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The Impact of Online Education as a Supplementary Tool for Special Education Needs (SEN) Students: Teachers' Perspectives

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Abstract: This study explores the challenges of providing special education needs (SEN) education in impoverished regions of China. It proposes a hybrid education model that combines traditional and online education to address these challenges. In this hybrid model, traditional face-to-face education dominates, and online education exists as a supplementary tool. This study focuses on teachers' perspectives, aiming to improve the educational environment for students with special needs. Qualitative research methods, specifically semistructured interviews, were employed to collect the data. A total of six special education teachers participated in the interviews. This study employed thematic analysis to categorize the data, resulting in the identification of six themes through the generalization of the coding of textual content. Among the six themes examined, poverty emerged as the most influential factor affecting online education. The findings indicate that the hybrid education model performs well in addressing the identified challenges.

Keywords: special education needs; inclusive education; special education needs student; child development; school education; family education; distance education

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1. Introduction

Special education needs (SEN) refers to the need for additional support during the learning process for various reasons. SEN encompass various areas, including academic, emotional, social, cognitive, and physical. These special needs encompass learning difficulties, disabilities, mental health issues, and language difficulties (Alan, 2009).

In the United Kingdom, children with special education needs (SEN) can access support through the Special Education Needs Support Department or the Special Education Needs Coordinator (SENCO) at their school or nursery (Gov.uk, 2022). SEN education is designed to provide tailored services for children with exceptional learning needs, aiming to ensure inclusion in the educational process and offer necessary support. Students with SEN can also apply for an Education Health and Care (EHC) plan, which outlines the specific support they require, such as interventions and auditory assistance (Gov.uk, 2022).

In China, the government provides free assistance to students with SEN, including policies, funding, and programs. According to the Ministry of Education's 2022 report, China aims to achieve a 97% enrolment rate for school-age children with disabilities in compulsory education by 2025. According to the Ministry of Education in China (Ministry of Education of the People's Republic of China, 2022), primary education in China is free for all children, including those with SEN, and resources such as accessible facilities are available to support their education. According to the 2023 National Education Development Statistics Bulletin issued by the Ministry of Education, as of 2023, there were over

912,000 students enrolled in special education schools nationwide. Of these, 341,200 were enrolled in special education schools, accounting for 37.4% of the total number of special education students. This means that approximately 62.6% of special education students are enrolled in regular schools, participating in inclusive education.

However, China's special education system still faces challenges compared with the UK's more established system. A report from Guangdong Guangzhou Daily Newspaper (2023) highlighted that while early childhood rehabilitation and intervention programs in Guangdong show promise, there is a lack of continuity in specialized support as children move through primary schools. Many schools have dedicated units for SEN students but suffer from a shortage of trained professionals to provide consistent intervention. Unlike in the UK, where schools offer individualized therapies, such as music therapy for SEN students (Gov.uk, 2022), specialized therapy services in China are often inadequate, especially in mainstream primary schools.

Students with SEN are confronted with a significant choice in their educational path: deciding between attending a mainstream school or a special school. This decision encompasses multiple factors. According to Kauffman et al. (2018), the requirements of students with SEN are highly personalized due to the unique circumstances of each student, which encompass diverse disabilities and factors, such as varying family economic conditions. Each student's plan is characterized by its uniqueness, encompassing diverse teaching methods and strategies, such as curriculum, specialized training, appropriate equipment, pedagogy, and personal planning. The involvement of SEN students and their families is crucial in the decision-making process because of their deep understanding of the students' needs and personalities (Huei Lan, 2009; Lendrum et al., 2015). In addition, students with special education needs (SEN) may consult specialists for advice and recommendations. These professionals, such as educational consultants, psychologists, and special education specialists, possess extensive knowledge regarding various types of schools and the support measures available; they can offer detailed information on these matters. Professionals collaborate with students and families to conduct personalized assessments, facilitating a deeper understanding of their individual needs and identifying the most suitable school environments.

Mainstream schools and special schools exhibit notable distinctions in their educational methodologies, learning settings, and support provisions. It is essential for students with special education needs (SEN) to comprehend these distinctions, as they have a direct impact on their distinct learning experiences and environments (Huei Lan, 2009). SEN schools are established with the specific purpose of catering to students with SEN. Compared with mainstream schools, they possess a greater level of expertise and a more comprehensive approach to addressing the unique requirements of these students. According to Kauffman et al. (2018) and Shani and Hebel (2016), teachers in mainstream schools lack sufficient training to effectively support students with special education needs and disabilities (SEND), which can make it difficult for them to address the individualized needs of all students in the classroom due to the complexity of teaching strategies and learning environments (Shani & Hebel, 2016).

