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LEARNING EXPERIENCES AND SPECIAL EDUCATIONAL NEEDS OF STANDARD THREE PUPILS WITH BINOCULAR VISION DIFFICULTIES IN TANZANIA

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Abstract

Learning in early primary school extends beyond academic outcomes to include pupils' participation in classroom activities. This qualitative study explored the learning experiences of Standard Three pupils who screened positive for binocular vision findings and reading difficulties in a rural government primary school in Geita District Council, Tanzania. Eighteen pupils (9 boys and 9 girls) were purposively selected based on predefined study selection criteria. Data were collected through two gender-homogeneous focus group discussions and analysed using reflexive thematic analysis. Three themes were developed: Visual Experiences During Reading, Environmental Condition on Reading Experience, and Psychosocial Consequences of Reading Difficulties. The findings highlight visual, environmental and psychosocial dimensions that may extend beyond what conventional reading assessments capture. The findings do not establish that binocular vision problems caused the reported reading difficulties. Instead, the findings highlight the importance of recognising pupils' reports of visual discomfort, providing a supportive classroom environment, and strengthening appropriate referral pathways for further assessment. The study recommends that education and health stakeholders strengthen school-based vision screening in rural primary schools, together with clear referral pathways for pupils with persistent visual concerns.

Keywords: binocular vision, learning experiences, reading difficulties, standard three pupils, school-based vision screening

INTRODUCTION

Learning in the early primary school years is not limited to the achievement of academic outcomes. It also involves how pupils participate in classroom activities, interact with teachers and peers, use learning materials and respond to difficulties encountered during learning. For young pupils, these experiences are particularly important because classroom participation and engagement are closely connected with their development as learners. Studies involving pupils with visual difficulties show that challenges in learning may extend beyond academic performance to participation, confidence, interaction with peers and access to appropriate learning support (Morelle & Tabane, 2019; O'Connor et al., 2025; Wegari & Hunde, 2025).

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Vision is one of the important functions that support pupils' participation in school learning. Many classroom activities require pupils to use vision for sustained periods, including reading books, copying information, looking at the board and following written learning materials. Effective visual functioning therefore forms part of the conditions that enable pupils to engage with classroom learning. Wilhelmsen and Felder (2020) emphasise the importance of vision in learning, while their work in Tanzania has also drawn attention to the role of school-based vision screening and visual difficulties in pupils' learning.

Reading fluency forms an important part of learning experiences since it involves how pupils read connected text with appropriate speed and accuracy. When pupils experience difficulty with reading, the experience may involve more than low performance on a reading assessment. Pupils may struggle to maintain attention on text, experience difficulties seeing or following words, or feel uncomfortable participating in reading activities. Understanding pupils' experiences of reading therefore requires attention not only to their engagement with reading activities but also to how they experience these tasks within their classroom environment. This experiential perspective is particularly relevant for Standard Three pupils, who are at an important stage of moving from learning to read towards using reading as a means of learning.

Within these learning experiences, visual functioning is one of the conditions that may be relevant to how pupils engage with written text. Binocular vision problems refer to difficulties in the coordinated use of the two eyes and may include convergence insufficiency and ocular misalignment. During sustained near tasks such as reading, difficulties in binocular visual efficiency may be experienced through symptoms such as eye discomfort, blurred or double vision, visual fatigue, headaches or difficulty maintaining clear and stable vision (Hussaindeen et al., 2018; Pillay & Munsamy, 2021; Scheiman, 2025). These experiences are important to consider when examining pupils' reading experiences because reading assessments may not show whether reading was physically comfortable, visually demanding or socially challenging for individual pupils.

International evidence has also begun to highlight the experiences of learners with visual difficulties within educational settings. Hovorková et al. (2025) explored the lived experiences of a pupil with visual impairment and his mother in an inclusive primary school in Czechia, identifying experiences related to educational support, teacher relationships, assistive technologies and the school environment. Similarly, Khanal and Khanal (2023) examined the lived experiences of visually impaired students in mainstream classroom settings in Nepal, highlighting challenges related to classroom facilities, peer support, teacher interaction and learning opportunities. These studies demonstrate the value of examining visual difficulties from learners' perspectives; however, they largely concern pupils with recognised visual impairment rather than children with screening-positive binocular vision findings whose difficulties may remain unidentified within the school setting.

