A Case Study on Teacher's Challenges on Inclusive Mathematics Classes in a Secondary Public School

Juan Paolo Martin Culajara[1], Carla Jobelle Culajara[2]
[1,2]Sta. Catalina National High School, SDO Quezon Province, Philippines

Article Info	ABSTRACT
	Inclusive education became the mainstream educational system in the Philippines. The study used a qualitative research design employing a case study approach. Two Mathematics teachers were observed and interviewed. Purposive sampling was used to choose the participants. Data gathering is carried out through open-ended questions, interviews, and observation. Three themes emerged in the study: lack of ASL training, personalization in pedagogy, and upskilling teachers' competency in inclusive education. This study reveals that learning should not be constrained and can be attained when everyone collaborates. It was evident that teaching is a continuous process that should not be interrupted because teaching is the noblest profession. Teachers and administrators should offer programs, projects, and activities connected to pedagogy, addressing diversity and personalizing in providing excellent services since inclusive education is now available within the educational system. It is recommended in the study to strengthen and expand inclusive education so that each student can be given more priority in accessing education for all, give them more possibilities and opportunities to address their differences, and strengthen their inherent capabilities as valuable members of society. The study seeks to contribute to the existing body of knowledge on inclusive education by exploring the experiences and perspectives of educators in the field.

Corresponding Author:

Juan Paolo Martin Culajara
Sta. Catalina National High School, SDO Quezon Province, Philippines
Email: juanpaolomartin.culajara@deped.gov.ph

1. INTRODUCTION

Education is a fundamental right for all individuals, and teachers play a crucial role in igniting hope and transformation in the lives of their students. To meet the needs of students with disabilities, teachers must employ creative and adaptable approaches, including learning American Sign Language (ASL) and other specialized teaching techniques. Inclusive education is emphasized in the Department of Education Republic of

the Philippines [1], which mandates the Department of Education to quickly resolve issues and ensure every student has the right to an equitable education. In light of the ongoing shift towards inclusivity, teachers must adapt and evolve their teaching practices accordingly. The focus on quality education in Sustainable Development Goal Four (SDG 4) brought attention to how crucial curriculum is to develop high levels of learning and articulating and promoting comprehensive development-relevant education. Teachers are the principal proponents of the K–12 curricula. Teachers should be the primary agents of change since they are the ones who embrace the changes taking place in the world, give importance to every difference, and promote religious harmony.

The study of Culajara [2] emphasizes that one of the goals of every teacher is to be innovative and creative in providing successful and productive teaching and learning processes. The recent global pandemic has highlighted the need for educators to be passionate and committed to guaranteeing high-quality education and improving their teaching methods. As we approach the era of inclusivity, teachers must possess the tenacity to maintain their beliefs and values, even in unconventional settings, when dealing with diverse students.

In a typical mainstream context, teachers must involve children with special needs as much as feasible in a typical class setup to offer inclusive education [3]. The ability of teachers to transfer knowledge, develop positive values, and improve the capacity of gifted students to overcome obstacles in life is what helps to encourage inclusivity in the educational system [4]. Thus, there is a lack of understanding in providing excellent service in inclusive classes, which makes it difficult for teachers to be prepared and to demonstrate their competence in various approaches to inclusive education. This was strengthened by Allam and Martin [5] that teachers who assist students with learning difficulties consider them unqualified because they do not have any special needs education training from the school.

Moreover, making classes adaptable and responsive to the educational learning demands of individuals with special educational needs and disabilities is another challenge teachers encounter [6]. As the department offers varied implementation of programs in providing quality services in education, it is only appropriate to prepare the competencies and teaching approaches needed to offer an inclusive class, and this will be accomplished if the teacher is competent in delivering instruction and will has enough support in every activity in inclusive education. The novelty of this study will pave the way for schools to know teachers' experiences in inclusive classes and make priority implementation areas in the school.

