EFFECT OF A SKILLS SPECIFIC COACHING EDUCATION PROGRAMME ON THE SKILL LEVEL OF MINI-RUGBY PLAYERS

Jacques BASSON & Wilbur KRAAK
Department of Sport Science, Faculty of Medicine and Health Sciences,
Stellenbosch University, Stellenbosch, Rep. of South Africa

ABSTRACT

It is essential to design age-appropriate activities and practices to develop youth rugby players optimally. The current study aimed to determine the effect of a skills specific coaching education programme on the skill level of mini-rugby players in the Western Province Rugby Union. The participants of this study consisted of coaches (N=6) and players (N=181) from different primary schools in Cape Town, Western Cape Province, South Africa. The schools were selected based on the mini-rugby structure at the schools, to ensure a uniform environment between the experimental and control groups. Two of the four schools were randomly allocated to the experimental group (n=84) and the other two schools were randomly allocated to the control group (n=97). After being exposed to the 16-week skills programme, the experimental group, when compared to the control group, showed significant improvements (p<0.05) in five of the six skills (passing, catching, picking up the ball, tackling and taking the ball into contact). Although the control group improved in three of the skills, the improvements were not significant (p>0.05). A major finding of this study was that the skills specific coaching education programme significantly improved the skill level of the players.

***Keywords*:** Mini-rugby; Skill development; Skill assessment; Key factor analysis; Skills coaching; Coaching education.

INTRODUCTION

The design of age-appropriate activities and practices is essential to attract, retain and optimally develop young rugby players (Rutherford, 1993). The International Rugby Board (IRB, replaced by World Rugby (WR) in 2014, introduced mini-rugby as part of a well-defined training system for boys and girls (Rutherford, 1993). The main aim of mini-rugby is to introduce young players to the game, to encourage them to enjoy the game and to develop different rugby skills (Meintjies, 2017). In South Africa, various provinces have implemented games for juniors with adjusted rules (Lambert & Du Randt, 2010). In the Western Province Rugby Union (WPRU), mini-rugby is played at under seven, eight and nine age levels (Basson *et al*., 2018). In line with the Long-Term Athlete Development Model (LTAD) (Balyi *et al*., 2013), the South African Rugby Union (SARU) has outlined potential stages of development for boys and girls according to age: the 'fundamental' stage – age 6 to 9 years (U7 to U9); the 'learning to train' stage – age 10 to 13 years (U10 to U13); the 'train to train' stage – age 14 to 16 years (U14 to U16); the 'training to compete' stage – 17 to 18 years (U17 to U19); and the

'training to win' stage – age 19 years and above (Posthumus, 2013). The fundamental stage supports all aspects of the subsequent development of an individual in physical activity and should be well-structured and retain an element of fun (Stafford, 2005).

The development of players from novice to expert levels and the continued participation of players in a sport are key objectives for any sport governing body (Ford *et al*., 2012). However, player development will not occur instinctively, nor will potential be realised spontaneously when an athlete attends training sessions. Merely exposing young players to hours of training, without also stressing an appropriate instructional and training context, will not lead to the desired effects (Brylinsky, 2010). Therefore, the quality of the training sessions and what the player does during the sessions is of paramount importance. A series of specific and appropriately periodised, well-structured schedules for training and competition can go a long way to ensure optimum development (Nash *et al*., 2011). Progressing basic movement skills through such well-structured, fun activities and games will lay sound foundations on which subsequent, sport-specific skills can be developed (Stafford, 2005).

Research that explored views of elite coaches on mini-rugby, the elite coaches emphasised the need for a pathway of age-appropriate competitive games, where specialised skills were built sequentially on top of the foundations of core basic skills (Thomas & Wilson, 2013). The development of fundamental movement skills (FMS) is essential to ensure that correct movement patterns are mastered in a safe and fun environment to guarantee safe and effective performance of more complex sports movements at a later stage (Lloyd & Oliver, 2012). FMS lead to specialised movement sequences, which are required for adequate participation in many organised and non-organised physical activities, such as rugby (Hendricks, 2012). However, Smith (2016) argues that FMS and fundamental games skills (FGS) should not be seen as dichotomised entities, where FMS are taught in the early years and FGS in late childhood and youth years, but rather as complementary pairs and should be taught in complementary ways at all stages of skill development. Coaches need to recognise the complementarity between FMS and FGS and adopt a practical pedagogy that incorporates both FMS and FGS, to employ both game-centred learning and technical teaching approaches at all stages of skill learning (Smith, 2016).

Implications are that the player should be exposed to a variety of skills during the early stages of development. In doing so, the player will develop a sufficient, broad base of skills that could be used later to refine the more sport-specific skills to ensure proficiency. The skills of interest to mini-rugby include: running (at various speeds, through various directions and changes of direction); stopping (with balance and control); weaving and chasing through a variety of patterns; passing and catching (using as large a range of techniques and methods as possible); falling; rolling; jumping; etc. (International Rugby Board, 2011). The players must be provided the opportunity and encouragement to be active regularly to develop these skills specifically in mini-rugby, This can only be achieved by presenting well-structured, age-appropriate training sessions that allow for player development (Nash *et al*., 2011). Players should be developed and not just kept busy.

