

# The Use of Group-Based Reflective Practice to Enhance Badminton Players' Performance: An Exploratory Study

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## Abstract

The purpose of this study was to examine the effects of reflective practice (RP) on improving badminton players' performance. Sixteen developmental badminton players were subjected to a six weeks group-based RP intervention. A mixed methods research design was employed to collect in-depth information to answer the research question. Pre- and post-intervention data were collected on the badminton skills of lob and underarm serve. Individual interview was conducted to examine participants' perception on the usefulness of group-based RP in enhancing their own learning and performance. Quantitative data were analysed using paired samples *t*-test, while thematic analysis method was employed to analyse the interview data. Quantitative results showed that there was significant improvement in accuracy scores for lob ( $t = 2.21, p = .04$ ), serve ( $t = 4.65, p < .001$ ), total scores for lob ( $t = 3.15, p = .01$ ), and total scores of underarm serve ( $t = 3.98, p < .001$ ). Participants believed that the group-based RP enabled them to improve skill consistency that lead to better performance. It also improved their self-confidence, self-awareness, and increased their motivation in learning the sport.

**Keywords:** reflection, group, badminton, self-improvement, sport performance

## Introduction

Reflective practice (RP), as defined by Schön (1983), is one's capacity to reflect on own experiences as part of a continuous learning process. Indeed, the positive influence of RP on personal development has been established across several professions such as healthcare (Driscoll, 2000; Powell, 1989), social work (Ruch, 2005), and education (Loughran, 2002; Sellars, 2013). It is therefore not surprising that there is a growing number of studies that have examined the effects of RP for professionals in the area of sport and exercise including sport psychology (Anderson, Knowles, & Gilbourne, 2004) and coaching pedagogy (Irwin, Hanton, & Kerwin, 2004; Knowles, Gilbourne, Borrie, & Nevill, 2001; Koh, Chew, Kokkonen, & Chew, 2017).

The evolution of effective strategies employed by coaches to enhance coaching practice has consistently been linked to RP (Koh et al., 2017; Richards, Mascarenhas, & Collins, 2009). Recently, studies have shown that the use of critical reflection on personal values, beliefs, and roles can aid in the development of youth sport coaches (Koh et al., 2017; Peel, Cropley, Hanton, & Fleming, 2013). Indeed, RP is a good tool to facilitate and promote coach learning (Whitehead et al., 2016) as studies have shown that RP helps to increase coaches' self-awareness, enhance coaching knowledge, and professional development (Peel et al., 2013; Taylor, Werthner, Culver, & Callary, 2015; Whitehead et al., 2016; Winfield, Williams, & Dixon, 2013). Scholars also suggest that the incorporation of RP into coaching practice has the potential to create an environment which athletes can be empowered to engage with, and contribute to their technical and tactical development to yield long term benefits

(Richards et al., 2009).

Coaches may engage in reflection on training and competition matters, as well as challenges faced voluntarily. However, the effectiveness of such practice is dependent on their attitudes, perceptions, and understanding of RP. The lack of proper guidance may also affect the quality and effectiveness of RP (Koh, Mallett, Camiré, & Wang, 2015). Research has shown that having a positive attitude towards critical reflection is likely to benefit coaches and enhance their professional development (Andersen, Hansen, & Hærem, 2015; Koh et al., 2015). Since coaches' attitudes towards RP have been found to be diverse (Koh et al., 2015), and they may be reluctant to change their behaviours (Märgärit, 2013), there is a growing interest in how athletes can be better engaged in RP to enhance their learning and sport performance (Koh et al., 2017; Silvia & Phillips, 2011).

Recently, there is increasing empirical evidence suggesting that athletes can benefit from self-reflection and enhance their sport performance (Faull & Cropley, 2009; Koh et al., 2017; Neil, Cropley, Wilson, & Faull, 2013; Silvia & Phillips, 2011). For example, a case study on an elite triathlete by Faull and Cropley (2009) found that RP encouraged the athlete in the study to immerse in active problem-based learning. Through the RP experience, the athlete was able to approach and solve the problem effectively, instead of allowing it to affect his sport performance. This form of self-learning and improvement in sport performance is important for athletes, as it helps to improve their competence in coping with challenges independently and still be able to succeed (Faull & Cropley, 2009). Another study conducted on an elite cricketer by Neil et al. (2013) also showed similar results. The cricketer reported how the development of more functional

reflective thinking had helped him to improve his confidence, and enhance his ability to reflect on his sport performance critically to be self-efficacious and successful.

