



## ***Case Study on Improving Orientation and Mobility Skills of Students with Visual Impairments in the School Environment without Using a Cane***

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### **Abstract**

Students with visual impairments often face challenges in performing orientation and mobility (O&M) activities independently, particularly without assistive tools such as canes. In the school environment, these skills are essential to ensure safety, spatial awareness, and confidence. This study aims to explore the teacher's strategies in enhancing the O&M skills of a visually impaired student within a school setting without relying on a cane. Employing a qualitative approach with a case study design, data were collected through observations, interviews, and documentation involving a Grade VII student and a classroom teacher at SLB A Bina Insani. The findings reveal that the teacher served as a facilitator, motivator, and primary trainer by applying gradual, structured training methods, including step-counting, spatial orientation, sensory exploration, and route repetition. As a result, the student demonstrated significant improvement in navigating the school environment confidently and independently without a cane. This study highlights the importance of teacher involvement and adaptive strategies in fostering mobility independence among students with visual impairments.

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## **INTRODUCTION**

Visual impairment is a general term used to describe a condition in which a person has a vision disorder. Visual impairment is classified into two categories: individuals who are totally blind (unable to see at all) and those who have low vision (still retain some usable vision) (Siahaan et al., 2020). A visual impairment refers to individuals who experience permanent limitations in visual function, either in the form of total blindness or significant vision loss, to the extent that they cannot function normally in daily activities (Eva, 2015).

Orientation is the ability that enables a person to understand their position,

direction, time, and surroundings, which is crucial for thinking, acting, and adapting effectively (Rahmawati & Sunandar, 2018). Mobility refers to the ability to move from one place, position, or situation to another, whether physically or socially (Rahmawati & Sunandar, 2018). Orientation and mobility are the abilities to recognize the environment and move safely, effectively, and independently from one place to another. These two aspects are essential for visually impaired individuals to determine spatial direction and move independently.

Limitations in orientation and mobility mean that blind individuals require specific techniques to navigate their environment. There are three main

techniques used in orientation and mobility: protective techniques, sighted guide techniques, and the use of a cane. In general, white canes for the blind are categorized into two types: the long cane and the folding cane (Yudhiastuti & Azizah, 2019).

The white cane is the primary assistive tool used by individuals with visual impairments to support orientation and mobility. The use of the cane allows them to detect obstacles, determine direction, and enhances their sense of safety and independence while moving. However, the cane has limitations, as it can only detect objects or obstacles in its immediate vicinity within a limited range (Bakri, 2022).

Based on preliminary observations conducted on August 3, 2024, a student with low vision in Grade VII was identified. Academically, the student performs at a level appropriate for their age. However, in terms of orientation and mobility, the student still relies on a cane. The researcher observed that orientation and mobility independence can potentially be developed without the use of a cane. The teacher has made efforts to provide support services through training aimed at enhancing the student's orientation and mobility skills without relying on a cane.

The researcher is interested in exploring the actual conditions in the field, particularly related to orientation and mobility training without the use of a cane. Based on the aforementioned problem, the purpose of this study is to examine the efforts made by teachers to improve the orientation and mobility skills of students with visual impairments within the school environment without using a cane.

## **RESEARCH METHODS**

This research uses a qualitative method with a case study approach. The qualitative approach focuses on gathering responses, opinions, concepts, and descriptive information to uncover the

core of the issue. A qualitative method was selected to obtain responses effectively through direct interviews with informants, as well as by observing the teaching and learning process firsthand.

The subjects of this research are a Grade VII student with a visual impairment who practices orientation and mobility without using a cane at SLB A Bina Insani, and a classroom teacher. The data collection techniques used in this case study include observation, interviews, and documentation.

The data analysis technique employed in this study follows the triangulation method, which involves three stages. The first stage is data reduction, where the researcher selects, simplifies, and organizes the collected data into a more structured format to facilitate effective analysis and conclusion drawing (Nurfajriani et al., 2024). The second stage is data presentation, where the researcher systematically displays and interprets the information, particularly focusing on the student's orientation and mobility skills without the use of a cane. The final stage is conclusion drawing, in which all relevant data are synthesized to produce comprehensive and meaningful findings related to the student's orientation and mobility abilities in the absence of a cane.

The research instruments used in this study consist of outlines or categories of the information sought, presented in the form of interview guides, observation checklists, and documentation guidelines (Alhamid & Anufia, 2019). Documentation in this context includes photos taken during the research process, video recordings, interview transcripts, field notes, and other relevant materials. The following section presents the research instrument grid, which serves as a reference framework for conducting interviews, observations, and documentation systematically throughout the study.