Plenty of opportunities to practise must be provided, and it should be enjoyable, but challenging and as representative as possible (McMorris, 2015). Sport skill instruction that focuses on LTAD provides the cumulative advantage to nurture talent, regardless of the training context in which it is offered (Brylinsky, 2010). Training sessions are the mechanisms through which coaches bring all the elements of effective practise together and are the points at which

they impart their craft to their athletes (Nash *et al*., 2011). Lloyd *et al*. (2015) highlighted that the success of any youth development pathway depends on the pedagogical abilities of coaches alongside the appropriateness of the structure that has been implemented. Similarly, Thomas *et al*. (2017) drew attention to the challenge of enhancing the skills of thousands of coaches at mini-rugby level who volunteered with limited experience, knowledge and expertise in coaching.

PURPOSE OF RESEARCH

Based on the above background, the aim of the current study was to determine the effect of a skills specific coaching education programme on the skill level of mini-rugby players. Specifically, the aim was to determine the effect of a 16-week individual skills specific coaching education programme on the ability of under 7, 8 and 9 mini-rugby players, respectively, to pass the ball, catch the ball, pick up the ball, take the ball into contact, evasive running and tackling.

METHODOLOGY

Study design

To assess the effect of a 16-week skills specific coaching education programme on the skill level of mini-rugby players in the WPRU, the researchers made use of quantitative research by conducting systematic field observations of the players. Babbie and Mouton (2001) explain that in baseline-testing, the subjects are measured in terms of a dependent variable, then exposed to a stimulus representing the independent variable and then retested (mid- and post-test), in terms of the dependent variable. For the purpose of this study, the skill level of the players represents the dependent variable to be measured and the skills specific coaching education programme represents the independent variable. Ethical approval (HS1199/2015) was obtained from the Research Ethics Committee: Human Research at Stellenbosch University.

Participants

The participants were selected from primary schools in the northern suburbs of Cape Town, South Africa. Cluster sampling was used to select the participants, based on the mini-rugby structure at the schools, like the number of training sessions per week (1 session per week), and the duration of each training session (60 minutes). This was to ensure a uniform environment, apart from the coaching activities and methodology, between the experimental and control groups. Four schools were included in the study, with each school providing under-seven (U/7), under-eight (U/8) and under-nine (U/9) groups. Thus, there were four groups per age group.

Two of the four schools were randomly allocated to the experimental group, and the other two schools were randomly assigned to the control group by the statistician. Before the start of the research project, the primary researcher conducted an information session with the school coaches, parents and participants to inform them about the rationale and process of the research project and they were provided the opportunity to ask questions. After the information session, coaches, parents and participants were asked to complete the consent and assent form if they agreed to participate in the research project. Players (N=181) who participated in the three age

groups of mini-rugby (U/7 to U/9) at the particular schools were included in the study as indicated in Table 1.

Table 1. **PARTICIPANTS PER GROUP**

Age groups	Experimental group	Control group	Total
Under 7	27	33	60
Under 8	26	26	52
Under 9	31	38	69
Total	**84**	**97**	**181**

Data collection procedure

Pilot study

The activities/drills which were used to assess the skill level of the players in conjunction with the key factors of each skill were tested using a pilot study before the start of the main study. During the pilot study, 20 rugby players from a primary school, who were not included in the main study, performed the baseline-test and after 28 days the same group of players completed the post-test. The results of the baseline- and post-test were subsequently compared, upon which the tests yielded the same results and the testing activities/drills. Therefore, the activities/drills were proven to be reliable and were included as part of the skill assessment.

20-week Intervention

Phase 1: Coach education training

The skills programme to which the experimental group was exposed between baseline, mid- and post-test was developed by the authors in conjunction with a specialist in mini-rugby coaching, the mini-rugby study guide used by the Blue Bulls Rugby Union and relevant skills development literature. The skills programme consisted of various activities/drills to address each of the six individual rugby skills applicable to the study. The programme included a detailed description of each coaching session that included a specific aim and focus, with an indication of the duration of each activity/drill, key factors for each activity/drill, coaching points for each activity/drill, layout for each drill/activity, as well as progressions to alter the difficulty to match the players' needs and aspects on which the coaches should focus on enhancing learning, area size and equipment required.

Each coaching session plan consisted of a 10-minute dynamic warm-up, followed by the 45-minute main part that consisted of technical activities/drills (through technical drill and small-sided games), and a 5-minute cool-down. Before the implementation of the programme, all the coaches of the teams in the experimental group, were given a 1-day training session consisting of theory and practical components presented by the primary researcher and the supervisor.