Cultural difference has been suggested to influence reflective behaviours and performance outcomes (Grossmann & Kross, 2010). While most of the studies that examined RP in sports were conducted in the Western countries (e.g., Andersen et al., 2015; Faull & Cropley, 2009; Silvia & Philips, 2011), there has been an increasingly number of studies examined in this subject area in Asian countries to advance this line of research (e.g., Koh et al., 2017; Tan, Koh, & Kokkonen, 2016). For example, in a study conducted on eight elite archers in Singapore, Tan et al. (2016) reported that athletes benefited from a guided reflective diary as it served as a reminder for them to reflect on their thoughts and performance (e.g., shooting form) during training. The guided reflection process also increased archers' motivation in training for personal improvement. Koh et al. (2017) extended Tan et al.'s (2016) study from an individual sport (archery) to a team sport (basketball) setting using a similar protocol. Specifically, they were interested to test the effectiveness of reflection-cards on sport performance in an elite youth female basketball team. Although no significant differences in performance were found, participants revealed that the reflection-cards helped them in goal-setting, identification of their strengths and weaknesses, and recognition of their personal efforts (Koh et al., 2017).

In sum, literature has demonstrated the beneficial effects of RP on athletes and coaches. Most of these studies involved RP practices that were facilitated by coaches of the teams, and there is a lack of studies which examined athletes using self-reflection to

improve their sport performance (Macquet, Eccles, & Barraux, 2012). Although athletes often gave positive feedback on RP in these studies, their sport performances were found to be in conflict with the findings and did not support the effectiveness of such a practice (Koh et al., 2017; Tan et al., 2016). This could be attributed to individual differences whereby certain individuals may prefer to be alone, or collaborate with another partner, or in a group (Tan et al., 2016; Threlfall, 2014). In fact, based on the *reflective practice spiral* proposed by York-Barr, Sommers, Ghore, and Montie (2001), RP in education can take place at four levels, starting with the deepest level of the individual, and approaching outward to the partner, then small group or team, and ultimately to the furthestmost layer, which is the school. This model of RP has the potential to be adapted into the sport context as the two settings share many similarities. For example, RP can be conducted in the sport setting with individuals, pairs or groups of athletes.

Many studies have shown that self-reflection can be beneficial to the individual in many ways. Some methods of self-reflection include writing reflective journals, blogs, diary, or reviewing one's own performance using video recordings. Study has also shown the benefits of collaborating with a partner in RP can further promote greater understanding of one's own actions (York-Barr et al., 2001). This is especially so when there is a high level of trust, elements of mutual support, and sense of challenge among them. Partner reflections can also result in increased social support and decreased feelings of seclusion. When RP is done in small groups or teams, both the potential impact of reflection and personal gain increase (York-Barr et al., 2001). When there are more individuals in a group,

the sense of connection and safety between them is different than with a partner. The group composition and level of commitment can thus affect the reflective interactions and outcomes of the RP in a positive way. For example, an individual's thought is challenged by a few group members, which may promote greater in-depth reflection and critical thinking. Huntley and Kentzer (2013) also mentioned that the presence of another person could impact the dynamic process of RP through active listening. When participants listen to the reflections of others, in return, they learn from their success and mistakes. Some approaches for partner and small-group reflections include interactive journaling, reflective conversations or critiquing each other's performances. Given that athletes tend to train in groups, regardless whether it is for individual or team sports, it is likely that group-based RP may be more appropriate for sport performance enhancement and personal development.

Many studies have examined the effectiveness of RP among elite athletes and coaches. Unfortunately, there is a lack of research on the same topic on other athlete populations such as developmental athletes<sup>1</sup> (Lyle, 2002). Indeed, many studies have revealed the huge disparity in knowledge learned and application between elite athletes and development athletes. For example, elite athletes were found to be more capable of handling competition pressure than developmental athletes (Gan & Anshel, 2006; Moss, McWhannell, Michalsik, & Twist, 2015). Moreover, Calmeiro, Tenenbaum, and Eccles (2014) also revealed the discrepancies in coping and appraisal strategies used by these two different types of athletes. For example, the differences in individual characteristics (e.g., learning style and coping processes) can

lead to different learning and performance outcomes. The purpose of the present study was to examine the effects of group-based RP on improving developmental badminton players' performance. It also sought to investigate the perceived benefits of using group-based RP as opposed to individual RP.

