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**Development and setting specific validation of a children's
physical education program for disadvantaged South African
primary schools - grades 1 to 3**

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Abstract

Background

Children need physical activity of moderate-to-vigorous intensity for at least 60 minutes a day to achieve effects on physical capability as well as cognitive, social and emotional development. Many children in low- to middle-income countries, particularly from marginalized communities, do not achieve this requirement. This also applies to South Africa. The school, therefore, plays an important role in making a meaningful contribution to the goal of achieving daily physical activity recommendations by incorporating physical education (PE) lessons into the school curriculum.

Methods

The comprehensive knowledge for the development of setting- and level-specific lessons was acquired by literature research of both Swiss and South African teaching aids as well as by various meetings with local teachers, experts and advisors. 96 pedagogically-didactically customized physical education lessons were tested, improved and revised during the pilot phase between October and November 2017 in Port Elizabeth, South Africa.

Results

The *KaziBantu* physical education team developed one physical education lesson of 40 minutes per week as well as ready-to-use assessments to supplement the school's academic curricula for grade 1 to 3 (foundation face) over 32 weeks of a school year. These setting-specific lessons impart age-specific motor competences in a synthesizing way. The content of the lessons follows the curriculum assessment policy statement from South Africa.

Conclusions

When implementing the developed teaching materials, it will be important to address local and school specificities and make adjustments to the teaching materials where deemed necessary. The *KaziBantu* physical education team is aware of the complicated feasibility of implementing the developed educational materials and strives for sustainability.

Zusammenfassung

Hintergrund

Kinder benötigen täglich mindestens 60 Minuten körperliche Aktivität mit moderat- bis hoher Intensität, um eine signifikante Wirkung auf die körperliche Fitness sowie die kognitive, soziale und emotionale Entwicklung zu erzielen. Viele Kinder, insbesondere aus marginalisierten Gemeinschaften von Ländern mit niedrigem bis mittlerem Einkommen, erreichen diese Anforderungen nicht. Dies gilt auch für Südafrika. Durch die Umsetzung des Sportunterrichtes an Schulen, kann ein wichtiger Beitrag zur Erreichung der täglichen Empfehlungen geleistet werden.

Methode

Das Wissen zur Entwicklung von setting- und levelspezifischen Unterrichtseinheiten wurde einerseits durch Literaturrecherche von schweizer- und südafrikanischen Lehrmitteln, sowie andererseits durch verschiedene Treffen mit lokalen Lehrpersonen, Experten und Beratern gewonnen. Während der Pilotphase zwischen Oktober und November 2017 in Port Elizabeth, Südafrika, wurden 96 pädagogisch-didaktisch sinnvolle Sportunterrichtsstunden getestet, angepasst und überarbeitet.

Ergebnisse

Das *KaziBantu* Physical Education Team erstellte pro Woche eine Sportunterrichtsstunde von 40 Minuten, sowie gebrauchsfertige Prüfungen, um die schulischen Lehrpläne der 1. bis 3. Klasse über die 32 Wochen des Schuljahres zu ergänzen. Die settingspezifischen, progressiv aufgebauten Lektionen vermitteln alterstypische motorische Kompetenzen. Der Inhalt der Lektionen ist angelehnt an das *National Curriculum and Assessment Policy Statement* (CAPS) von Südafrika.

Schlussfolgerungen

Bei der Umsetzung der entwickelten Unterrichtsmaterialien sollten die lokalen und schulspezifischen Besonderheiten berücksichtigt, sowie das Lehrmaterial angepasst werden. Das *KaziBantu* Physical Education Team ist sich der Schwierigkeit in Bezug auf die Durchführbarkeit bewusst und strebt nach Nachhaltigkeit.

Opsomming

Agtergrond

Kinders benodig ten minste 60 minute van matige tot hoë intensiteit fisiese aktiwiteit daaglik om 'n beduidende impak op fisieke fiksheid en kognitiewe, sosiale en emosionele ontwikkeling te hê. Baie kinders, veral van gemarginaliseerde gemeenskappe in lae- en middel inkomste lande, voldoen nie aan hierdie vereistes nie. Skole speel dus 'n belangrike rol en lewer 'n betekenisvolle bydrae tot die bereiking van die daaglikse aanbevelings deur die intensiewe uitvoering van liggaamlike opvoeding op skool.

Metode

Aan die een kant, deur literatuur navorsing van Switserse en Suid-Afrikaanse onderrigmateriaal, is professionele kennis verwerf vir die ontwikkeling van opstel- en vakspesifieke lesse, en aan die ander kant aangepas deur verskeie ontmoetings met plaaslike onderwysers, kundiges en konsultante. Gedurende die loods fase tussen Oktober en November 2017 in Port Elizabeth, Suid-Afrika, is 96 pedagogies-didakties betekenisvolle fisiese opvoedings lesse getoets, aangepas en hersien.

Resultate

Die *KaziBantu* Liggaamlike Opvoeding span het een fisiese opvoedings les (van 40 minute) per week geskep as ook assesserings per les, om skoolkurrikulum vir grade 1-7 oor 32 weke van 'n skooljaar aan te vul. Hierdie opset-spesifieke lesse dra gesamentlike ouderdomspesifieke motoriese vaardighede oor. Die inhoud van die lesse volg op die kurrikulum evaluasie verklaring in Suid-Afrika se Basiese Onderwys Departement.

Gevolgtrekkings

Aangesien die *KaziBantu*-projek steeds in die begin fase is en vir jare sal bly ontwikkel om volhoubaarheid te bereik, is daar min resultate wat bespreek kan word. Die *KaziBantu* Liggaamlike Opvoeding span is bewus van hierdie probleme ten opsigte van haalbaarheid en volhoubaarheid.

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List of abbreviations

CAPS	National Curriculum and Assessment Policy Statement
D-EDK	Deutschschweizer Erziehungsdirektoren-Konferenz
DASH	Disease, Activity and Schoolchildren`s Health
HAKSA	Healthy Active Kids South Africa
IASO	International Association for the Study of Obesity
MSc	Master of Science
MVPA	Moderate-to-vigorous physical activity
NCS	National Curriculum Statement
PA	Physical activity
PE	Physical education
WHO	World Health Organization

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1 Introduction

“Sport has the power to change the world. It has the power to inspire. It has the power to unite people in a way that little else does. It speaks to youth in a language they understand. Sport can create hope where once there was only despair.” Nelson Mandela, 2000

As children, we all dream of a successful and pleasant life. Mental and physical health play a crucial role in realizing this goal. Nevertheless, many of today's children lack the necessary foundation that sets a child up for a productive and healthy future as an adult. Overweight and inactivity as well as undernutrition remain worldwide problems that lead to a negative overall health and wellbeing, which decreases children's ability to reach their full potential. But for the first time in history, there are more children who are overweight than children, which are undernourished or stunted (Uys et al., 2016). According to the Healthy Active Kids South Africa (HAKSA) writing group (Draper, Basset, de Villiers, & Lambert, 2014), less than 20% of the young generation meets the recommendations for physical activity (PA) – 60 minutes of moderate-to-vigorous physical activity (MVPA) daily – on a global scale and over half of primary school learners perform below average in motor proficiency (McVeigh & Meiring, 2014). Similar trends are seen in South Africa, especially in disadvantaged areas (Yap et al., 2015).

However, this is hardly surprising since the implementation of PE in South African schools is compromised and children still have relatively low levels of in-school PA. Main reasons for the failure of the implementation of PE in South African schools are time constraints, teacher's workloads and staff reluctance to become involved in non-compulsory activities (McVeigh & Meiring, 2014). If children do not have the opportunity to be physically active in their school, then an option would be to do sports outside of school. However, the homes of primary school children from low-income communities in the Western Cape areas are characterized by high crime and traffic accidents (Uys et al., 2016). These circumstances are associated with lower levels of out-of-school PA (Uys et al., 2016). Because the schools are in most cases safe and supportive environments it is important to assist the teachers in the implementation of active play in schools.

Nelson Mandela (2000) mentioned in his speech at the Laureus World Sports Awards in Monaco, that sport can speak *“to youth in a language they understand”*. It is exactly this potential and power that the *KaziBantu* PE project wants to develop on and thereby make a contribution to the overall health of school children from disadvantaged neighbourhoods of Port Elizabeth, South Africa. Life in these communities is challenging and hard as most of these neighbourhoods are overcrowded and people live in fear because of the high unemployment rates and the lack of future perspectives. Many families still live in small shacks, and in some cases, must walk 200 meters to access water. Parents fear for their daughters because of the high incidences of rape and for their sons because of stabbings, shootings and gangsterism. The high level of crime is why these affected children lack the amount of recommended PA

outside of school. The problems in the townships regarding health, poverty and social, political, and economic discrimination still prevail (Myer, 2004). Such conditions cannot be changed from one day to the other since the country is still carrying deep scars from its past. But we can attempt to take a step into the right direction and strive for changes even if they do not yet reach the whole country. The goal is to “*create hope where once was only despair*” (Mandela, 2000), to create foundations, encourage and motivate children as well as their teachers so that they endeavour to reach their full potential. Effort is required to succeed in motivating and inspiring people to strive for a life with a healthier and better future, to create hope and to realize dreams.

The **master thesis** presented here describes and explains the emergence of a children’s PE toolkit that has been developed for schools from disadvantaged neighbourhoods in Port Elizabeth, South Africa: the *KaziBantu* toolkit. The theoretical background starts with a historical outline, which introduces the topic and intends to explain how the formation of today’s townships came about and why they still exist. The chapter continues with the preceding study *Disease, Activity and Schoolchildren’s Health* (DASH) 2014-2017, which illustrates the current state of the young South African nation, its health, the factors that impact its wellbeing and the ability to grow into healthy, confident and responsible adults. The last part of this chapter explains why the *KaziBantu* project has been initiated and what short- and long-term goals are aimed at.

Then, the methods of the paper, which provide explanations for the PE toolkit, are outlined. Although this is only specific to the foundation phase: grades 1 to 3. Furthermore, pedagogical considerations are illustrated and the question of the basic needs of a child is clarified. One of the most important questions during lesson planning is also addressed in this chapter, namely the question of what a child at a certain age should be able to perform in order to take part in the culture of sports and exercise. This chapter finally concludes with a search of criteria that contribute to successful PE class.

The progress report reflects the different phases of the **master thesis** timeline, reveals teacher-related as well as institutional barriers and explains in what way planned projects could be implemented. In the discussion, the strengths and limitations of the PE toolkit are exemplified. Lastly, the written part of this **master thesis** is concluded with an outlook into the future and possible speculations.