Phases 2, 4 and 6: Testing
The baseline-testing of all the participants was conducted at the start of the 2016 rugby season for primary schools, which was at the beginning of the second school term. To ascertain the progress of the participants during the study, or lack thereof, a mid-test was conducted midway through the rugby season of the schools, which was at the start of the third school term. The post-test of the participants occurred at the end of the rugby season, which was at the end of the third school term (after 16 weeks). The players' ability in passing the ball, catching the ball, picking up the ball, taking the ball into contact, evasive running and tackling during self-designed activities/drills were recorded and assessed using Windows Movie Player and the key factors for each of the six skills as prescribed by World Rugby. The key factors for each skill that was outlined in the World Rugby Coaching Key Factors manual were used in the skills assessment (World Rugby, 2015).

The analysis of the key factors breaks each individual, unit and team skills into different parts, which, when executed in the correct sequence, will enable the player to execute the skill correctly. Before the start of the skills assessment, each player was assigned a participant number which was allocated to the video footage. Each player performed the drill activities/drills individually with a size four approved rugby ball. Two video cameras were used to record the players' execution of each skill.

The primary researcher would watch each video clip on Windows Movie Player and either assign a tick (correctly performed the specific key factor) or across (incorrectly performed specific key factor) for each of the skills on Excel. After that, each player received a mark for each skill. The primary researcher was at liberty to pause, rewind and watch the tackle footage in slow motion before making a decision.

The reliability of the skills assessment was tested using an Interclass Correlation Coefficient (ICC) for intra-rater reliability. Intra-rater reliability was assessed by re-assessing 50% of the video clips after two years after the original assessment had been completed. During the intra-rate assessment, the primary was at liberty to pause, rewind and watch the clips in slow motion. The subsequently calculated ICC's showed the agreement between all the variables were perfect (1.00) and thus considered as reliable.

Phases 4 and 5: 16-week individual skills training programme
The 16-weeks was interrupted by the June/July school holidays, and therefore, was divided into nine weeks during the second school term and a further seven weeks during the third school term as presented in Figure 1. The complete skills programme consisted of 16 training sessions which were 16 hours in duration. The primary researcher requested feedback after each training session both positive and negative aspects and did frequent visits to the training session to check the implementation of the programme. During the same period, the control group continued with their regular rugby practises at their schools.
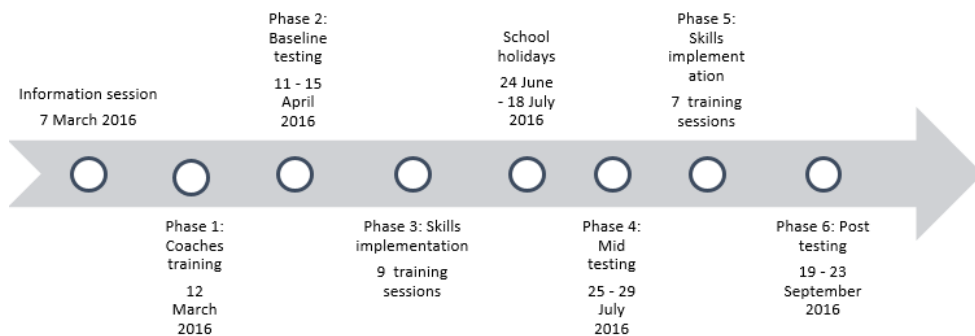
Figure 1.   TIMELINE FOR THE STUDY

Analysis of data

Each participant received a percentage mark, which represented the number of key factors performed correctly. Descriptive statistics were reported as means and standard deviations. Data were analysed using mixed model repeated measures ANOVA. In these analyses, age, group and time were treated as fixed effects. School nested in group and child nested in school*group*age were treated as random effects. Fisher's least significant difference (LSD) was used for post hoc testing. Cohen's d effect sizes (Thomas *et al*., 1997) were calculated, using the difference in means divided by the pooled standard deviation, to characterise the differences between baseline, mid- and post-testing for the experimental and control groups. The magnitude of Cohen's d effect sizes evaluated according to the following criteria: trivial (<0.2), small (≥0.2 and <0.6), moderate (≥0.6 and <1.2), large (≥1.2 and <2.0) and very large (≥2.0) (Hopkins, 2011). Results were considered statistically significant at p≤0.05.

RESULTS

The initial sample comprised 181 participants for both the experimental (n=84) and control groups (n=97). However, a few participants withdrew throughout the 16 weeks due to a variety of reasons, while others had not complied with the requirements originally defined relating to the attendance of the skills training programme. Table 2 presents a comparison between the three age groups for the experimental group. The results revealed a statistically significant improvement in all six of the skills from the baseline to the post-test within each of the three age groups. The U/7 group showed a large improvement in tackling (d=1.31) and picking up the ball (d=1.39), and a very large improvement in taking the ball into contact (d=2.58), from baseline to post-test.

