Pro Index | Journal of Research in Innovative Teaching and Inclusive Learning
Volume: 2 Issue: 11 Year: 2024
ISSN: 3030-3036 | http://journals.proindex.uz

Guided Peer Tutoring and the Development of Motor Abilities by Children with Dyspraxia in Buea of the South West Region of Cameroon

Munge Nzume El-Aldrien, The University of Buea, Cameroon
Patrick Fonyuy Shey, The University of Buea, Cameroon

Abstract: This study sought to examine the effect of guided peer tutoring and the development of motor abilities by children with dyspraxia in Buea of the South West Region of Cameroon. The research design adopted for this study was the experimental design and the type was the quasi-experimental since the participants of the study were not randomised. The type of quasi-experimental design adopted for the study was a comparative pre-test post-test design with non-randomized experimental and control groups. The purposive sampling technique was also used to select the sample for the study. The sample size was twenty-four (24) class four pupils with dyspraxia between ages 8-10 selected from two schools (Presbyterian School (P.S) Bomaka and Catholic School (C.S) Bolifamba) in the Buea Municipality. Both quantitative (motor ability test for pupils) and qualitative (interview guide for teachers) methodologies were used to collect data for the study. Descriptive statistical techniques were used to analyse the data collected from the field. Qualitative data were analysed using thematic approach whereby ideas or viewpoints were grouped under umbrella terms of key concepts. The quantitative data were subjected to inferential statistical analysis using Statistical Package of the Social Sciences (SPSS) version 21.0. The major results obtained were that the use of guided peer tutoring for pupils with dyspraxia enhanced the development of their motor abilities (in areas of strength, balance, coordination (gross motor skills) and fine motor skills (writing, drawing, cutting, lacing, buttoning, clapping and bouncing). Hence it is recommended that children with dyspraxia should be allowed to freely interact with their normal peers during lessons and play. During such moments, teachers can pair pupils with dyspraxia with other pupils so as to facilitate the development of motor skills through peer mentoring and interaction.

Key points: Guided peer turoting; motor abilities; dyspraxia

Introduction

Dyspraxia is an intrinsic disorder that is generally considered to mean an impairment of or difficulties with the organization, planning and execution of physical movement with developmental rather than an acquired origin (Kruntz, 2003). Children with dyspraxia have a marked impairment in the performance of functional motor skills required to succeed at school. Research shows that without early intervention children with this disorder often do not improve with development and poor motor behavior appears to have a detrimental effect on other aspects of functioning such as school achievement, behavior and self-esteem (Gibson, 1996). Dyspraxic children are more likely to fall or trip up, or bump into things. They may be messy eaters, find it hard to use a knife and fork together, spill drinks and be slower at dressing than brothers and sisters. Older children may be much disorganized and leave possessions and clothes all over the place.

Outside of clinical situations, there are two types of approaches that can be employed to address these children's difficulties. The first concentrates on processes underlying motor skills and aims to improve sensory motor areas. The second focuses on teaching functional tasks aimed at intervening

specifically in the deficient areas (Kruntz, 2003). Most individuals with dyspraxia manifest a combination of both ideational or planning dyspraxia and ideomotor or executive dyspraxia. Ideational or planning dyspraxia affects planning and coordination meanwhile ideomotor or executive dyspraxia affects the fluency and speed of motor activities. However, with appropriate help and understanding by teachers, a child with this condition can improve a great deal, developing coping strategies to help reach his potential. Early intervention and treatment can help to reduce the emotional, physical and social consequences that are often associated with this disorder.

The objectives of most schools if not all is to instill knowledge, skills and virtues in their learners. In a classroom environment, children are often expected to demonstrate a high level of academic strength and are expected to excel at almost all lessons otherwise they are considered failures and may be mocked by smarter peers. A child can be excellent in Mathematics but faces difficulties with physical education lessons; this becomes a call for concern. Inefficiency in the organization and execution of motor activities in areas involving gross and fine motor skills may have negative effects on body image, self-esteem and less participation in the environment. Due to the concept of inclusion, it has become even more important to keep on supporting children including those with disabilities to develop skills and abilities and to fully participate socially and academically in the society. Support is therefore one of those ways teachers can assist students with dyspraxia to develop their motor abilities for their academic and social growth. Again gross motor skills are essential for everyday tasks that children complete within the classroom, including their ability to sit up straight and listen to class instructions, copy notes and organize items. Improvements in the organization and execution of motor activities will have a secondary beneficial effect on body image, self-esteem and increased participation in the environment. With appropriate support and assistance therefore, gross motor skills will positively impact upon children's academic progress.

Hence purpose of this paper is examine the influence of guided peer tutoring on the development of motor abilities by children with dyspraxia. It is expected that teachers, parents and peers will learn to respond positively to the child with dyspraxia, interact, communicate and focus on what the child can do and achieve at their own pace, rather than focus on the difficulty the child is having. For without help and training, motor difficulties will persist into adulthood.

The paper consists of review of concepts and theories related the study, methodology and findings based on an empirical study carried out in South West Region of Cameroon. This is followed by discussions, conclusion and recommendations.