**Table 1.** Observation Blueprint

No	Observed Aspect	Indicators
1	Reduction of Cane Use in the School Environment	<ul style="list-style-type: none"><li>- The student walks without using a cane after several training sessions.</li><li>- The student appears confident even without a cane.</li></ul>
2	Recognizing Directions in the School Environment	<ul style="list-style-type: none"><li>- The student is able to distinguish between right, left, front, and back.</li><li>- The student is able to move from one place to another.</li></ul>
3	Avoiding Obstacles in the School Environment	<ul style="list-style-type: none"><li>- The student is able to sense and avoid obstacles (tables, chairs, poles) using their sense of touch.</li></ul>
4	Walking Independently at School Without Assistance	<ul style="list-style-type: none"><li>- The student is able to walk independently to specific locations after training.</li></ul>

**Table 2.** Interview Instrument Blueprint

No	Observed Aspect	Indicators
1	Teacher of a student with visual impairment	<ul style="list-style-type: none"><li>a. Reducing the intensity of cane use in the school environment</li><li>b. Recognizing directions in the school environment</li><li>c. Avoiding obstacles in the school environment</li><li>d. Walking independently in the school environment</li></ul>

## RESULTS AND DISCUSSION

### *Reducing and Eventually Eliminating the Use of a Cane in the School Environment*

The classroom teacher at SLB A Bina Insani plays a key role in improving the orientation and mobility skills of students with visual impairments by reducing and ultimately eliminating the use of a cane. The teacher's efforts go beyond merely teaching; they also take on the role of facilitator and motivator, encouraging students to remain enthusiastic in practicing orientation and mobility independently without the use of a cane.

Through these efforts, it is expected that the orientation and mobility skills of visually impaired students can be enhanced, enabling them to function more independently and optimally. The researcher engaged in interactions with both the teacher and the student, and observed the teaching and learning activities during orientation and mobility sessions.

The teacher applied a gradual training method, beginning with explanations of orientation and mobility

concepts, followed by familiarization with the school environment, memorization of room locations essential for the student to navigate, and eventually allowing the student to practice orientation and mobility independently, first with reduced cane use and later without using a cane, within the school environment.

In practice, during the first three sessions, the student was still allowed to use a cane while memorizing the environment. However, in subsequent sessions, the use of the cane was gradually reduced until the student was fully ready to carry out orientation and mobility tasks without it.

The findings show that the teacher plays a central role in developing the orientation and mobility independence of students with visual impairments through a systematic effort to reduce and eventually eliminate the use of a cane. The strategy used by the teacher involved a gradual training method, adapted to the student's physical and mental readiness. In the initial phase, the teacher allowed the student to use a cane as a tool to help recognize and explore the school environment. The purpose of using the

cane at this stage was to help the student build a cognitive map of the layout, identify obstacles, and understand the directions and distances between key locations such as the classroom, teacher's office, library, and restroom.

Once the student began to understand their surroundings, the teacher entered a transitional phase by gradually reducing cane use. The student was given verbal instructions to navigate without the cane, while still receiving remote guidance. The teacher directed the student to rely on step-counting, directional orientation (right, left, forward, backward), as well as the sense of touch and sound cues as substitutes for the cane. At this stage, the teacher no longer provided physical assistance, but rather functioned as a facilitator, carefully observing and evaluating the process. This strategy was intended to build the student's courage and confidence in making independent movement decisions.

The training was conducted repeatedly and consistently over several sessions. During the first three sessions, the student was still allowed to use the cane; however, in the following sessions, cane usage was significantly reduced until the student was able to move independently without assistive tools. The teacher provided varied training scenarios, such as walking to the teacher's office, returning to class from the library, or retrieving specific items from known locations. Each activity was tailored to strengthen the student's spatial memory and orientation skills.

The teacher also provided positive reinforcement in the form of praise, verbal encouragement, and assigning light responsibilities as a form of trust. Minor errors made by the student were not immediately corrected verbally, but rather treated as learning moments, allowing the student to discover solutions independently. This approach proved to be effective in shaping independent

character and boosting the student's self-confidence in performing activities without a cane.

Overall, the teacher's effort to reduce and eventually eliminate cane use showed positive outcomes. The student was not only able to walk without a cane but also demonstrated significant improvements in directional awareness, obstacle avoidance, and courage to move independently. These findings reinforce that active teacher involvement, through a gradual approach, structured training, and opportunities for independent exploration, can enhance the orientation and mobility skills of students with visual impairments within the school environment.