2 Theoretical background and current state of research

2.1 Historical background – 1948 until today's South Africa

“If you can't fly then run, if you can't run then walk, if you can't walk then crawl, but whatever you do you have to keep moving forward.” Martin Luther King Jr., 1967

South Africa, as a low- and middle-income country, is struggling with the consequences of the apartheid. Since the middle of the 17th century, after the arrival of the Dutch, people in South Africa have lived with a European influence and the country still carries two different identities (Mahajan, 2014). Many Natives have abandoned their original tribal customs, have adopted Europeans habits and rites and have reorganized their social life, religious or-economic system (Schapera, 2013). Europeans, as well as Natives, have exercised a steadily growing influence upon each other's lives, which makes it impossible for the two races to develop apart from each other. Nowadays, especially in the urban areas, the lifestyle is increasingly influenced by the Western European culture (Schapera, 2013) and modernisation (Mwakikagile, 2008) while the conditions in urban townships have not substantially improved (Jürgens, Donaldson, Rule, & Bähr, 2013).

Apartheid was formally instituted as a state policy in 1948 (Toit, Pienaar, & Truter, 2011). Between 1950 and the early 1980s, more than 3,5 million of black and coloured people were forcibly removed from their homes and put into homelands according to their ethnicity (Toit et al., 2011), in order to satisfy the racially segregated geographical ideal designated by the ruling national party (Setswe, 2010). That is how the so called “townships” were built, residential districts outside the city centres, in which unemployment, poverty and crime characterize everyday life (Mahajan, 2014). Unlike the “white” suburbs, the townships developed as dormitory settlements without any urban elements and infrastructure, as for example public service, recreation, industry, transport or green spaces. Usually, they were located on the city peripheries and were consciously separated from the “European” city centre (Jürgens et al., 2013).

With the political transformation in the early 1990s, the pass laws and other restrictions were abolished and the townships were opened for the first time (Jürgens et al., 2013). The public hoped that this transformation would result in visible improvements and that the townships would become an integral part of the new South African cities (Jürgens et al., 2013). Since autumn of 1994, remarkable changes, aiming to undo the apartheid legacy, have taken place: A new constitution, neo-liberal policies and new laws were instated. The ideal that has been defined by the post-apartheid South African constitution that promulgates the new “rainbow nation” and as a consequence the “deracialisation” and unrestricted social and spatial mobility for all, does not correspond to the reality (Jürgens et al., 2013).

Although there is proof of how much the country advanced in providing homes and infrastructure in the township areas and also in the combat of economic and social imbalance in all

spheres of life, since South Africa's democratic elections of 1994, conditions in urban townships have not substantially improved (Jürgens et al., 2013). The country deals with unresolved tensions of social distrust, hatred, disadvantage, corruption, poverty, crime and xenophobia. The government seems to be incapable to create habitable and sustainable settlements for the disadvantaged population (Jürgens et al., 2013).

2.2 The DASH study

The gap between poverty and wealth in South Africa is, among other incidents, reflected in different health parameters. According to the World Health Organization (WHO, 2008) communicable diseases, for instance the human immunodeficiency virus (HIV) or diarrheal diseases are widespread and difficult to get under control. But also non-communicable chronic diseases provide difficulties in societies due to malnutrition and lack of everyday activity are becoming more frequent (Murray et al., 2012). At increasing intervals, overweight and obesity are occurring worldwide as a health hazard. These conditions lead to the development of the most frequent non-communicable diseases, as for example cardiovascular diseases, osteoporosis, obesity, different types of cancer and diabetes mellitus (Jamison et al., 2006; Sahoo et al., 2015). More than 10 per cent of the world's child population is estimated to be overweight and a quarter of them are obese (Lobstein, Baur, Uauy & the International Association for the Study of Obesity [IASO] International Obesity TaskForce, 2004). These tendencies are also observed in South Africa, while the low-income communities in urban (Steyn et al., 2004) and rural (Tollman et al., 2008) areas are concerned the most.

Against this background of this *double* burden, which is typical for lower socioeconomic South African settings, the 3-year (2014-2017) longitudinal epidemiological cohort study with a final follow up in March 2018, entitled *Disease, Activity and Schoolchildren's Health Study* (DASH) was developed and carried out by the Nelson Mandela University (NMU) from Port Elizabeth, South Africa, the Department of Sport, Exercise and Health (DSBG) of the University of Basel and the Swiss Tropical and Public Health Institute (Swiss TPH). The study had its beginnings in health burdens such as neglected parasitic diseases, malnutrition and inactivity. The aim of the study was to assess the burden of communicable and non-communicable diseases and to determine their distribution by testing approximately 1,000 primary school children (9-12 years old) in disadvantaged neighbourhoods of Port Elizabeth, South Africa. The 8 selected schools outside the city centre were, due to history, meant for the non-white part of the population and represent today an allegory of poverty, unemployment and crime (Myer, Ehrlich, & Susser, 2014). In addition to the dissemination of health risks and diseases, the DASH study investigated the influence of diseases on cardiorespiratory fitness, cognitive performance and psychological health (Yap et al., 2015).

The 8 schools were divided into 2 groups: The intervention schools received a multi-fold school-based intervention consisting of (i) a Physical Education program, (ii) a Health and Hygiene education, (iii) a Nutritional Intervention and (iv) a Deworming with Anthelmintic Drugs. The control schools proceeded as per usual (Yap et al., 2015). One of the major results

of DASH for the understanding of the propounded **master thesis** is that the children from the intervention group could benefit with a better health-related quality of life (Yap et al., 2015).

Because this access to a healthier and better life should be offered to more children in the world, the idea of *KaziBantu* – Healthy Schools for Healthy Communities - was born. Although the last testing phase, T4, of the DASH project was finished only in March 2018, the follow up project – *KaziBantu* – already started in October 2017.

2.3 The idea of *KaziBantu*

Physical inactivity can lead to negative cognitive and/ or motoric consequences. However, there are also many physiological effects, for example overweight or other associated diseases such as cardiovascular disease, type 2 diabetes or osteoporosis. Furthermore, lack of exercising during childhood can negatively affect health in the adulthood (Steyn & Damasceno, 2006). As we know from the baseline data (832 children) of the DASH study, schoolchildren who are physically active for more than 60 minutes on at least six days of the week have a significantly higher health-related quality of life than their peers with lower PA levels (Salvini et al., 2018). Other findings suggest that a PE intervention programme is not only an attractive method to increase children's PA status, but can also have a positive effect on the learner's concentration and improve academic achievement (Adams, 2017). Similar results can be found in the study of Dwyer, Sallis, Blizzard, Lazarus and Dean (2001), which links a high level of physical fitness and good motor proficiency to a higher school performance.

In many low- and middle-income countries, as for example South Africa, the difference between rich and poor can also be observed in the health condition of the population (Murray et al., 2012). Health is a basic human right; however, it is not that simple especially for children growing up in disadvantaged environments. Most of them are at an increased risk of communicable diseases (Mayosi et al., 2012). Due to an increasing adaptation to the Western lifestyle (Mayosi et al., 2012), which includes the decrease of PA due to motorization and technology advancements or the consumption of high caloric and processed food (Lindeberg, 2010), the incidence of non-communicable diseases is also increasing steadily (Mayosi et al., 2012). Limited educational resources, insufficient health care and nutrition aggravate the effects of poverty and might cause developmental delays and school failure. Gall et al. (2017) showed by the means of multivariate analyses that low selective attention was associated with soil-transmitted helminth infection and low shuttle run performance while higher academic achievement was observed in children without soil-transmitted helminth infection and with higher shuttle run performance.

The **master thesis** presented here is part of the follow-up project of the DASH study (2014-2017): 'The *KaziBantu* project - Healthy Schools for Healthy Communities'. The focus of the new project phase is the scaling up and dissemination of the successful interventions and the development of a toolkit for teachers and learners in disadvantaged schools, located in townships and in the Northern Area of Port Elizabeth, South Africa. In addition to poor nutritional

and hygienic conditions at home, where children meet inadequate conditions to properly develop, children also barely have the possibility for PA in school (Yap et al., 2015). Through a partnership with the Novartis Foundation and a joint collaboration between the University of Basel, the Swiss Tropical and Public Health Institute and the Nelson Mandela University, South Africa, *KaziBantu* aims to scale up and empower children and teachers in schools throughout Africa simply by implementing health interventions.

The *KaziBantu* teaching tool is a multidimensional teaching aid for children as well as for teachers. The teacher's toolkit educates and empowers teachers to live a healthier life and become a good paragon for the children. To support the teachers in this process, the Teacher-Work-Place-Health-Program includes lifestyle coaching and the use of smart information technology in the form of a cell phone app. The children's toolkit "*KaziKidz*", with resources for primary schools (grades 1 to 7), contains the following subareas: (i) Physical Education (ii) Moving to Music (iii) Health & Hygiene and Nutrition. With consideration to the number of school weeks in a school year, as well as the available lessons, the *KaziKidz* team agreed to develop a total of 224 PE lessons, 224 Moving-to-Music lessons and 42 Nutrition and Health & Hygiene lessons (**figure 1**).


Lead: Basel			Children Adults	Lead: Port Elisabeth	
Physical Education 30 weeks / year Total Lessons: 224 (32 lessons per grade)	Dancing-to-music Lesson	Nutrition, Health and Hygiene Education		Teachers-Work-Place-Health-Programme	
	30 weeks/ year Total lessons: 224 (32 lessons per grade)	2 x 3 lessons/ year Total lessons: 42		Lead: South African colleagues	
	G1: 1 lesson/ week	G1: 6 lessons/ year		Stay of 4 Master students in Basel from mid August to mid Sept 2017	
	G2: 1 lesson/ week	G2: 6 lessons/ year		 Note: 1 lesson = 40 min Test of motoric basic competences after Grade 1/3/5	
	G3: 1 lesson/ week	G3: 6 lessons/ year			
	G4: 1 lesson/ week	G4: 6 lessons/ year			
	G5: 1 lesson/ week	G5: 6 lessons/ year			
	G6: 1 lesson/ week	G6: 6 lessons/ year			
	G7: 1 lesson/ week	G7: 6 lessons/ year			

Figure 1: Development of the children's toolkit - Resources

The emphasis of this **thesis** is in the PE part, which reveals what forms of movement are important for the early childhood to the middle child age and how we can get from the *early movement milestones* through the *fundamental movement skills* to the training of inter-individually different sport motor skills repertoires (Roth & Roth, 2009). In the broadest sense, it tries to reduce the before mentioned double burden, especially the increase in cardiovascular risk factors in disadvantaged South African schoolchildren through a multidimensional, school-based PA intervention. Through a persistent and intensive intervention, the PE toolkit tries to achieve a positive effect on the motor abilities, the cardiorespiratory fitness and therefore the holistic health.

