

Alexander Bendiksen

Self-regulation

A single-case study on elite youth soccer players

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Summary

The purpose of this study was to examine whether a self-regulation training program would affect two elite soccer players daily use of planning, self-monitoring, evaluation and reflection. In addition, the players' performance with the ball was documented and analyzed to see whether the training program affected on-field performance. This study utilized a single-case design and included a baseline period (4 practices for both players) and an intervention period (3 practices for player one and 4 practices for player two). The training program was implemented before (planning and self-monitoring) and after (evaluation and reflection) each practice session. The players completed a questionnaire before the start of the intervention as well as at the end of the intervention period to look at changes in the use of self-regulation from pre- to post-intervention. In addition the players were filmed during practice games and their performance with the ball was subsequently evaluated by the author and an independent and experienced soccer coach. In addition, a short questionnaire was completed at the end of each practice session throughout the intervention period to track changes. The results suggest that both players increased their use of self-regulation, and improved their performance with the ball during the intervention period (no tests for significance were performed). Looking at differences, one of the players seemed motivated and genuinely interested in the intervention from the onset, while the other player didn't show the same enthusiasm. Summed up, this being a pilot study, there are indications that the self-regulation training program had a positive effect on the players use of self-regulation as well as performance with the ball.

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Foreword

Long before I was accepted as a student at NIH, I was adamant that I would become a full-time soccer coach by the end of my studies. Five years later I've reached this goal, becoming a full-time soccer coach in august of this year.

When choosing my master thesis, self-regulation stood out as an interesting topic early in the planning process. This was due to recent published articles and the importance self-regulation seems to play when trying to achieve the top level in soccer. I realized early that gaining extensive knowledge on this topic would add to my coaching repertoire and help improve the way I communicate with players on a daily basis. The opportunity to use the experience to further develop as a soccer coach was the most important reason for choosing self-regulation.

I would like to thank Geir Jordet and Tynke Toering for their extensive help throughout the year, making it possible for me to hand in the paper in time. I would also like to thank the two players and their club for giving me the opportunity to carry out the project. In addition I would like to thank the numerous people helping me with proofreading and encouragement.

1.0 Introduction

According to a FIFA survey (2001) approximately 250 million people from more than 200 countries regularly play soccer. The same survey adds that almost five million referees, assistant referees and other officials are directly involved with the game. In addition, an unknown number of people follow the game from the stands or on television. The game of soccer is hence important to a wide range of people and the importance of gaining scientific knowledge is crucial if the game is to continue developing through new training methods, medical research and the mental aspect to mention some factors. This study looked at the influence of self-regulation on two young elite soccer players using a single case research design. In addition the study has looked at the development of the self-regulation process in itself. Several studies focusing on self-regulation both in academia and sport have been conducted (e.g., Husman & Dierking, 2000; Kitsantas & Zimmerman, 2002, 2006; Zimmerman, 1999, 2000, 2001, 2002; Zimmerman & Kitsantas, 1997; Winne, 1995). None of these studies have looked at the effects of a self-regulation training program on soccer players like the present study does. The reason for researching this topic is because of the influence self-regulation of learning has shown to have on an individual's ability to accelerate the learning process and learn more effectively (Baumeister & Vohs, 2004). The time one has to reach a top level in soccer is short and self-regulation could be an important tool to more effectively utilize this short time span. In addition, the adaptation process to different environments and settings becomes easier when one self-regulates (Schmeichel & Baumeister, 2004). Self-regulated learners also take an active part in their own learning process (Zimmerman, 1989, 2006). The main purpose of the present study was to assess the effects of a self-regulated learning. The intention was further to make the players more aware of their actions in training and to try to influence and increase their use of self-regulation in daily soccer practice. In addition, the study looked at whether a self-regulation training program would affect the players' performance with the ball. Every ball possession was evaluated and given a score.

Self-regulation can be defined as self-generated thoughts, feelings, and behaviors that are planned and cyclically adapted based on performance feedback (Zimmerman, 1989, 1998). Baumeister and Vohs (2007) further stated that 'regulation means change; especially change to bring behavior (or other states) into line with some standard such

as an ideal or goal. Changing one's behavior so as to follow rules, match ideals, or pursue goals is thus a (very useful) form of self-regulation'. The term self-regulation was first introduced in combination with academia by Zimmerman and Schunk (1989), creating the term self-regulated learning. According to Zimmerman (1990), this perspective has serious ramifications for how teachers should work with students and the way schools should be structured. The term self-regulated can be used to describe learning that is guided by metacognition (thinking about one's thinking), strategic action and motivation to learn (e.g., Boekaerts & Corno, 2005; Butler & Winne, 1995; Perry, Phillips, & Hutchinson, 2006; Winne & Perry, 2000; Zimmerman, 1990). Zimmerman (2008) constructed a cyclical model of self-regulation consisting of three phases; (1) the forethought phase where the athlete develops a plan consisting of goals and strategies which will help to guide that individual through the upcoming activity, (2) the performance phase where the athletes constantly makes himself aware of whether they have developed the appropriate plan to perform at a high level and attain their preset goal, and (3) the self-reflection phase where the athlete evaluates his performance according to outcome, in addition to evaluating if the plan set before practice needs to be modified or changed. Summed up, self regulation will not produce instant success or expertise but can help facilitate the learning process when acquiring knowledge and skills (Zimmerman, 2006)