Successful inclusive education generally offers more benefits to children with special education needs (SEN) than special schools, especially when adequate support is provided. Inclusive education not only enhances academic achievements and social skills but also boosts self-confidence and mental health (O'Leary et al., 2015; Buckley et al., 2006). However, its effectiveness is constrained by resources and support systems, and without the necessary measures, inclusive education may fail to achieve its intended outcomes. In China, policies prioritize the enrollment of children with disabilities in regular schools, but in rural areas, the effectiveness is limited due to a shortage of teachers and insufficient

resources (Heiman, 2000). While special schools provide specialized support, the sense of isolation they often create cannot fully compensate for the lack of social integration. Therefore, local inclusive education can effectively reduce social isolation and enhance children's sense of belonging and social identity.

Currently, China has not established a unified quality assessment standard for inclusive education. The absence of quantifiable criteria makes it difficult to accurately measure educational quality. Additionally, the lack of a clear evaluation framework has led to underdeveloped monitoring and feedback mechanisms, thus hindering the continuous improvement of policies and their implementation. Without unified assessment standards, it is challenging for the government and educational authorities to make informed adjustments to future education policies based on specific data and actual outcomes, which may lead to outdated and ineffective policies.

Another important factor to consider is the variation in curriculum and assessment approaches. Special education schools individualize the curriculum for students with SEN, considering various factors (Ninlawan, 2015). In mainstream schools, students must participate in classes and undergo assessments alongside their peers. Mainstream schools offer additional support services for students with SEN, but they do not modify the curriculum specifically for these students. Mainstream schools' assessment criteria may not always be applicable to students with SEN. These students prioritize differences in their performance and abilities; this includes assessing their progress in language skills and their ability to work independently (Colum & McIntyre, 2019).

However, this does not imply that mainstream education is unsuitable for students with SEN. According to Colum and McIntyre (2019), prominent international organizations, including UNESCO, have expressed their dedication to the principles of Education for All (EFA) and inclusive education practices (Slee, 2011). The Chinese government is actively promoting inclusive education. According to the Ministry of Education of China (Ministry of Education of the People's Republic of China, 2022), in mainstream educational institutions, children are afforded ample opportunities for socialization, a crucial aspect of their post-school life.

A comparison between mainstream schools and special schools in previous studies reveals that the primary drawback of mainstream schools lies in their insufficient capacity to develop individualized plans and provide ongoing intervention for students with special education needs. Some of these problems can be partially addressed through online education. For example, based on the specific needs of students with special education needs (SEN), relevant components can be effectively selected from a vast knowledge base to develop a personalized learning plan (Greer et al., 2014). Online education offers several advantages, including independence and self-selection. However, it is important to note that these benefits may not extend to special education needs (SEN) education. Roberts et al. (2011) offer an alternative approach to the advancement of online education. The research findings indicate that students with special education needs (SEN) perceived their disabilities as having a detrimental effect on their utilization of online education (Roberts et al., 2011). Independent engagement with online content can pose challenges for students with special education needs (SEN), necessitating support from educators or parents in a supplementary role. The research objective of this study is to explore methods for improving the educational environment for students with SEN. To this end, this study designed a hybrid educational model.

According to Greer et al. (2014), a blended education model refers to a form of learning in which a portion of the content is completed online. Figure 1 of Clayton Christensen's four-part visual model provides a detailed depiction of the blended learning model (BLM) (Staker & Horn, 2012). This study incorporates modifications based on the provided

definition. This study demonstrates that the blended model allows for the unrestricted utilization of online education in terms of hours and frequency. The integration of online education into the academic year resulted in the emergence of a hybrid education model. The model utilized in this study is referred to as the hybrid education model in order to establish a clear differentiation.

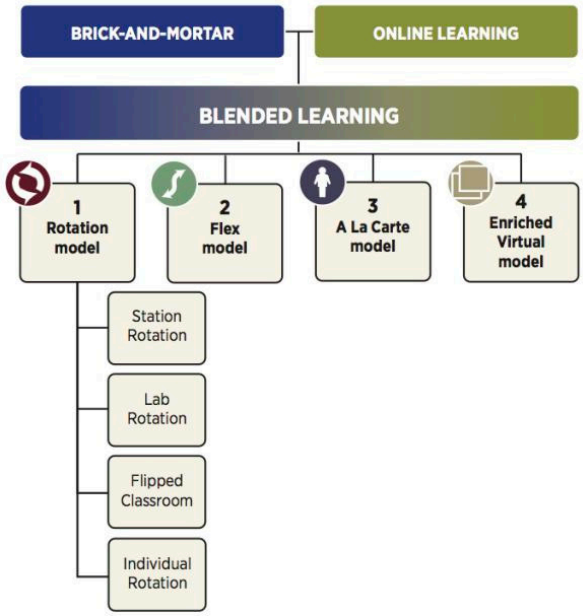

Figure 1. Four-part visual model describing in detail the blended learning mode (from the Clayton Christensen Institute) (Staker & Horn, 2012).