## Methods

### Participants

Eight male and eight female badminton players from a local international high school and a polytechnic each were recruited to participate in the study. The participants were recruited from their respective institutions through convenience sampling. One pitfall of this approach is that participants might share systematic similarities that make it difficult for researchers to generalise their findings to a wider population (Barton, 2001). This method was employed mainly because the second author has direct access to the participants. More importantly, the value of having this form of sampling is that it provides rich information as the participants are similar in ways meaningful to the research (Koerber & McMicheal, 2008). The participants were aged between 16 and 23 years old ( $M = 17.5$ ,  $SD = 0.6$ ), with at least two years of competitive playing experience at the high school/tertiary's level.

### Procedures

Prior to the commencement of the study, approval by the Institutional Review Board of the first author's university was sought. The subjects were informed of the aims, procedures, and their rights to withdraw from the study. They indicated their agreement to participate in this research by signing an informed consent

form. The participants' confidentiality and anonymity were also assured.

### Measures

**Skills performance test.** A skill performance test was administered to all participants before and after the six-week intervention programme. The participants were tested on two badminton skills, namely the lob and the underarm serve. These test items are commonly used in badminton to assess players' proficiency in a closed-skill setting (Chi, 1998). Participants' performance was measured in terms of accuracy and distance for each skill tested. Figure 1 shows the set-up of the badminton court for the tests. The scoring system for the tests is based on the numbers marked on the area. Row 1, 2, 3 and 4 represents the *distance scores* while column 1, 2, 3 and 4 represents the *accuracy scores*. The total score for each skill tested is summated from the distance score and the accuracy score (total score = distance score + accuracy score). For example, if the shuttlecock lands on "x," the total score given will be 4 (2 + 2); if the shuttlecock lands on "y," the total

score will be 5 (1 + 4). If the shuttlecock lands outside "x" or "y," 0 score will be awarded. Each participant was given five minutes for warm-up prior to taking the test. One trial on each test item was granted prior to the actual test. Results of the test were recorded electronically using Microsoft Excel sheet.

**Interview.** A semi-structured interview guide was developed to gather in-depth information from three randomly selected participants who have shown improvement in their performance upon completion of the intervention programme. The aim of the interview was to understand the perceived benefits of using group-based RP in personal development and performance enhancement among the badminton players. Some key questions included "What do you think about your performance in training?" "Do you think that you are showing progress?" "Were the training sessions with RP useful to you? If yes, in what ways? If no, why?" "As a whole, do you think RP is effective in enhancing your performance? If the answer is yes, how? If no, why?" and "What do you think you gained

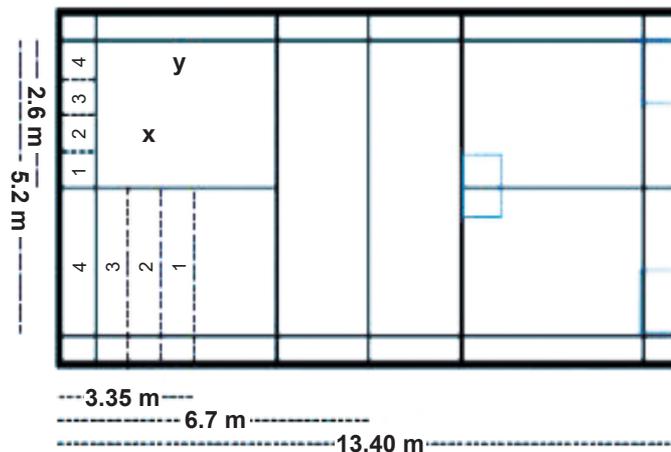


Figure 1. Set-up of the badminton court for the lob and serve skill tests.

most from this RP intervention? Give me some examples.” With the permission from the participants, the interviews were recorded using a digital audio recorder for data analysis.

### The RP Intervention Programme

A six weeks RP intervention programme was specifically designed to test its effectiveness on badminton players’ skills performance. All the participants underwent a total of six badminton sessions on a weekly basis in their respective schools. The second author carried out the programme throughout the intervention period to ensure consistency in protocol. Each session lasted for an hour. The intervention consisted of two phases:

#### **Phase I: Introduction to group-based RP.**

During the first session, the participants were introduced to group-based RP, its benefits, working mechanism, and limitations. They were also taught on listening and communication skills in a group-based RP setting to promote greater interaction and critical thinking among group members. The participants were also briefed on the procedures for the intervention. Subsequently, the participants were tested on lobbing and underarm serving skills to capture pre-intervention baseline data.

