

Challenges and Opportunities in Implementing Bilingual Strategies through Teachers' Practices to Improve Deaf and Hard of Hearing Language Learning

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Abstract

This paper aims to measure the level of implementing bilingual strategies into teachers' practices among deaf and hard of hearing (DHH) students. The research design applied two stages. The data of the first stage was collected through observing teachers in their classrooms to evaluate their practices regarding bilingual strategies and their effectiveness with the students. This was followed by analyzing the teachers' perceptions of bilingual strategies in their practice through a questionnaire. The participants were 54 DHH teachers from elementary, middle, and high schools. The results of this study will inform the field on how to implement bilingual strategies and provide a roadmap to establish evidence-based implementation to enhance teachers' practices in working with deaf or hard of hearing students so as to improve their language learning. The study provides suggestions for further research and study in the field of DHH students.

Keywords

Bilingual strategies, teachers' practices, deaf and hard of hearing, language acquisition and development

1. Introduction

Hearing is one of the most common challenges that children face in development because it not only affects the transmission of values, culture, and other social aspects but also reduces the levels of efficiency that children can attain in interacting with others. Children, despite their native language, follow the same path of acquiring language from words until they develop and master the syntax (Wilson, 2008). Children in the first years of their lives can use language, starting with nonverbal communication (pre-linguistic)—which includes facial expressions, eye movements, actions, gestures, and random sounds—and then move to verbal or manual communication or sign language (linguistic), which is the most complex skill that human beings develop (Shen et al., 2019). Language acquisition goes through many stages. These stages—which are described in theories put forth by Skinner, Chomsky, and Piaget—are predictable and are shared by both deaf and hearing children (Kidd et al., 2018).

Behaviorism theory explains the relationship between the child's performance and his/her environment. According to Skinner (1957), children imitate and react to their parents or caregivers; the positive responses reinforce the language learner that the child is imitating correctly, and this leads to language acquisition. This explains how the environment shapes the child's learning and moves him/her to acquire language. A child has some basic skills such as vocalizing and seeing himself/herself through the eyes of others (such as the stage in which children learn to associate with people, also

known as role-playing) (Johnson et al., 2017). The basic learning tool is association, by which a child learns the meanings of words to correct his/her speech with reference to the adults around him/her. This natural interaction meets their child's language needs without having to implement formal lessons to do so. Children quickly and naturally acquire language when they look at and observe the surrounding environment (Gandolfi & Viterbori, 2020).

Children need to acquire and develop language to meet their social needs. Children acquire their native language easily from their environment through parents, caregivers, and other children (Wilson, 2008). Therefore, surrounding conditions are especially important to help the child acquire language during this critical age. Language is the tool of learning, thinking, solving problems, and other complicated skills that the child will face in the future (Ilany & Margolin, 2010). However, just like how a child learns to communicate by being immersed in an environment full of communication, the environment plays a critical role for the child to learn language skills. Environmental variables could be advantageous but could also be disadvantageous given a lack of communication in the child's environment (Paul, 2009).

According to Chomsky (2006), this explanation has some limitations; he argues that language acquisition is far too complicated to be explained by a simple system of imitation and rewards. Chomsky criticizes this theory and supports the innateness and theory of knowledge, which emphasizes the internal structure of the human mind (Jäger & Rogers, 2012). This states that the brain is organized to deal with information separately and independently. This was supported by empirical evidence that showed children from different environmental conditions showing the same level of language acquisition as well as considerable similarities in syntax development. He says that the language innate device is responsible for language development, known as the language acquisition device (LAD) (Chomsky, 2006).

Piaget has influenced most of the cognitive linguistic theories stating that to learn a language, the child must be able to understand the content independently of the social or environmental setting (Santiago-Delefosse & Delefosse, 2002). Language is developed through innate devices and processes, and human beings are born with the ability to communicate even with people from different races and mother tongues, such as pidgin, which, through reduced syntax and flexible grammar, allows children to communicate with one another in their characteristically diminutive syntax.