Studies examining African educational contexts provide further evidence that learning experiences involving visual difficulties may extend beyond academic performance. Morelle and Tabane (2019) and Matsie and Stofile (2022) described challenges experienced by learners with visual difficulties in mainstream school settings, including participation, support and everyday educational experiences. These studies draw attention to the educational and social context in which learners experience visual difficulties. Nevertheless, the experiences of learners with recognised visual impairment should not automatically be treated as equivalent to those of pupils whose binocular vision screening findings have not been clinically assessed. The present study extends this area of inquiry by focusing on pupils' descriptions of reading and classroom learning in a rural Tanzanian school.

In Tanzania, the experiential dimension is also relevant to understanding reading and classroom participation. Wilhelmsen and Felder (2022) examined the importance of vision screening by teachers in Tanzanian schools, while Mgeni and Mugyenyi (2025) examined teachers' competencies for teaching children with visual disturbances. These studies point to the importance of recognising visual concerns within ordinary educational settings. However, limited evidence is available on the learning

experiences of primary school pupils with screening-positive binocular vision findings, particularly how they experience reading activities, classroom environmental conditions and interactions with teachers and peers. By focusing on pupils' own accounts, the study addresses an important concern in inclusive education: Learning barriers may be experienced by children even when their needs have not been formally identified. However, the present data cannot establish how frequently these experiences occurs beyond the participating group.

A further issue is that conventional reading assessments do not always provide a complete account of pupils' learning experiences (O'Connor et al., 2025; Kultas, 2026). Although binocular vision concerns and reading difficulties may be identified through school-based screening and reading assessments, these approaches may not fully describe what a pupil experiences while attempting to read. Pupils may report eye discomfort, visual disturbances, changes in comfort according to environmental conditions, embarrassment, teasing or difficulties in obtaining help. Such experiences highlight the importance of attending to pupils' own accounts of reading and classroom learning rather than focusing only on observable learning outcomes.

Theoretical Background of the Research

The study was informed by two complementary perspectives: Kolb's Experiential Learning Theory and Scheiman's Visual Efficiency Skills Model. The two perspectives address both how pupils experience learning in the classroom and how visual functioning relates to the conditions under which near tasks such as reading are experienced. Neither framework was used to test a causal relationship between vision and reading outcomes.

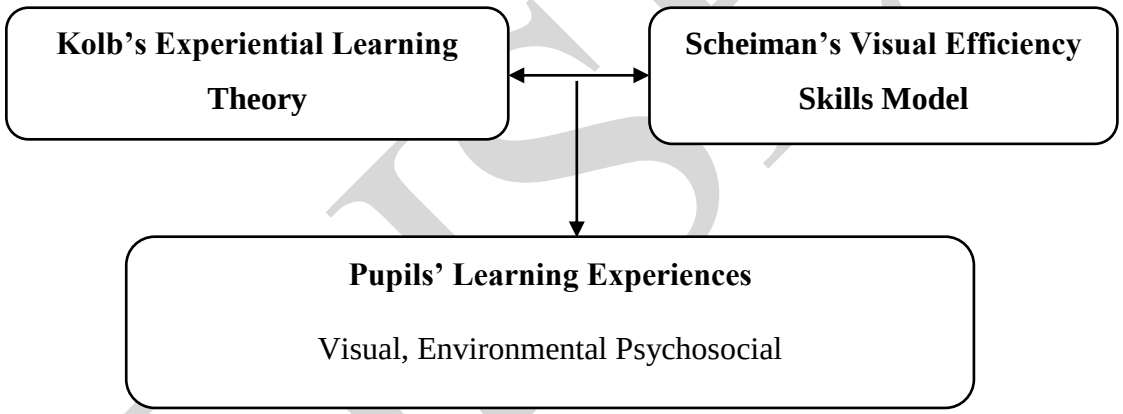


Figure 1. The Experiential Learning Theory and Visual Efficiency Skills Model of pupil reading experiences

Kolb's Experiential Learning Theory

Kolb's Experiential Learning Theory (1984) views learning as a process through which knowledge develops through experience and reflection. The theory conceptualises learning as a cycle involving concrete experience, reflective observation, abstract conceptualisation and active experimentation. In this study, the theory provides a lens for understanding reading as an activity that pupils experience repeatedly within a social and physical environment. A reading task may involve physical sensations, emotional responses, interactions with teachers and peers, and decisions about whether to continue or seek help. Kolb's perspective therefore supports interpretation of the accounts as experiences situated within classroom life rather than solely as indicators of academic performance.