As highlighted in the study by McGaha and Linder [7], in a world where everything is connected and interdependent, teachers must understand these concepts to instruct students effectively and take a global perspective. As such, the need for specialized training and professional development opportunities for teachers cannot be overstated. Through ongoing education and training, teachers can better serve their students and promote an inclusive learning environment that fosters growth, development, and achievement.

The present study seeks to investigate the teaching experiences of educators in the context of inclusion education. Nowadays, inclusivity is mainstream at all educational levels. It should be given equal opportunities and value differences. As diversity expands and every ability is different, teachers should be creative, integrate learning and apply differentiation and personalization in delivering instructions. Rekaa et al. [8] have noted that while inclusion is widely acknowledged as a desirable aim in education, some teachers perceive it as challenging due to lacking resources and competencies.

In order to effectively serve LWD, educators must undergo significant training, adapt their teaching practices, and enhance their dedication and commitment to meet the changing demands of the educational landscape. As the implementation of inclusive education continues to evolve, educators must remain informed and current on the latest teaching strategies and best practices for working with LWD.

The goal of inclusive education is to mainstream students with special needs in a flexible learning environment so they can receive a high-quality education that maximizes their chance for overall development [8], and this depends on teachers who can promote inclusivity in the educational system by instilling good morals, imparting knowledge, and enhancing the abilities of gifted children to deal with obstacles in life.

In sustaining education, development should be integrated and meaningfully performed by giving everyone an equal opportunity, and inclusion education should be prioritized [9]. Thus, McGaha and Linder [7] stated that individualization and differentiation in inclusive education is a way to address and provide educational services to students with special needs. The study seeks to contribute to the existing body of knowledge on inclusive education by exploring the experiences and perspectives of educators in the field.

As a paradigm for educating students with disabilities (SWDs), inclusion is a relatively new occurrence transforming how education is delivered [10]. In mainstreaming inclusive education, the schools should give and prioritize equal opportunity to provide education for all, which addresses the uniqueness and differences of the students.

With this study, teachers, as the prime mover of change, should have grit in developing their competencies and knowledge in adapting inclusive education to deliver quality services in education. In order to improve inclusive classroom practice, it is essential to understand better the needs of children with intellectual disabilities (ID) and how these needs can be met in inclusive mathematics classrooms [11].

With the challenges experienced in delivering services in inclusive education, Tan and Thorius [12] denote that the key to resolving these inconsistencies lies with mathematics teacher educators. Teachers as the sole driver in attaining the inclusive education goal that enables individuals to access an equal world and opportunities, professional development, and personal growth should be attained and retool their competencies. As facilitators and lecturers, utilizing and integrating approaches addressing differences where personalization and differentiation should be implemented.

Similarly, Das [13] differentiating instruction is one instructional task that is increasing relevance, and teachers must provide theoretically rich learning opportunities to even students through task design in Mathematics. In addressing the diverse world of the

students, varied activities should be provided to strengthen and showcase their diverse strengths and weaknesses in learning and teaching. The population of the class affects the learning and teaching process. It was evident in the study of Turgut and Uğurlu [14] that teachers who teach in much less crowded classes performed inclusion more effectively. Moreover, Schnepel et al. [15] that the classroom environment affects mathematics students' academic achievement. The study of Schnepel et al. [16] asserts that teachers have a crucial role in inclusive mathematics education, where teachers must combine two tasks: develop shared learning experiences for all students and offer individualized learning opportunities.

Moreover, Roos [17] reiterates that instructional interventions for mathematical engagement were utilized as a method of instruction, which concerns equity in mathematics education.   Legal rules stress competencies for inclusive components, standards for teacher education, pedagogy, and other topic areas [18]. This research aims to examine the teaching experiences of educators working with learners with disabilities (LWD) to identify the challenges they face and explore strategies that may be used to address them.

Figure 1. Conceptual Framework

Figure 1 shows that identifying the challenges will lead to intervention programs that can better deliver quality services in inclusive education. As providing equality, access, and culture-based learning, this study will pave the way for the preparation of every educator to open their minds and systems in addressing the diverse world of the students and be more inclusive in every service in education.