2. Review of the Literature

2.1 Language Acquisition and Development

Language acquisition for children, either hearing or deaf, starts from the same age that the child acquires spoken or sign language by undergoing many different stages (Schick et al., 2007). The need for communication with others and for social desire in infants starts from birth; both deaf and hearing children have the same needs in how they start to interact with the environment to acquire the language in the same age and interests (Morgan et al., 2021). In terms of hearing children and the way that they acquire a spoken language, one should mention two different stages: the pre-linguistic and linguistic periods.

The pre-linguistic period starts when the child makes cooing sounds back and forth in the discovery stage, which is the first stage in language acquisition. Then the child starts babbling by making sounds that exist in his/her environment in the communicator stage, which entails attempting to communicate, sending direct messages for social reasons, and trying to use his/her voice to control others (e.g., the child might make a sound to inform the parents that he/she is thirsty) (Serrat-Sellabona et al., 2021). This period from birth to the age of 13 months, many studies call the basic or foundation stage of language acquisition, a critical period since the child starts to interact with others if his/her parents' responses will help him/her move to the next period.

The second period (linguistic) begins when the child utters his/her first word. In the initial stage, the child produces only single words. These words might refer to the child's interest or a person in the child's environment (i.e., his/her mother or sibling). Then the child develops or gathers single words to create sentences. The sentences thus created mostly constitute two or three words since the child's vocabulary has just begun to grow (Johnson et al., 2017). Later, the child takes turns in conversations by linking two to three words, which further helps him/her develop his/her language. In due time, the child's vocabulary increases, and he/she begins to create longer and more complex sentences using more advanced forms (McCauley & Christiansen, 2019).

2.2 Language Acquisition and Development among Deaf and Hard of Hearing

Deaf and hard of hearing (DHH) children go through the same stages as hearing children (i.e., the pre-linguistic and linguistic periods) (Schick et al., 2007). They acquire sign language skills in the same age as hearing children acquire spoken language skills. Both these processes have the same sort of requirements and types of challenges (Mayberry & Kluender, 2018). Sign language is a natural language, like spoken language, that helps a deaf child communicate, and as a result, it enhances the expressive and receptive skills of DHH children later in their lives (Bailes et al., 2009). Thus,

the process of learning sign language by deaf children is similar to spoken language acquisition in hearing children. Some commonalities exist between deaf and hearing children in language acquisition, such as accessible communication as well as frequent and consistent communication. Irrespective of the mode of communication, whether sign language or spoken language, the same factors influence a hearing child, a deaf child from deaf parents, or a deaf child from hearing parents when he/she acquires a language (Crowe et al., 2019).

Deaf children of deaf parents (DCDP) are exposed to sign language at an early age as their parents use sign language for communication between themselves. The deaf child acquires sign language naturally as his/her first language, and he/she will develop his/her language with time and will be able to communicate easily with his/her environment in the same way as hearing children do (Brooks et al., 2020). The parents do not take much effort to teach their child sign language. Like the transition for hearing children from babbling to talking, the deaf child transits from babbling to signing. When a deaf child starts observing the surrounding environment, he/she notices the hand movements of his/her parents. Thus, a deaf child grows up watching and interacting with sign language. At the age of five, a hearing child starts using complex sentences, and a deaf child starts using sign language with the same amount of complexity and improves their capability of expressive language in the same period as his/her hearing counterpart (Hill et al., 2019).

On the other hand, deaf children of hearing parents (DCHP) acquire sign language skills if their parents have introduced sign language at an early age. Since 90% of parents who have deaf children are hearing, they need to learn sign language to communicate with their child when he/she starts discovering the surrounding environment (Vukkadala et al., 2019). Children in this stage observe the environment and start interacting with their parents by observing their facial expressions and hand movements. When the environment is rich in signing, even if the parents are not so fluent in sign language, the child will learn how different signs symbolize different meanings (Caselli et al., 2021). In contrast, if the parents do not respond to their child's communication needs, the child's chances of learning sign language will decrease, hence why most DCHP experience delays in language acquisition. In addition, acquiring incorrect or inconsistent linguistic inputs is a possibility if DCHP have limited access to sign language (Humphries et al., 2019).