Scheiman's Visual Efficiency Skills Model

Scheiman's Visual Efficiency Skills Model (2025) provides the visual-function perspective. It emphasises that effective visual performance in near tasks depends on functional skills beyond simple visual acuity, including binocular vision coordination, accommodation and eye-movement control. The model is relevant because reading requires sustained visual engagement with near print and

coordinated eye movement. It therefore provides a framework for considering pupils' reports of discomfort, blurred or double vision, visual instability and difficulty sustaining near visual tasks. However, this model does not establish that a particular symptom reported by selected pupils reflects a specific visual disorder. The screening findings in this study are interpreted in recognition of the fact that school-based screening findings do not constitute a clinical diagnosis. The framework therefore provides a context for discussing the visual demands of reading without assigning a clinical explanation to individual pupils' accounts.

Relevance and Complementarity of the two Perspectives in this Study

The two perspectives serve different but complementary purposes. Scheiman's model helps frame the visual demands of reading and the functional significance of binocular vision, whereas Kolb's theory helps interpret how repeated reading experiences are embedded in pupils' interactions with the classroom environment and other people. Together, they support a pupil-centred interpretation of visual, environmental and psychosocial experiences. They are used as interpretive lenses for understanding pupils' experiences rather than for testing relationships between binocular vision problems and reading fluency.

Aim and Research Gap

Taking together, research from Europe, Asia and Africa has documented experiences of learners with recognised visual impairment, while research in Tanzania examined vision screening and teachers' preparedness to support pupils with visual difficulties (Hovorková et al. 2025; Khanal & Khanal, 2023; Matsie & Stofile, 2022; Mgeni & Mugyeng, 2025; Morelle & Tabane, 2019; Wilhelmsen & Felder, 2022). However, the experiences of younger pupils selected through school-based binocular vision screening findings and reading difficulties warrant further attention, particularly in rural primary-school contexts. The present study responds to this gap by exploring pupils' accounts of visual experiences during reading, environmental conditions, and psychosocial experienced. Its contribution is a contextual-specific perspective that may inform how educators recognise and respond to reported difficulties.

METHOD

Research approach and design

This study employed a qualitative approach to explore pupils' learning experiences in relation to binocular vision findings and reading fluency. The study was conducted in one rural government primary school in Geita District Council, Tanzania. The qualitative approach was intended to provide an in-depth understanding of pupils' experiences during reading and classroom learning rather than to estimate prevalence or test causal relationships. The study focused on pupils' own accounts to understand the visual, environmental and psychosocial dimensions of their learning experiences.

Participants and sampling procedure

Eighteen Standard Three pupils, 9 boys and 9 girls, were purposively selected based on predefined selection criteria related to school-based binocular vision screening findings and reading difficulties. The screening findings and earlier reading assessment were used only to identify pupils who met the criteria for participation in the qualitative study. Purposive, criterion-based selection was chosen because the study sought pupils who could speak directly about the learning experience of interest, rather than a sample representative of the whole school population.

Data Collection

In this study, focus group discussions (FGDs) were conducted with the selected pupils to understand how they experienced reading activities, classroom engagement, and everyday learning, with one discussion involving the boys and the other involving the girls. The discussions provided pupils with an opportunity to describe their experiences, feelings, and challenges in their own words, enabling the researcher to gain a deeper understanding of the meanings they attached to their classroom learning experiences. Consequently, the qualitative phase provided contextual explanations and experiential

insights into pupils' learning experiences that may not be fully captured through conventional reading assessments. Gender-homogeneous grouping was chosen because methodological guidance on research with children suggests that group composition can shape how freely children speak, and that same-gender groups tend to support more open participation (Adler, Salanterä, & Zumstein-Shaha, 2019; Heary & Hennessy, 2002). Both discussions took place in a familiar classroom within the school, with desks arranged in a U-shape so that participants could maintain eye contact with one another and with the researcher throughout. The researcher moderated both sessions personally. Each session opened with a short warm-up story, lasting about five minutes, about a child who struggled to read because of an unnoticed visual problem; this approach was adopted after the pilot study showed that Standard Three pupils found it difficult to respond to direct questions without first being put at ease. Broadly, open-ended questions followed, with gentle probing used to draw out further detail once a pupil had begun to speak. The school-based binocular vision screening and earlier reading assessment were not used as qualitative data collection methods for this paper; they were used only to identify pupils who met the predefined selection criteria for participation in the FGDs.