The group also showed a moderate improvement in passing the ball (d=0.98), catching (d=0.72) and evasive running (d=0.74). The U/8 group showed a very large improvement in taking the ball into contact (d=3.66) and a large improvement in picking up the ball (d=1.57) from baseline to post-test. The group also showed a moderate improvement in passing the ball (d=0.66), catching (d=1.04), evasive running (d=1.08) and tackling (d=1.02). The U/9 group

made a very large improvement in contact (d=2.04) and a large improvement in picking up the ball (d=1.97) and catching (d=1.85). The group also showed a moderate improvement in passing (d=0.92), tackling (d=0.77) and evasive running (d=0.59).

The baseline to the post-test comparisons within each of the three age groups for the control group is presented in Table 3. The U/7 group showed improvement in passing, catching, evasive running and tackling while picking up the ball and taking the ball into contact, deteriorated (Table 3). The U/8 group improved in evasive running, tackling and taking the ball into contact and showed a decline in the remaining three skills of passing, catching and picking up the ball. The U/9 group deteriorated in all six of the skills from the baseline to the post-test.

The control group showed mixed results in that the U/7 group made improvements in four skills, namely passing, catching, evasive running and tackling, while the U/8 group made improvements in only evasive running, tackling and taking the ball into contact and the U/9 age group showed a decline in all six skills (Table 3). The U/7 group showed a moderate improvement in evasive running (d=0.76), and a small decline in picking up (d=0.48) from baseline- to post-test. A similar trend was observed with the U/8 group who also made a moderate improvement in evasive running (d=0.69) and a small decline in picking up (d=0.38) and passing (d=0.35), from baseline to post-test.

In comparing the experimental group with the control group, the results show that the experimental group showed statistically significant improvements (p≤0.05) in passing, catching, picking up the ball, tackling and taking the ball into contact. Although the experimental group did display improvement in their ability in evasive running, the improvement was not statistically significant (p=0.32).

Skill 1: Passing the ball

In comparing the experimental group and the control group, the results did not reveal any statistically significant differences for the three age groups (p=0.72). In Figure 2, the experimental group showed a moderate improvement from the baseline to post-test (d=0.81), a trivial improvement from the mid- to the post-test (d=0.01), and a large improvement from baseline to the mid-test (d=0.83) in passing the ball. The control group showed a small decline from the baseline to post-test (d=0.18), a trivial improvement from the mid- to post-test (d=0.01), and a small decline from baseline to mid-test (d=0.19) in passing the ball.

Table 2. **EXPERIMENTAL GROUP: BASELINE, MID- AND POST-TESTING SKILL SCORES OF DIFFERENT AGE GROUPS AND COMPARISONS WITHIN EACH AGE GROUP**

Skills	Base (n=84) M±SD	Mid (n=68) M±SD	Post (n=73) M±SD	Base *vs* Mid p	Mid *vs* Post p	Base *vs* Post p	Base *vs* Mid ES (d)	Mid *vs* Post ES (d)	Base vs Post ES (d)
Under 7	**(n=27)**	**(n=16)**	**(n=21)**						
Passing	48.04±21.38	66.67±17.09	67.52±18.60	0.00^	0.92	0.00^	0.96 (mod.)	0.05 (trivial)	0.98 (mod.)
Catching	51.85±23.94	73.61±20.06	66.67±16.46	0.00^	0.19	0.00^	0.99 (mod.)	0.39 (small)	0.72 (mod.)
Picking up	36.78±12.56	46.17±13.58	53.19±11.42	0.01^	0.09	0.00^	0.74 (mod.)	0.58 (mod.)	1.39 (large)
Evasive	51.78±11.21	57.00±9.60	59.71±10.62	0.24	0.37	0.02^	0.50 (small)	0.27 (small)	0.74 (mod.)
Tackling	32.78±20.32	51.00±15.81	57.24±17.21	0.00^	0.25	0.00^	1.00 (mod.)	0.39 (small)	1.31 (large)
Contact	29.07±16.65	53.89±17.26	67.90±13.54	0.00^	0.00^	0.00^	1.20 (large)	0.94 (large)	2.58 (v.large)
Under 8	**(n=26)**	**(n=23)**	**(n=22)**						
Passing	61.50±20.93	76.87±15.55	72.77±11.92	0.00^	0.35	0.00^	0.84 (mod.)	0.30 (small)	0.66 (mod.)
Catching	60.58±20.22	84.78±14.58	79.55±16.61	0.00^	0.22	0.00^	1.39 (large)	0.34 (small)	1.04 (mod.)
Picking up	35.77±16.09	54.30±14.42	59.86±15.09	0.00^	0.09	0.00^	1.23 (large)	0.39 (small)	1.57 (large)
Evasive	49.85±18.13	58.35±14.82	66.77±12.87	0.03^	0.01^	0.00^	0.52 (small)	0.62 (mod.)	1.08 (mod.)
Tackling	41.58±21.77	56.48±17.28	61.45±17.34	0.00^	0.35	0.00^	0.77 (mod.)	0.29 (small)	1.02 (mod.)
Contact	23.08±14.20	59.48±13.20	69.91±11.62	0.00^	0.00^	0.00^	2.70 (v. large)	0.86 (mod.)	3.66 (v.large)
Under 9	**(n=31)**	**(n=27)**	**(n=30)**						
Passing	65.61±19.65	77.15±13.83	80.47±12.30	0.00^	0.20	0.00^	0.68 (mod.)	0.26 (small)	0.92 (mod.)
Catching	55.65±15.42	84.26±12.30	85.00±16.87	0.00^	0.86	0.00^	2.07 (v. large)	0.05 (trivial)	1.85 (large)
Picking up	40.77±15.57	69.11±14.99	70.03±14.66	0.00^	0.65	0.00^	1.96 (large)	0.06 (trivial)	1.97 (large)
Evasive	57.45±13.45	59.11±17.01	65.10±12.84	0.69	0.04	0.01^	0.11 (trivial)	0.39 (small)	0.59 (mod.)
Tackling	49.94±19.78	68.00±12.07	64.50±18.90	0.00^	0.48	0.00^	1.10 (mod.)	0.22 (small)	0.77 (mod.)
Contact	46.58±15.58	68.11±13.93	72.67±9.64	0.00^	0.21	0.00^	1.48 (large)	0.39 (small)	2.04 (v. large)