1.1 Self-regulation in academia

Studies on self-regulation in academia indicate that the following six characteristics distinguish those using self-regulated learning (SRL) from those who do not. Firstly, those using SRL are accustomed with and know how to utilize a number of cognitive strategies (repetition, elaboration and organization), which help them to minister to, develop, organize, improve and recover information (e.g., Weinstein, Husman & Dierking, 2000) Secondly, they know in which way their mental processes should be planned, controlled and directed towards personal goal achievement (metacognition) (e.g., Winne & Perry, 2000). Further, they show a significant sense of academic self-efficacy, they embrace learning goals, and establish positive emotions towards tasks as well as the ability to control and change these, adjusting them to the requisite of the task and of the specific learning situation (e.g., Zimmerman, 1999, 2000, 2001, 2002). The fourth characteristic indicates that they are good at time management, and they know how to construct encouraging environments, such as suitable places to study, and help-

seeking from teachers and classmates when they are faced with tough challenges (e.g., Butler & Winne, 1995; Zimmerman, 1990). Further, to the extent that it is possible, they show extensive endeavor to part take in the control and regulation of academic tasks, classroom climate and structure (e.g., Boekaerts & Corno, 2005; Perry, Phillips, & Hutchinson, 2006). Lastly, they are able to create and use strategies, aimed at avoiding both internal and external disturbances, in order to preserve their concentration, effort and motivation while performing academic tasks (e.g., Corno, 2001; Winne, 1995)

As Pajares (2005, p. 345) indicated, ‘The evidence demonstrates that what is needed for children to become skilled self-regulators is a growing awareness of their own capabilities, including their cognitive, motivational and affective functioning. At the same time, teachers and parents will do well to recall that self-regulation and self-efficacy are ‘not so much about learning how to succeed as [they are] about learning how to persevere when one does not succeed’

1.2 Self-regulation and sport

Although self-regulation has been studied in academia for several decades, the research on self-regulation in sports has become increasingly more intense only in recent years, and several studies have shown a positive relationship between the use of different self-regulation processes and athletic achievement (e.g., Cleary & Zimmerman, 2001; Kitsantas & Zimmerman, 2002, 2006; Zimmerman & Kitsantas, 1996; Zimmerman & Kitsantas, 1997). In an early study on self-regulation and sport, Kirchenbaum, Ordman, Tomarken and Holtzbauer (1982) found that self-monitoring is an effective self-regulation process. Three studies looking at self-regulation and dart-throwing provided support for a cyclical model of self-regulation because of improvements shown in the forethought phase, performance phase, and the self-reflection phase (Kitsantas & Zimmerman, 2006; Kolovelonis, Goudas & Dermitzaki, 2010). The studies further showed the necessity of guidance in the early phase of training when learning a new set of skills in order to optimize engagement in effective self-regulated practice. In addition, the studies indicate the importance of providing positive social feedback and encouraging students to set process goals and to self-monitor their own performance. A single-subject study supported the use of mental skills training packages in athletic settings (Wanlin, Hrycaiko, Martin, Mahon, 1997).

Cleary and Zimmerman (2001) completed a study which looked at self-regulation differences between expert, non-expert, and novice basketball players in the forethought and self-reflection phase. The study was conducted during practice sessions in a gymnasium without the presence of other students. Measures were self-efficacy, self-satisfaction, goal-setting, strategy choice, attributions and shooting skill. The shooting skill results showed a significant difference in free-throw percentage favoring the experts (76%) over both non-experts (58%) and novices (42%). In addition to superior free-throw shooting, the findings in this study showed that experts demonstrated a higher level of self-regulation than non-experts and novices in both the forethought phase and the self-reflection phase. A similar study compared self-regulatory processes among expert, non-expert and novice volleyball players (Kitsantas & Zimmerman, 2002). All participants were measured on serving skill, strategy use, self-monitoring, self-evaluation, self-satisfaction with performance, self-efficacy, intrinsic interest, perceived instrumentality, self-satisfaction, goal setting, planning, attributions, and adaptation during a practice session. Results indicated a significant difference on all twelve self-regulated learning favoring the expert group. It is worth noting that experts showed a significantly higher level of self-regulation than non-experts despite similar volleyball experience, knowledge of serving, and age. As supported by previous studies (Cleary & Zimmerman, 2001; Zimmerman & Kitsantas, 1997), experts demonstrated a higher level of forethought than both non-experts and novices by setting specific technique or process goals. Results further indicated that experts outperformed non-experts and novices in the performance phase as well. Tests combining all of the self-regulatory processes showed that they contributed to 90% of the variance in volleyball serving. A study on the basketball free-throw ability utilizing Zimmerman's (2008) cyclical model of self-regulation showed that multiphase training of self-regulation processes resulted in superior shooting performance and made players more process-orientated with regards to strategic planning and when evaluating and reflecting on performance (Cleary, Zimmerman & Keating, 2006). As reported in both Zimmerman and Kitsantas (1996) and Kitsantas and Zimmerman (2002), this study supports the notion that athletes can learn and refine motor skills by becoming more cognizant and aware of specific errors they make.