The aim of this study is to investigate how online education can effectively leverage its strengths and address the limitations of traditional education within the hybrid education model; this is a refined version of blended learning, where face-to-face education is central and online elements are supplementary. The hybrid model offers flexibility and remote access, although its practical implementation is still being researched.

The model currently encounters challenges akin to those experienced in online education. Technology can play a crucial role in addressing certain issues, such as the development of efficient search engines. A new challenge arises in the form of users needing to acquire proficiency in utilizing the search engine. The presence of technicians capable of providing user instruction is crucial. Additionally, it is important to take into account the updating and maintenance of the database. The optimal approach for this research would involve the coordination of the Chinese government or the Ministry of Education to facilitate the creation of a hybrid education model for special education needs (SEN). This would effectively address the technological challenges within this context.

This study examines how online education can address the challenges experienced by SEN students within the current educational model. The hybrid education model employed in this study is a customized adaptation that reflects the specific circumstances in China. It is important to note that this model may not be universally applicable.

Beijing, China, was selected as the study site. During the prolonged lockdown in Beijing amid the COVID-19 pandemic, the educational system, which spans from primary schools to universities, relied predominantly on online education. These circumstances presented a favorable environment for the advancement of online educational platforms. The field of SEN in China is currently undergoing a sustained period of development and improvement. In 2021, China had a total of 2288 special education schools accommodating 149,100 students with special education needs. While there has been an increase in the

coverage of special education schools in China, this coverage still falls short in relation to the country's population and geographical size. The Chinese government has provided financial support for the development of special education and has shown a corresponding policy inclination. The integration of special education and online education in China has been ongoing for a considerable period, facilitated by the rapid development of online education and the current stage of special education in the country. The aforementioned background indicates a substantial amount of experience, which aligns with the research objectives of this study.

Furthermore, most of the selected research focused on the perspective of students with SEN, while neglecting the perspective of the observer. The individuals chosen for the research are teachers in online education or traditional education. Educators who have encountered COVID-19 suggest a three-stage progression from the conventional educational model to an online educational model and then back to the traditional educational model; this implies that the teacher possesses extensive expertise in both conventional and digital forms of education. Simultaneously, the teacher possesses expertise in instructing students with SEN through both traditional and online education models. Teachers who have experience in multiple contexts contributed to the achievement of the research objectives in this study.

2. Methods

The objective of this study is to investigate the effects of the hybrid model on the educational setting for students with SEN. This study focused on teachers' perceptions of and attitudes toward this educational model. This study examined the benefits and challenges of implementing a hybrid model in light of teachers' prior experiences. The research methodology is constructed around the following three questions:

(1) What are the challenges of SEN education under the current education model?

These challenges highlight the unmet educational needs that are not addressed by the existing educational model. This inquiry seeks to develop a comprehensive understanding of the educational requirements of students with SEN.

(2) What are the potential possibilities and pitfalls of online education as a supplementary tool?

This stage is crucial for examining the suitability of the hybrid education model in the context of special education needs (SEN). This inquiry examines the role of online education as a supplementary tool in comprehending the advantages and drawbacks associated with it.

(3) How can the hybrid model of education work better for SEN students?

This research question examines the effective integration of online education as a supplementary resource to address the educational obstacles faced by students with SEN. It investigates successful strategies for incorporating online education and identifies potential challenges that may arise during the implementation process. Drawing upon the previous analysis in question 1 and the subsequent discussion in question 2, a cross-sectional comparison was conducted to examine the two education models.

The research used a qualitative approach. The chosen research methodology situates phenomena within particular social, cultural, and historical contexts (Myers et al., 2013). Its primary objective is to cultivate a comprehensive understanding of the underlying reasons and motivations driving the phenomenon (Merriam, 1988); this is consistent with the research objectives, as it allows for an investigation into the unique challenges experienced by students with SEN in the present educational setting and the underlying causes of these challenges. Another reason for the use of qualitative research methods is their

emphasis on individual differences (Merriam, 1988). These methods involve analyzing individuals in terms of their experiences, attitudes, and emotions. As previously stated, it is crucial to highlight the importance of uniqueness in relation to students with SEN. Each of these students possesses unique characteristics, including individualized requirements, capabilities, backgrounds, and obstacles. Their education and support should be tailored to their individual needs.