Base=Baseline   mod.=Moderate   v. large=Very large   M=Mean   SD=Standard Deviation   p=p-Value   ES=Effect Size (d)

Table 3. **CONTROL GROUP: BASELINE, MID- AND POST-TESTING SKILL SCORES OF DIFFERENT AGE GROUPS AND COMPARISONS WITHIN EACH AGE GROUP**

Skills	Base (n=97) M±SD	Mid (n=72) M±SD	Post (n=68) M±SD	Base *vs* Mid p	Mid *vs* Post p	Base *vs* Post p	Base *vs* Mid ES (d)	Mid *vs* Post ES (d)	Base *vs* Post ES (d)
Under 7	**(n=33)**	**(n=24)**	**(n=25)**						
Passing	61.50±20.93	76.87±15.55	72.77±11.92	0.89	0.70	0.58	0.06 (trivial)	0.06 (trivial)	0.11 (trivial)
Catching	51.85±23.94	73.61±20.06	66.67±16.46	0.54	0.05	0.14	0.04 (trivial)	0.57 (small)	0.41 (small)
Picking up	36.78±12.56	46.17±13.58	53.19±11.42	0.21	0.20	0.01^	0.30 (small)	0.20 (small)	0.48 (small)
Evasive	51.78±11.21	57.00±9.60	59.71±10.62	0.00^	0.71	0.00^	0.60 (small)	0.13 (trivial)	0.76 (mod.)
Tackling	32.78±20.32	51.00±15.81	57.24±17.21	0.48	0.02^	0.09	0.08 (trivial)	0.71 (mod.)	0.57 (small)
Contact	29.07±16.65	53.89±17.26	67.90±13.54	0.00^	0.20	0.19	0.40 (small)	0.41 (small)	0.04 (trivial)
Under 8	**(n=26)**	**(n=21)**	**(n=19)**						
Passing	69.85±19.98	60.33±19.28	62.32±18.35	0.00^	0.97	0.01	0.49 (small)	0.11 (trivial)	0.35 (small)
Catching	70.19±17.35	64.29±14.94	67.11±14.56	0.13	0.68	0.30	0.37 (small)	0.20 (trivial)	0.19 (trivial)
Picking up	52.58±18.22	45.95±10.62	46.42±14.28	0.05	0.82	0.10	0.44 (small)	0.04 (trivial)	0.38 (small)
Evasive	48.27±19.38	56.33±12.89	59.26±10.84	0.01^	0.72	0.00^	0.49 (small)	0.25 (small)	0.69 (mod.)
Tackling	49.27±23.80	52.43±12.36	54.42±17.47	0.59	0.76	0.41	0.17 (trivial)	0.14 (trivial)	0.25 (small)
Contact	49.88±20.63	47.57±15.12	52.58±11.48	0.48	0.58	0.92	0.13 (trivial)	0.38 (small)	0.16 (trivial)
Under 9	**(n=38)**	**(n=27)**	**(n=24)**						
Passing	76.21±18.36	72.70±19.63	71.46±17.27	0.27	0.90	0.24	0.19 (trivial)	0.07 (trivial)	0.27 (small)
Catching	79.61±16.29	68.52±21.48	77.08±24.36	0.00^	0.06	0.57	0.61 (mod.)	0.38 (small)	0.13 (trivial)
Picking up	61.39±20.59	54.30±17.15	53.42±15.54	0.01^	0.67	0.01^	0.37 (small)	0.05 (trivial)	0.43 (small)
Evasive	63.37±13.08	56.48±14.96	61.71±10.76	0.02^	0.11	0.60	0.54 (small)	0.41 (small)	0.14 (trivial)
Tackling	64.53±24.12	55.63±22.60	59.71±17.01	0.01	0.29	0.23	0.38 (small)	0.21 (small)	0.23 (small)
Contact	62.76±21.17	48.63±14.32	57.63±15.24	0.00	0.01^	0.18	0.76 (mod.)	0.62 (mod.)	0.27 (small)