Conceptual and theoretical considerations

Development of motor skills

Motor skill development refers to the progressive change in motor behavior throughout the life span with the change being sequential and age-related. Motor development requires complex brain networking. The window of opportunity begins before children are even born as these growing infants engage in movements while in the womb. At 5-6 weeks after conception, a fetal movement appears shortly after nerves from the spinal cord establish functional synapses with muscle fibers (de Vries, Visser & Prechtl, 1982). Fetuses in the first trimester while still resembling a doll with foreshortened limbs and a disproportionately large head exhibit a variety of movements and postures (de Vries & Hopkins, 2005). Generalized movements occur that ripple through the entire body such as sideways bending of head and trunk, startles, hiccups, twitches, limb, finger movements, breathing movements, skipping movements, somersaults, and facial movements such as mouth openings, tongue protrusions, and yawns. The young child brings hand to face, suck fingers and thumb, touch the umbilical cord and uterine wall and move freely through the amniotic fluid (Sparling, Van & Chescheir, 1999). By the second trimester, fetuses produce smiles and other facial movements that comprise adult-like expressions of laughter, crying, and pain (Azumendi & Kurjak, 2003; Reissland, Francis & Mason, 2013). Hand-to-face contacts, kicks, hiccups and other movements also occur. Body and limb movements generally increase over development. Up to 30% of each day is spent actively moving until the fetus growing body becomes cramped by lack of space then movements decrease until birth (de Vries & Hopkins, 2005). Moessinger (1983) adds

that, fetal activity has other consequences for development. For example, moving before birth is necessary for proper physical development. Fetal movement exercises muscles, flexes joints, stretches skin, and circulates amniotic fluid. Without these movements, physical development does not proceed normally. As a consequence, the child will not develop normal facial features, skin, muscles, bones, connective tissue, mouth, gut, lungs and other movements that involve motor abilities.

Due to the immaturity of the human nervous system at the time of birth, children grow continually throughout their childhood years. Many factors contribute to the ability and the rate at which children develop their motor skills. Uncontrollable factors include: genetics or inherited traits and children with learning disorders. A child born to short and overweight parents is much less likely to be an athlete than a child born to two athletically built parents. Controllable factors include: the environment/society and culture they are born to. A child born in the city is much less likely to have the same opportunities to explore hike or trek the outdoors than one born in the rural area (Buschner, 1994). For a child to successfully develop motor skills, he or she must receive many opportunities to physically explore the surroundings/environment (Beamers, Higgins & Nicol 2012). Motor skills in this light can be group under gross and fine motor skills as explained below:

Gross Motor Skills

Gross motor refers to movements of the whole body using the larger muscles to complete everyday activities. Gross motor skills are important for everyday activities including dressing, sport, jumping, playground play and running. In the classroom gross motor strength is important for good posture, travelling between classes and play. Gross motor difficulties can impact a child's balance, coordination, endurance and participation in sporting activities. Children that have difficulty with gross motor skills may also experience fatigue and decreased motivation to perform related activities. Gross motor skills can be categorized into locomotor, non-locomotor and manipulative skills (Dale, 2000). Locomotor skills involve movement of the body in a horizontal or vertical direction from one place to anotherin a fluid coordinated way. Examples of locomotor skills include walking, running, galloping, hopping, leaping, skipping, jumping and crawling. Non-locomotor skills involve movement of the body in the same place. Examples are balancing, bending, twisting, stretching, rocking, swaying, turning, pushing, pulling, rising and sinking. Manipulative skills involve controlling the hands, feet and other parts of the body in managing objects such as bouncing a ball, tossing with a bat, throwing and catching beanbags.

Fine Motor Skills

Fine motor skills are the collective skills and activities that involve using the hands and fingers (Amundson & Weil, 2001; Case-Smith, 2000). In other words, fine motor skills are those skills that require the small muscles of the hand to work together to perform precise and refined movements. Fine motor skills involve to the use of the small muscles in the hands and fingers to complete activities such as buttoning and brushing teeth. Fine motor skills are important for everyday activities including handwriting, cutting, using cutely, tying shoelaces and opening containers. As a child develops they are expected to complete these activities with greater speed and precision therefore the activities become more complex. Activities may include; board games, construction activities, crafts, cooking and speed writing. Some children who have difficulty with fine motor activities may avoid tasks due to fear of failure, frustration, fear and fatigue.

Children between 8-10 years present varying skill levels, ranging from highly developed fine motor skills, such as proficient writing skills, to having very definite ‘gaps’ in their fine motor skills, such as being unable to use scissors or having an inefficient or immature pencil grasp (Exner, 2001). Children by this age are generally expected to demonstrate ability to:

- demonstrate hand dominance
- use the tips of the fingers and the thumb together in a precise pinch or pincer grasp

- assume and use some form of tripod pencil grasp, where a writing tool is held between the tips of the thumb, index finger, and middle finger (versus a whole hand grasp)
- follow an object smoothly with the eyes only while the head remains still
- cut around reasonably complex designs such as a combination of straight and curved lines and corners, with less than 1 cm deviation from set lines
- draw a circle, triangle, square, and a recognizable picture of a person and a house
- use one hand to stabilize an object and the other to perform a separate activity such as unscrewing a lid and doing up buttons, and think of the stabilizing hand as the helper hand and the hand performing the task as the worker hand
- manipulate small objects within the hand
- put together a complex, interlocking puzzle
- Independently complete many self-care tasks such as simple dressing, toileting, shoelace tying, and lunch set-up (Beery & Beery, 2004; Case-Smith, 2000; Edwards, Buckland, & McCoy-Powlen, 2002; Exner, 2001; Shaffer, 2000).