Objectives of the Study:

The study aims to assess the teachers' challenges in inclusive Mathematics classes in secondary public schools. Specifically, it adheres to answer the following objectives:

(1) What challenges have Mathematics teachers encountered in inclusion classes?
(2) What interventions do Mathematics teachers use in addressing the challenges?

2.   METHOD
Research Design

The study utilized a qualitative research design employing a case study approach to investigate teachers' experiences in inclusion classes in a secondary public school in the Philippines. The research data were collected through observation, semi-structured, and in-

depth interviews. Two teachers who were advisors to students with learning disabilities and subject teachers in inclusion classes were purposively selected for observation and interview. Two student participants were selected for interviews to triangulate the collected data. The inclusion class selected for the study involved a single mute and deaf student.

The qualitative case study approach was selected to minimize a large body of information into a single, researchable subject [19]. This methodological approach enabled the researchers to gather rich, detailed data through in-depth interviews and observations of participants' experiences. Codes and themes were used to analyze the data in the study.

Participants

A purposive sampling technique was employed to select participants with specific characteristics and experiences relevant to the research aims. The selection criteria included advisership to a student with a learning disability and subject teachership in an inclusion class. The chosen participants represented the target population and allowed the researchers to understand their experiences in inclusion classes. The chosen participants of the study were teachers involved and had experience in inclusive classes.

As shown in Table 1, the MT1 was a female teacher handling inclusive classes for five years. During MT2, male teachers handled inclusive classes for ten years. With the chosen participants' expertise, the researchers understand their experiences as teachers in an inclusive class.

Table 1. Profile data of the participants

PARTICIPANTS	SEX	YEARS IN SERVICE
MT1	F	5
MT2	M	10

*MT= Mathematics Teacher

Instrument

The research instrument used in this study was a semi-structured interview consisting of three open-ended questions. The researchers used a guided interview as the basis for the analysis. The interview guide's questions were validated to ensure they covered and addressed all pertinent study data. As Kallio et al. [20] emphasized that a qualitative semi-structured interview guide that has been carefully developed enhances the objectivity and reliability of studies and makes the findings more believable. As the aim of the study is to know the experiences of Mathematics teachers, questions given were adapted to the study's objectives, and the experts validated it based on the content that answers the research objectives.

Data Collection and Analysis

Observations were conducted over four sessions, each lasting one hour within one week. The interview was conducted through an in-person interview. Through the interview, there will be a deeper understanding of the experiences of each participant in the

study. This methodological approach enabled the researchers to gather rich, detailed data through in-depth interviews and observations of participants' experiences. Codes and themes were used to analyze the data in the study.

3.   RESULTS AND DISCUSSION

Based on the observation and interview, three overarching themes emerged from the responses of the participants *(1) lack of ASL training, (2) lack of personalization in pedagogy, and (3) need to upskill and retool teachers' competency.*

Lack of ASL Training

The educators have acknowledged that they face communication challenges when interacting with the LWD due to their lack of proficiency in sign language, which inevitably results in using writing as a primary means of communication. However, this communication method has proved to be time-consuming, and the exchange of information is limited to keywords. Moreover, the teachers have also realized that teaching the LWD is difficult because they cannot hear and ask questions. Additionally, the teachers' responsibilities and effective teaching strategies remain ambiguous due to the lack of training in inclusion education.

According to Pocaan [21], schools are the ideal setting to lay the foundation for a better world and to foster positive attitudes and values that will help people recognize and welcome variety. This school will serve as a means of overcoming the many approaches to inclusive education, particularly in mainstreaming equal opportunity despite inequalities. As a result, all pre-service educators and instructors will be more equipped to adapt their teaching methods and be open to new ideas and inclusivity-related initiatives. As MT1 shared:

"...One of the challenges I experienced in delivering instruction in an inclusive education was that I knew nothing about ASL or preparation to communicate with the students with disabilities. It is difficult on my part because how can I rely on learnings if what happens inside the room is the pace of his learning, he becomes independent."