Recently, there has been an increase in awareness of the role played by early intervention in ensuring the effective management of hearing impairment with the aid of cochlear implants regarding language acquisition and development. Research findings show that children fitted with cochlear implants before the age of five years recorded a higher growth rate per annum of language compared to those with implants fitted after this age (Lund, 2020). Research also shows that a child's ability to adapt to cochlear implants is increased threefold with early implants (Schorr, 2008). There has been considerable research regarding the effect of cochlear implants on language development in children (Ruben, 2018). Most learning experiences are hearing oriented, and therefore, children with hearing complications or serious hearing problems are less likely to benefit from these activities (Koopmann et al., 2020). Studies have shown that DHH children who have cochlear implants displayed the same levels of performance with respect to language development (Benchetrit et al., 2021; Gagnon et al., 2020; Wie et al., 2020).

2.3 Teachers of Deaf and Hard of Hearing

The growth of education has led to a shift from traditional education to evidence-based research that promotes best practices in educational systems. These systems have established a solid policy of emphasizing the role of research when building curricula and instructional designs that align with effective theoretical frameworks and models (Miller, 2014). In the same context, teachers' practices should be parallel with this transformation to empower this change. Teachers' practices have a significant impact on the language acquisition processes that allow DHH children to attain high achievements (Strassman et al., 2019). Changing and improving teachers' practices is a fundamental means of shaping the educational system to meet learners' various needs. Thus, improving current teaching practices is a critical aspect of the professional learning framework to ensure the highest education quality possible (Hattie, 2012).

DHH education has shifted from a theoretical educational principle and concept to more practical implementation (Cawthon & Garberoglio, 2021). This movement to enhance the field of DHH through educational service programs came after legislation and regulations were created to support the rights of education for DHH individuals (United Nations, 2022). Teachers of DHH children, as part of the educational system, should undergo multiple phases that are extensive, intensive, ongoing, and uptodate (Alzahranı & Alsalem, 2021) to acquire and maintain skills that improve language development for DHH students.

2.4 Bilingual Strategies for Deaf and Hard of Hearing

Bilingual strategies designed for DHH students have been successfully implemented in different curricula, instructional designs, and materials through teachers' practices (Ormel et al., 2022; Swanwick et al., 2022; Wolsey et al., 2018). Bilingual strategies include but are not limited to strategies for separating sign language from spoken language to

preserve sign language among DHH children. Alrayes and Alawad (2013) illustrate such bilingual strategies as separation by subject matter (literary subjects in sign language, scientific subjects in spoken language), separation by time (the first lesson in sign language, the second in spoken language), and separation by place (spoken language used in the lab, sign language in a restaurant). The teacher then presents the lesson in spoken language via the preview-view-review strategy (reading a story); the discussion takes place in sign language and the review in spoken language (writing a summary of the story or the most important lessons in the story). This study sought to establish a clearer understanding of how bilingual strategies through teachers' practices benefit DHH students in terms of language development. Thus, the major research question of this study is as follows:

- How do teachers successfully improve DHH students' language learning through bilingual strategies?

3. Methodology

3.1 Participants and Setting

The participants of this study were teachers of DHH students from different districts and areas in Saudi Arabia. These teachers worked directly with DHH students for all levels—elementary, middle, and high school. The Saudi system has separate educational settings for male and female students; therefore, the study sought to include both male and female teachers in this study to better understand the bilingual strategies in their practices. A request for human subject approval for this study was submitted to the Ministry of Education in Saudi Arabia, and approval was granted to begin this study and collect data. Table 1 illustrates the participants' demographic information.

Table 1. Demographic Information

Schools	Number of Participants	Type of Participants	Teachers' Qualification
Elementary Schools	24	Male: 12 Female: 12	Bachelor's degree: 7, Graduate degree: 5 Bachelor's degree: 4, Graduate degree: 8
Middle Schools	13	Male: 6 Female: 7	Bachelor's degree: 4, Graduate degree: 2 Bachelor's degree: 2, Graduate degree: 5
High Schools	17	Male: 8 Female: 9	Bachelor's degree: 5, Graduate degree: 3 Bachelor's degree: 4, Graduate degree: 5
Total	54	Male teacher: 26 Female teacher 28	Bachelor's degree: 16, Graduate degree: 10 Bachelor's degree: 10, Graduate degree: 18

