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The Benefits of a Gross Motor Development Program on the Lives of Rural Marginalized Multi-Grade Primary School Learners in the Western Cape

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ABSTRACT This paper investigates the impact of a Gross Motor Development (GMD) program on the lives of learners in marginalized multi-grade environments in rural areas of the Western Cape. A transformative research paradigm was employed in order to address the research questions posed by this study. A purposive sampling technique was used to collect data from three schools. The researchers investigated the influence of an 18-month gross motor development program upon earners' lives in three multi-grade schools in the Western Cape of South Africa from the start of 2012 to the middle of 2013. A sample of 50 (N=30 males and N=20 females), grade 4-6 multi-grade learners participated in the study. Their gross motor skills were assessed using Project 4 – Innovative Motor Ability and Development (IMAD+) Test Battery. The test battery consisted of a series of physical exercises designed to assess gross motor proficiency.The data revealed that a total gross motor ability percentage score change occurred in the sample from 32.1 percentage score to a 56.8 percentage score; indicating a significant overall gross motor improvement of 24.7 percentageover an 18 month period. Improved self-esteem, positive attitudinal and motivational changes and increases in class attendance occurred among the learners. This improvement is aligned with research that indicates that development and improvement of motor skills through physical activity are related to positive development of self-esteem among learners. This paper contributes to a growing body of knowledge on education at rural, marginalized schools; suggesting that providing learners with the opportunity to participate in a structured program is likely to improve motivation which can, in turn, contribute toward positive scholastic achievement.

INTRODUCTION

Till today no clear dispensation has been presented by the South African Department of Education to address the need for physical education in schools; especially those too poor to afford sporting facilities. At best, gross motor development is mentioned in the National Curriculum and Policy Statement (CAPS) as a guideline for learners' physical development in South Africa.There is considerable evidence that systematic programs for human movement promote discipline, improve concentration and raise academic performance: not least by familiarising learners from challenging backgrounds with the process of setting and attaining reasonable goals. When despair demoralises home-life in areas of poverty, learners need to be made aware of patterns of achievement as a way of gaining self-confidence and independence of purpose. Although there is often evidence of spontaneous play at schools in areas of financial deprivation, one of the elements that learners in multi-grade environments most lack is structured engagement in movement and physical interaction.

Therefore the researchers investigated the influence of an 18-month gross motor development programupon learners' lives in three multi-grade schools in the Western Cape of South Africa. Recent literature suggests physical education is essential as a discipline in primary schools. Cleophas (2014) emphasises that learners need to be exposed to physical development programs. Abruzzi et al. (2016) suggest that there is a demonstrable link between physical well-being and learning capacity. By contrast, lack of physical development programs can lead to social disfunction as demonstrated by Chetty et al. (2017). Branson et al. (2014) raises important issues in stressing the logistical barriers that face poor communities: transport, nutrition and

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literacy. Fraefel's (2014) research assisted in determining effective strategies for constructing a research program that incorporated the many aspects of such recent research.

The Curriculum and Assessment Policy Statement refers to motor development in the Life Skills syllabus but does not indicate which phase is relevant or whether this statement is simply a general statement in CAPS which provides teachers with learning outcomes through which a learner's physical and motivational development has to take place within the school context (Department of Education 2012: 12). No clear guidelines are provided as to how this development can take place in a multi-grade environment in CAPS or how gross motor development activities enhance the scholastic achievement of learners. The only physical education components that receive anymention in CAPS do not stipulate learning directions or learning pathways.

This obvious lacuna in Curriculation has actuated the need for the present research. The researchers address two specific pedagogical challenges: (i) there are currently no systematically developed multi-grade curricula forthcoming from the South African National Department of Education, and (ii) the same Department has drastically reduced the physical education syllabus to a few exercises in Life Skills. The researchers place particular focus on demonstrating how the implementation of a structured gross motor development program can improve the lives and school performance of a set of learners from multi-grade classes in rural schools in the Western Cape. In South Africa, especially in socio-economically disadvantaged schools, the negative effects of poverty on school success and motivation are evident. One particularly neglected type of education in South Africa is the multi-grade classroom. In poor communities feelings of helplessness may exist: such attitudes militate against the will to succeed.