Also, it is determined that there is a need for research that directly applies the universal design for learning's suggested principles to study the impact of its implementation on the inclusion of all students at the institution. Due to the lack of opportunity or comfortability to work on their pedagogical content knowledge while managing their classes, teaching practice is essential in preparing teachers to create good future educators [22].

This was supported by Rojo-Ramos et al. [23], asserting that contemporary approaches to rights and quality of life call for integrating individuals with diversity and disabilities in society, including their involvement in the educational system. In order to ensure that children with disabilities receive the modifications and assistance they require as part of inclusive education, several groups are asking governments to take action. As MT2 shared:

"...My challenge is giving or communicating with the student using sign language because I do not know anything. It is also difficult on my part that his learning is that he learns on his own and he does independent learning after providing instructions to him/her because I have no means to communicate apart from writing instructions on paper to connect to the LWD directly."

Based on the participant's responses, they face the lack of ASL training challenges regarding providing equal and quality service in education. Because the teacher handling classes with inclusion did not undergo training and preparation, another obstacle they encountered was that the LWD's academic knowledge was not on par with that of their peers, which created a considerable gap that is challenging to bridge. Providing a separate activity sheet for the LWD also adds extra workload to their teaching responsibilities. As MT2 reiterates:

"..what LWD does in the room becomes independent learning because, as a teacher, I cannot communicate well with him/her, so what happens is that there are gaps; instead of me teaching him, he learns using textbooks or learning materials that he needs to read on his own and understanding."

Consequently, Otukile-Mongwaketse et al. [24], in order to make material accessible for students with disabilities during the teaching and learning processes, teachers' expertise is essential. The study's findings also suggest that the students in the inclusion class supported the learner with disability (LWD) to the best of their ability. Participants demonstrated a willingness to learn and use sign language to communicate with the LWD, even if their proficiency in this mode of communication may not be at the standard level. Despite the communication challenges, the LWD understood the students' attempts to communicate through sign language or written modality.

This suggests that schools must comply with the many policies and guidelines about inclusive education and how it will be provided to the school settings to meet and reach every student in any manner and format. To maintain the world for high-quality services in education and be open to the same access and learning opportunities as everyone else, inclusivity must be prioritized as we embrace equality, differentiation, and personalization. The perception of each student who has members who are learners with disabilities in their physical education classes, and how they address the difference and individuality, as well as a teacher in the delivery of instruction, will be explored through this study by looking at their teaching strategies.

The teachers' intervention strategies in response to the challenges of teaching a learner with a disability (LWD) included the creation of a separate activity sheet. This document contained all the necessary information from the lesson and served as a substitute for a lesson plan. It featured pictures and printed PowerPoint presentations, thus enabling the LWD to represent the lesson visually. This approach was the only intervention implemented during the first week of classes, with the hope of devising other strategies as the course progresses. Providing such resources would also allow the teachers to ensure

that LWDs receive the same quality of education as their peers, as recommended by the principles of inclusive education [25].

The teachers suggested that it would benefit the school administration to mandate master teachers to create and provide learning materials tailored explicitly for LWDs. They argued that having access to such materials would significantly alleviate their workload and allow them to focus on providing more effective instruction.

Lack of Personalization in Pedagogy

With the challenges teachers are experiencing in delivering quality services in education, personalization in addressing the differences of students has been a crucial task for teachers. In a world where diversity is evident, inclusivity should be prioritized. All students need to be cared for and valued, with their differences contributing to developing their capabilities and knowledge. Teachers, as the sole source of knowledge and skills, need to connect the gaps and be more of a guide for each student. With this, the personalization in pedagogy was affected in delivering quality service in education if teachers could not attain this practice.