**Phase II: Skills training and practice of group-based RP.** From the second session onwards, participants were given one-hour training sessions on a weekly basis over six weeks. During each session, twenty minutes were set aside for the participants to practice the skills of lobbing, underarm serving, and group-based RP respectively. They were instructed to practice the badminton skills, and thereafter reflect upon their own performance in a group setting. They were encouraged to share their thoughts and responses with a partner or two

other members within a small group throughout the entire six weeks. Each group consisted of four to five players to ensure maximum interaction among group members. To facilitate RP, guided questions following Gibbs’ reflective cycle (Gibbs, 1988) were asked, “What went well?” “What did I do to make it go well?” “What didn’t go well?” “What did I do / didn’t I do that resulted in a poor performance?” and “What can I do differently?” The coach facilitated the groups’ weekly discussion by walking around and making himself available to listen to the participants when necessary.

### Data Analysis

The performance tests data were analysed using the Statistical Package for the Social Science (SPSS, Version 24.0). A paired samples *t*-test was used to examine the differences in performance test scores before and after the intervention for the two badminton skills identified. The level of significance was set at  $\alpha < .05$ .

All interviews were transcribed verbatim and analysed deductively using pre-established themes and sub themes (Sparkes & Smith, 2014). In this case, we were interested to know the benefits of using group-based RP to enhance badminton players’ development and performance. The data analysis procedure began with the division of the text from each interview into meaning units, which were given labels, called codes. Codes with similar meanings were grouped together in the next level of analysis resulting in higher-order themes and sub themes (Sparkes & Smith, 2014). The second author coded all the transcripts. In addition, thirty percent of the total transcripts were analysed by the first author independently. Consensuses were reached after examining the coding process

and in-depth discussions between both of them. This step is important to ensure that the data were analysed and interpreted accurately by the research team.

## Results

### Quantitative

Table 1 shows the performance scores for both the skills of lob and underarm serve, expressed in mean scores and standard deviations. A significant difference was found in the total lob skill scores for pre-intervention ( $M = 28.25$ ,  $SD = 2.05$ ) and post-intervention ( $M = 29.88$ ,  $SD = 2.55$ );  $t(15) = 3.15$ ,  $p = .01$ . Similarly, a significant difference was also evident in the total underarm serve skill scores for pre-intervention ( $M = 28.94$ ,  $SD = 3.32$ ) and post-intervention ( $M = 31.38$ ,  $SD = 3.40$ );  $t(15) = 3.98$ ,  $p < .001$ . These results suggest that group-based RP has a positive effect on both the lob and underarm serve skills performance of the badminton players in the present study.

There were no significant differences between distance scores for both the lob and underarm serve skills before and after the RP intervention. However, significant improvement

was found in the accuracy scores for both skills tested on the badminton players after the intervention. In addition, a significant difference was found in the lob skill accuracy scores for pre-intervention ( $M = 13.19$ ,  $SD = 1.42$ ) and post-intervention ( $M = 14.00$ ,  $SD = 1.75$ );  $t(15) = 2.21$ ,  $p = .04$ . There was also a significant improvement found in participants' underarm serve skill accuracy scores for pre-intervention ( $M = 13.63$ ,  $SD = 2.42$ ) and post-intervention ( $M = 15.44$ ,  $SD = 2.50$ );  $t(15) = 4.65$ ,  $p < .001$ . The results suggest that the group-based RP intervention could have improved the participants' performance in the two skills, specifically the accuracy of the lob and underarm serve.

### Qualitative

Analysis of the qualitative data revealed four key benefits, mainly (1) improved skill consistency, (2) improved self-confidence, (3) improved self-awareness, and (4) increased motivation (Table 2). Interview quotes that highlighted the participants' thoughts on the benefits of using group-based RP were selected and presented in-text to support the arguments

Table 1  
*Participants' Pre- and Post-Intervention Performance Scores on Lob and Underarm Serve Skill Tests*

Variables	Pre-intervention		Post-intervention		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Lob distance	15.19	1.42	15.88	1.31	1.66
Lob accuracy	13.19	1.42	14.00	1.75	2.21*
Lob total	28.25	2.05	29.88	2.55	3.15*
Serve distance	15.31	1.25	15.94	1.57	1.37
Serve accuracy	13.63	2.42	15.44	2.50	4.65*
Serve total	28.94	3.32	31.38	3.40	3.98*

\* $p < .05$ .