Research shows that the trend of reducing play time in preschool and kindergarten to increase learning is counterproductive to children's motor develop (Blakemore, 2003). Related studies confirm that active play is vital for cognitive development in preschool aged children and that poor motor development can actually inhibit academic progress. In this light, active play has been found to be most beneficial for developing motor skills in children. These have been classified and explained under these sub-headings

Dyspraxia

Dyspraxia is a developmental disorder affecting motor abilities in normal healthy children. Children with this disorder appear clumsy or awkward (Sugden & Wright, 1995). The precise cause of dyspraxia is unknown (Brown, 1994). The condition is believed to result when neurons in the right hemisphere of the brain fail to form precise pathways as the brain develops. This leads to a lack of accuracy when the brain instructs the body to perform movements, resulting in clumsy, poorly coordinated actions. A mechanism for why this happens has been proposed by Portwood (1996), and the biologist Gerald Edelman (1989; 1992): infants are not genetically preprogrammed with all the motor skills they need, but have to establish them for themselves through a process of trial, error and reinforcement. The acquisition of motor skills depends upon the formation of efficient neural pathways for the transmission of instructions from brain to limbs. As the developing infant experiments with movements, connections between neurons in the cerebral cortex are reinforced as a result of "successful" outcomes (such as grasping a toy or balancing a brick) because the movement sequences that lead to success are practiced again and again. In short, neuronal links form as the infant consolidates motor movements. It is suggested that in dyspraxia children, this reinforcement of neuronal connections in the cerebral cortex is somehow impeded, leaving the brain in a state of immaturity. Thus the dyspraxic child is slow to process motor instructions and lacks fluency of movement. Other authors describe dyspraxia as primarily a "disorder of gesture" and offer a neuropsychological explanation (Dewey, 1995; Morris, 1997). Risk factors for dyspraxia may include prematurity, post-maturity, perinatal problems and a family history of dyspraxia or other developmental disorders (Gubbay, 1978).

Mercuri, et al (1996) found that children born prematurely or with birth complications are often associated with clumsiness. The key symptoms of dyspraxia are clumsiness and lack of physical co-ordination. Dyspraxic children lack fluency even when basic movement skills have been mastered and they have difficulty in adapting skills to different situations. This lack of adaptability hinders their capacity to learn games and play with other children. They may also exhibit problems with self-care and activities of daily living. The severity of symptoms varies; some dyspraxic children develop considerable competence in many areas and learn to compensate for their skill deficits, whilst in others, poor motor ability is persistent causing delayed development.

Guided Peer Tutoring

Tutoring, small group instruction and mini lessons have proven to be quite effective learning strategy. Rothman and Henderson (2011) suggested "one-on-one tutoring had the strongest effect on reading achievement, while small and mixed instructional practices had the greatest impact on mathematics achievement". Peer tutoring offers a certain degree of spontaneity and freedom from classroom constraint. The tutor has the advantage of time and being responsive to the learner in a way that a classroom instructor generally does not during a normal class session. The immediacy of the assistance provided by the tutor helps to eliminate confusion and enhances the speed and depth of learning. Peer learning session's serves to reinforce what was learned in the classroom and enhance learning for learners who struggle academically. Peer tutoring has many positive outcomes as it is recognized as a powerful instructional strategy (Hattie, 2009). In this type of learning, instruction are adapted to the learner's pace, learning style and level of understanding. Feedback and correction are immediate. Basic misunderstandings are quickly identified and corrected, practice provided and more difficult material introduced as soon as the student is ready. (Gaustad, 1993)

Guastad (1993) posit that, cross-age or peer tutoring is effective because 1) tutor is closer in age, therefore may have a better understanding of tutee, 2) tutor may present subject matter in terms (language) the tutee understands, 3) tutees receive immediate clarification on information they might not understand and feedback in a non-threatening environment, 4) tutors can model desired skills and behaviors 5) tutors benefit academically reviewing, practicing material and skills with their tutees.

Horvath (2011) adds that, other benefits associated with cross-age tutoring includes; 1) increased student achievement for both the tutor and tutee, 2) providing students with opportunities to be actively engaged in learning at the same time, 3) helping both the tutor and tutee have the opportunity to improve on social and behavioral skills (sharing, giving feedback) and 4) it has shown to improved self-esteem of tutors and tutees.

According to Greenwood (1997), inclusive learning, which is the practice of teaching disabled students alongside non-disabled peers in regular classroom settings, can be facilitated through an emphasis on differentiated learning, where students of varying academic levels receive instruction appropriate for their individual learning styles and speeds. Differentiated learning, which emphasizes providing students with varied opportunities to acquire knowledge and master skills, can be difficult to implement in a traditional classroom setting. Guided peer tutoring is thus an effective strategy for educators to facilitate differentiated learning without stigmatizing and alienating students. When peer tutoring is implemented in a class-wide setting, students are able to approach the curriculum at their individual learning level, using strategies tailored to individual mentees. By explaining concepts in detail, high-level questioning, and the use of supportive communication skills, peer tutors help low-performing students master material previously introduced in a traditional classroom setting and build on their knowledge using higher-ordering thinking skills. Training students in peer tutoring strategies helps them take responsibility for their learning, reinforce their knowledge and skills, build their self-confidence and develop social responsibility.