Numerous studies pertaining to the development of motor skills and self-esteem among young learners focus on the improvement of motor skills through physical activity and the relation to self-esteem (Biddle and Asare 2011). Participation in physical education is deemed necessary to nurture positive attitudes and inculcate values that assist learners to be physically fit, mentally alert, emotionally balanced and socially well-adjusted.

Objectives

The objective is to develop a structured and sustainable gross motor development program specifically designed for the needs of learners from a rural marginalized, multi-grade environment. This project investigatesphysical changes in learners from the implementation of a gross motor development program and investigates the influence of the GMD on motivation, self-esteem and attitude.

Aim of the Study

The aim of this paper is to record the results of a systematic, closely monitored research project, which was conducted to determine whether a gross motor development program could in fact beneficially influence the lives of learners from rural marginalized multi-grade primary schools.

METHODOLOGY

A purposive sample was used to select all learners in Grades 4-6 in the three marginalized multi-grade schools selected. Purposive sampling was used because it allowed selection of a specific number of schools and testing of all learners in those selected schools (Cohen et al. 2011). Data were collected from one school from each of the three Western Cape rural educational districts that border the Cape Metro. In all three schools the Cape Peninsula University of Technology's Centre for Multi-grade Education had an academic research/training and support partnership that made access to the schools easier for the researchers. Three districts were surveyed in the course of this research project: the West Coast (Hopefield), Cape Winelands (Wellington) and Overberg (Grabouw). The sample for the pre-test in 2012 started with 82 respondents (N=40 males and N=42 females). Due to parents' nomadic movement patterns and the broad social context of the study, the post–test sample changed to only 50 respondents (N=30 males and N=20 females). All 50 respondents were in grades 4-6. All three of these schools operate from the same milieu: a multi-grade educational environment. All learners in the three Grades were chosen and identified purposefully. Since this was a multi-grade class, all three grades were in the same class.

Study Population

There was a pre-test in 2012 and a post-test in 2013. In pre-assessment seven schools were initially tested (N=116 males and N=106 females). For the post-test three schools only were sampled due to transport difficulties and access although educative criteria remained the same. The three schools sampled had co-ordinators who had adhered most closely to the principles of the training program. Although the final corroborative sample size was 50 the preliminary testing group was far larger including an initial seven schools. A crucial factor in assessing the extent of the study population was the nature of the agricultural communities in which these schools existed. Because most learners' parents were farm workers the seasonal nature of their occupation meant that learners did not exist as a permanent body but changed according to the movements of their parents agricultural employment. Many learners who were sampled left or moved back so that the number of learners actually sampled was far greater than it appears in the final figures. Substantial debate exists in the literature concerning the manifestation and importance of gender differences in gross motor skills among learners (Venetsanou and Kambas 2011). Males are consistently reported as more physically active than females; regardless of age or measure. Often, this difference results in females being identified as under active and at risk of long-term poor health outcomes (Hands et al. 2016: 3). Results of numerous studies show marked differences between genders in gross motor skills of learners (Lejarraga et al. 2002; Hallal et al. 2012: 245-257).

These authors argue convincingly that boys generally prove to be superior in skills requiring strength and speed, while girls are often superior in balance and certain coordination skills. In contrast several researchers report no significant differences between preschool boys and girls (Pollatou et al. 2005; Venetsanou 2007; Kourtessis et al. 2008; Waelvelde et al. 2008; Kirk and Rhodes 2011).Reasons for gender differences are mainly considered to be related to environmental factors and biological composition (Barnett et al. 2009). The nature of play and the social style that boys and girls engage in tends to be stereotyped.

Measuring Instrument

The researchers developed the Innovative Motor Ability and Development (IMAD+) program based on elements from the following four integrated programs: HUMAN KINETICS (Plowman and Meredith 2013) Fitness gram: Fitnessgram is a comprehensive educational, reporting and promotional tool used to assess physical fitness and physical activity levels of learners.

It is the most widely used health-related physical fitness assessment for learners in the world.