Data Analysis

The two focus group discussions were audio-recorded and transcribed verbatim in Kiswahili. Only the FGD transcripts were subjected to qualitative analysis in this paper; the school-based screening findings and earlier reading assessment were used only for participant selection and were not analysed as quantitative data. Analysis was conducted manually in Microsoft Excel using Reflexive Thematic Analysis (RTA), following Braun and Clarke (2021). An inductive and semantic orientation was adopted, with codes and themes developed from participants' accounts rather than imposed from a predetermined coding framework. The researcher became familiar with the transcripts and recordings, generated initial codes, developed and reviewed candidate themes, refined and named the final themes, and produced the written analysis using representative quotations translated into English. Emerging codes, quotations and interpretations were discussed with the supervisory team and an independent qualitative researcher to support analytic reflexivity and examine the fit between participants' accounts and the developing interpretation; this was not treated as inter-coder reliability. Quotations were anonymised using PB for participants from the boys' group and PG for participants from the girls' group.

Trustworthiness

The trustworthiness of the qualitative findings was addressed through credibility, transferability, dependability and confirmability. Credibility was strengthened through pilot refinement of the Focus Group Discussion guide, the use of an age-appropriate introductory story to support pupils' understanding of the topic, immediate replay of each audio recording with participants to confirm that their contributions had been captured accurately, and supervisory debriefing of emerging codes, quotations, sub-themes and themes. Transferability was supported by providing contextual detail about the rural school setting, participant characteristics, criterion-based purposive sampling, data collection procedures and the conditions under which the findings were generated, allowing readers to judge their relevance to comparable settings rather than assuming statistical generalisability. Dependability was enhanced through an audit trail comprising field notes, records of methodological decisions and revisions, audio recordings, transcripts and analytic records showing the development of codes and themes. Confirmability was supported by keeping interpretations traceable to participants' accounts through verbatim transcription, retention of original recordings, reflexive consideration of the researcher's role, and supervisory discussion of analytical decisions. Together, these procedures were intended to keep the qualitative analysis systematic, transparent and grounded in participants' accounts (Nowell et al., 2017; Riazi et al., 2023).

Ethical Considerations

Ethical clearance was obtained from the University of Dodoma Research Ethics Committee (Ref. No. MA.84/261/104/63) before data collection began. Administrative permission was subsequently obtained from the relevant regional, district and school authorities. Passive parental consent was

obtained through information provided to parents or guardians before participation and verbal assent was obtained from every pupil immediately before their discussion began. Participation was entirely voluntary, and pupils were informed that they could withdraw from the discussion at any point without consequence. Confidentiality was explained to pupils in simple, age-appropriate language, consistent with recommended practice for research involving children (Heary & Hennessy, 2002; Peñaherrera-Vélez et al., 2023), and all identifying details, including the name of the school, were withheld from this paper to protect participants' privacy. The audio recordings and transcripts were handled confidentially.

RESULTS

Visual Experiences During Reading

The first theme describes the visual experiences reported by pupils during reading activities. Participants explained that reading was often accompanied by different forms of visual discomfort and visual disturbances, making reading difficult and uncomfortable. Although pupils used different expressions to describe their experiences, their responses highlighted challenges related to eye discomfort and unstable vision while reading. This theme is presented through two sub-themes: Ocular Discomfort During Reading and Visual Disturbances During Reading.

Ocular Discomfort During Reading

The first sub-theme describes the physical discomfort experienced by pupils while reading. Participants described several forms of ocular discomfort, including painful eyes, eye irritation, internal eye pain, eye heaviness and headache during reading activities. Some participants provided brief descriptions, while others gave more detailed accounts of their experiences. One participant described pain inside the eyes, reporting, "I feel pain in my eyes" (PG, FGD, June 2026). Another participant described the discomfort as involving both pain and movement of the eyes, stating, "My eyes become painful and keep moving" (PB, FGD, June 2026). Similarly, another participant described a sensation of heaviness, stating, "My eyes feel heavy" (PG, FGD, June 2026). These accounts show that pupils described ocular discomfort in different forms during reading, rather than as one specific type of discomfort.