Vygotsky's Social Constructivist Theory

Lev Vygotsky was born on the 5th of November 1896 in Russia. He was a teacher and later became a psychologist. His early works between 1922 -1926 were mainly on teaching methods in literature, use of translation and language understanding and education of the sensually and physically impaired learners. He advocated that psychology should not only be a theoretical and reflective science but also a practical course that help actively to shape human life. His works have contributed to develop psychology and continuous to impact on psychological studies till this date.

Vygotsky's (1978) social constructivist theory posits that, the child's culture and interactions with others are significant in their overall development especially in relation to cognitive development.

This theory, illustrates the interaction between social and practical elements in learning through speech and practical activities. Here, the child's interactions with significant others (more knowledgeable or experience persons and peers) is considered as the key to their overall development. According to Tchombe (2011), every learner functions at two levels; firstly as he/she constructs meaning through practical activity at an intrapersonal level and secondly as he/she interacts with others using speech and cultural tools to connect the meaning of the interpersonal world he shares with others. Vygotsky believed that a child would internalize dialogues with others and use this information to guide actions and acquisition of new skills on later occasions. Vygotsky's theory highlights the notions of scaffolding and the zone of proximal development as key ideas in cognitive development.

Zone of Proximal Development: cognitive development of learners is dependent on their interaction with more experience others. The zone of proximal development is the gap between what a child knows and what he does not know and for the gap to be closed the child needs the assistance of a more experienced or a more knowledgably person who would direct and guide him to acquire the knowledge/skill. The social constructivist theory advocates that, the environment should be manipulated in a desirable way so that the child acquires what will help him to adapt and function well within the socio-cultural environment in future (Vygotsky, 1978). This is important in supporting learners in inclusive classrooms through capable peers, teachers, parents and the social context since it is known that the main task for inclusive education is to bring about a transformation of the ZPD. The teacher as such tailors the learning experience for a particular child at a level just above his/her current level of performance. The learner and teacher engage in cooperative dialogues to enhance learning such that the learner is able to recall privately when completing a similar task/activity independently. Therefore the child takes in the discussion of the task/activity and uses it as private speech on later occasions.

Scaffolding: According to Vygotsky (1978), the concept of scaffolding directly relates to his idea of private speech and the zone of proximal development. In order for a child to learn new concepts or skills the teacher must provide scaffolds for the learning experience. This scaffold refers to the changes in social supports over the teaching of a concept. Scaffolding is directly linked to personal needs of the individual. These scaffolds or supports are withdrawn as individuals competence develop. Scaffolding may include prompts and clues along with more specific teaching strategies to enable the child grasp the concept being thought. According to Feldman (2003), scaffolding is that support for learning and problem solving which encourages independence. The attributes of scaffolding here includes; task definition, instruction, specification and sequencing of learning activities as well as provision of materials. Task definition here refers to the learning needs of the person with motor difficulties, which is what he/she wants to learn at a particular moment. This is followed by learning instruction whether direct or indirect. By direct instruction, the individual receives information from either the teacher or peers and indirectly by performing certain tasks that builds their skills. With specification, the learner is able to analyze information sequentially for possible harmonization and improvisation. The provision of play activities/opportunities is vital as the individual depends on such activities to develop motor skills.

Vygotsky's Zone of Proximal Development (ZPD), which uses social interaction with more knowledgeable others to move development forward is beneficial for persons with motor difficulties. In this light, a more capable person such as the teacher or a peer provides academic assistance such as throwing more light on a task to the student with motor difficulties. The student in turn is able to complete tasks with this assistance from the more knowledgeable others. Students who are in the ZPD need support and active teaching. Teachers can be supportive to these learners with motor difficulties by ways of explaining, modeling and using guided practice in the classroom. By modeling what they want their students to do, students will be better able to work through their assigned tasks. This entails meaningful and productive collaborative activities that need to be engaged in by both students and teachers. Learning can occur through play, formal instruction or work between a learner and a more experienced learner. Teachers must therefore actively assist and

promote the growth of their students so they can develop the skills they need to fully participate in the society.

Scaffolding is a form of adult assistance that enables a child or learners to solve problems, carry out a task or achieve a goal which would be beyond his/her unassisted efforts. Teachers can equally support students to enhance their motor skills by way of engaging them in scaffolding, small group activities, cooperative learning, group problem-solving, cross-age tutoring, assisted learning, and alternative assessment. These will enable students bypass their deficit areas, build self-esteem and most especially improve academic performance.

Methodology

Research design

The research design adopted for this study was the experimental design and the type is quasi-experimental since the participants of the study were not randomised. The type of quasi-experimental design adopted for the study was a comparative pre-test post-test design with non-randomized experimental and control groups. The quasi-experimental design identified a control (comparison) group that is as similar as possible to the experimental (treatment) group in terms of baseline or pre-intervention characteristics. In this study, participants were shared into the experimental and control groups based on teacher nomination. There was a pre-test and post-test plan, for both experimental and control groups.