3 Methods – Development of the physical education toolkit

The **master thesis** presented here took place within the framework of the *KaziBantu* project, where four other fellow students from the Department of Sport, Exercise and Health at the University of Basel wrote their **master thesis** (August 2017 – April 2018). The children's toolkit, *KaziKidz*, is segmented into three parts – Physical Education, Moving-to-Music, Health & Hygiene and Nutrition – within which my project partner Roman Aebischer and me developed the PE teaching tool. In the following paragraph, the background and the structure of the PE programme will be described and explained, whereby the focus is put on the foundation phase, grades 1 to 3. More detailed information about the development process of grades 4 to 7 can be found in the **master thesis** of Roman Aebischer: *Development of a setting specific comprehensive physical education programme for South African primary schools located in disadvantaged neighbourhoods - grades 4 to 7*.

The first phase of the **master thesis** consisted of practical work, which aimed at the preparation and development of the *KaziBantu* toolkit. In a team of 2 Master of Science (MSc) students, an attempt was made to create a suitable structure and valuable content for the development of 224 PE lessons. The aim was to produce a professional and auxiliary toolkit which can be handed over to teachers or their representatives and make an important contribution to the educational mandate of the schools. While developing the toolkit, the aim was to consider all grades – 1 to 7- and integrate the developed teaching material into the CAPS from South Africa. The CAPS is the culmination of efforts over a period of 17 years to transform the curriculum bequeathed by apartheid (National Curriculum Statement [NCS], 2011). The curriculum is built on the values that inspired the Constitution (Act 108 of 1996) and represents among others, the aims to “*improve the quality of life of all citizens and free the potential of each person*” (NCS, 2011, p. 4).

Education and therefore its curriculum play an important role in realizing these aims. Regarding the development of the lessons it is of utmost importance to integrate the prescribed topics as well as the values of the CAPS and link the values and content of the Swiss curriculum: ‘Lehrplan 21’ (www.lehrplan.ch) and ‘QUIMS’ (Qualität in multikulturellen Schulen) (www.quims.ch). By means of the toolkit, we aim to improve physical and motor skills of the 6 to 12 year-old school-children, improve their body-awareness, try to reach a more conscious relation for themselves with others and support the children in the recognition of the benefits of physical exercise regarding health and well-being. Moving together supports active participation in the school community and promotes cohabitation. The overall goal of the PE toolkit is the enablement of every child to participate in movement- and sports-culture and help the children to develop cognitive, emotional, motivational, volitional and social aspects of their personality. The toolkit therefore teaches different movements, game forms, sports and competition forms and tries to ideally consider the natural need for movement of children during the school day.

With the knowledge and experience of four South African students in Switzerland we managed to develop around 60% of the PE toolkit-lessons before the pilot testing in Port Elizabeth, South Africa, in October and November 2017. The completion of the remaining 40% and the revision of the already developed lessons occurred straight on site with great collaboration, help and local expertise from South African colleagues.

3.1 Pedagogical concept

“The reason for climbing the mountain is to climb the mountain. That is, learning to climb the mountain is inherently rewarding since it provides the climber an increased array of choices for adaptive and skilled behaviour.” Metcalfe & Clark, 2002, p. 25

To characterize the motor skill development, the PE toolkit is guided, among others, by Jane E. Clark’s metaphor of *the mountain*. It characterizes as an integrated framework both, the products, i.e. the descriptions of motor behaviours that are observed; and processes, i.e. the explanations of change; of motor development (Metcalfe & Clark, 2002). Clark (1994) describes the motor skill development as a *“nonlinear, self-organizing process that is driven by the goal of becoming an adaptive, autonomous actor in the world”* (Clark, 1994, p. 10) and links that process to the process of learning to climb a mountain. The main quest of the pedagogical issue of the PE toolkit is to understand and implement how individuals become skilful in their movement, respectively how a performer can move with biomechanical, psychological and physiological efficiency (Metcalfe & Clark, 2002).

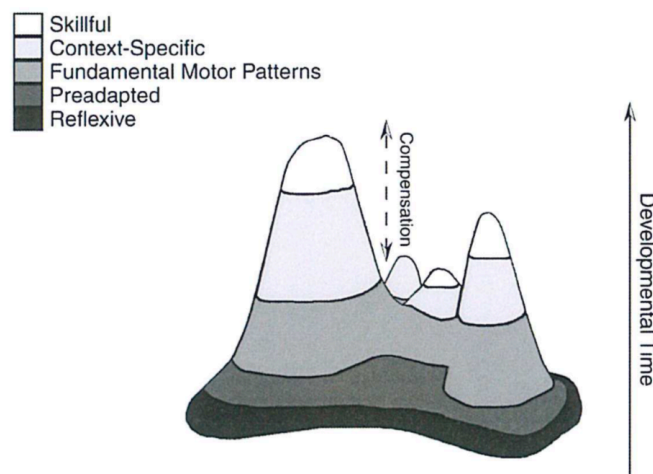


Figure 2: The mountain of motor development (Metcalfe & Clark, 2002)

To approach the mentioned difficulties, we work with Clark’s (1994) characterization of six periods - (1) reflexive, (2) preadapted, (3) fundamental patterns, (4) context-specific, (5) skilful, (6) compensation - in lifespan motor development (**figure 2**). The ability to climb the mountain of motor development is influenced by individual skills and abilities as well as individual differences in context and practice (Metcalfe & Clark, 2002). Gaining motoric skills

is a sequential and cumulative process and takes years to learn and embody (Metcalf & Clark, 2002). To understand the pedagogical structure of the first three grades (grades 1 to 3, age 6 to 8) of the *KaziBantu* PE toolkit it is only necessary to expand on periods 3 and 4. The other periods (1, 2, 5 and 6) are not considered within the scope of this **master thesis**.

3.1.1 Fundamental patterns – period 3

Meinel and Schnabel (2015) define early childhood as being from the 4th to the 7th year of life. Children arriving in this phase of their motor development are already equipped with the basic patterns of coordination for manipulation and locomotion and are now building a diverse motor repertoire that can be used for later learning of adaptive and skilled actions (Metcalf & Clark, 2002). It is the phase of the perfection of various forms of movement and the appropriation of the first movement combinations (Meinel & Schnabel, 2015) with the goal to flexibly operate and switch between different movement contexts (Metcalf & Clark, 2002). This period is particularly important for the later history because it leads to a clear progress in the following forms of movement: walking, climbing and ascending, running and jumping, throwing and catching, pulling and pushing, hanging and swinging, rolling, carrying, beating and balancing (Meinel & Schnabel, 2015). Most typically developing children achieve the fundamental patterns (Meinel & Schnabel, 2015). But already at this age there are notable differences between those who have enriched movement experiences (Metcalf & Clark, 2002) and can therefore achieve higher movement combinations and those who have not and can therefore only learn combinations of movements that can be combined with the basic motor forms of walking and running (Meinel & Schnabel, 2015).

3.1.2 Context-specific period – period 4

The goal of the period represented here is to learn how to adaptively apply fundamental movement patterns to a variety of constrained situations, how actions can be adapted to several specific situations and how rules and context-specific knowledge is associated with tasks (Metcalf & Clark, 2002). The context-specific period normally starts at the age of 7 and lasts a lifetime because humans consistently pounce on new movement contexts throughout their life (Metcalf & Clark, 2002). Because of a pronounced liveliness, mobility and joyous readiness to solve sporting exercise tasks, children from the age of 7 to 10 experience a rapid increase in motor learning ability (Meinel & Schnabel, 2015). Another advance compared to the younger age is the control of the motions and the ability to concentrate on a specific activity (Metcalf & Clark, 2002). Children of this age are much more sustainable and balanced in performance striving and can react more appropriately and successfully to corrections of their movements (Meinel & Schnabel, 2015).

The human becomes acquainted with the range and versatility of his motor repertoire and the development of the motor skills becomes increasingly individualized (Metcalf & Clark, 2002). The way in which a child develops his/her motor skills is strongly affected by cultural, familial, and social aspects (Metcalf & Clark, 2002). This fact constitutes one of the main challenges for the development of the toolkit.

3.2 Basic needs of a child

For the elaboration of the PE lessons for the township-schools of Port Elizabeth, South Africa, the first step was to get familiar with the setting. Although the Swiss teaching aids helped us to structure the lessons in a pedagogical reasonable way, they could not be adopted one-to-one because the setting was extremely different and rash adaptations had to be made. Our first step was therefore to start with something that is the same all over the world: the nature and basic needs of a child.

Children in grades 1 to 3 are between 6 and 8 years old. In general, the movement behaviour in this young age is characterized by an enormous and pronounced need for movement, to play and compete, the need for copying and above all, they must acquire the ability to speak and think (Meinel & Schnabel, 2015). They have a voracious spirit to discover and learn and would need PA with middle-to high-intensity for more than one hour per day (Deutschschweizer Erziehungsdirektoren-Konferenz [D-EDK], 2016). Hence, it is in the schools' teaching curriculum to provide PE lessons regularly, distributed over the week and consequently contribute to a healthy development of the child. It is particularly important for the younger children (grades 1 to 3) that every PE lesson includes the following three goals: learn, laugh and achieve.

3.3 Basic motor competencies grades 1 to 3

As in all other school subjects, clearly defined standards should also be marked out in PE so as to know which competencies pupils of a particular grade should attain (Oelkers, 2005). The pedagogical guideline of the developed toolkit is based on the idea that PE should contribute to the personal development, education and subjectification of the pupils (education through sport), as well as enable students to partake in a critical-constructive way in the sport and movement culture in, beside and after the school (education to sport) (Prohl, 2010). An important prerequisite for this is the disposability of basic motor competencies (Gogoll, 2012).


While developing the toolkit one of the main questions was: "*What should a child at a certain age be able to perform in order to take part in the culture of sports and exercise*" (Herrmann & Seelig, 2016, p.5)? To ensure curricular validity, we developed the toolkit in close alignment with the learning goals specified in the CAPS from South Africa and used the Swiss guidelines as comparison and supplementation.

The PE toolkit conveys for the first 3 grades 32 lessons with 4 lessons at a time putting the focus on one of the following basic motor competencies given by the CAPS: (i) locomotor, (ii) perceptual motor, (iii) rhythm, (iv) co-ordination, (v) balance, (vi) spatial orientation, (vii) laterality and (viii) sports and games (NCS, 2011). A lesson has an average duration of 40 minutes and is divided into 3 parts. The introduction (10 minutes) which contains 1 or 2 exercises in order to make the children understand what the following lesson is going to be about. The focus in this part will be fun, which is one of the main aims of the PE program. The main

part (20 minutes) will put the focus on one of the 8 named topics above. The cool down (10 minutes) is about stretching and calming down.