The IAAF Kids Athletics program (Gozzoli et al. 2006): IAAF Kids' Athletics is one of the largest grassroots development programs in the world of sport. Created in 2005, the program, by the end of 2011, had reached a cumulative audience of 1.5 million learners across 100 territories. Third, the Fitness Test Battery (Nel 2003: n.p) and lastly the Joubert - Gross Motor Development Test (Joubert 2011).The program was constructed to meet the requirements of the Centre for Multi Grade Education (CMGE) outcomes and include all the skills outlined by the Project 4 research. The program needed to be constructed for the specific needs of the rural marginalized multi-grade environment. The program was sufficiently adaptable to be moulded by the Project 4 coordinators at each of the 3 selected schools. The program was designed to be used in a multi-grade, -sex, -age and -ability environmentfor schools that lack adequate facilities. While constructing this program, it needed to be taken into account that the following challenges faced many learners: the presence of foetal alcohol syndrome, Down syndrome, malnutrition and physical abuse.

Ethical Clearance

A letter of permission was obtained from the Western Cape Education Department (WCED), approving the research to be conducted. After the letter of permission was granted from the Western Cape Education Department, the permission of the principal of each school was sought and obtained for learners to become active participants in the study. All three schools made the effort to be part of the research. The privacy of the learners and the confidentiality of the research were guaranteed by the researchers. Learners, parents, teachers and principals

were assured that all information collected during the research would be treated as confidential. All learners completed a waiver and an indemnity form before any research commenced. David et al. (2001) state that researchers need to inform learners that they have the right to withdraw at any point in the research if they so choose to do.

Statistical Analysis

Since the sample size of the group comprising of both female and male learners is greater than 30, a paired t-test was used to test for a significance difference in the measurements between 2012 and 2013 in each of the physical tests. Extensive literature searches conducted on the EBSCOhost and Nexus databases catalogues of South African and international university libraries, Sabinet as well as the World Wide Web, provide little evidence of studies conducted into the influence of gross motor development on the scholastic achievement of learners from rural disadvantaged multi-grade environments. Internationally, a critical and analytical review of the literature revealed: A focus on the multi-grade education milieu; Studies that addressed motivation through movement; and Theories that analyse the motor development concept.

RESULTS

A sample of 50 (N=30 males and N=20 females), grade 4-6 multi-grade learners participated in the study. The gross motor skills were assessed using Project 4 – IMAD+ (Innovative Motor Ability and Development) Test Battery, previously developed by the Cape Peninsula University of Technology, Centre for Multi-grade Education. The test battery consisted of a series of physical exercises designed to assess gross motor proficiency. The Year 1 administration of the battery took place in April 2012 and the Year 2 administration took place in September 2013. The total timeframe for the IMAD+ program consisted of 18 months including all school holidays within the above timeframe. Table 1 reveals the overall gross motor development improvement of the various categories for the total sample of n=50 analysed in this research. The data revealed that a total gross motor ability percentage score changes occur in the sample 50 (N=30 males and N=20 females) from 32.1 percentage score to 56.8 percentage score; indicating a significant overall gross motor improvement of 24.7 percentagein an 18 month period. An examination indicates an increase in all categories tested on the IMAD+ battery from Year 1 to Year 2. A few salient categories are explained below: length, weight, pull-ups, push-ups, hand wall toss exercises and skipping.

Length (Height) and Weight Comparisons

In both cases, of length and weight, it is observed in Table 2 that an increase occurred. Mean length increased from 1.3674 cm to 1.459 cm and further the Std. Error of Mean changed from

Table 1: Populations of learners in sample school (Grabouw, Wellington, Hopefield) (Total: n=50)

Schools	*Numbers of learners in sample*	*Gende*		*Age range in years*	*Area*
		Boys 30	*Girls 20*		
School One	12	8	4	9 -13	
	Grade 4 6	6	0	9 -12	Grabouw
	Grade 5 6	2	4	11-13	
School Two	22	13	9	9 -15	
	Grade 4 12	6	6	9 -15	Wellington
	Grade 5 10	7	3	10 -13	
School Three	16	9	7	8 -13	Hopefield
	Grade 4 10	6	4	8 -10	
	Grade 5 6	3	3	10 -13	