Study area

The study was carried out in the Buea Municipality located in the South-West Region of Cameroon. Buea is an academic town with so many governments, lay private and confessional schools that range from primary, secondary and higher institutions. The literacy rate is on the rise with some 60-75% of the youths having access to education. Also, this municipality has just few special schools that cater for children with special needs and these schools includes; Borstal Institute, Rehabilitation Institute for the Blind and the Buea School for the Deaf. Due to the limited resources available in these schools, they often admit limited number of students. Hence, most children with special needs are often admitted into regular schools in the Municipality.

Population and sample of the study

From table 1 below, our accessible population was 101 pupils from both schools and our sample was 24 pupils. P.S class 4, accessible population 48, sample 12 and C.S class 4, accessible population 53, sample 12.

Table 1: Accessible population

Name of school	class	Number of pupils	Number of pupils with dyspraxia
Presbyterian School (P.S) Bomaka	4	48	12
Catholic School (C.S) Bolifamba mile 16	4	53	12
Total		101	24

Table 2: Distribution of pupils to experimental and control groups by sex

Groups	Number of boys	Number of girls	Total
Experimental	06	06	12
Control	06	06	12
Total	12	12	24

From table 2 above, 12 pupils were chosen for the experimental group, made up of 6 boys and 6girls. While 12other pupils were chosen for the control group, made up of 6 boys and 6 girls. This made a total sample of 24 pupils, 12 boys and 12 girls.

Instruments for Data Collection

For the purpose of this study, data were collected with the use of a motor ability test for pupils and an interview guide for teachers.

Motor Ability Test: The test was adapted and constructed in order to measure the ability level of pupils in relation to motor skills. The test was divided into two sections. Section A measured gross motor abilities, in relation to aspects of strength, balance, coordination (each having 3 items) and section B measured fine motor control skills, with a total of 7 items.

The test was constructed and self-administered by the researcher with the aid of two trained field agents. These agents were trained for a period of one week on the various items of the test. The researcher practised with the agents on the various roles they will perform during the conducting process. Information results were collected with the use of a camera device and note taking technique.

Interview Guide

An interview guide for teachers was purposefully designed to examine teachers experience on the phenomenon under investigation. The interview guide had 16 structured open ended items dealing with teachers' experiences on the use of support strategies for children with dyspraxia.

The interview was constructed and conducted by the researcher. An audio recording device and note taking technique were used in collecting the responses of the teachers. These were later transcribed for analysis.

Validity of Instruments

Face Validity

After constructing the test and interview guide, the researcher presented them to the supervisor for scrutiny and cross checking. The supervisor then made some corrections which the researcher effected and made modifications by adjusting some items while some others were eliminate. The instruments were then considered valid to collect relevant information for the study.

Content Validity

The validity of instruments was done using the content validity which sought to measure the extent to which the content of the instruments corresponded with the conceptual understanding and operationalization of variables used in the study.Content validity was mathematically calculated using the Content Validity Index (CVI) whereby the instruments for data collection were checked by the supervisor. To come out with the statements that an instrument is judged valid, the inter-judge coefficient of validity was computed using the following formula: CVI = (No of judges declared item valid) / (total No of judges). According to Nana (2012) if the CVI is above 0.75, then the content validity is satisfactory.

Reliability of Instruments

The reliability of the instrument was achieved through a pilot test using the test and retest method. To ensure this, the test and retest was used whereby, the instrument was administered to 6 pupils (3 control and 3 experimental) in Government School (G.S) Muea who were not part of the sample population and after a week, the same test was administered to the same respondents. A comparison was made between the responses of the two tests. The coefficient of reliability was calculated as 0.95 that is the data collected method was tested for reliability using the Cronbach Alpha Coefficient. The values were considered high enough to justify that the instrument is reliable and satisfactory for use in the research.

Table 4: Reliability analysis

Intervention type	Reliability coefficient	N_{cases}	N_{item}
GuidedPeer tutoring			
Strength	0.964	12	3
Balance	0.935	12	3
Coordination	0.937	12	3
Fine motor task	0.979	12	7

The reliability from table 3 above was very satisfactory for all the components including the IVM with coefficient yielded by the parallel test ranging from 0.935 to 0.979. This therefore indicates that the instrument was satisfactorily consistent in the measuring.

Comparing Between Pre-test and Post-test

Here we are faced with two related samples and the non-parametric test used in this context is Wilcoxon Sign-Rank test as to compare the situation before and after within group. This test will be supported by the progression results that estimates the number of children that have improved as explained earlier.

Statistics were discussed at the 95% Confidence Level (CL), that is Alpha=0.05. That is, depending on the assumption or the hypothesis under discussion, this was to be accepted or rejected if P-Value is greater or less than Alpha. For instance, for the difference between the control and the experimental groups to be significant, the calculated P-Value shall be <0.05.

Ethical Considerations

The researcher obtained a research authorisation from the Head of Department of Educational Psychology, Faculty of Education, University of Buea. Permission to administer the interview and motor ability test was sought from the school administrator (Head Teacher), the class teacher and the parents of the pupils. Participants were informed that their participation was free and voluntary and they could withdraw from the study at any time without any consequence. They were also assured that their time will not be wasted. Finally, participants were guaranteed anonymity and that the information gathered from them will be kept confidential and only be used for purposes of the study.

Findings

This section describes the various scales (strength, balance, coordination, fine and gross motor tasks) that were used in measuring aspects of motor abilities for pupils with dyspraxia. These results are as presented below.