For the foundation phase (grades 1 to 3) there is an easy structured assessment plan for every grade that evaluates every child at the end of each term. Appraisal criteria are: *participation, concentration/endurance, learning progress, meet the objectives of activities, social interactive skills, commitment/attentive*. The scale of achievement ranges from the mark 1 (not achieved) to the mark 7 (outstanding achievement). The design of the assessments is kept simple, without colours or decorative elements, as these will be photocopied for each child. A more detailed example of an assessment plan is given in the **appendix (evaluation sheet grade 1)**.

Grade 1	Grade 2	Grade 3	Grade 4-7
Term 1: Locomotion: L1, L2, L3, L4 Perceptual Motor: L5, L6, L7, L8	Term 1: Locomotion: L1, L2, L3, L4 Perceptual Motor: L5, L6, L7, L8	Term 1: Locomotion: L1, L2, L3, L4 Perceptual Motor: L5, L6, L7, L8	
Term 2: Rhythm: L9, L10, L11, L12 Co-ordination: L13, L14, L15, L16	Term 2: Rhythm: L9, L10, L11, L12 Co-ordination: L13, L14, L15, L16	Term 2: Rhythm: L9, L10, L11, L12 Co-ordination: L13, L14, L15, L16	
Term 3: Balance: L17, L18, L19, L20 Spatial Orientation: L21, L22, L23, L24	Term 3: Balance: L17, L18, L19, L20 Spatial Orientation: L21, L22, L23, L24	Term 3: Balance: L17, L18, L19, L20 Spatial Orientation: L21, L22, L23, L24	
Term 4: Laterality: L25, L26, L27, L28 Sports + Games: L29, L30, L31, L32	Term 4: Laterality: L25, L26, L27, L28 Sports + Games: L29, L30, L31, L32	Term 4: Laterality: L25, L26, L27, L28 Sports + Games: L29, L30, L31, L32	
Assessment	Assessment	Assessment	



simple to complex

Figure 3: Overview of the synthesizing lesson structure grades 1 to 3

Every grade is structured into 4 terms whereby every term approaches 2 of the mentioned competencies. The competencies are constructed in such a way that they follow the overarching principles from *simple to complex* and are repeated, expanded and amplified in grade 2 as well as in grade 3 (**figure 3**). For a movement pattern to be learned, ideally, it must be practiced in various ways. Anchoring in long-term memory requires many repetitions under altered conditions (Roth & Roth, 2009). If this process is successful, humans are notably adaptive and show an enormous capacity to solve an almost infinite number of motor problems (Metcalf & Clark, 2002). With practice and development, the motor repertoires can become highly differentiated (Metcalf & Clark, 2002). While developing the PE toolkit it was therefore important to integrate all grades, 1 to 7, and enable a structured and consecutively synthesizing program that leads the children over 7 years to an age-appropriate motor basic education. When a child converts to grade 4 he/ she should be equipped with all essential capabilities that are required for phase 5 in lifespan motor development: the skilful phase (**chapter 3.1**).

Within the competences prescribed by the CAPS, an effort was made to also integrate the basic motor competencies (MOBAK) as well as the basic motor qualifications (MOBAQ) proposed by Herrmann and Seelig (2014). Qualifications that are suggested for grades 1 and grade 2 would be: *bouncing, dribbling, catching, throwing, balancing, rolling, sidestepping and jumping* (Herrmann & Seelig, 2014). The complication for grade 3 is therefore: *throwing, throwing & catching, bouncing, dribbling, balancing, rolling, rope skipping, moving variably* (Herrmann, 2015). Some of the competencies that are demanded in the Swiss curriculum could not be considered in the PE toolkit because of the challenging setting of the South African township schools. Swimming, moving on device or movements like rolling that are performed on the floor are not practiced or are only viable under certain circumstances. More information about the setting specific validation is given in **chapter 4.2.1**.

3.4 Criteria for a successful physical education class

In the CAPS, the teaching assignment of PE succumbs the subject *life skills*, which pursues the aim to “*encourage learners to acquire and practice life skills that will assist them to become independent and effective in responding to life’s challenges and to play an active and responsible role in society*” (NCS, 2011, p. 8). According to the CAPS the participation in PE lessons should promote positive attitudes and values that will help learners to be “*physically fit, mentally alert, emotionally balanced and socially well adjusted*” (NCS, 2011, p.8). In addition, skills like problem solving, the improvement of self-esteem or relationship skills are addressed (NCS, 2011). The Swiss curriculum - Lehrplan 21 - speaks along these lines about multi-perspective education which should promote personal (self-reflection, autonomy), social (ability to cooperate, ability to deal with conflicts) and methodical competences (solve problems and tasks) (D-EDK, 2016).

Klieme, Lipowski, Rakoczy and Ratzka (2006) describe three principal features for good teaching that promotes student performance as well as motivation: *classroom organization, student orientation* and *cognitive activation*. Based on the PE subject, *classroom organization* is given with a clear and structured teaching process with binding rules and targets which avoids or decreases the waste of time or discipline problems (Klieme et al., 2006). Especially in the South African setting where we come across classes with 60 children, classroom organization is of utmost importance. PE lessons should be prepared in regard of the available teaching material, place and time of the lesson (Herrmann & Seelig, 2016). It is in the teachers remit to support and care for the children (Herrmann & Seelig, 2016). This *student orientation* constitutes especially in the South African township setting, a vast challenge. It is almost impossible for one teacher to answer and foster each of the 60 children individually or consider gender, talents and demands of every child as claimed by the Swiss curriculum. Further criterions that are suggested for a good student orientation would be *codetermination of the children, differentiation, social and emotional orientation, contemporary relevance* and so forth (Herrmann & Seelig, 2016). Another challenge for teacher’s educating in South African

townships is the *cognitive activation* that urges teacher support and an alignment of the individual learning process with the behavior and action of the child (Herrmann & Seelig, 2016).

4 Progress report

4.1 Preparatory work

On Wednesday 16th of August 2017 the *KaziBantu* team started the intensive working phase with a successful kick-off meeting in Basel, Switzerland. From that day on until the 11th of September, 4 students from the Nelson Mandela University, South Africa, were working in close collaboration with 5 Swiss MSc students from the DSBG Basel. The South African students were already involved in the DASH study before and were therefore well acquainted with the circumstances in township regions. The keynote of the first phase was to learn about the South African project partners and to get a first impression of their country. This exchange was very valuable and helped us to complete around 60% of the planned lessons by the end of that phase.

What we basically did during these 4 weeks was to form an overall perspective of the situation and reify what we wanted to achieve with our lessons. The first step was therefore to investigate the setting in the South African townships, get familiar with the CAPS and the basic conditions in South African township schools. The South African students could facilitate our work in a timesaving way by sharing their experiences, giving us advice and reconsidering our suggestions critically. With this fundamental knowledge, we could start structuring the lessons and linking them to the CAPS and the Swiss Curriculum. Ideas for the games and exercises used in the learning medium were found in different books (e.g. *Afrikanische Kinderspiele* (Truus Nijhuis), *Platinum Life Skills*, *Kompetenzbox* from the School- and Sports Department of Zurich), on the internet (e.g. www.mobilesport.ch/de/, www.jugendundsport.ch/, www.burnermotion.ch/de/, www.righttoplay.ch/, www.activeforlife.com/) and with the help of the South African students. They were then adapted to the setting and limited capabilities of the township schools.

The last third of this phase was dedicated to the planning of the oncoming field stay in Port Elizabeth, South Africa. In close collaboration with our South African colleagues, 2 schools, namely Sapphire Road Primary School and Enkwenkwezini Primary School, were selected for the pilot-testing of our developed teaching material. Originally, the plan was to work with an intervention school and a control school to test our developed PE lesson plans on strengths and weaknesses. We had planned to conduct one lesson of PE per week in which the intervention school would be accompanied, supported and advised by experts while the control school would try to teach and perform the PE lessons without expert supervision. We were hoping to get a constructive and transparent feedback from the teachers to develop a setting specific validation in form of an experience report. Unfortunately, this proposal could not be implemented. More information about the feasibility can be found in **chapter 4.2.2**.

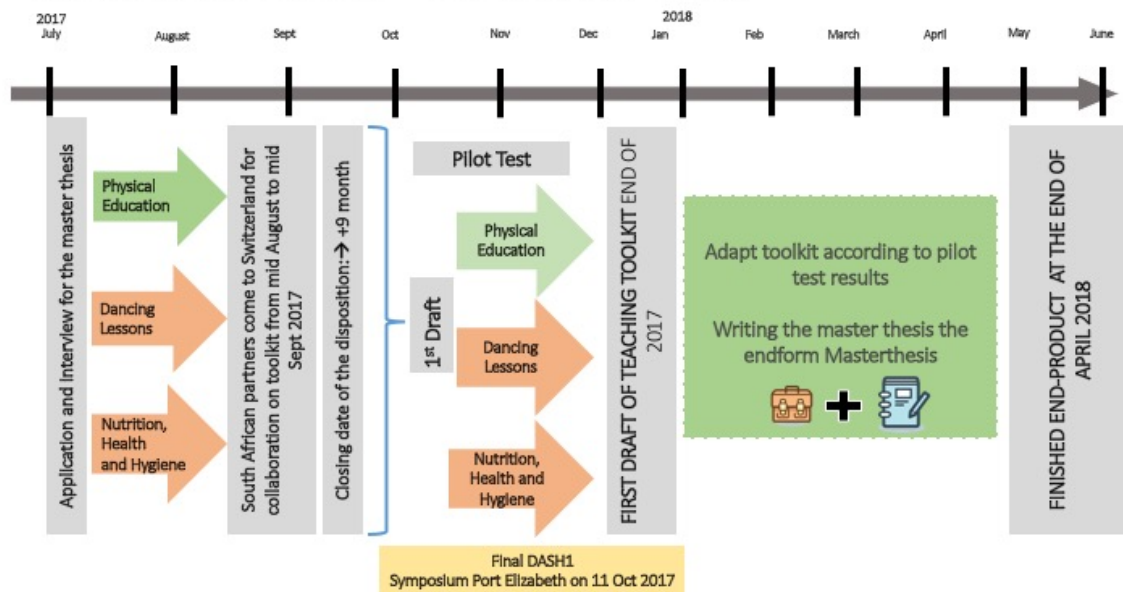


Figure 4: **Master thesis** timeline – development of the toolkit.

4.2 Pilot phase

The field stay for the Swiss MSc students officially started with the DASH/ *KaziBantu* symposium on Wednesday, 11th of October 2018, where the results of the DASH study pertaining to the effect of helminth infections on the growth and development, fitness and academic and psycho-social health of children were shared. Many important entities were represented to support the project: Department of Health, South Africa; Department of Education, South Africa; Novartis Foundation, UNESCO, Swiss embassy of South Africa, University of Basel, Switzerland; Nelson Mandela University, South Africa, but also several principals from the concerned schools. The symposium was a successful event for all participants, gave hope and confidence for the future steps and celebrated the official *KaziBantu* project launch.