Visual Disturbances During Reading

Besides physical discomfort, many pupils also described different forms of visual disturbances while reading. Participants explained that they sometimes experienced double vision, blurred vision, moving words, unstable vision and tearing, making it difficult to maintain clear and comfortable reading. Some pupils described these experiences as affecting how clearly they could see the reading material or whether they could continue reading. Some participants described changes in their visual perception, while others explained how particular visual disturbances affected their ability to continue reading. One participant reported, "I see double" (PB, FGD, June 2026), while another stated, "I see words keep moving" (PB, FGD, June 2026). Another participant described a combination of eye movement and tearing, stating, "My eyes start shaking, and then tears come out" (PB, FGD, June 2026). Some pupils reported that their vision became unclear while reading. One participant explained, "My eyes cannot see clearly" (PB, FGD, June 2026). The accounts also showed differences in pupils' ability to continue reading when their eyes started tearing. One participant stated, "I can still read even when my eyes become tearing" (PB, FGD, June 2026). In contrast, another participant explained, "No, I cannot continue reading when my eyes become tearing" (PG, FGD, June 2026). These accounts indicate that visual disturbances affected pupils' reading experiences in two main ways: they interfered with how clearly pupils perceived reading material and, for some pupils, made it difficult to continue reading comfortably.

Environmental Condition on Reading Experience

The second theme describes how environmental conditions were related to pupils' reading experiences. Participants explained that environmental lighting was related to the comfort with which they were able to read. While many pupils preferred reading when sunlight was less intense, others

reported that bright daylight was associated with increased visual discomfort during reading. No direct measurement of classroom illuminance was undertaken; therefore, these findings describe pupils' reported experiences rather than objectively measured lighting conditions. This theme is presented through two sub-themes: Preference for Comfortable Lighting Conditions and Visual Symptoms Worsen in Bright Daylight.

Preference for Comfortable Lighting Conditions

The first sub-theme describes pupils' preferred lighting conditions during reading. Participants reported different preferences regarding the time of day they found more comfortable for reading. Some participants preferred reading in the morning, while others preferred reading in the evening or during the day. Among those who preferred morning reading, some linked this preference to greater eye comfort or the absence of strong sunlight. One participant explained, "I like reading in the morning because my eye feels fine" (PG, FGD, June 2026). Similarly, another participant stated, "I like reading in the morning because my eyes are not painful" (PG, FGD, June 2026), while another participant reported, "I like reading in the morning because there is no strong sun. My eyes itch, shake, and tears come out" (PG, FGD, June 2026). Other participants expressed different preferences, with some reporting a preference for reading during the day and others preferring the evening. These accounts indicate that the time of day was part of how pupils experienced comfort during reading, with less intense sunlight often described as more comfortable for reading.

Visual Symptoms Worsen in Bright Daylight

The second sub-theme describes pupils' experiences of increased visual discomfort when reading during daylight. Participants reported that some visual difficulties were more noticeable during the day, particularly when reading under strong sunlight. These experiences included eye itching, eye tiredness and general discomfort during reading. One participant explained, "I feel uncomfortable when reading under bright light" (PB, FGD, June 2026). Another participant described experiencing eye itching during the day, stating, "During the day my eyes itch" (PG, FGD, June 2026). Another participant described feeling sleepy while reading during the day, stating, "When I read during the day, my eyes feel sleepy" (PG, FGD, June 2026). These accounts indicate that bright daylight was associated with less comfortable experiences for some pupils, as visual discomfort became more noticeable under such conditions.

Psychosocial Consequences of Reading Difficulties

The theme describes the psychosocial experiences associated with reading difficulties among pupils who met the study's binocular vision screening criteria. Participants explained that reading difficulties were accompanied by experiences involving emotions, relationships with classmates and access to academic support. Some pupils reported feelings of embarrassment or sadness during experiences of reading difficulty. Others described negative reactions from classmates, while some explained that they experienced different forms of support and barriers when seeking help with reading. This theme is presented through three sub-themes: Emotional Responses to Reading Difficulties, Peer Stigma Following Reading Difficulties, and Barriers to Academic Support.

Emotional Responses to Reading Difficulties

The first sub-theme describes pupils' emotional responses associated with difficulties encountered during reading. Participants reported different emotional experiences when they needed help with reading, including embarrassment when seeking assistance and sadness or feeling bad when assistance was not available. Some participants explained that they did not ask for help because they felt embarrassed. One participant stated, "I feel embarrassed" (PG, FGD, June 2026). Another participant described how they felt when they were unable to obtain help with reading. One participant reported, "I feel sad." (PG, FGD, June 2026). These accounts indicate that reading difficulties were accompanied by emotional responses at different points in pupils' experiences, including when they sought assistance and when they were unable to obtain it. The finding suggests that the emotional experience of reading difficulties extended beyond the act of reading itself to situations in which pupils needed support but felt uncomfortable seeking it or experienced difficulty obtaining it.