This research employed semistructured interviews as the data collection method. The interview process adhered to the structured guidelines outlined in Horton et al.'s (2004) manual. The interviews were conducted via communication tools, such as telephone, WeChat, and Teams. The interviews were recorded in their entirety and transcribed after their conclusion. The transcribed text was subsequently analyzed. The interviews examined participants' perspectives and perceptions regarding specific matters (Boyce & Neale, 2006). The objective of this study was to investigate the viewpoints of teachers. Conducting interviews with teachers is an effective and convenient method of obtaining primary data directly. During the interview, questions can be modified based on participant responses, allowing for the inclusion and clarification of additional questions to delve deeper into topics of interest (Horton et al., 2004; Harrell & Bradley, 2009). When examining teachers' experiences, it was important to explore various topics and incorporate additional information to comprehend the specific requirements of diverse students with different types of SEND that they have instructed. Semistructured interviews facilitate reflective and evolving discussions (Dearnley, 2005). The researchers must exercise caution when selecting their words to ensure that they ask questions that are both open-ended and unbiased. Objective questioning and caution play crucial roles in maintaining the validity of the research. The researchers must acknowledge their subjective position and actively mitigate the influence of subjective bias on the research outcomes.

2.1. Interview Questions

The interview questions were designed based on the guidelines for semistructured interviews provided by Boyce and Neale (2006). Building upon the original questions, the interview questions were modified locally to suit the Chinese context. The interview questions were categorized into two sections. The initial inquiry requested demographic information, accompanied by a concise transcription of the participants' fundamental personal details. The second part constituted a reply to the research inquiries, which were related to the three research questions mentioned earlier.

2.2. Data Collection

2.2.1. Participants

This study was conducted in a border suburb of Beijing, China, characterized by a blend of urban and rural features. This study examined various rural areas in the vicinity of the suburban region, with a specific emphasis on economically disadvantaged rural areas. A total of seven participants were initially enrolled in the research, but only six ultimately participated in the interviews, as one participant withdrew before the interviews commenced. The group consisted of five women and one man. All participants were employed in the aforementioned rural areas, which consisted of two mainstream primary schools and one school catering to students with special education needs.

The ethical section of this research adhered to the requirements of the Ethics Review Committee (ERC) in accordance with the four fundamental ethical principles. Informed consent was obtained from all participants and their legal guardians. Prior to the interviews, all the participants provided their consent by signing consent forms. The confidentiality of participants' personal information and identities will be strictly maintained. Data are

processed in an anonymized format to prevent disclosure of their identities. Throughout the interviews, the researcher carefully monitored the psychological and mental well-being of the participants to prevent any potential harm, particularly when discussing significant events, such as the COVID-19 pandemic.

The teaching experience of the participants was taken into consideration when selecting the participants. The participants had to fulfil all the conditions to take part in the research:

(1) Be an in-service teacher.
(2) Have received training related to special education needs, with systematic learning and training.
(3) Have taught no fewer than three students with special education needs.
(4) Have taught no fewer than two students with special education needs and disability types.
(5) Have conducted long-term online education (more than six months).
(6) Have taught special needs students through online education during the COVID-19 pandemic.
(7) Have taught special needs education students through traditional face-to-face education prior to COVID-19.
(8) Taught special needs education students through traditional face-to-face education prior to COVID-19.

Items 1, 2, 3, and 4 were established to ensure that teachers possessed a comprehensive understanding of special education needs education within the prevailing educational framework. The requirements pertaining to the quantity and categories of students with SEND were implemented to ensure that teachers possessed a comprehensive understanding of and familiarity with the specific needs of SEND students. Conditions 5, 6, 7, and 8 were dedicated to the practical implementation of two educational models by educators. The teaching experience of each teacher was also recorded. Table 1 presents comprehensive data on the six participants.

Table 1. Demographic information for participating.

Pseudonym	Gender	School Type	Subject	Years Teaching SEN Students	Total Years Teaching
Olivia	Female	Primary SEN school	Chinese	6	15
Emily	Female	Primary mainstream school	Manual skills	7	28
Sarah	Female	Primary mainstream school	Chinese	10	32
Jessica	Female	Primary SEN school	Math	2	27
Alec	Female	Primary SEN school	Math	11	30
Daniel	Male	Primary mainstream schools	English	5–6	8–9

2.2.2. Procedures

The data collection process was segmented into multiple stages. The initial stage involved advertising the research and recruiting participants. The research was advertised to the teachers with the approval of the school leaders. Educators with a vested interest in this study reached out to the researchers. The interviews were scheduled for participants who met the qualifications after their qualifications were reviewed. Prior to conducting the interviews, the researchers provided the participants with an informed consent form in addition to the interview questions.

Following the researcher's interaction with the participant, the recording commenced following the researcher's notification to the participant regarding the recording of the conversation. Prior to commencing the interview, the researcher verified the participant's

consent. After obtaining a positive response, the researcher inquired whether the participant understood the contents of the informed consent form and reiterated the participant's rights, including anonymity and the right to withdraw. Following this confirmation, the interview commenced. The researcher modified and broadened the research inquiries in response to the participant's experiences and responses.