The following week was filled with meetings and planning organized by our supervisors to prepare us for the coming weeks without their local support. Our key task in South Africa was to develop the remaining 40% of our lessons, develop all assessments, discuss and question them critically with different South African experts and finally test them for strengths and weaknesses in the field. By the end of the pilot phase on the 10th of November 2018 we managed to complete most of the PE lessons as well as the assessments and were also able to test different lessons in every grade.

4.2.1 Setting specific validation

Metcalf and Clark, have considered that “*the path up the mountain, as well as the level of success attained, are products of the characteristics of the mountain, environmental conditions on the mountain, and the individual skills and abilities of the mountaineer*” (Metcalf and Clark, 2002, p.10). In terms of the South African setting for implementing the toolkit, the mentioned quote reveals that different aspects can exacerbate the path up the mountain and could consequently negatively affect the level of success attained. Especially in regard to the

conditions on the mountain (Metcalf & Clark, 2002,) the township-setting depicts a formidable challenge: In addition to the mundane challenges, like the lack of basic facilities (e.g. running water or electricity), the large residential settlements, squatter- or simple cottage areas with low infrastructure or the struggle of high crime, poverty, hunger, hygiene problems, disease and high levels of violence (Mahajan, 2014), there are many untold problems that get in the way of a proper school education. The study of Pienaar, Visagie, & Leonard (2015) purveys scientific evidence for the citation of Metcalf and Clark. They analysed the effects of sex (433 boys, 292 girls), high (n = 312) and low (n = 514) socioeconomic school environments and ethnicity (619 Blacks, 207 Whites) in South African primary school children. Significant differences between proficiency could be found in sex – favouring boys – as well as in socioeconomic environments (Pienaar et al., 2015). The researchers found that the primary cause for differences across skills are environmental opportunities as well as the rates at which the skills are learned (Pienaar et al., 2015).

Teacher-related barriers

Our first visit to Enkwenkwezini Primary School, where we conducted most of our testing, was based on getting to know the teachers and the setting. Our goal was to build a foundation of trust between the teachers and the team to get a sincere feedback after our testing. We therefore used as much time as possible to observe and learn about the circumstances.

What we learned from the school was that the classroom teachers are also responsible for teaching PE. Most of them are not active themselves and have therefore no interest or even have a negative perception regarding PE. They do not have any experience or professional training and thus lose confidence in themselves and their ability to teach. The reason for this lack of qualification is the closure of PE training colleges. In contrast to the intermediate and senior phase PE teachers (grades 4 to 6 and 7 to 8), the department of education provides Continued Professional Development (CPD) workshops for the foundation phase teachers but it is condensed to two weeks, which seems to be unsatisfying and insufficient according to the surveyed South African PE teachers. This lack of training affects the teacher's ability to conduct lessons comfortably with the correct technique. Thus, learners mirror incorrect technique and cannot improve their motor skills.

A further problem is the teacher's attitude towards PE, they perceive PE to be less important compared to other subjects because it is non-examinable. They lack the ability to create and perform PE assessments because they lack background knowledge about identifying criteria to assess PE. Our job was therefore to integrate an assessment for every grade to refute the aforementioned argument and start an attempt to equate PE with the other subjects.

Chapter 3.4 dwelled upon general criteria for a successful PE class. One of the mentioned criteria was the *classroom organization* (Klieme et al., 2006) which is one of the greatest challenges for the teachers because they lack the skill and knowledge in structuring PE lessons (warm-up, main part, cool down) and do not know what a PE lesson plan should look

like. The PE toolkit takes up on that and tries to depict and explain the content of the lessons as simple and comprehensible as possible. This attempt is strengthened by illustrations that depict the written text to facilitate the teaching process again.

Institutional barriers

While developing the lesson plans, there were not only teacher related but also institutional barriers to overcome. As already mentioned, the selected schools are in townships near Port Elizabeth, South Africa, where premises and sporting equipment are scarce. The lack of basic equipment makes it impossible to ensure a diversified PE program offered in a structured or regular basis. As emerged from a teacher interview, sports items are often stolen and the schools do not have the financial means to replace them. The department of education does not provide funding for sporting facilities and equipment. If a school gets any form of equipment, it is usually sponsored by private organizations. But even then, it does not cater for the entire school. That's why teachers often bring their own sports items, which are far from enough for a whole class of 60 children. Moreover, the equipment is usually in bad condition because it is used by many learners and should therefore be replaced from time to time.

Another barrier is the insufficient and inadequate infrastructure. The schools do not have enough facilities such as gym halls, athletic tracks and fields on which to play. The available space is often associated with safety risks. Stones, glass, thorns or potential pathogens that could be picked up aggravate a lesson planning considerably. PE lessons are therefore conducted outside on a meadow or a hard pitch with no shelter from the sun or the rain, which means the lessons do not take place if the weather conditions are inappropriate. Rain converts the soil to mud and dirt. Most of the children cannot afford any sports clothes and wear the same clothes for the academic subjects as well as for the PE lessons. This is predominantly the school uniform, which is often old and torn and does not fit. Most schools do not have any spatial fall-back procedure for implementing the PE lesson inside. Some schools implement the lesson in the classroom, where they first need to put away all the desks and chairs and then try to conduct the lesson with a huge number of children in an all too small room. These extremely unpleasant conditions make it almost impossible to act regardless of the weather and the PE lessons are continuously cancelled and replaced with other (examinable) subjects.

This marginalization of PE lessons also happens when teachers need to catch up on curricular work. There are various factors that contribute to PE class time being reduced: gang violence surrounding school areas, protest actions, teacher absenteeism, shortage of staff and many more. From the teacher interviews, we learned that some teachers even feel like there are too many subjects taught in primary school and that some of them, especially PE, should be removed from the curriculum to lessen the load.

Referring once again to the general criteria for a successful PE class mentioned in **chapter 3.4**, it becomes clear how difficult the external circumstances for the South African township-teachers are and that much of the success depends on not only them but also on the extremely

challenging conditions. As already mentioned, a class with only 20 to 30 learners is considered a privilege. Disadvantaged areas usually have 40 to 65 children in one class and this makes it difficult for the teachers to present PE classes with limited space and equipment. One thing we observed when visiting the classes was that the children were extremely obedient and attentive. They listened to what the teacher was saying, followed the rules and tried to obey the tasks as good as possible. This attitude facilitates the teaching process enormously but a tremendous pedagogical skill is still required to control, back up and answer every one of the 60 children. Especially challenging are many special needs learners that increase the pressure on teachers since they get a full class to teach.

For the development of the toolkit it was important to embed and complement the lessons of the curriculum and incorporate it with their work. The teachers are overwhelmed with workloads from other projects that are brought to the school in addition to the already congested curriculum.

4.2.2 Feasibility

During the intensive working phase in Switzerland the PE team developed ambitious plans for the field stay in South Africa. It soon became clear on site, that our planned intentions were not applicable. Originally, it was planned to work with an intervention school and a control school to test our developed PE lessons for strengths and weaknesses. Unfortunately, the available period for the testing was extremely unsuitable because the examination period of the selected schools was at the same time. Something we realized too late. The teachers were therefore less flexible and could not completely participate on the project. The time and selection of the schools was binding. Therefore, we almost entirely worked with the Enkwenkwezini Primary School and got only a small glimpse into the other schools. Moreover, there were riots with road blocks and shootings in some areas, which made it too dangerous to conduct testing during that time.

The feasibility of the developed PE lessons is difficult to describe. As we already knew beforehand, the teachers do not have enough experience or professional training and thus lose confidence in themselves and their ability to teach. This was clearly noticeable by observing some of the teachers. They did not follow the lesson plans, did not understand the exercises and passed through the lesson way too fast. Some of the teachers performed in regular clothing (jeans, blouse, flip flops) and were therefore not able to demonstrate the exercises correctly. Others changed the content of the lessons in a way which did not meet the basic effects required. Something that attracted special attention was the occupation of the children. The teachers were clearly overwhelmed with the number of children and could therefore only keep a small number of learners active. The rest of the children could only observe and had to wait until it was their turn, if it came at all.

Another challenge was the communication between the schools and the team. Arrangements were not respected or simply forgotten. We would show up to a testing and the teachers

would not be prepared or ready, could not find the lessons anymore or would have an exam at the exact same time. One rainy day, we had an appointment and when we showed up at the school, we were told that all the younger children, grades 1 to 3, were not at school because it was too cold for them. Unfortunately, nobody had warned us in advance. These and other incidents made it difficult for us to comply with our time management and to test all the intended lessons.

However, there were teachers that treated the testing with urgency and showed curiosity and willingness to learn. They showed us that the feasibility of the lessons was given and possible. These teachers could implement the testing lessons one-by-one and achieve our overarching objective of *learn, laugh and achieve*. In a teacher interview we were told that an easy to understand and structured PE lesson plan, based on the CAPS, would decrease the teachers fear to teach PE and help them conduct an age appropriate PE lesson.

When interviewing the teachers, they predominantly showed a great understanding towards the toolkit and welcomed the project. Several teachers told us from other projects that had had a similar or even the same idea but were not sustainable. They told us that they would not implement anything that was not based on the CAPS. For the *KaziBantu* project to be sustainable, it therefore meant having to produce content that is based on the CAPS and is accepted by the Department of Education.

It also emerged from different conversations that an enormous lack of material prevails. Most of the teachers were complaining about their unsatisfying situation of being at the mercy of these external challenges and expressed their hope of getting more sports equipment from sponsors or even from us. Even though the teachers appreciated our work and lesson preparation, it soon became clear that their expectation was, in addition to the fully developed lessons, to get the appropriate equipment to implement the ideas. Our response to these expectations lies in the sustainability of the *KaziBantu* project. Our goal is it to use the existing system as a starting point and to continue developing and stabilizing it in a way which can then be carried on autonomously, without long-term external support. The lessons have therefore been designed in a way that requires the least amount of sports equipment and are self-explanatory, even for a layman. This discussion is captured again in **chapter 5**.

What we realized too late was that there are schools that do not even have basic sports equipment: no balls, no cones, no bean bags. These schools are rare of course, but nevertheless, we had to make major adjustments to the toolkit and think of ways to handle such extreme situations. Our idea was to create a manual that describes and instructs how to tinker sports equipment such as balls from everyday objects. Due to time constraints, however, this project could not be implemented. It is not yet clear if this manual will be developed at a later date. The current toolkit proposes alternative possibilities for some of the required equipment. Whether the developed lessons are feasible in all township schools could not yet be tested completely.