Table 2: Length (height) and weight 2012 vs. year 2 – 2013

Total (n=50)	*Length*	*Weight*
Year 1 (Mean)	1.3533 (Total)	30.690 (Total)
2012	1.3533 (Male)	30.750(Male)
	1.3885 (Female)	30.600 (Female)
Std. Error of Mean	0.0137	1.0166
Year 2 (Mean)	1.4586 (Total)	38.280 (Total)
2013	1.4453 (Male)	37.433 (Male)
	1.4785 (Female)	39.550 (Female)
Std. Error of Mean Total	0.01635	1.2359
Difference	0.0912	7.59
Sig (95%)	Yes	Yes
T-value (Paired T-test)	8.021	9.415
P - value	0.001	<0.001

0.00131 in the year 1 to 0.0164 in the year-2; mean weight increased from 30.69 kg to 38.280 kg and a Std. Error of Mean changed from 1.0166 to 1.2359. Although this improvement appears in the results of the IMAD+ gross motor development test results, the change in length (height) and weight cannot be attributed directly to the IMAD+ program. The change in length may be the result of natural maturation patterns in adolescence between the ages of 10 and 16; where considerable increases in height occur over an 18-month period; known as the adolescent growth spurt.

Proper nutrition is essential for growth and increase in height and weight. Studies have reported that poor nutrition has led to stunted growth, and developmental lag in learners (Kruger 2006: 28; Solorzano and McCartney 2010). Schools in the research were recipients of a government feeding scheme. Learners received a balanced meal every day. On numerous occasions, local farmers (and local community members) brought some of their harvest (apples, grapes, oranges, naartjies, watermelons, beans, meat, amongst other items) to the school to supplement the feeding scheme. The constant supplementation of such food to these learners whose home backgrounds are deprived of nutritious food may have had a beneficial influence. However, it was beyond the scope of this study to determine scientifically the exact influence of the supplementary nutrition provided by the government feeding scheme upon height and weight of learners. Given that there was no control group (an unfed group) to ascertain this comparison and any ethical implications, any direct or incontrovertible attribution of the role of nutrition in this study on height and weight of the learners could not be assessed. It was observed, however, that learners participated in the National Education feeding scheme and were not starving.

It is plausible that the nutrition scheme contributed positively to the overall increase in length and weight of learners in the sample. Future research could specifically examine the degree of nutritional supplementation and its effect on growth of learners

Pull-ups and Push-ups Comparisons

A considerable pull-up improvement occurred (from a mean of 1.24 in Year-1 to a mean of 3.18 in Year-2: a difference of 1.94) and a Std. Error of the Mean change from year-1 from 0.417 to 0.656 in year-2. This improvement accounts for the number of completed pull-ups per learner. Only one maximum attempt was allocated to the test battery. Prior to the program, there were no resources in the schools for students to participate in this activity. At the start of the program, permanent fixtures of two pull-up bars were constructed at each of the three schools. With the implementation of the program and training on these pull-up bars, learner interest accelerated and spontaneous pull-up games developed before and after school, and during breaks. Informal competitions took place among learners to complete numerous pull-up exercises and games on the pull-up equipment. The same type of challenge occurred for push-up exercises (which increased from a mean of 14.47 to a mean of 22.44 from year-1 to year-2, with a considerable difference of 9.978) observed in Table 3.

Table 3: Pull-ups and push-ups 2012 vs. year 2 – 2013

Total (n=50)	*Pull-ups*	*Push-ups*
Year 1 (Mean)	1.24 (Total)	14.47 (Total)
2012	1.93 (Male)	17.25 (Male)
	0.20 (Female)	9.88 (Female)
Std. Error of Mean	0.417	1.158
Year 2 (Mean)	3.18 (Total)	24.24 (Total)
2013	4.93 (Male)	26.86 (Male)
	0.55 (Female)	20.47 (Female)
Std. Error of Mean Total	0.656	1.158
Difference Total	1.94	9.978
Sig (95%)	Yes	Yes
T-value (Paired T-tests)	4.895	9.37
P – value	<0.001	<0.001

The Std. Error of the Mean stayed constant at 1.158. Structured exercises, and the interest exhibited by the trainee coordinators, and the researchers, provided a new interest for learners, and an incentive to participate in a new challenge or type of adventure. This finding aligns itself with research that indicates that the development and improvement of motor skills through physical activity are related to positive development of self-esteem among learners (Biddle and Asare 2011). The competitive aspect of the structured exercise motivated learners to increase their performances: to determine whether they could outperform their peers. This healthy competitiveness comprised one of the reasons why there was a significant improvement in the number of pull-ups among both males and females.

