, -0.13

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

These results indicate that the participants' social inclusion, self-esteem and self-regulation significantly improved after the four weekly sessions of AAI and suggest that AAI may be an effective intervention for improving the social inclusion, self-esteem and self-regulation of SEN students in Hong Kong. These findings have implications for the development of interventions that target the mental health and well-being of individuals with SEN.

Discussion

In this study, we aimed to provide empirical data assessing the effectiveness of AAI in enhancing social inclusion, self-esteem, and self-regulation among SEN students in integrated classrooms in Hong Kong. Although this was an uncontrolled study with a small number of participants, preliminary evidence from the intervention sessions suggests that AAI successfully achieved its goal of improving these key areas for SEN students.

The findings indicate that AAI effectively improves **social inclusion** among SEN students. The unconditional social support from the animals served as a stimulus for the SEN students to engage in social interactions, and therefore increased positive social interactions with the peers (Friesen, 2010, p. 265). The presence of animals is significant in creating a positive social atmosphere (Hergovich et al., 2002).

Sessions were conducted in groups of 6 to 10 students, which facilitated enhanced social interaction, feedback, and support among peers. Although the SEN students did not engage in formal group tasks, they shared experiences during the four sessions, participating in the same activities and interacting with the animals simultaneously. This common goal and interest aligned with findings from Kogan et al. (1999, p. 117), the sociability with peers had been increased. This echoed with the framework introduced by Vyrastekova (2021) that feelings of connectedness, the sense of belonging, and friendships are the core elements of social inclusion (p. 4).

There was a notable improvement in the **self-esteem** of SEN students during the AAI sessions. During the sessions, students participated in the activities with the

company of animals who are non-judgmental to their performance, and, in turn, students enjoyed the moments with the animals who were friendly to them. Patting, touching and hugging animals, brushing animal's hair, walking with animals, all these first-person HAI experiences bring joy and relaxation to the students. Similar to the findings from Meints et al. (2022), the presence of animals helped reduce students' stress levels.

Additionally, the design of activities contributed to enhancing self-esteem. In Session 1, picture books were chosen to cater for the reading and speaking weaknesses of the students with Intellectual Disability, ADHD, SpLD, and Speech and Language Impairment. The sessions of Art Jamming and Craft Making served a similar objective in providing an individual moment for SEN students to concentrate on their creation of art products. At the end of these two sessions, students were encouraged to appreciate their own creations and those of their peers. This sense of pride and accomplishment from their successes in AAI significantly strengthened their self-esteem.

AAI was found to be somewhat effective in improving students' **self-regulation**. Participants showed slight improvements in both behavioral and emotional self-regulation. Most students remained focused on tasks such as drawing and crafting, exhibiting stable and calm emotions in the presence of animals. However, mild disruptive behaviors were noted, particularly during reading activities. Students may have felt uncomfortable, as reading is typically associated with formal lessons rather than after-school activities.

Limitation

This pilot study had a limitation which relied solely on the views of school staff and teachers, potentially overlooking the firsthand experiences and insights of SEN students themselves. Including the perspectives of SEN students could offer a more comprehensive understanding of their challenges.

Implication & Further Study

Overall, the current study enhances knowledge in the field of AAI showing convincing evidence of assisting SEN children and this may provide a basis for changes in educational practice, including public policy change and enhance the health and well-being of SEN students while providing safe and welfare-oriented interventions.

This is the pioneer study in Hong Kong to include cats in animal-assisted interventions. We believe that incorporating cats into these programs will provide new insights for researchers and practitioners interested in conducting animal-assisted therapy.

We suggest that conducting future studies with a larger and more diverse sample size can enhance the reliability and generalizability of the findings. Implementing a Randomized controlled trial (RCT)

design with a control group can provide a more robust evaluation of the effectiveness of interventions like AAI in addressing the identified difficulties of SEN students.

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Disclosure statement

The authors report there are no competing interests to declare.

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Figure 1

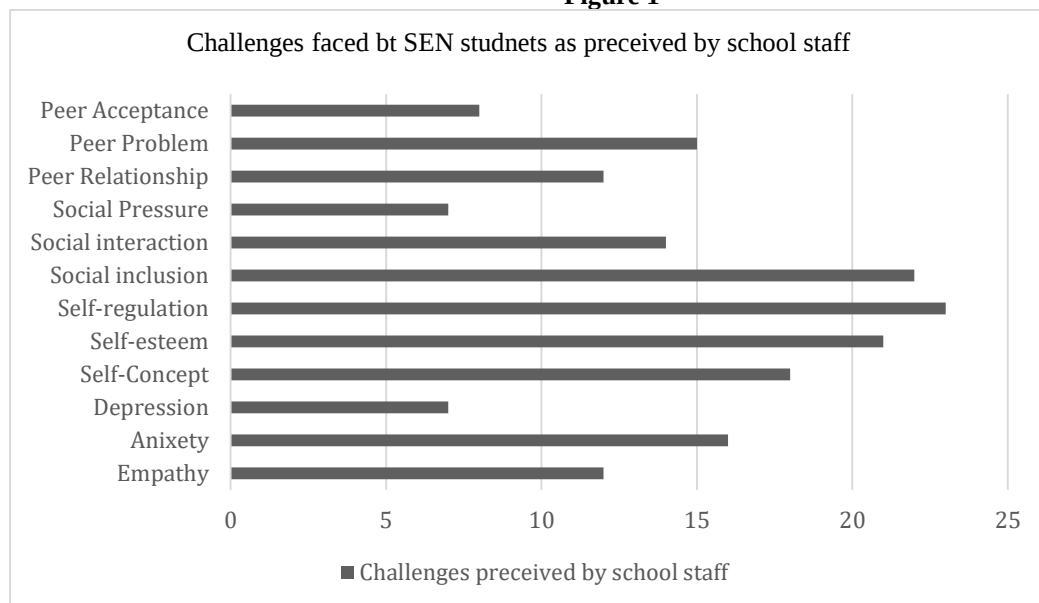


Table 3

Details and pictures of AAI sessions

Session 1 : Reading animal-related picture books with company of pets
Session 2: Art Jamming with company of pets



Session 3: Craft making with company of pets



Session 4: Singing Bowl with company of pets