Table 2  
*Benefits on the Use of Group-Based RP Reported by the Badminton Players*

Theme	Sub-themes
Benefits	<ul style="list-style-type: none"> <li>• Improved skill consistency (9)</li> <li>• Improved self-confidence (9)</li> <li>• Improved self-awareness (8)</li> <li>• Increased motivation (3)</li> </ul>

*Note.* RP = reflective practice. The numbers in the brackets represent the number of times a code was repeated in the participants' interview transcribed verbatim.

put forth by the research team. To distinguish individual participants but at the same time maintain their anonymity, quotes are identified as P1–P3 for the players.

**Improved skill consistency.** All the participants believed that the group-based RP had aided them to be more consistent in performing the badminton skills learned and enhanced their confidence. P1 provided an example saying:

I feel that my strokes are more consistent and powerful now. In the past, I wasn't really confident with my service. However, through the training, I managed to improve my service. Last time, my lob was also not as consistent as now. However, after this short training, I was able to lob at a consistent distance and quality.

P2 provided another similar example saying:

I feel that I am more confident after going through the training. My lobbing and serving skills are slightly better. I feel more consistent in my strokes and accuracy. Previously I

had trouble controlling the power and accuracy [of my strokes] as somehow when I increased the power, the shuttle tended to move towards the right, if I used lesser power, it landed at three quarter court. My strokes are more consistent now.

P3 believed the intervention not only helped her identified specific weaknesses to work on but also enabled her to focus on executing consistent strokes. She said:

I believe it [RP] has some impact on my improvement in my strokes consistency. The RP training not only consists of technical skills, there is also some theory involved. It somehow gives me a set of ideas on how to work on my weaknesses and improve on the consistency of my skills execution.

**Improved self-confidence.** All the participants also discussed how the intervention programme had helped them to be more confident in managing and overcoming their fear and pressure on the court. As a result, they were able to execute the skills properly. One of the participants said:

Previously when I served, I felt fear and pressure in me as I was afraid that I can't execute a quality serve. But throughout the past few sessions, I was able to understand and cope with myself to be steady in my serve. I was more relaxed and comfortable when it came to service in a real game scenario. As I reflect back on how I was able to execute the ideal serve, I feel more confident about my badminton strokes, even though it's not perfect but definitely it is way better than before. (P1)

Another participant believed that the group-based RP intervention enabled him to be more systematic in his reflection during and after training, thus increasing his self-confidence in skill execution. He said:

Before the intervention, there were no proper guidelines on how and what to reflect on, but after going through the reflective training, I know clearly what to seek out to improve on certain things. Most importantly, what are the key things to focus on ... and eventually it becomes a habit. My underarm serve is more consistent, and it helps to increase my confident level. (P2)

P3 also shared an example on how the group-based RP had enabled her to be more confident in performing the skills of lob and underarm serve:

In the past, I wasn't really confident with my underarm serve. However,

through the training, I managed to improve my serve and thus, build my confidence level. Last time, my lob was not as consistent as now. However, after this short training, I was able to lob at a consistent distance. I feel more confident now!

**Improved self-awareness.** The group-based RP seemed effective in enhancing developmental badminton players' self-awareness level. In particular, knowing their strengths and weaknesses. One of the participants provided an example to illustrate this point, saying, "Throughout the group-based RP programme, I was able to see myself from a different angle. I became more aware of my strengths and weaknesses" (P1). P2 shared the same sentiment, saying:

[RP] helps [me] in knowing my strengths and weaknesses, giving me the proper set of strategies and framework to work on my technical skills [to get better]. I understand my own strengths and weaknesses better. When I start using more power, I need to tell myself to maintain my position and keep my swing consistent, so in a way I won't compensate accuracy for power.

The perceived improvement of self-awareness might have helped the participants' reflect and focus on specific areas to improve on. P3 shared how the group-based RP had encouraged her to take certain important actions to improve her badminton skills. She said:

This [RP] somehow gives me a

set of ideas on how to work on my weaknesses and improve on my consistency of shuttle placement. Before the serve, I need to tell myself to focus on the shuttle, maintain my body position, keeping my swing consistent with good follow through. I won't want to compensate the accuracy of my serve for power.