Hand Wall Toss and Rope Skipping Comparisons

Observation indicatedthat spontaneous ball games developed before and after school, and during breaks. Learners constructed games and challenged each other constantly to improve their ability to throw, catch and skip. The hand wall toss test which consisted of throwing a ball against the wall with the one hand and catching it with the other hand, garnered great interest among learners. Learners normally played with a ball (in soccer, or by simply kicking a ball to one another and so on) but the hand wall toss exercise added a unique way to challenge the individual and develop group participation. Hand Wall Toss improvedin Table 4 from a mean of 6.89 in year-1 to a mean of 18.49 in year-2: a difference of 11.6 and a Std. Error the Mean change from 0.635 to 0.806. It was observed that learners began to concentrate on coordinating how they tossed, caught and returned the ball. Their responses and demeanour indicated a sense of achievement and enjoyment during the exercises: a self-reinforcing exercise that produced an increase in results; shown in the IMAD+ test battery.

Rope Skipping Comparisons

The introduction of skipping produced a phenomenal, unprecedented increase; from a

Table 4: Hand wall toss and rope skipping 2012 vs. year 2 – 2013

Total (n=50)	*Hand Wall Toss*	*Rope Skipping*
Year 1 (Mean)	6.89 (Total)	64.2 (Total)
2012	7.89 (Male)	51.12 (Male)
	5.39 (Female)	81.2 (Female)
Std. Error of Mean	0.635	5.541
Year 2 (Mean)	18.16 (Total)	94.61 (Total)
2013	19.26 (Male)	84.88 (Male)
	17.33 (Female)	107.250 (Female)
Std. Error of Mean	0.806	4.864
Difference	11.6	30.413
Sig (95%)	Yes	Yes
F – ratio	14.858	8.110
P – value	<0.001	<0.001

mean of 64.2 in year-1 to a mean of 94.61 skips per minute in year-2, a difference of 30.413, thus a Std. on the Mean change from 5.541 to 4.864. Rope skipping as a competitive sport in South Africa was introduced in 2002 by Maarten Goedeme from Belgium at the first workshop in Mitchells Plain, Cape Town and is now managed by the South African Gymnastics Federation (SAQF 2002).

Its popularity has grown in the Western Cape, especially in disadvantaged areas. This is because skipping requires minimum resources: a rope and shoes. The exercise may be undertaken barefoot, as is observed in the schools in the sample. The easily accessible nature of this sport, and the limited equipment needed, produced a great interest in this sport by learners in all three schools sampled. Improved self-esteem, positive attitudinal and motivational changes and improved class attendance occurred among learners.

Summary of the Most Important Trends

Negative Trends

The following negative components were noted. Several mentally-challenged learners (FAS) actively participated in the lessons: challenging the coordinator to reorganise and set a new rhythm for the lessons. No community or parental involvement towards learner improvement or general well-being was discerned. Attendance on rainy days was poor due to the distances these learners had to walk to school and back.

Positive Trends

Numerous examples occur where learners offered their help to set up and break down the lesson equipment. Data from the observation sheets for the total time period of the IMAD+ program indicate that learners' attitudes towards fellow classmates, test-administrator and teachers improved. Observation sheets showed that learners engaged in several conversations with the researchers about their socio-economic circumstances. This observation indicated that on several occasions learners showed positive attitudes towards classmates. Learners started to ask classmates to use their implements; rather than simply taking items without asking. On more than one occasion, a learner gave a reason to the coordinators and teachers for being absent from a session. These indications of social etiquette showed the researchers that these students exhibited an interest in the program that they were following and had benefitted from it.