Following the conclusion of the interview, the audio recording underwent numbering and transcription. In the transcription process, the researchers obscured sensitive personal information, such as the names of the participants. Pseudonyms were employed in the final transcribed text (Dearnley, 2005).

The interviews were conducted online via various tools, including mobile phones, computers, and communication software. The average duration of the interviews was approximately 20 min. Due to the proximity of the interviews to the summer holidays in China and the potential travel plans of some teachers, conducting remote online interviews provided a solution to overcome geographical limitations. Given that this study was carried out in China with a homogeneous sample of Chinese participants, the interviews were conducted exclusively in the Chinese language throughout the duration of the study. This was performed to mitigate any potential misinterpretation of the research due to language barriers. To ensure the reliability of the data, all the transcribed texts underwent two rounds of translation. The researchers manually performed one translation, whereas the other translation utilized Google Translate as a machine translation. The researchers subsequently conducted a sentence-by-sentence comparison of the two translation versions, leading to the development of the final version. The third translation that underwent review was utilized for the purpose of data analysis.

2.2.3. Data Analysis

The data analyses in this study relied solely on the interview content provided by the six participants. Thematic analysis was utilized to comprehensively examine the texts and derive significant insights from them. Thematic analysis is a technique used to identify, analyze, and report patterns, also known as themes, within a dataset. In accordance with Braun and Clarke (2006), the dataset was organized and described in rich detail. The utilization of this data analysis method is prevalent in qualitative research. The process entails categorizing and summarizing the data to identify recurring concepts and constructing themes by further summarizing and reconstructing similar concepts (Braun & Clarke, 2012). Reflexivity plays a crucial role in this process, as it aims to minimize the impact of bias on the research findings and results (Steier, 1991).

The thematic analysis aligns with the research aims and questions of this study. The research question encompassed various intricate factors, such as the supportive functions of online education, challenges encountered by the hybrid model, and the requirements of students with SEN. This study highlights the importance of personalization in delivering services and support to students with SEN. Additionally, it examines strategies for programming the service process. Thematic analysis can offer insights into the connections and patterns of interactions among these factors, aiding in the identification and exploration of emerging issues and trends in the education of students with SEN within hybrid models.

Braun and Clarke (2006) propose a six-step division for thematic analysis. The table presented in Table 2 displays the relevant data. The initial stage involves acquainting oneself with the data, referred to as transcription, which entails converting the audio file into text and reviewing it multiple times. The second step involves generating initial codes, whereas the third step involves searching for themes. In this stage, a preliminary analysis of the codes is conducted, and a summary of their findings is provided. This research is better suited to the inductive approach. Themes are determined by the data content

rather than by preexisting theories. At this stage, a data-driven approach is employed to generate an initial version of the code. Based on data frequency and logical relationships, the code is categorized into different themes. This study employed hierarchical coding, first identifying sub-themes and then synthesizing them into main themes. Certain items do not align with any of the established themes and should be categorized as "others". Theme review involves assessing the suitability of the identified themes. The process subsequently involves the identification and labelling of themes, followed by a more in-depth analysis to ensure the coherence and comprehensiveness of the data descriptions. In the later stages, the double coding method was implemented to strengthen the reliability of the data. Finally, there is the task of generating the report. The data analysis process involved the utilization of NVivo for coding organization (Braun & Clarke, 2012).

Table 2. Phases of thematic analysis (Braun & Clarke, 2006).

Phase	Description of the Process
1. Familiarizing yourself with your data	Transcribing data (if necessary), reading and rereading the data, noting down initial ideas.
2. Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire dataset, collating the data relevant to each code.
3. Searching for themes	Collating codes into potential themes, gathering all the data relevant to each potential theme.
4. Reviewing themes	Checking if the themes work in relation to the coded extracts (level 1) and the entire dataset (level 2), generating a thematic "map" of the analysis.
5. Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6. Producing the report	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back to the analysis to the research question and literature, producing a scholarly report of the analysis.

3. Results

These codes were identified and categorized into specific themes, which are described and elaborated. Table 3 shows the extracted codes and the summarized themes. Some codes are related to more than one theme.

(1) Economic issues and the pressures of poverty.
(2) Family attitudes, including support, challenges and problems faced by parents.
(3) Content of SEN education, including comparisons between mainstream and special schools.
(4) Support provided by schools for SEN students and the challenges they face.
(5) Teachers' needs when delivering SEN education, including mainstream and special schools.
(6) Some briefly mentioned codes or themes.

Table 3. Coding tree.

