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APPLICATION OF INDIVIDUALIZED LEARNING PLANS IN DEVELOPMENT OF COMMUNICATION, SOUND PERCEPTION, AND RHYTHM (PKPBI) FOR HEARING-IMPAIRED STUDENTS

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Abstract

Hearing impairment significantly affects children's ability to perceive auditory stimuli, which directly hinders their language acquisition, pitch discrimination, and overall communication skills. This study aims to evaluate the implementation of an Individualized Learning Plan (ILP) using the Development of Communication, Sound Perception, and Rhythm (PKPBI) method, specifically through musical scale introduction (do, re, mi, fa, sol, la, si, do), for a primary school student with hearing loss relying on single ear residual hearing at SLB Yayasan Putra Pancasila. A qualitative descriptive methodology was utilized, incorporating field observations, semi-structured teacher interviews, direct communication assessments, and customized auditory tests. The intervention combined visual scale flashcards and audio-visual piano videos to engage multi-sensory processing. The results demonstrated a remarkable enhancement in the subject's auditory detection, pitch discrimination, auditory memory, and responsiveness to auditory-verbal commands. Furthermore, the structured auditory-visual stimulation boosted the student's confidence and simple oral communication. It is concluded that multi-sensory PKPBI intervention using structured musical scales serves as an effective pedagogical framework to optimize residual hearing and functional communication in hearing-impaired elementary learners.

Keywords: Hearing Impairment; PKPBI; Individualized Learning Plan; Musical Scale; Auditory Perception

1. Introduction

Students with hearing impairment experience significant challenges in sound perception, particularly regarding speech sounds and pitch variations. This sensory restriction limits language development and vocabulary acquisition, impeding their ability to understand verbal information, express thoughts, and engage meaningfully with their social environment (Suwandari & Sustiawati, 2021). Despite these sensory limitations, hearing-impaired children retain cognitive and linguistic potential that can be systematically unlocked when early, tailored auditory and speech stimulation is provided (Anggraeni et al., 2019). Vocabulary development plays a foundational role in language proficiency; a greater repository of vocabulary directly correlates with higher communicative competence (Tarigan, 2009). When auditory reception is compromised, vocabulary accumulation slows down, necessitating specialized educational strategies.

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In this study, the target participant is a 4th-grade elementary student at SLB Yayasan Putra Pancasila who experiences severe hearing impairment and relies exclusively on residual hearing in one ear, as the contralateral ear exhibits no functional acoustic reception. Although the student utilizes a hearing aid and demonstrates reasonable daily communication via a combination of total communication oral speech, lip reading, and gestures he faces persistent difficulties in auditory pitch discrimination, specifically distinguishing high and low musical tones. To mitigate these auditory processing barriers, targeted educational interventions utilizing residual hearing are critical (Gunawan, 2013). One highly recognized specialized curriculum in special education is the Development of Communication, Sound Perception, and Rhythm (PKPBI), which systematically trains students to perceive, discriminate, identify, and comprehend environmental and linguistic sounds through acoustic vibrations and visual aids (Direktorat Pendidikan Khusus, 2019; Hermanto, 2010).

The implementation of PKPBI through structured musical scale activities (do, re, mi, fa, sol, la, si, do) offers concrete, repetitive, and progressive auditory exercises. Musical scales provide structured acoustic frequency variations that enhance pitch sensitivity, auditory memory, sound duration recognition, and focus (Maulana et al., 2019; Mustika & Pertiwi, 2020). Previous educational studies emphasize that integrating multisensory media such as interactive flashcards and audio-visual videos significantly improves engagement and acoustic discrimination in hearing-impaired children (Elyondri & Azizah, 2023; Setyaningsih & Rahmawati, 2018; Winarti et al., 2019). Grounded in instructional taxonomies and specialized pedagogy (Bloom, 1956; De Vaus, 2014; McKenzie et al., 2008), this study investigates the baseline auditory perception of the target student, outlines the multi-sensory PKPBI intervention steps, and evaluates post-intervention gains in auditory responsiveness and simple oral communication.

2. Method

This study employed a qualitative descriptive research method designed to provide an in-depth contextual analysis of the student's auditory perception and communication development under a tailored Individualized Learning Plan (ILP).

2.1. Research Subject and Site

The investigation was conducted at SLB Yayasan Putra Pancasila. The single research subject, designated as "Zawawi," is a 10-year-old 4th-grade elementary student diagnosed with hearing loss, currently utilizing residual hearing in one ear supported by a hearing aid.

2.2. Data Collection Techniques

Data collection involved a four-fold qualitative protocol:

2.2.1 Direct Observation: Continuous systematic observation of the subject's classroom behavior, auditory response, and interaction patterns.