### ***Recognizing Directions Within the School Environment***

The classroom teacher plays an important role in enhancing the ability of students with visual impairments to recognize directions within the school environment. In practice, the teacher employs a verbal spatial orientation method combined with step counting, which is an approach where students are given verbal direction instructions (such as right, left, forward, backward), and are then asked to walk according to those instructions using a step-counting system. For example, the teacher might give a command such as: "Ara, take five steps forward, then turn right and walk three steps to reach the teacher's office." "Ara, raise your right hand. Now take two steps to the left."

These exercises are conducted repeatedly and gradually so that the student can build an understanding of the layout of school rooms, including the classroom, teacher's office, library, and restroom. The teacher also provides long-distance feedback, allowing the student to make small mistakes in order to develop independence and spatial memory.

The data was collected through direct observation and interviews with the classroom teacher. Documentation indicates that the student was able to recognize directions more effectively after several training sessions. This was evident through the student's improved ability to orient their body, determine step counts, and adjust their position relative to surrounding objects.

The teacher plays an important role in guiding students to use these tools effectively, ensuring that each student can learn in an inclusive and adaptive manner (Marito et al., 2024). The ability to recognize direction is a key component of orientation and mobility, as it forms the foundation for independent movement.

In practice, the teacher applied a verbal-spatial approach combined with a structured step-counting technique, which was repeated consistently. Students were given clear, specific instructions such as: "Take five steps forward, then turn right and walk three steps to reach the teacher's office," or "Raise your right hand, now take two steps to the left."

This technique helps the student become familiar with right, left, forward, and backward directions, while also learning to estimate distance using their own footsteps. The teacher trained the student along fixed routes within the school so they could memorize and understand the spatial layout of the rooms. For students with low vision, the teacher also used assistive tools such as guiding ropes or textured objects that could be felt.

In this process, the teacher not only provided instructions but also created training situations that encouraged the student to think, respond, and self-correct. When the student moved in the wrong direction, the teacher gave hints from a distance rather than immediately correcting them, so the student became accustomed to self-correction and building internal spatial memory.

These exercises were conducted consistently over multiple sessions, combined with direct exploration of the school environment. The teacher directed the student to navigate to locations such as the teacher's office, restroom, and library, expanding the student's understanding of different areas.

The results of this training showed that the student was able to recognize directions more accurately, understand body positioning relative to the environment, and showed improvement in determining routes from one point to another. This skill significantly supported the student's independence and readiness to perform daily school activities more confidently and efficiently.

### ***Avoiding Obstacles in the School Environment***

The classroom teacher trained the visually impaired student to avoid obstacles in the school environment using a sensory response and obstacle exploration training method. This method emphasizes the use of the sense of touch, step counting, and repeated environmental exploration to help the student recognize, feel, and avoid various types of obstacles.

These obstacles include: desks and chairs in the classroom, poles, cabinets, fences in the school corridors, walls, doors, and stairs. In practice, the teacher provides verbal directions such as: "Ara, five steps ahead there is a chair, so let's just take four steps." "Ara, two steps to the right there is a desk, so you can go around it from the left."

The student was also taught to use their palms and the tips of their feet to feel the surfaces around them before proceeding. The teacher consistently emphasized hands-on practice in avoiding obstacles rather than relying solely on theoretical instruction.

Observation results showed that the student demonstrated improved ability in



recognizing the location of obstacles and adjusting their movement accordingly, even in changing situations (e.g., a different desk arrangement). The student learned to predict potential obstacles through direct experience and verbal reinforcement from the teacher.

To equip students with visual impairments to avoid obstacles in the school environment, the teacher employed a sensory response training method and direct obstacle exploration. The main focus of this training was to maximize the function of non-visual senses (Pahlefi et al., 2024), such as touch and hearing. The teacher did not simply verbally explain the presence of obstacles but also trained the student to detect them independently using the palms, tips of the feet, and environmental cues such as changes in echo or floor texture.

Training was conducted in various school areas with both static and dynamic obstacles, such as classrooms with desks and chairs, corridors with poles or cabinets, and access points like stairs and doors. The teacher gave verbal commands like: "There is a chair three steps ahead; we stop on the second step," or "Turn left because there's a desk to the right." However, more importantly, the teacher encouraged the student to feel the walls, rotate the body to avoid obstacles, and touch surrounding surfaces before proceeding further. Students were also taught to pay attention to sound or vibrations as cues for detecting nearby objects or people.

In addition to giving instructions, the teacher created dynamic obstacle simulations, such as changing the position of furniture or modifying routes, so that the student would not rely solely on memorization but learn to adapt to real-life, unpredictable conditions. This approach encouraged the development of anticipation and reflexes in unexpected situations.