Category	Code
Poverty	
Instrumentation	Instrumentation
Fee	Electricity fee, Communication fee, Caregiver, Early intervention
Work	Delayed work
Family	
Parents	Parent knowledge, Parent helper intervention, Communication
Finance	caregiver, Delayed work, Equipment technology, Students' after-school needs (early intervention)
Content	
Personalized (for SEND students)	Personalized plan, Life skills, Adapting the curriculum, Assessment, Targeted slides, Examination, Sign language, Body language
General knowledge	General knowledge, Standardized test
school	
Instrumentation	Resource classroom, Equipment technology, Safety (round corner tables and chairs)
Teachers	Available personnel (retired teachers), SEND relevant professionals
Health	Mental health of teachers

3.1. Theme 1: Economy and Poverty

3.1.1. Infrastructure

Economy and poverty were recurring themes, with all participants emphasizing the importance of infrastructure, including machinery, electricity, and communication costs. One participant consented to have their response used anonymously.

> "You may not be able to imagine what true poverty is like. In the first three months of the pandemic, it was not very obvious, but as time passed, it became increasingly evident. I prepaid my student's phone bill for three months—I never mentioned it to anyone, I did not seek reimbursement from the school, and I did not care if anyone knew about my contribution. My purpose was very simple: I could not allow my student to be deprived of an education. He is my student, and I could not bear to see him drop out for this reason. He deserves an education".

The high cost of infrastructure was a common concern across both mainstream and special schools. Low-income households often cannot afford devices, such as tablets or computers, forcing students to rely on parents' mobile phones for lessons. Additionally, internet and electricity costs are significant but often overlooked, creating a persistent financial burden for impoverished families.

3.1.2. Delayed Work

Delayed work was another key issue. Economically disadvantaged students who lack access to online learning resources rely on parents' mobile phones, which disrupts parents' ability to work. During the COVID-19 lockdown, this overlap between children's lessons and parents' work hours created significant financial strain, as parents could not use their phones for work-related tasks.

This issue persists beyond the pandemic. For SEN students, a responsible adult is required to supervise online learning at home, either through a caregiver or by the parents

themselves. This adds to the financial burden, as hiring a caregiver or sacrificing work time leads to additional costs and reduced household income.

3.2. Theme 2: Families

All the participants reported receiving support from students' families, regardless of whether they attended mainstream or special schools. Parents generally cooperated with teachers, offering emotional and material support, although the results were not always optimal. The importance of parents' attentiveness to their child's psychological well-being and the maintenance of regular communication with the school was emphasized. Parents were seen as competent and optimistic in this regard.

One participant highlighted the critical role of parental support during the pandemic, noting that parents were responsible not only for care but also for their child's education. They helped procure educational tools and ensured their child's safety during online lessons, as teachers could only observe students through screens and could not intervene if students engaged in risky behaviors. All parents agreed to accompany their children with SEN during online sessions.

Despite the parents' efforts, challenges remain. One participant shared that the parents of a child with Down syndrome struggled to understand their child's behavior. While teachers explained that the child's language difficulties were genetic, parents insisted that it was due to introversion. This issue was more common in special education schools, although mainstream teachers also faced similar challenges.

3.3. Theme 3: Content

The subject matter of instruction varies significantly between mainstream and special education schools, despite both following the Ministry of Education curriculum. Teachers in both settings have some autonomy, but their primary differences lie in their teaching content and assessment methods. Mainstream schools adapt the curriculum for SEN students by focusing on essential skills, whereas the core curriculum remains aligned with that of other students. SEN students are assessed through traditional exams, but the grading criteria are less stringent and focus more on basic knowledge and life skills. However, evaluations lack standardization and individualized plans for SEN students when they are developing courses.

Special education schools offer early intervention services, including therapy and traditional subjects, such as language and math, a practice not widely adopted in mainstream schools. However, a shortage of qualified teachers in this field limits its implementation, with only a few mainstream schools receiving extensive SEN training.

Interactivity in online education emerged as a major concern.

Online platforms pose challenges for engaging SEN students, particularly in early intervention programs that require physical interaction and verbal reassurance. Educators face difficulties in connecting with students, such as those with autism, who may not respond or may move out of view during lessons, causing concern and anxiety among teachers.

3.4. Theme 4: School

Most participants reported positive feedback about the support and services provided by schools for students with special education needs (SEN). Many mainstream schools have a dedicated resource classroom equipped with tools to help tailor learning plans for SEN students. These classrooms include safety features, such as desks without sharp corners and computers for student use. SEN schools offer a wide range of specialized resources, with classrooms structured to support specific interventions, all funded by the government.

One conventional school emphasized the importance of home visits to strengthen relationships between the school and families. Retired teachers with prior SEN experience

were recruited to conduct these visits, addressing the shortage of experienced teachers for SEN students. The school organized home visits on a schedule, allowing retired teachers to independently manage this task.