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Peer Stigma Following Reading Difficulties

The second sub-theme describes pupils' experiences of negative reactions from classmates after they experienced reading difficulties. Participants reported being laughed at, teased and negatively labelled when they experienced difficulties in reading. Some pupils explained that such teasing occurred not only in the classroom but also outside the classroom. One participant reported, "They mock me" (PG, FGD, June 2026), while two participants also explained "They laugh at me" (PB, FGD, June 2026). Another participant gave a more detailed account, explaining:

> "When they see you on the road, they teasing. Even when we are going home, they tease you. Even when we are going to buy things, they tease you Oooooo… "She cannot read and thus why they laughing on you"." (PG, FGD, June 2026).

Similarly, another participant stated "They tease me oooo…" They say, "that fool" she fails to read yooo…" (PG, FGD, June 2026). These accounts indicate that some pupils experienced negative peer reactions in response to their reading difficulties, including teasing, ridicule and negative labelling. The finding suggests that reading difficulties were experienced within a social environment in which difficulties in reading could become a source of negative attention from classmates.

Barriers to Academic Support

The third sub-theme describes pupils' experiences of accessing academic support when they encountered reading difficulties. Participants reported different experiences. Some pupils received support from their friends and teachers, whereas others experienced barriers such as peer refusal, fear of punishment and limited support from classmates. In some situations, the available support was insufficient because the classmates providing assistance also experienced reading difficulties or because pupils could not remember what they had been taught. One participant explained, "My friend agrees to help me read" (PG, FGD, June 2026), while another participant described the support received from the teacher: "I, teacher taught us. When I fail to read, the teacher tells me that, here it written this and this, then you repeat by yourself." (PG, FGD, June 2026).

However, not all pupils had similar experiences. Other participants explained, "If you do not help others, they will not help you either." (PB & PG, FGD, June 2026), while another reported that their classmates also experienced reading difficulties. One participant stated, "My friend also cannot read" (PG, FGD, June 2026), while another participant explained, "My friend reads the passage for me, but I do not remember it" (PG, FGD, June 2026). Other pupils experienced direct refusal from classmates. One participant explained, "My friend says that is she helps me; her intelligence will come to me" (PG, FGD, June 2026). These accounts indicate that access to academic support varied among pupils. Some received direct assistance from teachers and friends, while others had limited or ineffective support because of peer refusal, the reading difficulties of those providing assistance, or difficulty retaining the assistance received. The accounts mean that the availability of someone to provide help did not always result in effective academic support for pupils experiencing reading difficulties.

DISCUSSION, CONCLUSION, and RECOMMENDATIONS

The first theme revealed that many pupils reported visual discomfort while reading. Participants described eye pain, itching, headaches, heavy eyes, blurred vision, double vision, moving words and excessive tearing during reading activities. These accounts are important because they show that pupils' reading difficulties were experienced not only as difficulty in producing correct or fluent reading, but also as physical discomfort during the reading activity itself. They therefore add an experiential dimension to understanding reading by showing how visual discomfort formed part of pupils' everyday reading experiences.

The present findings are consistent with previous studies by O'Connor et al. (2025), who found that pupils with visual impairment experienced barriers to meaningful participation in classroom learning when teaching approaches and learning materials did not adequately accommodate their visual needs. Participants in their study reported difficulties participating in classroom discussions, collaborative

activities and other learning opportunities. Although their study involved pupils with recognised visual impairment, the similarity lies in the emphasis on how visual difficulties may affect pupils' participation and engagement in learning. The present findings similarly suggest that visual discomfort can become part of pupils' everyday experience of reading and classroom participation.

Similarly, Mgeni and Mugyenyi (2025) found that Standard Three pupils with visual disturbances showed behaviours such as tilting their heads, holding books very close and experiencing difficulty maintaining concentration. These observations provide useful contextual support for considering such behaviours as signs that may warrant attention when pupils repeatedly experience difficulties during reading. However, such behaviours should not be interpreted as evidence of a specific visual disorder without further assessment. The present findings may also be interpreted through Scheiman's Visual Efficiency Skills Model (2025), which emphasises the role of coordinated binocular vision, accommodation and eye movements in sustained visual tasks involving written text. The reported experiences of blurred vision, moving words, difficulty seeing the text clearly and eye discomfort during reading are relevant to this perspective because they describe difficulties encountered during a sustained near-vision task. The model therefore provides a useful interpretive lens, while the reported experiences should not be treated as evidence of a specific clinical visual mechanism.