4.3 Finalization of the toolkit

After our testing's we conducted many discussions with South African experts and advisors to adjust and improve our lessons. The teachers who could not implement the lessons represented the biggest challenge. How can someone who has never experienced PE lessons themselves and never learned how to teach a PE class suddenly implement such efforts? We therefore decided to be even more accurate with our descriptions and to let South African experts go over every lesson to facilitate the content and reduce possible language ambiguities. Further, our hope was that the illustrations drawn by professional designers would make the content more comprehensible.

Back in Switzerland, an effort was made to hand in the first draft of the PE lessons by the end of December 2017 so they could be surveyed by our mentors and other experts from South Africa. Another reason for the timely submission was the close cooperation with the designers of the South African creative agency “*Rooftop Production*” (Port Elizabeth, South Africa), which got the challenging assignment to design coherent illustrations out of our submitted first draft of the PE toolkit. Those designers were not only implementing our lessons graphically but also helping us in the process of developing our final product. During various meetings in South Africa, intense discussions were held on how and in which time-frame cooperation should take place. Major points of discussion were: decisions on a logo; development of a child-orientated mascot (**figure 5**); design of the final product (**figure 6**); style, number and granularity of the graphical implementation of the stick figures; design of the lessons (**figure 7**, **figure 8**) and the specific colours for each module (**figure 5**); financial issues; information and lesson exchange; the form of communication by the time the Swiss MSc students would be back in Switzerland and the creation of a timeline to finish the end product by the end of April 2018.



Figure 5: Mascot of the KaziKidz toolkit. From the left: Physical Education, Moving-to-Music, Health & Hygiene and Nutrition. Developed by Rooftop Production (Port Elizabeth, South Africa).

The mascot *Kazi* is a lion with human features. The aim was to find a companion throughout the *KaziKidz* toolkit that represents no specific race, complexion or age, so everyone can identify themselves with the mascot. The mascot should be powerful and proud but simultaneous-

ly casual and youthful. Furthermore, it should be related to Africa. *Kazi* is the same mascot throughout every section of the toolkit, but changes clothes and symbol depending on either Physical Education (blue), Moving-to-Music (red) or Health & Hygiene and Nutrition (green).


By the beginning of January 2018, the final version of the Corporate Identity Manual (CIM) of the children's toolkit was developed. This is a manual for teaching materials in Sport, Health & Hygiene and Nutrition education for primary level grades 1 to 7, including lesson plans, posters, assessments and the intended final product.



Figure 6: First idea of the design of the final product. Designed by Rooftop Production (Port Elizabeth, South Africa).

For the finalization of the toolkit, a content review team from *Rooftop Production* surveyed every lesson to ensure that language and grammar were correct. Running slightly behind on illustrations, *Rooftop Production* shared the first draft for review at the beginning of March 2018, which we checked for validity, intelligibility and integrity and handed back with written feedback for each illustration so that any discrepancies could be corrected. This process lasted until the middle of April 2018. The reviewed content and illustrations were then handed to a layout team who was responsible for applying the approved corporate identity lesson plan to everything. The last step was the quality check which was completed by a content team composed of South African primary school teachers. Three selected lessons from the final product can be viewed in the **appendix**.

An illustrated overview of the described phases of the **master thesis** timeline and the development of the *KaziBantu* toolkit is given in **figure 4**.



Perceptual motor

Physical-education: Foundation phase

Grade 1 | Lesson 6 | Time: 40 min

Equipment

- About 10 balls.
- Cones.

Feel the ball

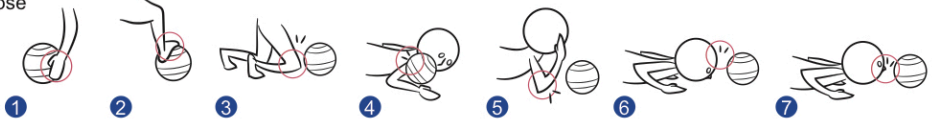
Introduction
Time: ~ 10 min

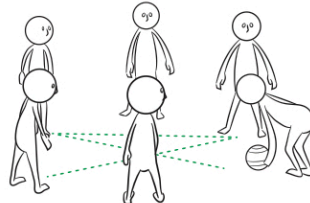
What you need: Any kind of balls, one for each group.

How to play

The teacher asks the learners to make groups of 6. Every group stands in a circle and gets one ball. Learners need to roll the ball along the ground, using their:

1. Hand
2. Foot
3. Knee
4. Shoulder
5. Elbow
6. Head
7. Nose





Goal of the game _____

- Ball skills - how to push and roll a ball.

What to watch for: Make sure that every learner gets the ball 3 - 4 times before you move to the next task.

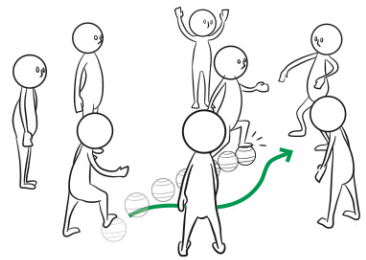
The one in the middle

Main part
Time: ~ 10 min

What you need: Soccer balls (6 - 8 balls)

How to play

Form groups of 8 - 10 learners, who should stand in a circle while one learner goes to the middle. The learners standing in the circle try to pass the ball to each other using their feet, as many times as possible, without letting the learner in the middle intercept the ball. As soon as the learner in the middle intercepts the ball, another learner must go to the middle.



Goal of the game _____

- The learners react quickly and pass the ball in such a way that the learner in the middle cannot intercept the ball.

What to watch for: Are the learners considering tactical aspects? Are they passing the ball to avoid the middle learner?

Figure 7: Sample lesson, grade 1, term 1, lesson 6. Developed by Rooftop Production (Port Elizabeth, South Africa).

Grade 1 | Lesson 6 | Time: 40 min

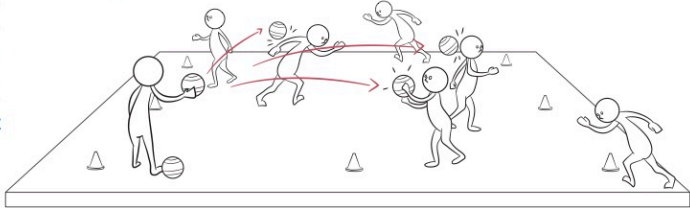
Hitting ball

Main part
Time: ~ 10 min

What you need: 5 soft balls; cones to mark the field.

How to play

Mark an activity area with cones and tell the learners to spread out in the marked field. Use about three balls. You can add more balls if needed. The aim of the game is to strike someone with the ball. If someone has been hit by the ball, he/she has to run once around the sports field. Then the player can go back to the playing area. If someone catches the ball, he/she can continue playing. If the ball hits a learner's head it is not counted as a strike.



Goal of the game

- Ball skills.
- Throw and catch the ball.

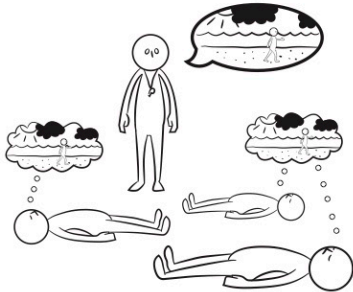
What to watch for: Make sure that if a learner has been hit, he runs once around the playing area. Also make sure that learners do not throw the ball at someone's head.

Sunbathe on the beach

Cool down
Time: ~ 10 min

How to conduct

Tell the learners to lie on the floor in a comfortable way, close their eyes and listen carefully: "Imagine you are on the beach. The sun is very strong today and warms your skin in a very comfortable way. As you look to the ocean, you can see three dolphins jumping out of the water. They seem to be very excited. Far, far away, you can see whales splashing water into the air. Suddenly a cloud darkens the sky. You get very cold and wrap your arms around yourself. After a while you decide to go home for dinner. You take all your things and leave the beautiful beach." Tell the learners to open their eyes and slowly get up



Goal of the game

- Cool down and relax. Be creative and improve your imagination.

What to watch for: Learners should lie in a relaxed and comfortable way with their eyes closed.

Figure 8: Sample lesson, grade 1, term 1, lesson 6. Developed by Rooftop Production (Port Elizabeth, South Africa).

5 Discussion: Strengths and limitations of the toolkit

A strength of the developed toolkit is the pedagogic-didactical structure that works as a thread throughout grade 1 to grade 7 and considers all feasible learning objects required by the CAPS. This close dependence on the CAPS is one of the principal reasons for the teachers to even incorporate the lessons into their class schedule. Further, we managed to integrate all basic motor competencies required by the South African but also the Swiss curriculum in a simple but effective way, develop assessments and transform PE into an examinable subject. All the lessons are specified and adjusted to the very special setting. Modification proposals are given for different class sizes and the required equipment is reduced to a minimum. Typical South African games and sports are integrated so that teachers, but also children, can draw on familiar game forms. The content of the lessons is easy to understand and provided by professional Pencil Drawings. Further elements to help teachers better understand the structure of the lessons are the use of colours and symbols to differ between content pillars (Physical Education, Moving-to-Music, Health & Hygiene and Nutrition) and grade. The teacher is guided through the PE teaching material by the mascot *Kazi*, whose character resonates with children and works as a teacher's aide. *Kazi* is animated as a lion and should represent an aspirational icon that the children want to emanate and look up to (**figure 5**).

Our project is still in the initial phase and statements about the future cannot be made. Will the lessons also be conducted without the team's attendance? How can the team convince the teachers that PE should not be replaced by other subjects on any account? Many projects already tried to be sustainable with PE interventions in township-schools of Port Elizabeth, South Africa. Unfortunately, none of them were sustainable. A justified question is therefore "what does it take for such a project to survive despite all the challenging factors over the years and contribute sustainably to an active sports culture in South African township schools"?

Our project is strongly dependent on funding and therefore on the defaults of our investors, the Novartis Foundation. In the interest of both sides, it has been decided to submit the final *KaziBantu* toolkit by the end of April 2018. During the field stay in South Africa the MSc students from Switzerland realized that the time spent in South Africa would be too short but unfortunately there was no possibility to adjust the time scale. In our opinion the first step, before even starting to develop any lesson, should have been a visit to every school that will work with the toolkit at a later time. We should have talked to the teachers in advance, observed different PE lessons, discern the challenges of the teachers and check out each school's equipment. Further, we should have developed every lesson directly on-site with more foreknowledge and tested more than half of the lessons but also assessments in different schools to see if they could be implemented or not. If not, we should have taken the time to find out why. On the one hand, such a procedure would have taken much more time and funding, but on the other hand, it would have ensured more sustainability.

Despite our effort in reducing the required equipment to a minimum, several lessons still contain equipment that is not available in some schools: ropes, cones, bean bags, balls and many more. Although the goal of *KaziBantu* is drawn on the existing capabilities it may be worth purchasing basic equipment for every school, so each lesson can be conducted without any limitations. How can we teach a child to throw a ball without a ball or to skip without a skipping rope? In most cases, children are quite creative and would have different ideas to tinker for example a ball, but tasks like this could be quite devastating. To mention an example, one child was given the above-mentioned task, came back with a used condom and wanted to blow it up. Even if schools possess one or two balls, it is still a challenge to perform efficiently so that every child gets the opportunity to work with the ball at least once without even speaking about achieving serious learning effects.