3.5. Theme 5: Teachers' Needs

The participants provided suggestions based on their needs, which can be grouped into two categories: learning needs related to SEN knowledge and those related to specific skills. Teachers in special schools typically have relevant professional backgrounds and have completed specialized courses tailored to specific special education needs. In contrast, teachers in mainstream schools often take on this role in addition to their general teaching responsibilities. Most have only undergone basic training, which primarily focuses on the principles and significance of inclusive education, offering a general overview of how to communicate with students with special education needs (SEN) and their families, as well as how to document special needs. However, they have not received training in intervention strategies, nor have they completed coursework dedicated to addressing specific special needs. A teacher from a specialized school expressed a desire to acquire additional specialized skills, whereas two mainstream school educators highlighted the need for knowledge about SEN, particularly in understanding related symptoms and behaviors. As one participant said:

> "I mainly teach based on my experience as a teacher, and the training we receive tends to focus on how to do. However, I actually don't have much knowledge about their symptoms. I once had an Attention-Deficit/Hyperactivity Disorder (ADHD) patient who drove me crazy, and later I found out that he was moving and talking constantly because of a physical reason".

3.6. Theme 6: Others

All the participants expressed excitement about the hybrid education model. A special education school teacher noted that it would reduce her workload and improve resource availability for both herself and her students. A mainstream school teacher emphasized the importance of patience in special education.

One participant questioned whether all SEN students with are suitable for the hybrid model. She cited a student with ADHD who struggled with online learning, often losing focus and accidentally displacing his phone, which posed a safety risk. The limited camera range made it difficult to monitor his status, leading to heightened anxiety during online lessons compared with traditional in-person education, where she could ensure his safety.

4. Discussion

The participants identified poverty as a major barrier to the development of online education in this context, noting its pervasive impact on all aspects of education. This study, like that of Pang (2020), focuses on remote areas and online education for SEN. While Pang (2020) highlighted the impact of online education in these areas, this study revealed its influence on SEN education to be limited, with poverty as a central issue. Pang's study involved teachers with higher qualifications than those in this research, where local teachers lacked advanced degrees, further exacerbating resource limitations.

Pang noted insufficient school–family connections as a barrier, but this study revealed stronger connections. However, the impact of online education on educational outcomes has remained minimal. The main issue was the affordability of necessary equipment—devices, electricity, and internet costs—which poor families struggle to cover; this highlights how poverty obstructs effective participation in online education, despite its potential benefits, such as flexibility and access to resources (Mukhtar et al., 2020; Dumford & Miller,

2018). However, the hybrid education model—combining traditional face-to-face instruction with online components—may be more suitable for impoverished regions. Unlike full online education, it reduces one's reliance on expensive technology. Government efforts to provide free computers to SEN students further mitigate equipment costs, recognizing the model's potential. In wealthy regions, such as Haidian, Beijing, online education offers greater benefits, such as virtual reality (VR) for immersive experiences, demonstrating the significant role of economic factors in shaping the advantages of online education.

4.1. Discussion of Family Involvement and Hybrid Education

Family involvement is crucial for the emotional welfare of SEN students and enhances their self-esteem and confidence (Lendrum et al., 2015) The shift to online education has expanded parental roles, with parents assuming teaching responsibilities that were traditionally handled by educators; this increases the pressure on parents, especially in poorer regions, where they must balance educational duties with work and family life (Smith et al., 2016) This redistribution of responsibilities disrupts family income, exacerbating challenges for low-income families. To alleviate financial burdens, policymakers could consider providing internet subsidies, device support, or financial assistance to ensure that students from low-income families have equitable access to online education resources.

Parents' educational background also impacts the effectiveness of hybrid learning. While online education provides abundant resources for parents to support their children's learning, it requires that they be proficient with technology and knowledgeable about SEN, which is not always the case (Smith et al., 2016). This gap can be addressed through online resources, but it remains a challenge in poorer areas.

The hybrid education model, which combines traditional teaching with online support, may better accommodate these needs, allowing teachers to guide students while leveraging online resources. This model can narrow the gap between mainstream and special education, providing greater flexibility for students to choose between different educational settings.

It is necessary to establish effective support mechanisms to ensure that all families, especially those from low-income backgrounds, can adapt to this transition. For instance, schools and government agencies can offer parent training programs, including online learning modules and community workshops, to help parents enhance their technological skills and deepen their understanding of special education needs (SEN).

4.2. Resource Classrooms and Teacher Shortages

Resource classrooms play a key role in implementing blended learning, offering a safe environment and necessary equipment for SEN students. Schools cover network and equipment costs to prevent financial strain on low-income families. Online education, when paired with teacher guidance in resource classrooms, can provide effective learning for SEN students, especially in impoverished areas (Bullock et al., 2008; Kotera et al., 2019).

The shortage of qualified educators remains a challenge, as most teachers in remote areas lack advanced degrees in special education. This issue is compounded by a lack of practical experience in mainstream schools. Online education can address this by providing access to global resources and specialized therapists. However, it cannot fully replace in-person therapy, which is essential for high-quality interactions with SEN students (Bullock et al., 2008). The hybrid model mitigates this by offering both face-to-face teaching and online support.