The qualitative findings can further be understood through Kolb's Experiential Learning Theory (1984), which emphasises the role of learners' experiences in the learning process. In the present study, pupils did not describe reading only in terms of whether they could read correctly or fluently; they also described what they experienced while attempting to read, including pain, blurred vision, moving words, eye discomfort and difficulty maintaining visual attention. The pupils' accounts show that reading was experienced as an activity involving physical, visual and emotional experiences rather than as a purely academic task. Kolb's perspective therefore helps interpret these accounts as part of pupils' broader learning experiences within the classroom.

The second theme showed that classroom environmental conditions formed part of pupils' experiences during reading. During the Focus Group Discussions, participants reported that their comfort while reading varied according to the lighting conditions and the time of day. Some pupils preferred reading in the morning or evening, while others reported eye itching and discomfort when reading under bright daylight. These accounts indicate that pupils noticed differences in their reading comfort under different environmental conditions. The finding is relevant to learning experiences because physical conditions in which reading takes place form part of the context in which pupils engage with written materials. However, because environmental conditions were not directly measured or statistically tested in the present study, the findings are interpreted as pupils' reported experiences rather than evidence that classroom lighting was associated with differences in reading fluency.

The present findings are consistent with evidence from different educational settings showing that classroom lighting is relevant to pupils' visual comfort. Korsavi et al. (2022) and Fakhari et al. (2021) reported that classroom lighting conditions were relevant to children's visual environment and comfort. The similarity with the present study lies in the reported importance of lighting conditions for visual comfort. However, unlike those studies, the present study explored pupils' lived experiences rather than objectively measuring classroom lighting. The Tanzanian context provides further support for considering classroom environmental conditions as part of pupils' learning experiences. Toyinbo et al. (2025) assessed indoor environmental quality in 14 classrooms across five Tanzanian secondary schools and found that classroom lighting was unevenly distributed, with significantly higher levels near windows than at the centres of classrooms, while artificial lighting was generally insufficient. Although their study involved older pupils and objective environmental measurements, it supports the relevance of classroom conditions when considering pupils' experiences of learning. The present findings extend this context by showing how younger pupils described their own comfort during reading.

The psychosocial findings show that reading difficulties were experienced within pupils' emotional and social relationships, rather than being limited to the reading task itself. Pupils described embarrassment and sadness when they experienced difficulty reading or needed assistance, while others reported being laughed at, mocked and negatively labelled by their peers. Some pupils also described barriers to seeking help, including embarrassment, peer refusal and fear of punishment, although others received support from teachers and friends. These experiences show how difficulties with reading were experienced in relation to pupils' feelings, participation and help-seeking within the classroom. The contrasting experiences of support and stigma also suggest that social interactions within the classroom environment may shape how pupils experience and respond to reading difficulties.

The findings are consistent with literature recognising learning experiences, participation and pupils' social experiences as important dimensions of engagement with learning (Kultas, 2026; Wegari & Hunde, 2025). Kolb's Experiential Learning Theory provides a useful framework for interpreting these findings because it views learning as a continuous process shaped by learners' experiences and their interaction with the learning environment. In this study, experiences of struggling to read, being teased or feeling embarrassed when seeking help formed part of the social and emotional context in which pupils engage with learning. This suggests that support for pupils experiencing reading difficulties should attend to both their learning needs and the social conditions that influence participation.

The integrated findings can also be understood through the two theoretical perspectives used in the study. Scheiman's Visual Efficiency Skills Model (2025) provides a framework for understanding the visual demands of sustained reading, while Kolb's Experiential Learning Theory (1984) helps interpret the emotional, social and environmental experiences surrounding learning. Together, the two perspectives support a pupil-centred interpretation of how visual and broader classroom experiences are woven into reading and learning activities. Specifically, Scheiman's model provides a perspective for interpreting pupils reported visual experiences during reading, while Kolb's theory helps explain how these experiences, together with environmental conditions and psychosocial interactions, form part of pupils' broader learning experiences. The findings show that pupils' experiences of reading extended beyond the act of reading itself to include visual comfort, environmental conditions, emotional responses, peer relationships and access to support. These dimensions highlight the value of attending to pupils' own accounts when seeking to understand how reading difficulties are experienced within everyday classroom life. The findings should be interpreted as pupils' reported experiences rather than as evidence that binocular vision problems caused their reading difficulties. The school-based screening process was not a clinical diagnostic assessment, and purposive sampling was selected to provide in-depth accounts of the phenomenon under study. The value of the findings therefore lies in documenting pupils' experiences of reading and classroom learning in context.