Observation results showed that the student demonstrated improved ability to recognize and avoid obstacles, even in conditions different from the original training. The student was able to respond to obstructing objects, change direction, or adjust steps accordingly. This indicates that the teacher's sensory-based training successfully equipped the student with practical strategies to move safely in the school environment without a cane, while also enhancing their readiness to face obstacles in other environments.

### ***Walking Independently in the School Environment***

The classroom teacher's efforts to enhance the student's ability to walk independently in the school environment were implemented using a repetitive route training method based on reference point orientation. This method teaches visually impaired students to identify fixed pathways in the school by recognizing key orientation markers such as different floor textures, doorways, wall corners, specific sounds (such as those from the teachers' office or library), and step counts.

In practice, the teacher guided the student during the initial phase by: Leading and pointing out the direction to specific rooms Providing long-distance verbal instructions after several practice sessions Encouraging the student to try walking independently once familiar with the route Examples of the teacher's instructions include: "Ara, seven steps forward, then turn left to reach the teacher's office." "Please return to class from the library without assistance." "Ara, go get your book from my desk."

Observation results showed that after gradual and repeated training, the student was able to move independently from one room to another without the use of a cane or assistance from others. The student's confidence also increased, as evidenced by their initiative in moving

between rooms independently when given a task.

Walking independently represents the advanced and final stage of orientation and mobility training, as it integrates all previously acquired skills, such as recognizing directions, avoiding obstacles, and measuring distance and position. The teacher implemented a strategy of repetitive route training based on fixed orientation points, which involved having the student repeatedly walk the same paths to build strong spatial understanding.

The orientation points used included specific sounds (e.g., voices from the teachers' office, an open door), floor textures (tiles, cement, carpet), temperature differences between rooms, and step counts between locations. Initially, the teacher guided the student to a particular location and explained each stage of the route in detail. Then, the teacher shifted to giving long-distance instructions, allowing the student to practice moving without physical assistance. Finally, the student was tasked with completing the routes independently without verbal cues. This training was supplemented with real tasks, such as: "Go get your book in the teacher's room," "Return to class from the restroom," or "Go to the library by yourself after break."

The aim was not only for the student to recognize routes, but also to be able to complete tasks independently, just like other students. The teacher also monitored the student's progress in each session, offering encouragement and gradually increasing the level of difficulty.

As a result of this training, the student showed significant progress. They were not only able to follow routes without a cane, but also began to take initiative in moving from place to place without being prompted and could correctly return to the original point of departure. The student's confidence improved, and they became more active

and engaged in classroom and school activities. This confirms that the repetitive route training and orientation-based approach is highly effective in developing mobility independence for students with visual impairments.

In conclusion, the teacher's efforts successfully created a supportive and motivating learning environment, enabling the visually impaired student to improve their orientation and mobility skills without using a cane by recognizing directions, overcoming various obstacles, and walking independently within the school setting.

## **CONCLUSIONS AND SUGGESTIONS**

Based on the research conducted at SLB A Bina Insani, it can be concluded that the teacher's efforts to improve the orientation and mobility skills of students with visual impairments without using a cane have proven effective through a gradual, structured, and consistent approach. The teacher served not only as an instructor but also as a facilitator, motivator, and primary trainer who provided comprehensive support throughout the learning process. The strategy involved a phased reduction in cane use, starting with full usage and gradually decreasing it until the student could walk independently.

To enhance direction recognition, the teacher applied a verbal-spatial method using step-counting and long-distance instructions, helping the student distinguish directions and move independently. Obstacle avoidance was developed through sensory training involving the sense of touch and real-life environmental practice. Furthermore, the ability to walk independently was strengthened through repeated practice on familiar routes marked by orientation points, enabling the student to navigate confidently and unaided.

Based on the research findings and field observations, several suggestions are

proposed. For teachers in special education schools, it is important to continually develop creative and adaptive teaching strategies that enhance the orientation and mobility skills of blind or visually impaired students without relying solely on assistive tools like canes. Training should be consistent, gradual, and grounded in real-life contexts within the school environment. Moreover, fostering a positive and supportive teacher-student relationship is crucial to help students feel secure and confident during the learning process.

For future researchers, it is recommended to broaden the scope of orientation and mobility training to include environments outside the school, such as public spaces or the home. Further studies may also investigate the integration of technology or alternative methods that support long-term independence for students with visual impairments, including addressing the social and emotional aspects that influence their mobility development.

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