According to O'Flaherty and E. M. Beal [26], inclusive education is implied in various diversity concepts. According to this idea, the phrase "inclusive education" is currently used to define the method of satisfying the educational needs of all students by fostering engagement, academic achievement, and a sense of community, assisting all students in reaching their full potential [27]. Inclusive education is a continuous process of learning that offers equal opportunity to all learners that address their uniqueness and diversity [28]. As shared by MT1 and MT2:

"...in reality, inclusion is very much accepted in the school, but there is a lack of preparation of the teacher and the students to be with them in the classroom because we do not have the training or skills to do basic sign languages. One is also the first to know how the classroom can be truly inclusive without barriers or gaps in learning if we cannot acquire basic skills."

Teachers must be creative in addressing students' differences and uniqueness and provide equal learning opportunities. As Hutzler et al. [29] assert that ensuring teachers are knowledgeable about inclusive classrooms and equipped to implement these is one way of supporting the efforts to enhance inclusive education for students:

"Because students in the classroom have different pacing, teachers must have a "personal touch" in delivering instruction to meet the needs and reach every student. Personalization must meet the diverse world and their pacing to make the class inclusive."

It was evident that teachers must practice the teaching strategies and approaches addressing personalization to meet the demands and needs of every student in a diverse world of learning. The study of Lindner et al. [30] emphasized that it should allow for discussing the need for action and inclusive interventions and provide insights into practical inclusion instructional practices in inclusive classrooms. Similarly to Demchenko

et al. [31], adopting inclusion in schools has accelerated and established equal opportunity for all learners. The study of McGaha and Linder [7] revealed that inclusive education practices and philosophies lack teacher training.

The idea of creating inclusive education has led to an acceleration in the adoption of inclusion in schools. This is due to the fragmented nature of the courses explicitly designed to prepare physical education teachers to work with special needs students, which does not considerably raise the caliber of the instructors' credentials. In order to be successfully implemented at the national level, inclusive education must be explicitly stated and supported. Additionally, efficient data collection and management systems, flexible curricula, and collaboration with other societal spheres where inclusive education matters, such as employment, are required. According to Raguindin et al. [32], inclusive education is implied in various diversity concepts. Every industry that interacts with people tries to spread an understanding of each individual's worth. Also, it promotes everyone's full engagement in society, regardless of their particular physical or mental traits.

Upskilling Teacher's Competency in Inclusive Education

Teachers and administrators make a special effort to consider the best teaching method and resources, especially for kids with special needs. One of the educators' key objectives is ensuring students have equal opportunity and genuinely understand and assimilate everything they are taught. Sumayang et al. [33] assert that teachers' perspective and practical experience in mainstreaming inclusive education was published in 2022. Thus, teachers encounter various challenges and coping techniques when implementing DepEd Order 72 s. 2009 [21].

Teachers must adapt their methods of instruction in order to create an inclusive classroom where each student can study at their speed. They consist of student-led presentations, partnered learning, interactive whiteboards, etc. Because of the diversity of the students, one teacher in an inclusion classroom definitely will not be able to meet everyone's needs. The teachers in this study expressed a negative attitude towards class inclusion, which differs from the findings of Sargeant and Berkner [34], who reported a generally positive attitude among teachers. With the participants' responses, teachers mainly suggest upskilling teachers' competency in inclusive education as the best intervention in improving service delivery in inclusive education. MT1 shared that:

"..to provide quality, equitable, and culture-based education, teachers must upskill, retool and relearn competencies in delivering quality services in education. Education is man's equalizer to the needs and progression, and teachers must be capable of adapting and embracing change to welcome inclusive education in reaching every student in different modes and avenues. The department should offer different training, workshops, and seminars addressing the needs for inclusive education, particularly assessment, pedagogy, and teaching approaches. "

A teacher can develop effective teaching strategies with the help of the competencies identified in teacher qualification structures. However, there are significant differences in their perception, purpose, utilization, and acceptance [25]. Similarly, Karacan Ozdemir [35] highlighted the importance of teacher upskilling to optimize their

support of both their professional growth and the implementation of career development learning for students. As the prime movers, teachers should uphold the competency needed to deliver quality service in education. This was strengthened by ElSayary [36] that increasing teachers' abilities to facilitate teaching and learning would favorably affect students' academic performance. Hence, MT2 added that:

"...because inclusive education is mainstream nowadays in educational settings, teachers must prepare themselves in different programs, activities, and training to be more effective and efficient inclusive educators in diverse students. It is necessary to increase the quality of services through teaching pedagogies and practices. The organization or the school must support it to meet the addressed goals in the curriculum."