KaziBantu developed “easy to understand” lessons that are simple to implement, even for a layman. Despite this effort, we noticed that the teachers, in many cases, did not understand the core of a game. The fact that some teachers were only taking a quick look at the lesson and would then teach a different content without sufficient know-how in adapting exercises so that the core of the game would remain the same, aggravated this problem.

6 Conclusion and outlook

Since the *KaziBantu* project is in the initial phase and will take another few years to ensure sustainability, there are hardly any results to be discussed yet. Questions like how the toolkit could be implemented by the teachers or what progress, regarding motoric skills, concentration, health parameters or social skills could be made because of the toolkit cannot be answered yet.

If the Novartis Foundation is on board, the baseline measurements of *KaziBantu* will be done with the help of 4 schools – 2 intervention schools, 2 control schools - by February 2019. In the following year, the *KaziKidz* material will be intensively implemented at 2 schools. To withdraw clear conclusions about the feasibility, the testing phase will end with a follow-up measurement in 2020. Without on-site controlling, the concept has little chance of survival in the first phase of implementation. We need to remind the teachers of their important role in the project. Regular presence from the projects assistants should ensure that the teaching tool does not disappear in the drawer. A regular controlling and report of the status of implementation, problems, difficulties, successes and so forth, is indispensable so that corrective measures can be discussed and initiated again.

The vision of *KaziBantu* is it to upscale the DASH project, so more schools in South Africa can benefit from it. If we could spread the project in low-to-middle income countries throughout Africa, or even across the world, we could contribute to the overall health of many children and give them the chance to live a healthier and happier life. As Nelson Mandela (2000) said: “*Sport has the power to change the world*”.

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Appendix

The following content is designed by Rooftop Production (Port Elizabeth, South Africa).

Sample lesson: grade 1, term 1, lesson 1

Grade 1 | Lesson 1 | Time: 40 min



Locomotor skills

Physical-education: Foundation phase

Equipment

- Cones.

Traffic lights

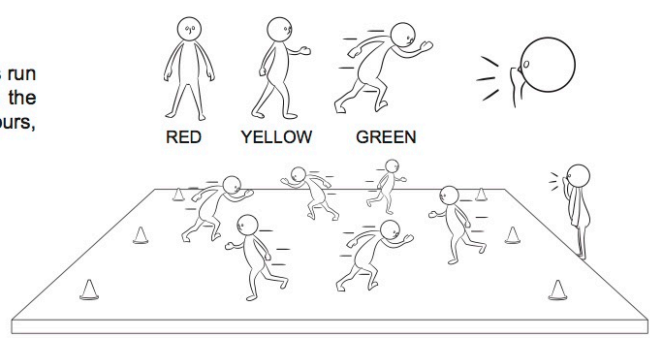
Introduction
Time: ~ 10 min

What you need: Cones to mark out the area.

How to play

Mark out an area with cones. Learners run freely around the activity area. When the teacher calls any of the following colours, the learners must react.

RED means: stop.
YELLOW means: walk.
GREEN means: run.



Goal of the game

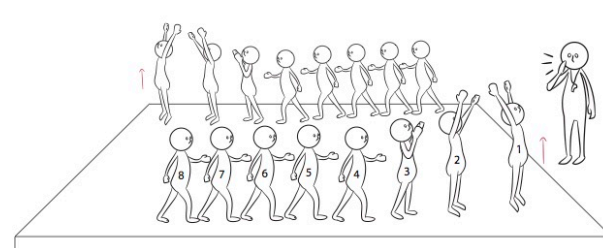
- Dodge each other and walk in different directions.
- Use senses: hearing – listen to instructions while moving around.

Follow the leader

Main part
Time: ~ 10 min

How to play

Divide the class into lines of 8 or more learners. The person in the front of each line (the leader) moves in various ways (walking, skipping, running, crawling, hopping, marching, galloping etc.) according to the teacher's instruction and the others follow, by imitating the movement. When the teacher blows the whistle, the leader changes and the teacher instructs what the next movement will be.



Goal of the game

- Follow instructions - walk, run and skip using signals to change from walking to running and skipping.

What to watch for: Students performing the movements incorrectly. If they are struggling with the movements, then focus on the movements which they find easier, such as walking, running and hopping.

Grade 1 | Lesson 1 | Time: 40 min

Simon says

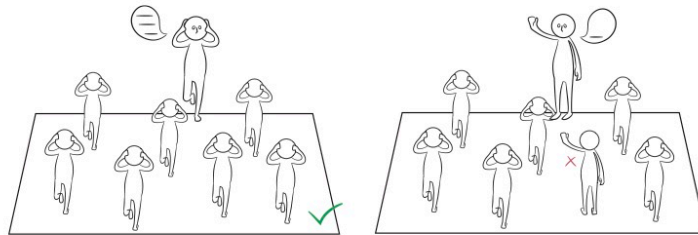
Main part
Time: ~ 10 min

How to play

The teacher takes the role of "Simon" and issues instructions to the learners which should only be followed if introduced with the phrase "Simon says". Players are eliminated from the game should they follow instructions that are not immediately preceded by the phrase, or should they fail to follow an instruction which does include the phrase "Simon says".

Possible instructions:

- Jump, shout hurrah, touch your toes, stamp your feet, wiggle your ears, hop like a frog, slap your knees, roll your eyes, fly like a plane, wiggle your fingers, spin around, run on your tip toes.



Goal of the game

- Practise the ability to distinguish between genuine and fake commands.
- Move different parts of the body.

What to watch for: Learners reacting incorrectly. They must do 10 jumping jacks.

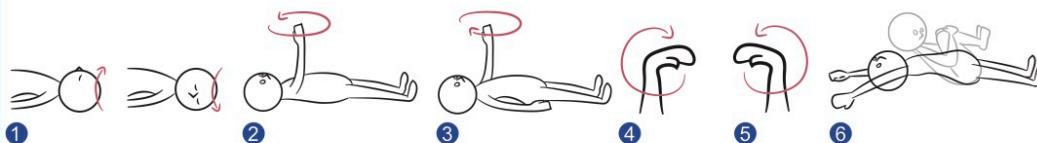
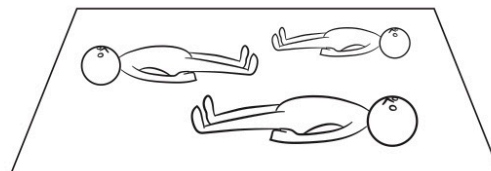
Cool down your body

Cool down
Time: ~ 10 min

How to conduct

Tell the learners to lie on the floor. After finishing task 1 to 6 tell the learners to slowly stand up.

1. Move your head from the right side to the left side and back for 30 seconds.
2. Use your right arm and draw five circles in the sky.
3. Use your left arm and draw five circles in the sky.
4. Circle your right hand five times.
5. Circle your left hand five times.
6. Move your whole body, stretch and pull.




Goal of the game

- To feel and move the different parts of your body in different directions and to be able to use only one body part at a time.

What to watch for: Make sure the learners know the difference between right and left and are able to move their body parts in various directions.

Sample lesson: grade 1, term 2, lesson 9



Rhythm

Physical-education: Foundation phase

Grade 1 | Lesson 9 | Time: 40 min

Equipment

- Music and a music player.
- Skipping ropes (about 20).

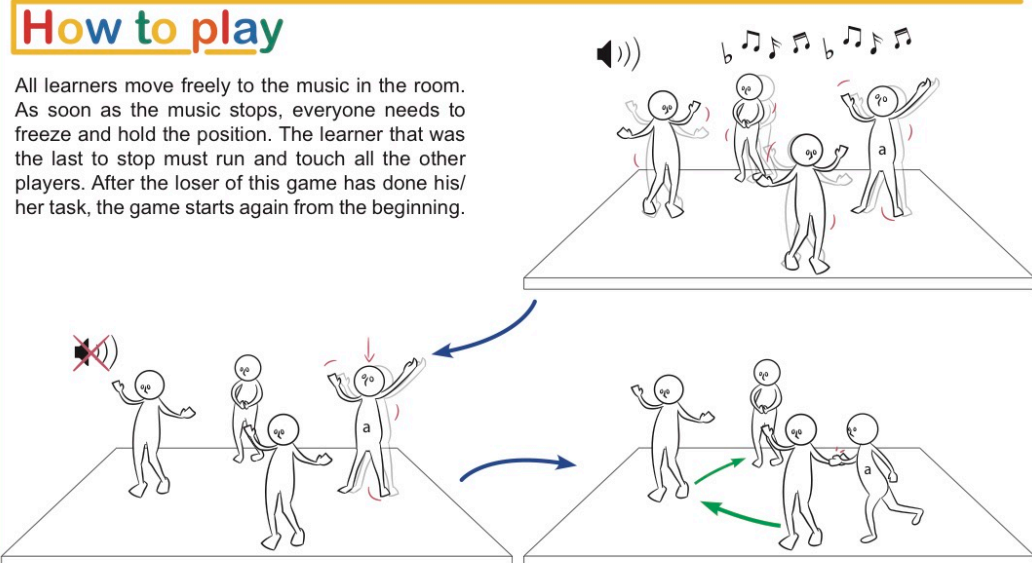
- Hula-hoops (about 10).

Freezing game

What you need: Any popular music for learners; music player.

How to play

All learners move freely to the music in the room. As soon as the music stops, everyone needs to freeze and hold the position. The learner that was the last to stop must run and touch all the other players. After the loser of this game has done his/her task, the game starts again from the beginning.



Introduction
Time: ~ 10 min

Goal of the game

- Quick reaction time, movement to music, move to the correct rhythm, hold the same body position for a longer time.

What to watch for: Are the learners moving correctly to the rhythm of the music? Do the learners react quickly?

Hopscotch, rope skipping and a trick

What you need: Skipping ropes, hula-hoops.

How to play

Divide the class into three groups (A, B and C) and let them perform the following tasks. After 7 minutes change the tasks of the groups.

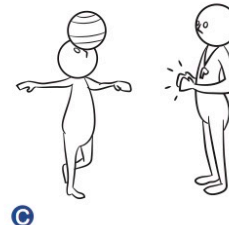
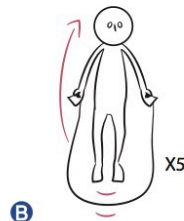
- Group A: Create a hopscotch court with hula-hoops. Each member of the group needs to hop through the course four times - twice with the dominant leg and twice with the non-dominant leg.
- Group B: Use a skipping rope. Each member of the group tries to jump at least five times over the rope without interruption.
- Group C: Create a trick that you can show to your teacher.