3.2 Research Design

The purpose of this study was to measure teachers' practices to improve DHH language learning through bilingual strategies. To reach this goal, the study used different levels of collecting data through various stages to ensure that the data comes from multiple methods to mitigate validity threats and establish trustworthiness in the findings (Creswell, 2017). The research design was built to answer the research question through a rigorous conceptual framework that relies on different models to enhance the quality of the work and to make the design more coherent (see Figure 1). Building the conceptual framework to make connections among these models leads to effective and successful practices (Ravitch & Riggan, 2016). Consequently, it supported the basis for future research on the framework of bilingual strategies that could be considered by a larger segment of teachers.

The first stage of this study aimed to measure DHH teachers' practices as the starting point regarding bilingual strategies through observation. Observations were conducted in the teachers' classrooms to evaluate their practices and effectiveness with the students. The results of this stage were a key element to design the second stage, in the form of follow-up procedures after assessing the teachers' needs.

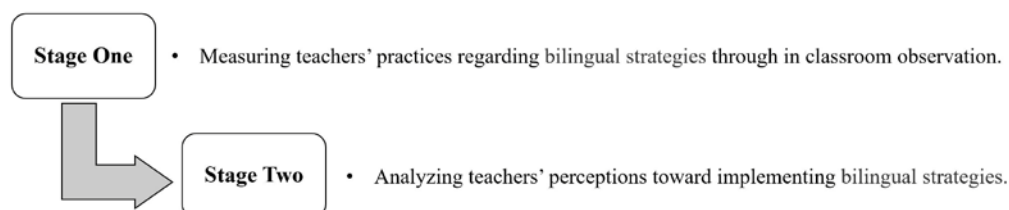


Figure 1. Research design of the study.

The second stage was designed to analyze the teachers' perceptions toward implementing bilingual strategies among DHH students into their practices. Therefore, a questionnaire was sent to the teachers who were observed in the previous stage to provide a depth of information to the teachers during the process of implementing bilingual strategies into their practices. This stage helped establish a solid foundation for bilingual strategies and create an environment to facilitate their implementation by mapping the needed resources, processes, and strategic vision.

3.3 Instruments

3.3.1 Stage One Instrument (Observation)

The study also sought to observe bilingual strategies in teachers' classrooms and to measure their effectiveness on both the teachers and their students. During the observation, the researcher confirmed whether or not the teachers were applying bilingual strategies into their practices. The four rating categories of the observation tool were as follows: NA= bilingual strategies not applicable; 1=bilingual strategies not provided clearly; 2= bilingual strategies provided with general use; and 3= bilingual strategies provided in an appropriate manner with intentional use from the teacher. The total score of the observation tool is 20, where NA=0–2, 1=3–7, 2=8–14, and 3=15–20. In addition, the tool has a notes section for the researcher to write down any notes during the observation or any barriers that prevented bilingual strategies from being used.

3.3.2 Stage Two Instrument (Questionnaire)

The second stage aimed to allow the teachers to voice their perspectives and opinions about how to optimize their practices based on bilingual strategies. The questions were designed to allow the teachers to narrate their experiences in improving their practices based on bilingual strategies. Also, this stage supports the social validity of the study procedure to ensure that the teachers have opportunities to express their thoughts about bilingual strategies and their implementation. This instrument analyzed how bilingual strategies were implemented and whether they benefited the teachers in their practices. In addition, the instrument analyzed the barriers of implementing bilingual strategies in teachers' practices and ways to optimize such strategies through teachers' experiences. The first phase of the instrument included a pilot study, which provided suggestions that have been taken into consideration and applied to the final instrument. The reliability analysis was evaluated by calculating the internal consistency coefficient (Cronbach's alpha). The instrument was developed by including two main sections that were divided—the bilingual strategies applied by teachers ($\alpha=.84$) and barriers ($\alpha=.74$)-using a five-point Likert scale.