Moreover, De Vera et al. [37] assert that teachers should take responsibility for their education, be committed to improving the present system, and engage in changes that will build our society and equip it for future developments.

As the key to the success of every student, the teacher must be open, committed, and passionate in every modeling of the students' capability addressing the core values of being humane. Furthermore, when it comes to faculty development for teaching, many institutions take a one-size-fits-all strategy that does not consider the specific requirements of the faculty, who often have various levels of expertise [38].

Furthermore, Aalberg et al. [39] reiterate that to ensure students are reached and meet their demands, the Teachers Training Department must take serious measures that have our educators' desire and preparation to advance their skills in inclusive education, supported by novel development sources and solid professional commitment. About the study, learning begins with how teachers deliver quality services in education. It must be given priority to establish a good relationship with the students in addressing their diversity. It should be prioritized and have a plan to address its consequences and advantages in delivering an equality, access, and culture-based curriculum.

Observation Result

Inclusive education proves that everyone becomes open to accepting the diverse world of learning and opens a great opportunity to accept and be aware of every word and action in every person. During this study, two teachers were observed in their respective inclusion classes. Upon observation, it was noted that the teachers faced challenges in communicating with the learner with disabilities (LWD), who primarily used sign language as their primary form of communication. In order to overcome this communication barrier, the teachers resorted to writing essential points on the board or paper provided to the LWD. However, it appeared that the LWD could not fully comprehend the teacher's instructions as they could not effectively relate to the discussion. Miyauchi [40] reiterates that teachers should use a standard set of efficient pedagogical techniques, efficient teaching-learning instruments, and outside help were crucial in enhancing topic accessibility which underlined the value of comprehensive support systems and teacher preparation programs.

Both teachers provided separate activity sheets for the LWD, which contained written instructions for the lesson and tasks to be completed. It was also observed that the LWD participated in group activities and was assisted by classmates throughout the lesson. This finding contrasts with the assertion made by Rhode et al. [38] that disabilities can be predictors of bullying. In this particular inclusion class, the whole class was observed to be supportive of the LWD, and there were no instances of bullying. It means that students are very open to accepting diversity and wholeheartedly accepting differences, which shows that society nowadays values respect and becomes humane in every decision and action.

4. CONCLUSION

The study shows three challenges in providing quality services in inclusive education: lack of ASL training, lack of personalization in pedagogy, and needs to upskill teachers' competency in inclusive education. This study shows that there should be no restrictions on learning, and it can be achieved if everyone works together. As a teacher is the noblest profession, it was truly evident that teaching is a continuous process that is continuous and should not be stopped. As inclusive education is now open in the education system, teachers and administrators should provide programs, projects, and activities related to pedagogy, addressing differences and personalization in delivering quality services.

The negative attitude of the teachers in this study, however, is attributed to their lack of training and the sudden implementation of the inclusion program without proper preparation. Furthermore, since the school where the study was conducted is a separate class of Special Education, the teachers question the need for inclusion when they have teachers already trained to teach LWDs. The teachers are therefore seeking support from the school head to provide training and resources to teach effectively and enjoyably in inclusive settings. It is recommended that schools must provide and ensure quality services in education by upskilling teachers' competency in handling an inclusive education.

5. SUGGESTIONS

Further studies can be continued to expand the knowledge of each school's teaching pedagogies, approaches, and readiness to deliver quality education services that offer safe and equal opportunities for learning and teaching in inclusive education. This goal will provide baseline information on the current setting in inclusive education. Curriculum managers will be better prepared and able to implement programs to address its goal of equal access, well-being, and governance in education.

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