The findings have implications for how reading difficulties are recognised and responded to within school settings. Pupils who repeatedly report visual discomfort or difficulties seeing reading materials may need opportunities to communicate these experiences without fear of embarrassment or negative labelling. Teachers may also pay attention to observable behaviours during reading and communicate persistent concerns through appropriate school or health referral pathways. These implications do not mean that every pupil with reading difficulties has a visual problem; rather, they highlight the value of responding to pupils' reported experiences before such difficulties are overlooked or attributed only to ability or effort. The findings also indicate the importance of a supportive classroom environment. Pupils may benefit from learning environments where asking for help is accepted, negative peer responses are discouraged and reported discomfort is taken seriously. Where practical, teachers and schools may also consider reading conditions that pupils find more comfortable.

Conclusion

The study concludes that pupils' learning experiences during reading involved visual, environmental and psychosocial dimensions. The qualitative accounts showed visual discomfort and visual

disturbances, differences in reading comfort under environmental conditions, and psychosocial experiences involving embarrassment, peer reactions and access to academic support. These findings highlight the importance of understanding reading difficulties through pupils' own experiences within the classroom. They do not, however, establish that binocular vision problems caused the reported reading difficulties.

Recommendations

Based on the research findings, the following recommendations have been developed: It should focus on an integrated, multidimensional approach that addresses visual, environmental and psychosocial factors that affect students' reading experiences, while also encouraging more holistic screening.

Below are recommendations categorized by theme.

Classroom and Environmental Adjustments

- To mitigate visual discomfort and accommodate diverse student preferences, reading areas should maintain proper, glare-free lighting conditions.
- To minimize visual disturbances, teachers should pay attention to pupils' reported visual discomfort during reading and consider their expressed preferences when organising classroom reading activities.
- To minimize sensory overload, it is recommended that quiet, comfortable, and well-lit reading corners be created.

Psychosocial and Emotional Support

- Schools should promote peer-awareness and supportive interactions among pupils to reduce negative peer reactions and stigma and embarrassment associated with reading difficulties.
- It is recommended that practitioners should provide supportive and inclusive reading activities that allow pupils experiencing reading difficulties to participate without fear of embarrassment or negative judgement.
- Future research and school policies should focus on strengthening support mechanisms for pupils experiencing reading difficulties, while ensuring that such support is accessible and does not expose pupils to stigma or embarrassment.

Screening and Collaborative Practices

- Educators should be trained to pay attention to pupils' physical and emotional experiences during reading and provide opportunities for pupils to express difficulties that may not be reflected in reading speed and accuracy alone.
- Based on the findings indicating visual discomfort without definitive binocular vision anomalies, it is recommended that schools consider establishing links with eye-care professionals so that pupils with screening findings that may require further assessment can be referred for appropriate professional evaluation.
- Future initiatives should foster collaboration among teachers, school counselors, and vision specialists to respond to pupils' reported visual discomfort and psychosocial experiences during reading.

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Ethics and Conflict of Interest

Ethical clearance was obtained from the University of Dodoma Research Ethics Committee (Ref. No. MA.84/261/104/63) before data collection began. Administrative permission was subsequently obtained from the relevant regional, district and school authorities. Passive parental consent was obtained through information provided to parents or guardians before participation and verbal assent was obtained from every pupil immediately before their discussion began. Participation was entirely

voluntary, and pupils were informed that they could withdraw from the discussion at any point without consequence. Confidentiality was explained to pupils in simple, age-appropriate language, consistent with recommended practice for research involving children (Heary & Hennessy, 2002; Peñaherrera-Vélez et al., 2023), and all identifying details, including the name of the school, were withheld from this paper to protect participants' privacy. The audio recordings and transcripts were handled confidentially. The authors declare that ethical guidelines were followed throughout the research process. We make clear that the views and findings expressed in the study are solely those of the authors. The authors also declare that there is no conflict of interest regarding this study.

Author Contribution
All authors contributed equally to the research. All authors read and approved of the final manuscript.

Data Availability
The data that support the findings of this study are available on request from the corresponding author.

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