**Increased motivation.** Increased consistency in skills execution and self-confidence through the group-based RP process motivated the participants' desire to learn more in badminton training. P3 provided an example to illustrate her point:

I think that with [RP] I can look back on how I've changed and be more motivated to work even harder to achieve higher goals. This will not only benefit myself, but also the team in general. Because if we are able to improve together, the impact on the team will be bigger.

## Discussion

The aim of the present study was to examine the effects of group-based RP programme on developmental badminton players' skills performance, and to find out its associated benefits. The quantitative results showed that the participants were able to improve on their lob and underarm serve skills after the intervention, especially in the area of accuracy. This finding contradicts previous studies which showed no significant effects of self-reflection on performance (Koh et al., 2017; Tan et al., 2016). Such contrasting findings may be due

to different athlete populations studied such as elite versus developmental athletes. Indeed, past studies have suggested that developmental athletes may differ in learning behaviours as compared to their elite counterparts (Gan & Anshel, 2006; Moss et al., 2015). For example, elite athletes were found to have a higher level of stress tolerance and management as opposed to developmental athletes. In addition, the performance of elite athletes might already be considerably high, which makes it more difficult to see any significant improvements through RP (Tan et al., 2016). In contrast, developing athletes might be still in the developmental phase of their sporting careers, so their skill level is likely not as refined as the elite athletes. Hence, there may be more room for improvement for them.

It is also important to note that the method of RP used in the present study differs from previous studies (e.g., Koh et al., 2017; Tan et al., 2016) where the focus is on group-based than individual RP. Our results suggest that athletes could possibly benefit more from RP in a group-based setting as compared to an individual one. One possible reason could be the opportunity for group interaction under such a setting that may promote deeper reflection and interaction. In fact, group-based RP was commonly used in educational and training environments to enhance the development of professionals (Huntley & Kentzer, 2013). For example, in previous studies which examined the education of trainee doctors, participants reported that group-based RP helped them to share more honest and specific feedback, learn from each other's experiences and become better in their fields (Branch, 2010; Branch et al., 1991). Similarly, participants in the present study may be able to relate to each other's problems, and provide constructive and useful feedback to

improve each other's performance. Past studies also showed the important role of the learning facilitators in guiding and enhancing athletes' development in the RP process by asking key questions and proposing ideas to them (Culver & Trudel, 2006; Koh et al., 2015). Indeed, it is common for coaches to take on such facilitating roles (Collins & Durand-Bush, 2014). The present study contributes to research in sports coaching by presenting a novel idea, showing how peers can play the role of the learning facilitator (usually by the coach) in a group-based RP setting. Indeed, our result shows that it has the potential in contributing to the quality of learning and performance enhancement of developmental badminton athletes.

Gan and Anshel (2006) suggested that proficiency in skills execution could significantly influence athletes' cognitive appraisal of stress in sports. Indeed, elite athletes were found to cope better with stress as compared to their non-elite counterparts. As some developmental athletes might progress to the elite level later, it is paramount to equip them with necessary knowledge such as critical reflection so as to enhance their proficiency in appraisal of stress in competitive environments. This would be an important process to enhance their sport performance. Our qualitative findings revealed that participants' self-confidence improved after the group-based RP intervention. In particular, they were more proficient and comfortable when executing the skills learned. Improvements in participants' performance in the present study could also be attributed to the perceived increase in self-confidence. Indeed, many studies have shown a strong positive linear relationship between these two variables (Woodman & Hardy, 2003). For instance, earlier studies showed that self-confidence was found to be a significant predictor of performance in

long-distance running (Martin & Gill, 1991) and swimming (Burton, 1988). Recently, Koh et al. (2017) also demonstrated that reflection cards helped youth basketball players identify specific areas for improvement, thereby increasing their confidence and execution of skills learned when they were on court. The perceived increase in self-confidence as reported by the participants in the present study could have boosted their overall performance for the two skills tested.