Base=Baseline   mod.=Moderate   M=Mean   SD=Standard Deviation   p=p-Value   ES=Effect Size (d)

Skill 2: Catching the ball

No statistically significant differences between the three age groups were found when the experimental group was compared to the control group (p=0.09). As shown in Figure 2 the experimental group showed a moderate improvement from baseline to post-test (d=1.16), a small improvement from mid- to post-test (d=0.21), and a large improvement from baseline to mid-test (d=1.41) in catching the ball. The control group showed a trivial increase in performance from baseline to post-test (d=0.05), a small decline from mid- to post-test (d=0.37) and a small decline from baseline to mid-test (d=0.41) in catching the ball.
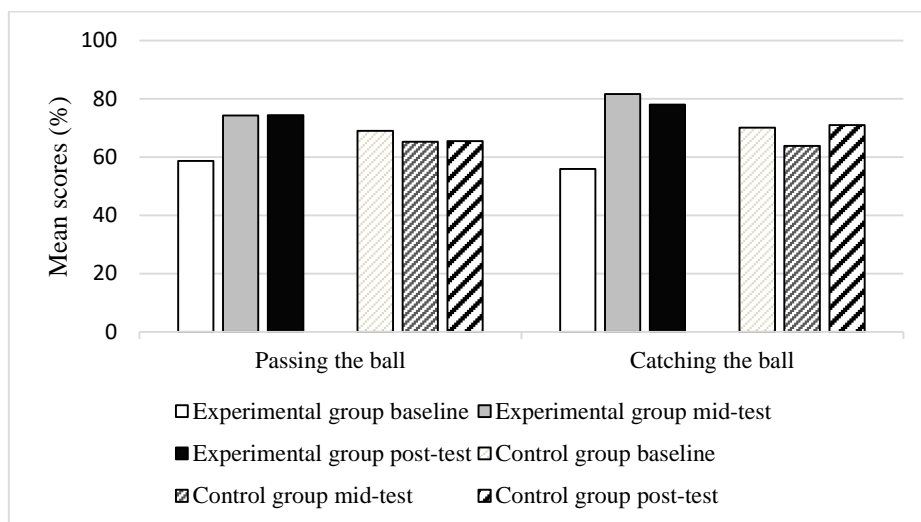
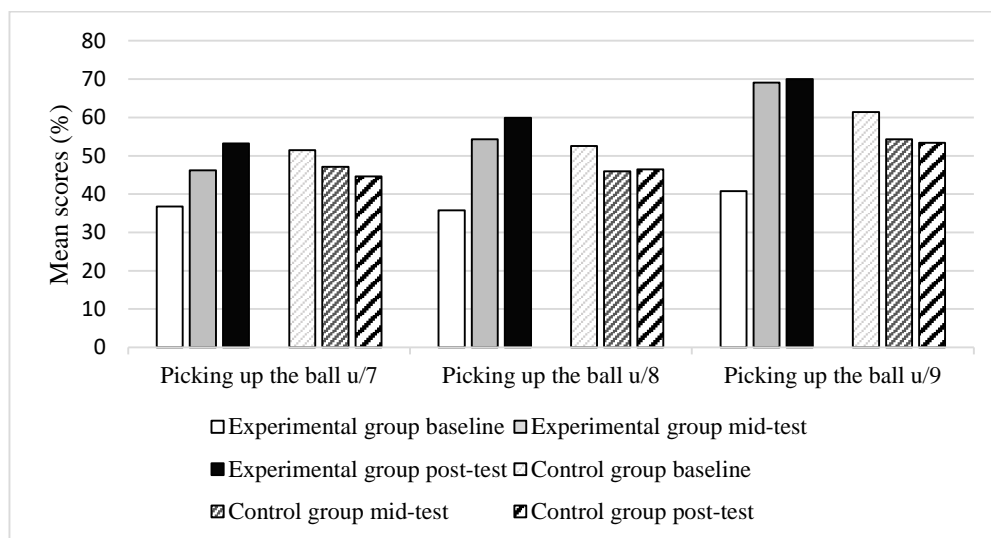*Figure 2.* **COMPARISON BETWEEN CONTROL AND EXPERIMENTAL GROUPS FOR PASSING AND CATCHING BALL**

Skill 3: Picking up the ball

In comparing the experimental group and the control group, the results revealed a statistically significant difference between the three age groups (p=0.04). As indicated in Figure 3 and Table 2, the U/7 group of the experimental group showed a moderate improvement from baseline to mid-test (d=0.74), a moderate improvement from mid- to post-test (d=0.58), and a large improvement from baseline to post-test (d=1.39). In contrast, the U/7 control group showed a small decrease from baseline to mid- to post-test (d=0.30), a small decrease from mid- to post-test (d=0.20) and a small decrease from baseline to post-test (d=0.48) (Figure 3 and Table 3).