Quantitative results

A. Guided peer tutoring and strength of pupils with dyspraxia

Table 5: Guided peer tutoring and the strength of pupils with dyspraxia within test level and between groups

Scale	Stats	Pre-test		KS test* (P-Value)	Post-test		KS test* (P-Value)	WSR test (P-value)	WSR test (P-value)
		Experimental	Control	Comparing between experimental and control group	Experimental	Control	Comparing between experimental and control group	Comparing within experimental group (Pre-test Vs Post-test)	Comparing within control group (Pre-test Vs Post-test)
Strength at guided peer tutoring	N	6	6	0.818	6	6	0.002	0.026	0.414
	Mean	3.5	3.7		10.5	4.0			
	SEM	0.2	0.3		0.5	0.3			
	Median	3.5	3.5		11.0	4.0			
	SD	0.5	0.8		1.2	0.6			

*Kolmogorov-Smirnov Z test
** Wilcoxon Signed Rank test

From table 5 above, as concerned strength at guided peer tutoring, at the pre-test, the experimental and the control groups had almost the same average score and although the average was slightly higher in the control group with 3.7 points as compared to 3.5 points in the experimental group, this difference was not statistically significant (P>0.05). At the post-test however, the experimental group improved to 10.5 points while in the control group there was a slight change in score from 3.7 to 4.0 points. This difference at the post-test between the control and the experimental group was significant (P<0.05). This therefore implies that guided peer tutoring significantly improved pupils' strength.

B. Guided peer tutoring and balance of pupils with dyspraxia

Table 6: Guided peer tutoring and the balance of pupils with dyspraxia within test level and between groups

Scale	Stats	Pre-test		KS test* (P-Value)	Post-test		KS test* (P-Value)	WSR test (P-value)	WSR test (P-value)
		Experimental	Control	Comparing between experimental and control group	Experimental	Control	Comparing between experimental and control group	Comparing within experimental group (Pre-test Vs Post-test)	Comparing within control group (Pre-test Vs Post-test)
Balance at guided peer tutoring	N	6	6	1.000	6	6	0.003	0.026	0.414
	Mean	4.5	4.5		11.7	4.2			
	SEM	0.2	0.2		0.3	0.3			
	Median	4.5	4.5		12.0	4.0			
	SD	0.5	0.5		0.8	0.8			

*Kolmogorov-Smirnov Z test
** Wilcoxon Signed Rank test

As far as balance at guided peer tutoring was concerned from table 6 above, at the pre-test, the experimental and the control groups had the same average score of 4.5 points each but this difference was not statistically significant (P>0.05). At the post-test however, the experimental group improved to 11.7 points while in the control group there was a drop in score from 4.5 points to 4.2 points. This difference at the post-test between the control and the experimental groups was significant (P<0.05). This shows therefore that guided peer tutoring significantly improved pupils' balance.

C. Guided peer tutoring and coordination of pupils with dyspraxia

Table 7: Guided peer tutoring on the coordination of pupils with dyspraxia within test level and between groups

Scale	Stats	Pre-test		KS test* (P-Value)	Post-test		KS test* (P-Value)	WSR test (P-value)	WSR test (P-value)
		Experimental	Control	Comparing between experimental and control group	Experimental	Control	Comparing between experimental and control group	Comparing within experimental group (Pre-test Vs Post-test)	Comparing within control group (Pre-test Vs Post-test)
Coordination at guided peer tutoring	N	6	6	1.000	6	6	0.002	0.026	0.317
	Mean	4.0	4.0		11.7	4.3			
	SEM	0.3	0.3		0.3	0.2			
	Median	4.0	4.0		12.0	4.0			
	SD	0.6	0.6		0.8	0.5			

*Kolmogorov-Smirnov Z test
** Wilcoxon Signed Rank test

From table 7 above, looking at coordination at guided peer tutoring, at the pre-test, the experimental and the control groups had the same average score of 4.0 points each but this difference was not statistically significant (P>0.05). However at the post-test, the experimental group improved to 11.7 points while in the control group there was a slight change in score from 4.0 points to 4.3 points. This difference at the post-test between the control and the experimental groups was significant (P<0.05). This proves therefore that guided peer tutoring significantly improved pupils' coordination.

D. Guided peer tutoring and gross motor abilities of pupils with dyspraxia

Table 8: Guided peer tutoring and gross motor abilities of pupils with dyspraxia within test level and between groups

Scale	Stats	Pre-test		KS test* (P-Value)	Post-test		KS test* (P-Value)	WSR test (P-value)	WSR test (P-value)
		Experimental	Control	Comparing between experimental and control group	Experimental	Control	Comparing between experimental and control group	Comparing within experimental group (Pre-test Vs Post-test)	Comparing within control group (Pre-test Vs Post-test)
Gross motor task at guided peer tutoring	N	6	6	0.813	6	6	0.003	0.026	0.577
	Mean	11.7	12.0		30.5	12.3			
	SEM	0.3	0.3		0.6	0.4			
	Median	11.5	12.0		31.0	12.0			
	SD	0.8	0.6		1.4	1.0			

*Kolmogorov-Smirnov Z test

** Wilcoxon Signed Rank test

As concern gross motor tasks for guided peer tutoring from table 8 above, at the pre-test, the control group had a higher average score of 12.0 points as against 11.7 points for the experimental group but this difference was not significant (P>0.05). At the post-test however, the experimental group performed significantly (P>0.05) higher than the control group, with an average score of 30.5 points as against the stagnated value of 12.3 points for the control group. This progression in score observed in the experimental group was significant (P<0.05). This therefore confirms that guided peer tutoring improved pupils' gross motor skills significantly.