Observations indicated that learners became more punctual. When the IMAD+ program started, learners took a longer time to get ready to start the session. Progressively, learners started to arrive on time and encourage other classmates to be ready on time. These observations led the researchers to conclude that some learners developed a sense of belonging and ownership towards what they were doing in the IMAD+ program.

Positive motivation and attitudes serve as the principal motivating factor in conditioning a learner's orientation to learn and improve the use of skills and knowledge to be learnt. Face-to-face interviews indicated that on several occasions learners showed positive attitudes towards classmates. For example, learners started to ask their classmates to borrow an implement rather than snatching it away without asking. On more than one occasion a learner made personal excuses towards the test administrator and teachers for being absent from a session. Face-to-face interviews indicated that learners became more punctual. When the IMAD+ program started, learners took considerable time to get ready to start the session. Progressively, learners started to arrive on time and encourage other classmates to be ready on time.

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tors and teachers for being absent from a session. These indications of social etiquette and social awareness showed the researchers that these students exhibited had benefitted in several ways from the program that they were following. A cumulative amount of support implies that people who feel capable in performing physical skills endure more activity throughout their lives (Lubans et al. 2010).By contrast, those who are less capable of physical activities may be reluctant to reveal what they consider to be a shortcoming: many opt out of behaviours involving higher levels of motor competency (Stodden et al. 2008).

At School 1 the following positive attitudes and motivational trends were observed. Learners showed clear signs of a positive attitude towards participation in the IMAD+ program. Males and females in different grades interacted successfully while completing the lessons. Class attendance improved on the days the IMAD+ program was implemented. Learners started to encourage fellow learners in their physical efforts.

Teachers commented on positive attitude changes of learners and noted improved discipline in classes. Negative components found in the reflective journal were mainly the result of the marginalized socio-economic environment that exists at School 1. There were a few learners who presented symptoms of FAS and Down syndrome. The school itself was inadequately equipped to facilitate such children. These children were keen to participate, however, and the coordinators faced the additional challenge of organizing and setting rhythms for such children. This burden of specialised tuition produced a positive outcome, however, in that it tested the resourcefulness, patience and interpersonal communication of coordinators; an important aspect of teacher training and maturity of personality. A negative aspect of the program was that no community or parental involvement towards learner improvement or general well-being was observed. Attendance on rainy days was poor, because no transport to school is provided for these learners.

At School 2, the following positive attitudes and motivational trends were found. Teachers embraced the research and were flexible and encouraging towards the researchers and the learners in their classes. Good interaction between males and females in different grades was observed while completing the IMAD+ program. The attitudes of learners changed for the better and parental involvement increased. Comprehensive parental support at Provincial Athletics and Cross-country events was observed. A positive, competitive culture emerged between learners. Class attendance improved on the days the IMAD+ program was followed. The following negative components were noted. Several mentally challenged learners (FAS) and physically challenged learners (Double Amputee) actively participated in the lessons: which challenged the coordinator to organise and set a unique rhythm for the lessons. At school three, the following positive attitudes and motivational trends were discerned. Learners were disciplined while completing the lessons. This action can be related to the structure provided at each of the lessons that the IMAD+ coordinator presented to the learners. Comprehensive support and flexibility towards the coordinator were apparent.

Teachers allowed for the time that the coordinator presented lessons to the learners. This extra time enabled the teacher to complete other administrative tasks that she struggled to finish due to the intimidating workload in the multigrade classroom. Class attendance improved on the days the IMAD+ program was followed.

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DISCUSSION

This systemic improvement has been amply demonstrated in implementation of an IMAD+ gross motor skills development program as described in this study and deployed in sample schools. In this study, the lives of learners, teachers and parents from a rural marginalized multi-grade environment have been significantly stimulated and transformed through active participation in an IMAD+ gross motor devel-

opment program. Findings suggest that a fundamental role does exist for gross motor skills development in physical education classes. Several studies indicate that learners from lower social classes perform more poorly than those from the middle classes in motor development assessment batteries. A number of explanations for the lower class learner's poor performance may be offered. Gross motor problems are related to poor pre- and post-natal nutrition, which affect the central nervous system. Not only nutrition retards growth but deprived, non-stimulating environments and FAS (in some cases) can be decisive factors as well. Sport offers opportunities for play and self-expression; beneficial especially for those young people with few other opportunities in their lives.