Besides increased self-confidence, the participants also reported enhanced self-awareness during and after training. The participants became more mindful of their strengths and weaknesses, and paid more attention to the specific cues provided by their coach and peers during the group-based RP intervention programme. As a result of the active engagement in the RP process with group members, their level of self-awareness increased. As a result, it could have contributed to the improvement in performance by the participants. The results are consistent with a study by Faull and Cropley (2009), whereby a triathlete shared how RP contributed to the improvement in his performance. He had to be constantly aware of how he is feeling and the reasons underlying them, and what to do in certain circumstances. The more he is engaged in the process, the better he became. A similar finding was reported in another study by Tan et al. (2016), where elite archers reported increased sensitivity to their shooting with the use of a reflective diary. Such increase in self-awareness among the athletes might have enhanced their focus on the positive feelings, and specific cues in executing proper technique to achieve desired objectives (Neil et al., 2013).

## Implications

The findings of the present study have

significant implications on the field of RP. Our results support the belief that group-based RP has the potential to improve athletes' skills performance, increase their self-awareness, self-confidence, and motivation in learning (Faull & Cropley, 2009; Koh et al., 2017). The findings of the present study suggest that there are merits for developmental athletes to engage in group-based RP. Coaches may want to strive toward including group-based RP as part of their coaching strategies to enhance their athletes' performance in sports.

However, it should be noted that for group-based RP to be effective, athletes must first be interested in the practice. It is important to educate and convince the athletes about group-based RP, such as its usage and how it can be beneficial to their sport performance. Researchers have advocated that effective RP requires that individuals are skilled at doing so, and that the art of reflection is a skill which needs to be developed and nurtured (Andrews, Gidman, & Humphreys, 1998). It is important to note that athletes and coaches must first have interest and believe in the benefits of group-based RP on their personal development and sport performance. Subsequently, attention should be put into educating them about its usage as it should be taught explicitly, directly, thoughtfully and patiently (Russell, 2005). In particular, listening and communication skills in promoting greater interaction and critical reflection among group members.

## Limitations and Future Research

### Directions

The present study has contributed to the sport coaching literature by extending the RP research from elite athletes to developmental athletes, as well as from the individual RP

setting to a group-based RP setting. The mixed methods design employed in the present study also allowed the research team to delve deeper into the benefits of the group-based RP in enhancing their skills. While the findings are encouraging, especially on how group-based RP can enhance personal development and skills performance, it is important for readers to interpret the findings of this study with caution. First, there could be lack of consistency in terms of height and distance for the shuttles delivered during the lob tests, as the manual feeding of shuttles by the coach is prone to human error. Second, the present study only examined a relatively small sample size of 16 developmental badminton players from only two schools. It may not be an accurate representation of the same athlete populations. Future studies could test the effectiveness of group-based RP in other sports using a bigger sample size to advance our knowledge. In particular, the research should study youths in schools (as compared to those in elite teams) as there has been growing interest in this huge population participating in sports (Koh, Mallett, & Wang, 2011). Given the positive outcomes related to group-based RP, it would be beneficial if youths can be exposed to it earlier in their sporting journey, developing it as a life-skill that has long term merits. Third, the current study only examined two badminton closed skills in a training environment. Future study may want to test the effectiveness of group-based RP with other important skills in an open skill setting (e.g., actual competition) to advance this area of research. Fourth, the present study did not have a control group to clearly demonstrate the intervention effects. The improvement of participants' skills level might be due to training effects. Future studies should consider comparing a control group to an intervention group to better establish the

intervention effects. Finally, the questions used for group-based RP in the present study were taken from Gibbs' reflective cycle (Gibbs, 1988) to encourage participants to articulate and exchange their thoughts with their peers. Future studies could extend the current design to include other types of RP tools such as journal writing, video-taping, or mental reflection to advance our knowledge.

## Conclusions

The findings from the present study advanced our understanding of RP in sports coaching. Specifically, it has demonstrated how group-based RP intervention, over a short period of six weeks, can improve the performance of developmental badminton players, as well enhance areas of personal development such as self-awareness, self-confidence, and motivation in learning. As such, the use of group-based RP should be introduced to developmental athletes early in their sporting experience to aid in their development and performance. Although the effects of reflection might only manifest after a considerable amount of time has been invested, there has been strong evidence for its potential advantages as documented in past literature and also in the present study. Hence, it is an important research area that warrants further investigation to advance our knowledge. Our understanding in group-based RP is still in its infancy. We hope the present study is able to stimulate further discussion on RP in sports coaching.

## Footnotes

1. Athletes are selected based on skill level to take part in formal/structure competition. Commitment from athletes and coaches is high, and their relationship

is usually stable. For example, school or varsity athletics, sport clubs, etc.

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