4. Results

During the first stage, multiple observations were made using a tool that measured how bilingual strategies were applied through teachers' practices. In addition, the tool was used to observe how the teachers' practices affected the students' interactions in light of these strategies. Recall that the observation tool has four ratings depending on whether the bilingual strategies are applicable in classrooms. Among the 54 teachers who had been observed, 12 teachers fall into NA, 18 teachers into Category 1, 13 teachers into Category 2, and finally, 11 teachers into Category 3. Figure 2 shows the scores for the various observations made.

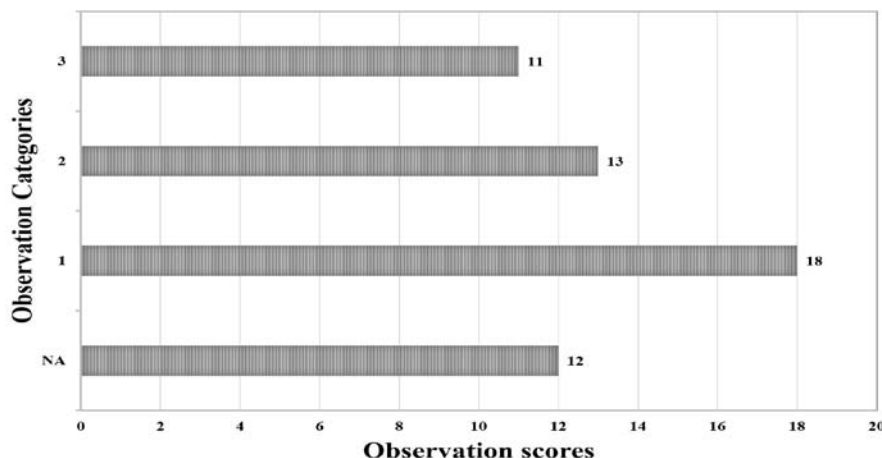


Figure 2. Observation in the classroom.

The second stage was designed to analyze teachers' perceptions toward bilingual strategies to build a better understanding of the effective implementation system that is aligned with the educational system in Saudi schools. Moreover, the goal was to increase the social validity of the study procedure through a questionnaire to provide an opportunity to allow the teachers to voice out their perspectives on how to optimize their practices based on bilingual strategies. Descriptive statistics were conducted to analyze the data by calculating the means of the items and standard deviations to report the teachers' responses. Within this instrument, the following scale was used: 1= Never, 2= Not Very Often, 3= Often, 4= Very Often, and 5= Daily. Table 2 reports the mean and standard deviation of the instrument items.

For the barriers to implementing bilingual strategies into teachers' practices, the participants used the following scale: 1= SD (Strongly Disagree), 2= D (Disagree), 3= N (Neutral), 4= A (Agree), and 5= SA (Strongly Agree). Table 3 shows the mean and standard deviation.

Table 2. Descriptive statistics of bilingual strategies

Statement	M	SD
Providing choices for DHH students in class based on various bilingual strategies	3.11	1.38
Designing the activities for DHH through bilingual strategies on a regular basis	2.12	1.27
Using lectures in sign language and then discussions in spoken language	3.35	1.41
Encouraging DHH students to use sign language through small groups	3.83	1.14
Allowing DHH students to discuss in groups by using sign language outside of class	2.54	1.39
Providing a summary after teaching in both spoken and sign language	1.98	1.36
Identifying the essential concepts in both spoken and sign language in every class	3.31	1.46
Allowing DHH to communicate online through spoken language or facetime by sign language	2.59	1.45
Providing information for the first time in sign language and then spoken language	3.06	1.45
Using closedcaptions in all visual materials	2.59	1.45
Offering assignments (homework) in both sign and spoken language	3.22	1.53
Using software programs that allow DHH students to interact	2.79	1.35
Providing an outline in sign language for each assignment	3.55	1.29
Allowing DHH students to make their own choices on which language they want to use in the classroom	3.07	1.39
Using a deaf adult as a role model when teaching a subject matter	1.69	1.08
Bilingual strategies have improved my DHH students' language learning	3.33	1.49
Average	2.88	1.37