Physical activity can reduce the risk of dying prematurely from non-communicable diseases as well as developing illnesses ranging from cardiovascular diseases, cancer and diabetes to stress, anxiety and depression. Assessment and evaluation in the education and health fields are interlinked. Given that the South African National Department of Basic Education is under pressure to achieve academic success for all learners, identifying key indicators of educational achievement and health may permit educators and policy makers to make informed decisions. Better understanding of the interdependent relations between gross motor development, scholastic motivation and attitudinal changes that develop when learners are actively involved in gross motor development programs is imperative for ensuring the appropriate assignment of resources as well as the conduct of programs to advance learners' health-related behaviours.

CONCLUSION

Data suggest that learners who actively participated in the IMAD+ program expressed better attitudes and motivation towards themselves, their peers, teachers, their schoolwork and physical movement. Such a program ought to be considered a vital component in the holistic educational background of the South African child, especially those left to suffer in deprived socio-economic conditions not of their own, or their parents', making. The following urgent conclusions can be drawn:

Gross motor skills, psychological stability and academic focus may be improved by the structured nature of a recognised Gross Motor Development program to which learners are exposed. Early assessment of gross motor complications can reveal motivational difficulties, learning backlogs and social interactions. These results are significant for policy makers, teachers, and professionals dealing with the motor development of learners. Lack of opportunities, dismissal of structured physical education classes, closing of multi-grade schools, may further harm victims of historical racial segregation in rural areas of the country. Changes through active participation in a structured gross motor development program could relieve several dire situations at schools, bringing hope and advancement to learners, teachers and parents alike. Motivational and positive attitudinal changes may be enhanced by involvement and active participation in a structured gross motor development program. Effective development and enrolment of gross motor development programs in a marginalized multi-grade environment can be implemented and managed by non-trained physical education teachers.

RECOMMENDATIONS

Derived from the data in the study, the following recommendations are proffered:

The effective execution of a structured gross motor development program such as IMAD+ needs to be implemented provincially to determine the effects on student motivation and the ramifications of that effect upon scholastic achievement. To achieve that intervention nationally requires mechanisms for regular supervision, monitoring and support. Given budgetary restraints, and a lack of policy in this regard, it remains a daunting task to implement. One of the advantages of this model tested is the affordability of the project. A practical model may be that the Department of Education develops at least five prototype schools at which the program is implemented as a longitudinal study to determine the effect of such a holistic program. The National Department of Education acknowledges that the curriculum as it stands does not suit or pedagogically benefit learners in a multi-grade classroom. Along with this acknowledgement, a commitment should be made to curricu-

lum construction that includes pedagogies appropriate to the rural environment and predicaments of poverty inherited from an unjust, racially divisive system. Policy development in this regard is the first step.To support the Western Cape Department of Sport and Recreation Mass Participation, Opportunity and Access, Development and Growth (MOD) program, a survey needs to be conducted urgently to determine factors that contribute significantly to learner participation in a gross motor development program. Educators need to be empowered through annual teacher development programs specifically designed for physical education. The aim of such programs needs to be the holistic gross motor development of learners. These programs should be compulsory for all teachers of Physical education.

For optimal gross motor development to take place, the key to an effective physical education program ought to be that these programs are not designed to be sport specific, but rather focus on motor foundations presented in this research. The IMAD+ program empowered non-qualified coordinators who presented the program to learners at each of the sample schools. Research showed that non-qualified physical education coordinators who are efficiently trained and supported could significantly increase gross motor scores, improve attitudes and enhance motivation of learners in rural marginalized multi-grade schools.

The contribution that this intervention has on the learner, school, community and coordinator can and should be duplicated with all urgency at all rural marginalized schools throughout South Africa.The simple design and layout of the IMAD+ program and wheelie bin enable the user to be fully functional and ready to present a lesson in less than 5 minutes. Equipment can be used on all surfaces and no officially designated field or sports facility is needed to present the lessons. These factors render the IMAD+ program affordable and easy to use.

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