As shown in Figure 2 and Table 2, the U/8 experimental group showed a large improvement from baseline to mid-test (d=1.23), a small improvement from mid- to post-test (d=0.39), and a moderate improvement from baseline to post-test (d=1.08). In contrast, the U/8

control group showed a showed a small decrease from the baseline to mid- to post-test (d=0.44), a trivial decrease from mid- to post-test (d=0.0.4), and a small decrease from baseline to post-test (d=0.38) (Figure 3 and Table 3). Lastly, in Figure 3 and Table 2, the U/9 experimental and control groups displayed near similar results of the U/8 groups.

The U/9 experimental group showed a large improvement from baseline to mid-test (d=1.96), a trivial small improvement from mid- to post-test (d=0.04), and a large improvement from baseline to post-test (d=1.97). In contrast, the U/9 control group showed a showed a small decrease from the baseline to mid- to post-test (d=0.37), a trivial decrease from mid- to post-test (d=0.0.5), and a small decrease from baseline to post-test (d=0.43) (Figure 2 &Table 3).

Figure 3.   **COMPARISON OF U/7, U/8 AND U/9 EXPERIMENTAL AND CONTROL GROUPS FOR PICKING UP BALL**
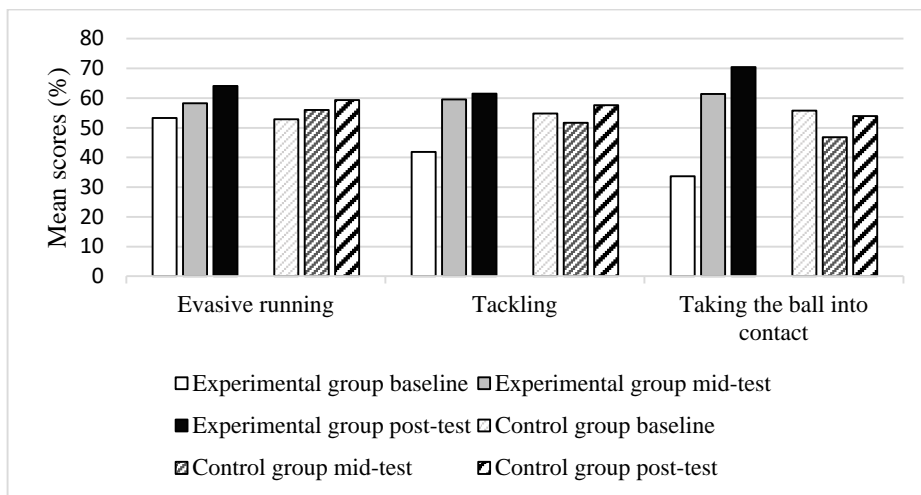
Skill 4: Evasive running

No statistically significant differences between the three age groups were found when comparing the experimental group to the control group (p=0.09). In Figure 4 the experimental group showed a moderate improvement from baseline to post-test (d=0.79), a small improvement from mid- to post-test (d=0.43), and a small improvement from baseline to mid-test (d=0.35) in evasive running. The control group showed a trivial improvement from baseline to post-test (d=0.18), a small improvement from mid- to post-test (d=0.25), and a trivial improvement from baseline to mid-test (d=0.18) in evasive running.

Skill 5: Tackling

No statistically significant differences between the three age groups were found when the experimental group was compared to the control group (p=0.55). In Figure 4 the experimental group showed a moderate improvement from baseline to post-test (d=0.99), a trivial improvement from mid- to post-test (d=0.11) and a moderate improvement from baseline to

mid-test (d=0.92) in tackling. The control group showed a trivial improvement from baseline to post-test (d=0.15), a small improvement from mid- to post-test (d=0.34), and a trivial decrease from baseline to mid-test (d=0.15) in tackling.

Figure 4. **COMPARISON BETWEEN CONTROL AND EXPERIMENTAL GROUPS FOR EVASIVE RUNNING, TACKLING AND TAKING BALL INTO CONTACT**

Skill 6: Taking the ball into contact

No statistically significant differences within the three age groups were found when viewing the experimental group and the control group (p=0.17). In Figure 4 the experimental group showed a very large improvement from baseline to post-test (d=2.37), a moderate improvement from mid- to post-test (d=0.67), and a large improvement from baseline to mid-test (d=1.62) in taking the ball into contact. The control group showed a trivial decline from the baseline to post-test (d=0.09), a small improvement from mid- to post-test (d=0.46), and a small decrease from baseline to mid-test (d=0.46) in taking the ball into contact.

DISCUSSION

The aim of this study was to determine the effect of a 16-week individual skills coaching education programme on the skill level of mini-rugby players in Western Province Rugby Union. The results show that all three age groups of the experimental group improved their ability in all six of the skills that were assessed. The experimental group did not display statistically significant differences between the age groups in five of the six skills (passing the ball, catching the ball, evasive running, taking the ball into contact and tackling), while a statistically significant difference between the three age groups was revealed for the skill of picking up the ball.