2.2.2 Semi-Structured Interviews: In-depth interviews conducted with the classroom teacher to gather detailed background data on the subject's academic trajectory and communication barriers.

2.2.3 Direct Interaction: Evaluative communicative interaction utilizing total communication (oral speech, sign language, and lip-reading).

2.2.4 Informal Auditory Assessment: Simple distance-based acoustic testing involving verbal calls at varying distances (1 to 3 meters) and decibel levels to assess baseline hearing limits.

2.3. Individualized Learning Plan (ILP) Design

Based on the baseline assessment, an Individualized Learning Plan (ILP) was formulated to guide the PKPBI intervention over a structured implementation session. Table 1 details the structured layout of the ILP.

Table 1. Individualized Learning Plan (ILP) Framework for PKPBI

Program Dimension	Specification
Student Identity	Name: Zawawi Age: 10 Years Grade: 4th Grade Elementary (SDLB)
Short-Term Goal	Recognize and discriminate individual musical scale sounds (Do, Re, Mi) through audio-visual prompts and flashcard identification.
Long-Term Goal	Understand scale sequence, independently arrange flashcards in correct order (Do to High Do), and pronounce tones accurately.
Learning Activities	1. Listening to musical scale audio via video media. 2. Identifying and lifting corresponding scale flashcards upon hearing acoustic cues. 3. Re-arranging jumbled scale flashcards into proper sequential order independently.
Media & Resources	Illustrated musical scale flashcards (Do–Do') and piano scale instructional video.
Assessment Strategy	Formative & Sumative evaluation measuring focus, card selection accuracy, independent scale arrangement, and vocal imitation.

3. Results and Discussion

3.1 Result

Baseline testing revealed that prior to the intervention, the subject could only perceive acoustic cues at close range (within 1 meter) when delivered at higher volume levels. When calls were executed in lower soft tones, the subject exhibited no auditory response, acknowledging verbally that no sound was detected. In terms of pitch processing, the student struggled to differentiate high pitch from low pitch and could not arrange musical tones sequentially without physical prompting.

Following the implementation of the PKPBI program using multi-sensory media (piano audio-visual video combined with large lettered flashcards), the student demonstrated notable progress across all target metrics:

3.1.1 Auditory Detection & Focus: The student showed heightened alertness to acoustic stimuli, responding faster to auditory signals generated from the instructional video.

3.1.2 Tone Discrimination & Identification: When specific tones were played, the subject correctly selected and lifted the corresponding flashcards (Do, Re, Mi, Fa, Sol, La, Si, High Do) with increasing accuracy.

3.1.3 Sequential Memory: The subject successfully transformed jumbled flashcards into a correct linear sequence independently after 3 guided practice trials.

3.1.4 Communication & Vocalization: The student exhibited increased confidence in imitating pitch vocalizations and responding verbally to teacher instructions.

3.2 Discussion

The findings corroborate established theories regarding auditory rehabilitation in special education. As emphasized by Gunawan (2013) and Hermanto (2010), systematically structured auditory-rhythmic training allows hearing-impaired learners to maximize their residual hearing. The four classic stages of PKPBI detection, discrimination, identification, and comprehension (Elyondri & Azizah, 2023) were successfully activated through musical scale training. Musical scales offer an optimal acoustic framework because pitch steps provide distinct, predictable frequency changes that train the brain's auditory processing centers.

Furthermore, the multi-sensory strategy proved crucial. Integrating visual flashcards with acoustic cues enabled the student to establish cognitive bridges between abstract auditory pitch and concrete visual representations (Setyaningsih & Rahmawati, 2018). This aligns with research by Winarti et al. (2019) and Maulana et al. (2019), who noted that combining visual and tactile-vibrational feedback accelerates phonetic and rhythmic recognition in deaf learners. The noticeable gain in the subject's simple oral communication and willingness to vocalize supports the assertions of Anggraeni et al. (2019) and Tarigan (2009), proving that targeted pitch perception exercises directly enrich expressive communication confidence. Broad educational evaluation principles (Bloom, 1956; Scheinin, 2009) and motivational frameworks (Putra et al., 2019; Makmara, 2009) further reinforce that structured, success-oriented task steps foster sustained academic and communicative growth in special needs environments.

4. Conclusion

The implementation of the Individualized Learning Plan (ILP) using the PKPBI method focused on musical scale introduction successfully enhanced sound perception, pitch discrimination, and auditory-visual coordination in a hearing-impaired elementary student. Multi-sensory integration using flashcards and audio-visual videos effectively bridged the

student's sensory limitations, transforming passive hearing into active auditory processing. Consequently, the student demonstrated improved oral responsiveness, sequential acoustic memory, and self-confidence. Special education educators are encouraged to incorporate multi-sensory pitch and rhythm exercises into daily instructional routines for students with hearing loss.

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