Table 3. Descriptive statistics of barriers in implementing bilingual strategies

Statement	M	SD
Curricula do not support bilingual strategies	3.24	1.39
Diversity in the class makes it hard to use bilingual strategies	3.58	1.19
My understanding of bilingual strategies is very limited	2.65	1.41
Using bilingual strategies in class is a disruption for hearing students	3.40	1.59
Limited resources that support bilingual strategies	3.83	1.14
Low participation among other teachers to implement bilingual strategies in school	3.38	1.33
Average	3.35	1.34

5. Discussion

The purpose of this study was to measure the level of implementing bilingual strategies among teachers of DHH students into their practices. This study was conducted in two stages to build a better understanding of bilingual strategy implementation. The first stage was conducted through observation in teachers' classrooms, followed by a questionnaire to analyze teachers' perceptions toward bilingual strategies. The results, as mentioned above, show a broad assessment of the current levels of the bilingual strategies used by teachers and gathered information on potential barriers to implement these strategies.

This study considers the cultural and social perspectives of the Saudi educational system when applying bilingual strategies. Teachers of DHH students should have an adequate understanding of these strategies through a wide knowledge of conceptual frameworks, historical trajectories, and principles (Swanwick et al., 2022). Prior to the start of this study, there was an initial question as to whether bilingual strategies could be adapted to fit within a school culture having both hearing and DHH students. The literature has indicated that bilingual strategies aim to enhance students' achievements by providing the necessary support and understanding for the specific needs of all students (Wolsey et al., 2018). The results were aligned with the potential of bilingual strategies that allow learners to respond to different tasks in multiple ways (Ormel et al., 2022).

This study looks at the teachers as a fundamental part of the learning process; therefore, teachers should be aware of effective bilingual strategies that will enhance their DHH students' outcomes and achievements (Strassman et al., 2019). Thus, the research design was built through different procedures and stages that measure teachers' practices to see the benefits and potential implications for bilingual strategies in their practice. One objective of this study was to create a culture regarding bilingual strategies that will ensure long-term change at all levels among teachers' practices (Alzahraani & Alsalem, 2021).

The observation stage sought to observe bilingual strategies in teachers' classrooms and their effectiveness on both teachers and students. As was noted from various observations, bilingual strategies can be shaped into any environment, and a good understanding comes through fully grasping the effect of these strategies into teachers' practices. An effective learning environment could be built by knowing the features of personalized instruction where such instruction aligns with learning needs and is designed to the specific interests of various DHH learners (Alrayes & Alawad, 2013). In general, the teachers were aware of these strategies where their instruction was designed to meet particular learning needs and differentiation to create an effective learning environment designed for learning preferences (Miller, 2014).

The second stage was designed to analyze teachers' perceptions toward bilingual strategies to build a better understanding of an effective implementation system. The teachers have reported through the questionnaire how bilingual strategies were effective, increased students' interactions, and increased creativity among the teachers, which motivated the students on the content and helped them become more engaged. In addition, the teachers demonstrated the variables that could prevent the adaptation of bilingual strategies into their practices. Overall, the results of this study will assist teachers in their vision of the feasibility of bilingual strategies' implementation in schools. The findings of this study and its implications have provided data and information to understand bilingual strategies in classrooms.

6. Limitations and Implications of the Study

This study has limitations that should be considered prior to the design of other studies. First, given time constraints and funding limitations, this study was conducted only with teachers of DHH students. Another limitation is that the participants were chosen based on their willingness to participate; therefore, the sample was not randomly selected, and this may have influenced the findings. To strengthen the research base on bilingual strategies, future research should gather data by including observations that illuminate the changes in classroom routines that occur using bilingual strategies. In addition, future studies should measure students' achievements in their classrooms to evaluate bilingual strategies in depth.

7. Conclusion

The purpose of this study was to measure the implementation of bilingual strategies through teachers' practices. Therefore, a coherent research design was built through two stages to ensure the social validity and fidelity of the study. The data was collected through observing teachers of DHH students in their classrooms. In the second stage, the study analyzed the teachers' perceptions toward bilingual strategies to provide a better understanding of the effective implementation of these strategies. The results of this study provided rich data for teachers to improve evidence-based implementation for integrating bilingual strategies in day-to-day teaching practices in schools as well as provide implications for future studies.

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