E. Guided peer tutoring and fine motor abilities of pupils with dyspraxia

Table 9: Guided peer tutoring and fine motor abilities of pupils with dyspraxia within test level and between groups

Scale	Stats	Pre-test		KS test* (P-Value)	Post-test		KS test* (P-Value)	WSR test (P-value)	WSR test (P-value)
		Experimental	Control	Comparing between experimental and control group	Experimental	Control	Comparing between experimental and control group	Comparing within experimental group (Pre-test Vs Post-test)	Comparing within control group (Pre-test Vs Post-test)
Fine motor task at guided peer tutoring	N	6	6	0.485	6	6	0.003	0.026	0.157
	Mean	10.0	10.5		28.2	10.2			
	SEM	0.0	0.2		0.7	0.2			
	Median	10.0	10.5		28.0	10.0			
	SD	0.0	0.5		1.8	0.4			

*Kolmogorov-Smirnov Z test
** Wilcoxon Signed Rank test

Concerning fine motor tasks from table 9 above, at pre-test, the control group had a higher average score of 10.5 points as against 10.0 points for the experimental group but this difference was not significant (P>0.05). However at post-test, the experimental group performed significantly (P>0.05) higher than the control group, with an average score of 28.2 points as against the 10.2 points score for the control group. This progression in score observed in the experimental group was significant (P<0.05). This also proves that guided peer tutoring improved pupils' fine motor skills significantly.

Hypothesis: There is no significant relationship between guided peer tutoring and the development of motor abilities by pupils with dyspraxia.

Table 10: Guided peer tutoring on the development of motor abilities by pupils with dyspraxia within test level and between groups

Scale	Stats	Pre-test		KS test* (P-Value)	Post-test		KS test* (P-Value)	WSR test (P-value)	WSR test (P-value)
		Experimental	Control	Comparing between experimental and control group	Experimental	Control	Comparing between experimental and control group	Comparing within experimental group (Pre-test Vs Post-test)	Comparing within control group (Pre-test Vs Post-test)
Overall score at guided peer tutoring	N	6	6	0.180	6	6	0.004	0.026	1.000
	Mean	21.7	22.5		58.7	22.5			
	SEM	0.3	0.4		1.2	0.6			
	Median	21.5	22.5		59.5	22.0			
	SD	0.8	1.0		2.9	1.4			

*Kolmogorov-Smirnov Z test
** Wilcoxon Signed Rank test

From table 10 above, overall speaking for guided peer tutoring at pre-test, the control and the experimental groups had almost the same scores with average of 22.5 points for the control group and 21.7 points for the experimental group. However, at post-test, the experimental group performed significantly (P>0.05) higher than the control group, with an average score of 58.7 points as against the stagnated value of 22.5 points for the control group. This progression in score observed in the experimental group was significant (P<0.05). This trend is equally supported by the progression table 11 below;

Table 11: Progression rate on the development of motor abilities by pupils with dyspraxia at guided peer tutoring

Group	Stats	Progression peer tutoring		Total
		Progression	No progression	
Experimental	n	6	0	6
	%	100.0%	0.0%	100.0%
Control	n	2	4	6
	%	33.3%	66.7%	100.0%
Total	n	8	4	12
	%	66.7%	33.3%	100.0%

Cramer's V: V=0.707; P=0.014.

From table 11 above, the progression was 100% in the experimental group and 33.3% in the control group and this gap was significant (P<0.05). The hypothesis stated here is then rejected thus implying that guided peer tutoring significantly influenced the development of motor abilities of pupils with dyspraxia. This assertion is further supported by the qualitative results from teacher's interview as presented below;

Qualitative Findings

How teachers evaluate pupil's level of interaction in their classroom as depicted by thematic analysis were:

Pupils do not mix up: pupils form groups such that each group mostly associate or socialize with their kinds such that 'normal' pupils interact with their kinds and disabled pupils interact with their kind. Teachers explain that *"Pupils socialize mostly with their kinds during games; play and class exercises. They always form play groups among themselves where the "normal" and abled children play their own games separate from the disabled pupils.*

Form cliques: Smart pupils mostly associate amongst themselves while slow pupils associate among themselves. "*Pupils often form small clicks whereby those without disabilities associate and play amongst themselves while those with disabilities associate in their own groups to avoid rejection. Other disabled pupils even shy away from the play activities of normal peers to avoid embarrassment".*

The level of interaction amongst peers with and those without disability as depicted by thematic analysis were:

Minimal level of interaction: This implies little or no interaction such that very few peers without disabilities usually make friends or interact with those with disabilities. *"When 'normal' children interact less with disabled children, it brings about feelings of depression as these children feel stigmatized and unloved."*

Isolated/ unwanted: Feeling left out or not integrated. Teachers explain that *"Pupils with motor deficits are always isolated or neglected by their "normal" peers during activities or group task and this makes these children to feel depressed and not wanted".*

The benefits of interaction for pupils with motor problems as depicted by thematic analysis were:

Facilitate learning: When pupils interact, learning is facilitated and skills are retained easily. As teachers say *"through such interactions, pupils are exposed to varied opportunities to acquire knowledge and master skills from their more capable friends".*

Improve socialization/reducing stigmatization: Social acceptance and integration is enhanced which reduces feelings of isolation and stigmatization. Teachers report that *"by explaining concepts in details through the use of one on one communication skills, peer tutors help low-performing pupils master materials previously taught during normal school hours".*

Improve self-esteem: This refers to confident in one's own worth. Teachers say *"pupils gain self-confidence when they attempt to or actually do a task correctly on their own and are thus able to expand beyond their perceived limitations".*

Flexibility: This is the ability to do tasks with ease. According to teachers, *"when pupils perform tasks more often they become flexible in executing such activities. Constant practice thus improves speed in task performance".*

Improved academic performance: To earn good grades/marks or a pass in a subject. Teachers explain that when *"pupils interact they learn with ease and at their pace, understand better and this in turn improves academic performance. A Peer learning strategy helps pupils take responsibility for their learning, reinforces knowledge and skills, builds self-confidence and develops social responsibilities".*

The challenges pupils face when interacting with peers without disability as depicted by thematic analysis were:

Rejection: Not every non-disabled child is willing to interact with disabled pupils. Teachers explain that *"not all smart peers are willing to incorporate those with motor deficits in their plays. They reject them and this brings about feelings of isolation on the playground".*

Mockery: These children are often mocked and get provocative comments from their non-disabled peers during play and are usually left out during games. Teachers explain that *"Even when some abled pupils involve disabled pupils in their games, they insult, laugh and mock them when they perform poorly in games. This makes most of these children to shy away from play activities which in turn increases sedentary behaviors and reduces motor skill developments".*

Exclusion: They are left out or prevented from participating in activities. *"Most times during sports or game activities those with motor problems are deemed unfit or incapable to participate and as such are left out to watch as spectators while their other peers play".*

Discussions

The results of the present study revealed that guided peer tutoring had a significant effect on the development of motor abilities by pupils with dyspraxia, with a high progression rate for the experimental group. This is indicative of the fact that pairing children with motor difficulties with children with non-motor difficulties to perform motor ability tasks can improve on the development of motor skills of children with dyspraxia. This falls in line with the response from teacher's interview where they affirm the fact that allowing children with and those without motor deficits to perform common tasks and socialize together facilitates learning, skill mastery, improves flexibility, reduces stress, anxiety and stigmatization.

The key element here is to allow children to interact freely with each otherwhere the less experience learns from the more experienced. Outlining the advantages of peer tutoring that were exploited for the purpose of the current study, Guastad (1993) states that: the tutor is closer in age, therefore may have a better understanding of tutee, the tutor may present subject matter in terms (language) the tutee understands, the tutees receive immediate clarification on information they might not understand and feedback in a non-threatening environment, the tutors can model desired skills and

behaviours, the tutors benefits academically from reviewing, practicing material and skills with their tutees. Results of the present study are supported by the theoretical perspectives of Vygotsky (1978) and Badura (1976). Vygotsky sees learning more of a social interaction where children learn from experienced elders and peers. Peer culture is of great significance as children easily learn from their friends through play and other interactions. On the other hand, Badura's social learning theory highlights attention, retention, reproduction and modelling in reciprocal modelling circle where children learn from each other as they interact during play and other activities.

Empirically, the results of this study correlates with those of Johnson and Johnson (1978; 1983) who found out that peer tutoring as a strategy gives pupils with learning disabilities increased time to work and develop skills at a convenient pace and involves the pupils receiving instruction, having increased practice time and reinforcement on a one-to-one basis from their more experienced peers. Houston-Wilson, Dunn, Hans van der Mars, and McCubbin (1997) equally found out in their study that trained peer tutors were effective at assisting students with developmental disabilities to improve their motor performance in integrated physical education classes.WhileVan de Putte, Behets, Van Keer and Van Hove, (2010) concluded in their study that class wide peer tutoring intervention was more effective than whole group instruction in meeting the goal of including students with disabilities into physical education.

Conclusion

Children with dyspraxia should be allowed to freely interact with their normal peers during lessons and play. During such moments, teachers can pair pupils with dyspraxia with other pupils so as to facilitate the development of motor skills through peer mentoring and interaction. The unique contribution of the study lies in the profound analysis of the magnitude of progression amongst the independent indicators of the study. This progression trend indicates that each of these interventions has contributed to the development of motor skills for these pupils, thus their integration in their educational process could be recommended. Additionally, the study has a unique contribution in the field of research through the development of a motor ability test that is sensitive to the context of Cameroonian children. Based on its reliability and validity, this instrument can be adapted and used in other context to measure motor abilities of children with a similar disability. The study also highlights a mismatch between the teacher centred methods of instruction that are used in some schools and learner centred and enactive modes of representation that are needed by children with dyspraxia to foster their motor development. There was a significant effect on the progression rate on the use of peer tutoring (P=0.014) on the development of motor abilities. Finally, qualitative results from teachers indicate a gap between the school and home. Some lessons given by teachers do not have a follow up at home and what children do at home do not reflect the lessons that are given in school. This discontinuity between home and school poses challenges for teachers, parents and pupils.

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