4.3. Hybrid Model's Role in Teacher Development

The teachers in this study reported that online education helps address knowledge gaps by offering various learning platforms, including instructional videos, forums, and

expert consultations. This approach enhances their skills and knowledge, which can be applied to traditional classrooms, making the hybrid model beneficial for both students and teachers.

4.4. Hybrid Model for Policy Reform and Dynamic Optimization

The advancement of special education is deeply dependent on policy support; however, establishing a legal and regulatory framework is not a one-time effort but an ongoing process of refinement and dynamic adaptation. The evolution of laws and policies should be guided by shifting societal demands, insights from educational practice, and the empirical research, ensuring continuous enhancements that improve the adaptability and effectiveness of the special education system.

At present, while the right to education for children with special needs has been legally recognized to some extent, the policy framework still requires further refinement and reinforcement. In China, strengthening legislative efforts in special education and improving regulatory provisions are key to advancing inclusive education and ensuring educational equity. This includes not only clarifying legal responsibilities and securing financial support, but also enhancing the feasibility of policy implementation to ensure that children with special needs across diverse regions have equal access to educational resources.

Furthermore, special education must evolve in tandem with societal and technological progress, necessitating flexible and responsive support mechanisms. For example, with the rise of hybrid education models and AI-assisted teaching, policies should be periodically updated to reflect technological innovations and their impact on instructional methods. Expanding the scope of support and refining personalized educational services tailored to diverse learner needs will help ensure that all children with special education needs receive high-quality, legally protected education.

5. Limitations

The study's focus on a single rural area in Beijing restricts its generalizability to other regions in China, as each area presents unique cultural and socioeconomic challenges. Rural regions across different provinces may experience varying policy implementations and disparities in resource allocation, further constraining this study's applicability beyond its immediate context. The theoretical framework applied is tailored to impoverished rural regions and may not be universally applicable. The small sample size of six participants and the use of semistructured interviews, while providing in-depth insights, may also limit this study's external validity. A larger sample, drawn from multiple regions, would enhance the robustness of the findings and allow for cross-regional comparisons. Additionally, memory biases in participants' responses could affect the accuracy of the findings. To overcome this limitation, future research could incorporate quantitative methods, such as surveys or experimental studies, to validate the reliability of interview data. Additionally, adopting a longitudinal research design with long-term tracking and multiple rounds of data collection could provide a more comprehensive understanding of the evolving trends within the research phenomenon.

6. Conclusions

This study explored the challenges faced by students with SEN in both urban and rural areas of Beijing, China, particularly in disadvantaged regions; this highlights the potential of hybrid education models, focusing on online education as a supplementary resource for SEN students. Unlike most existing studies, which examine traditional and online education separately, this research investigated their integration and the adaptability of the hybrid model.

Based on semistructured interviews with SEN educators, this study proposes the hybrid education model as a promising solution to the limitations of the current education system; it emphasizes the role of poverty as a significant barrier to effective online education and recommends that the government and educational institutions implement measures to support the broader adoption of the model. The hybrid model offers a promising solution, especially in remote and low-income areas. It reduces one's reliance on expensive technology, fosters a collaboration between teachers and parents, and supports teachers' professional development. While some disabilities may not align with online learning, the hybrid education model offers a flexible approach, allowing teachers to assess the suitability of online components for individual students. Unlike full distance learning, hybrid education allows teachers to switch between online and in-person instruction, ensuring that the needs of SEN students are met (Silletti et al., 2021). This flexibility is key to ensuring that online education supports rather than hinders SEN students' learning.

This study outlines seven key strategies to increase the hybrid model's effectiveness:

1. Provide government-funded online education tools to ease economic pressures.
2. Create online databases and provide technical support to improve parents' understanding of SEN.
3. Enhancing relevant laws and regulatory frameworks to ensure adequate protection and support.
4. Facilitate resource sharing to address teacher shortages.
5. Strengthen the collaboration between families and schools to better support students.
6. Offer training for teachers to effectively implement the hybrid model and improve their skills.
7. Allow teachers to adapt the hybrid model to meet the specific needs of their students, emphasizing flexibility and adaptability.

These strategies aim to improve educational access and quality for SEN students and ensure the successful integration of hybrid education in the system.

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Abbreviations

The following abbreviations are used in this manuscript:

SEN	Special education needs (SEN)
SENCO	Special Education Needs Support Department or the Special Education Needs Coordinator
EHC	Education Health and Care
SEND	Special education needs and disabilities
EFA	Education for All
ERC	Ethics Review Committee
VR	Virtual reality
UNESCO	United Nations Education Scientific and Cultural Organization

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