From the baseline to the post-test, the experimental group showed moderate improvements in their ability to pass the ball, catch the ball, evasive running and tackling, while they showed a very large improvement in their ability to take the ball into contact. Similarly, for the skill of picking up the ball, the U/8 group showed a moderate improvement, while the U/7 and U/9 groups showed a large improvement from the baseline to the post-test. In contrast, over the same period, the control group showed a small decrease in their ability to pass the ball and pick up the ball, a trivial decrease in their ability to take the ball into contact and a trivial improvement in the skills of catching a ball, evasive running and tackling.

The results of this study indicate that an organised and scientifically structured individual skills coaching education programme can have a positive effect on the skill development of mini-rugby players in the WPRU. This is in accordance with previous studies showing a positive relationship between a well-structured training session and optimum development of athletes (Stafford, 2005; Davids & Baker, 2007; Nash *et al.*, 2011). The results also speak to the fact that the quality of training sessions is as important as the quantity thereof and that mere engagement in activities does not by itself lead to improvement in performance, but rather that appropriate training is needed for learning and improvement to occur. This is consistent with studies highlighting the importance of the quality of a training session (Rink, 2003; Brylinsky, 2010; Silverman, 2011). The skills coaching education programme, which was utilised for the current study encompassed lead-up games, as well as age-appropriate activities with suitable progressions. These elements contribute greatly to the quality of such practice sessions (Stafford, 2005; Martens, 2012; Côté, 2013).

Another element that undoubtedly contributes to the quality of a training session is the ability of the coach (Nash *et al.*, 2011; Martens, 2012; Light *et al.*, 2015; Martindale, 2015; Gould, 2016) and the impact that effective coaches have on the improvement of the skill level of players have been illustrated by several studies (Côté & Gilbert, 2009; Nash *et al.*, 2011; Chase & Martin, 2013). Considering previous studies that have highlighted the positive effect of coaching education and training on coaching efficacy (Light, 2015), and taking into account the fact that the coaches of the experimental groups in the current study received training in the skills coaching education programme, it could be argued that these coaches were effective in implementing the programme. Although the training was limited, it was very specific to particular individual skills, and thus, it could be expected to have been very effective in preparing the coaches for and improving their competence in delivering the coaching education programme.

The significant improvements displayed by the experimental group in the current study, have important practical implications for the design and structure of mini-rugby training session plans. The results show that a well-structured training programme, like the skills coaching education programme to which the players in the current study were exposed, is of vital importance and an obvious necessity to foster skill development. Such training sessions should incorporate age-appropriate activities with suitable progressions to allow the coach to alter the difficulty of the exercises from simple to more complex. The practice plan should also allow for the element of play and fun through the use of warm-up and introductory games. It is furthermore essential to include and utilise the key factor analysis (KFA) for each of the various individual skills (World Rugby, 2015). These factors should be used for the step-by-step teaching of the particular skills to enhance learning by drawing the players' attention to specific aspects of the skill, as well as to correct errors. The necessity of appropriate coaching education

is clear and a detailed discussion on its significance to the skill development of players is beyond the scope of this study. Perhaps it is adequate to state that coaches will inherently influence the quality of programme delivery and will, therefore, greatly impact on the skill development of their players.

CONCLUSION

To the researcher's knowledge, the present study is the first to examine the effect of an individual skills specific coaching education programme on the skill level of mini-rugby players in the Western Province Rugby Union. A major finding of this study was that the skills specific coaching education programme significantly improved the skill level of the mini-rugby players. During the course of the programme the players showed noteworthy improvements in their ability to pass the ball, catch the ball, pick up the ball, run evasively, tackle, as well as their ability to take the ball into contact.

Except for the U/7 and U/8 age groups in evasive running, the three age groups of the control group scored higher than the experimental groups in all six skills in the baseline-test. However, after being exposed to the skills coaching education programme, the experimental group as a whole improved considerably from baseline to mid-tests. All three age groups of the experimental group also displayed an overall improvement from baseline to post-test in all six skills. This highlights the value of a well-structured and substantiated training programme, which incorporates age-appropriate activities/drills, suitable progressions and the elements of play and fun, as well as the necessity of a coach who is trained for the specific training programme.

The current study was, however, not without limitations, mainly due to time constraints. Due to the large number of players that needed to be assessed and the limited time available for the tests, the players executed each skill only once during the baseline, mid- and post-tests, respectively. Another limitation pertaining to time, is the fact that the schools, which were included in the study, only allowed one training session of an hour per week, with the second session allocated to playing a match. A further limitation concerns the initial baseline testing of the experimental and control groups. The fact that the experimental group tested considerably poorer than the control group in the baseline tests, meant that the experimental group had much more scope for improvement, which was subsequently observed.

Future studies should explore the findings from the current study further and specifically aim to assess the effect of more comprehensive training and education of the coaches, as well as a greater frequency of training on the effectiveness and success of such a skills intervention programme. This will help to further inform the design and implementation of future mini-rugby training programmes.

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Corresponding author: Dr. Wilbur Kraak; **Email:** kjw@sun.ac.za

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