Main part
Time: ~ 20 min

Grade 1 | Lesson 9 | Time: 40 min

Hopscotch, rope skipping and a trick

Continued



Goal of the game

- Improvement in coordination, rhythm and creativity.
- Rope skipping and hopscotch - each learner should be able to jump at least 3 times over the rope without interruption.

What to watch for: Are the learners able to fulfil the task? Do the learners have a timely jump release and an upright body position while skipping? Are the learners able to change from the dominant to the non-dominant leg when skipping or playing hopscotch?

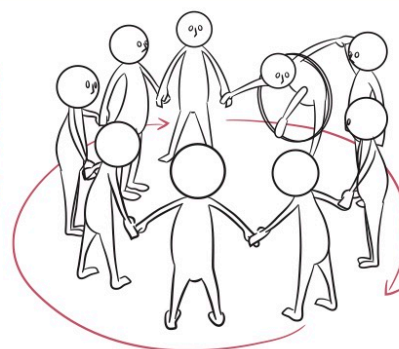
Go through the hoop

Cool down
Time: ~ 10 min

What you need: About 6 - 8 hula-hoops.

How to perform

Learners should get into groups of 8 - 10, form a circle and hold hands. Two learners hold a hula-hoop in a vertical position. The learners holding the hoop now walk around the circle without releasing their grip on the hoop. The learners in the circle then climb through the hoop without letting go their hands. The learners practise for 2 minutes. They then have a competition between the groups.



Goal of the game

- The learners with the hoop should walk around the circle as fast as possible. The learners in the circle must not let go of their hands.

What to watch for: If a learner in the circle lets go of their hands, they are out of the game.

Sample lesson: grade 1, term 3, lesson 17



Balance

Physical-education: Foundation phase

Grade 1 | Lesson 17 | Time: 40 min

Equipment

- 50 cones.
- Ropes or something to mark lines on the floor.

Collect berries

Introduction
Time: ~ 10 min

What you need: As many cones as possible.

How to play

Divide the group into two different teams. Have each group stand at opposite ends of the field. In the middle of the field, spread out cones (berries). When the teacher shouts "GO" the learners have to run into the centre of the field, take a cone (only one at a time), run back to their line and put it behind the line. When all the cones have been collected from the centre of the field, the teacher counts the cones of each group.




Goal of the game

- Raise the pulse rate.

What to watch for: The learners must be able to stay on their feet when they turn back with their cone. They need to run around the field and must not just run around the same cone.

Balance exercises

Main part
Time: ~ 20 min

How to play

Give the learners different tasks which they have to fulfil by using their creativity. Always pick a good example and show it to the other learners.

- Find a position with only one foot on the ground. Hold the position for 15 seconds.
- Find a position with no feet on the ground and hold it for 15 seconds.
- Make groups of two. Tell the learners to try out the positions shown on the pictures (see pictures A, B, C, D).
- Make groups of three. There is one learner in the middle, the others are behind and in front of him/her. This task is about a good body tension. The learner in the middle falls backwards and the learner behind catches him/her. He/she is then pushed forward to the other learner.



1

eg.





2

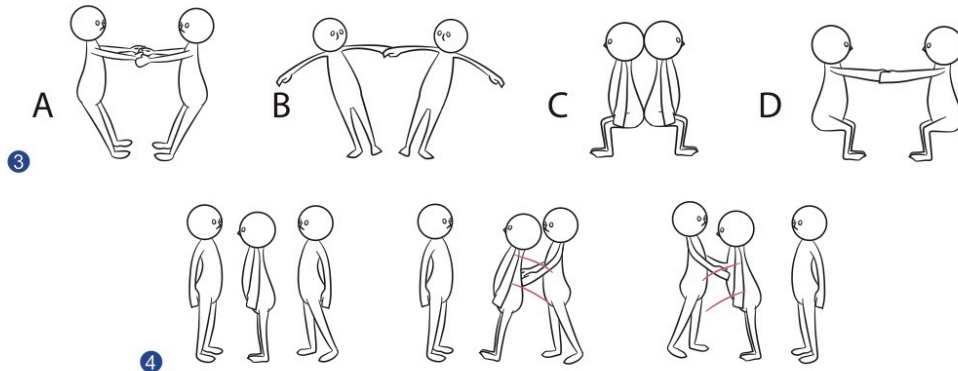
eg.



Grade 1 | Lesson 17 | Time: 40 min

Balance exercises

Continued



Goal of the game

- Try out different balance positions/build up trust in the other learners.

What to watch for: The learners need a proper body tension/straight back.

Challenges level I

Cool down
Time: ~ 10 min

What you need: A rope or line marked on the ground.

How to play

Make teams of 6 learners. Each team stands behind a starting line. Team members should stand in a straight line behind each other. Designate a turning point 20 paces away. On the leader's signal to run, the first player races as quickly as possible to the turning line and then back to the starting line. When the player returns to the starting point, he/she high fives the next person in the team who will then carry out the same action. Once all team members have finished they must sit with their hands on their heads. The winning team is the first team all sitting with their hands on their heads.

- Task 1: Walk/run on a rope or line marked on the ground.
- Task 2: Walk/run backwards on a rope or line marked on the ground.
- Task 3: Walk/run sideways on a rope or line marked on the ground.




Goal of the game

- Challenge the learners, challenge their balance skills.

What to watch for: Make sure learners are walking on the line and do not cheat.

Sample lesson: grade 1, term 4, lesson 25



Laterality

Physical-education: Foundation phase

Grade 1 | Lesson 25 | Time: 40 min

Equipment

- About 8 balls.
- 1 hula-hoop.

Pass the ball

Introduction
Time: ~ 10 min

What you need: About 8 balls.

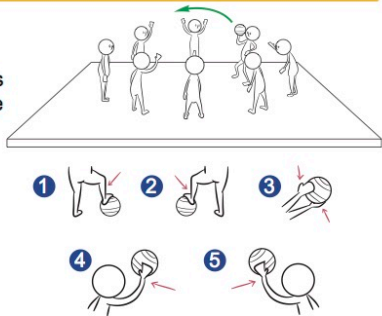
How to play

Ask the learners to make a circle with 7 – 10 learners. Every circle has one ball. Learners must fulfil the following tasks. Always keep the same order and repeat each round three times.

1. Pass the ball with the dominant foot.
2. Pass the ball with the non-dominant foot.
3. Pass the ball with both hands.
4. Throw the ball with the dominant hand.
5. Throw the ball with the non-dominant hand.

Goal of the game

- Practise activities using the non-dominant side of the body.
- Throw and catch with the non-dominant hand.



What to watch for: Are the learners able to change sides from dominant to non-dominant? If it is too difficult tell the learners to make the circle smaller.

Ostrich tag

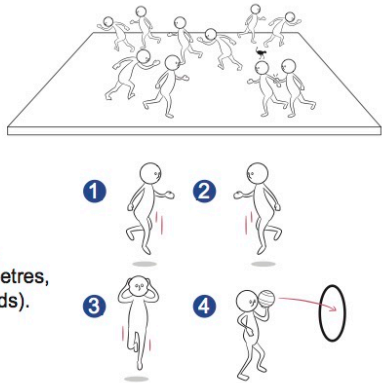
Main part
Time: ~ 20 min

What you need: 1 hula-hoop, 1 ball.

How to play

Choose five catchers, who need to touch as many learners as they can. The other learners need to run and duck under the catchers. As soon as a catcher has touched a learner, he/she becomes an ostrich. The ostrich can be released by doing a task, jumping on one leg to another ostrich and giving him/her a high five. After that, both ostriches are freed. After 4 - 5 minutes, change the catchers and also the task for the ostriches:

1. Jump on the dominant leg.
2. Jump on the non-dominant leg.
3. Jump on the non-dominant leg, with their hands covering their ears.
4. Go to the teacher who is holding a hoop. From a distance of 2 metres, throw a ball through the hoop (with dominant and non-dominant hands).



Grade 1 | Lesson 25 | Time: 40 min

Ostrich tag

Continued

Goal of the game

- Practise activities using the non-dominant side of the body.
- Balance on the non-dominant leg.
- Throw a ball through a hoop with the left/right hands.

What to watch for: Make sure that the learners have an upright and strong body position so that they can keep their balance. Tell the learners to use their arms to keep their balance.

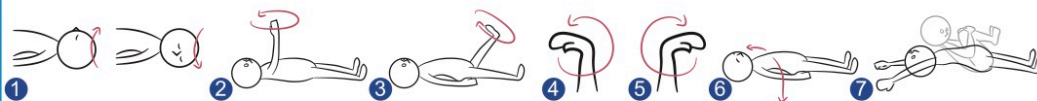
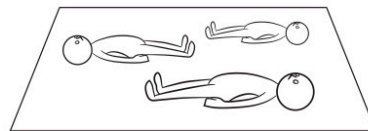
Cool down your body

Cool down
Time: ~ 10 min

How to conduct

Tell the learners to lie on the floor and close their eyes. After they have completed Tasks 1 to 6, tell the learners to slowly stand up.

1. Move your head from the right side to the left side and back for about 20 seconds.
2. Use your right arm to draw a big circle in the air. After a few repetitions change your arm and repeat the exercise.
3. Use your right leg and draw a big circle in front of you. After a few repetitions change your leg and repeat the exercise.
4. Circle your right hand in one direction and after a few repetitions change the direction.
5. Circle your left hand in one direction and after a few repetitions change the direction.
6. Roll sideways in both directions.
7. Tell the learners to move their whole body, stretch and pull.



Goal of the game

- To feel and move the different parts of the body. To learn the difference between moving to the right and moving to the left. Learn to isolate one part of the body.

What to watch for: Do the learners know the difference between right and left? Can they move their body parts in various directions?

Evaluation sheet, grade 1

Grade 1 | Evaluation sheet | Physical-education



Assessment - Rhythmic Movement

First and last name: _____

Date: _____

Class: _____

Rating: **5 points:** Meets the expectations with excellence

3 - 4 points: Meets the expectations

1 - 2 points: Meets not all the expectations

0 points: Did not meet any expectations

	Term 1	Term 2	Term 3	Term 4
1) Participation				
2) Concentration/ endurance				
3) Learning progress				
4) Meet the objectives of activities				
5) Social interactive skills				
6) Commitment/ attitude				
Total points (max 30):				
Mark:				

General comments:

Scale of achievement: Grading

Total points	Percentage	Final mark
0-8	Not achieved	1
9-12	Elementary achievement	2
13-15	Moderate achievement	3
16-18	Adequate achievement	4
19-21	Substantial achievement	5
22-24	Meritorious achievement	6
25-30	Outstanding achievement	7

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Date: 30th April 2018

Signature:

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