In a recent study on self-regulation and soccer, Toering, Elferink-Gemser, Jordet, and Visscher (2009) examined the relationship between self-regulation and performance

level in elite and non-elite youth soccer players (from Holland). A total of 444 youth soccer players participated in the study and were divided into either elite (n=159) or non-elite (n=285) dependent on whether they played for a professional club's youth team or at a lower level. A questionnaire was used to assess the following measures; planning, self-monitoring, evaluation, reflection, effort and self-efficacy. Results showed that, on average, elite players scored higher than non-elite on all of the self-regulatory measures. Further, effort and reflection were significantly related to performance level. Players with a high reflection score were almost five times (4.9) more likely to be part of the elite group than those scoring low. When looking at the aspect of effort, the players scoring high were seven times (7.07) more likely to belong to the elite group than those scoring low on the same measure. In total almost half of all participants in the elite group scored high on these two measures, whereas only about one fifth of the players in the non-elite group scored high on the same measures. At the same time, there were only a small number of players in the elite group who scored low on reflection and effort. The authors conclude by stating that elite soccer players tend to reflect more on their performance and exert more effort into training/competition and thus may be factors contributing to reach the elite level in soccer.

1.3 Intervention studies

The studies discussed under *self-regulation and sports* give strong indications that self-regulation has positive effects on sport performance. However, few studies on self-regulation and soccer exist (e.g., Toering et al., 2009; Toering, Elferink-Gemser, Jordet, Jorna, Pepping, & Visscher, 2011). Nonetheless, several recent intervention studies in academia have showed promising results with regards to self-regulated learning. Cleary, Platten, and Nelson (2008) looked at the effects of a self-regulation empowerment program on high school students' academic performance. The training program lasted for 11 weeks and a total of 23 sessions (twice a week) which lasted for about 50 minutes each. The training program was based on Zimmerman's three-phase cyclical dynamic feedback loop of self-regulation including the forethought phase, performance phase, and the self-reflection phase. In short, the program focused on sequence and content of instructional modules which consisted of enhancing students' awareness of their maladaptive beliefs, such as poor causal attributions (e.g., blaming failure on tests to poor ability), and providing explicit instruction in significant forethought processes, such as goal-setting, strategic planning and task analysis. Second it emphasized strategic

thinking which involved teaching students that success in school was entirely under their own control if they put the effort in developing and refining study strategies. In summary, the students raised their grades to either class average or higher. The authors conclude that for students to achieve academic success, they must be taught effective learning strategies in addition to forethought and reflective thinking skills. When equipped with such skills, students will become more active and strategic in their own learning process. Further, Ramdass and Zimmerman (2008) looked at middle school students and the effects self-correction strategy training had on math performance and several self-regulation processes. A total of 42 participants (5th and 6th grade) from a parochial school took part in the study. Students from both grade levels were randomly assigned to either a training group or a control group. The study consisted of four different phases; pretest, training, problem solving and posttest. Results showed that participants in the experimental group outscored those in the control group on self-efficacy accuracy, self-evaluation accuracy, and math performance. While acknowledging that these results cannot be generalized beyond the two grade levels or parochial schools, the authors suggest that teachers need to monitor students' self-efficacy judgments as well as their mathematics learning in order to provide optimal instruction. In a third intervention study, Housand and Reis (2008) looked at self-regulated learning and reading. This was a case study looking at two different 5th grade classrooms where one was considered a classroom high in self-regulation and the other low in self-regulation. The classrooms were differentiated using several tests like the Naglieri Nonverbal Ability Test (NNAT: Nagliere, 1997), high achievement scores and teacher nominations. The study focused on identifying differences both within the same classroom and when comparing classrooms. The study specifically looked at environmental conditions and instructional methods in the high self-regulation classroom as well as differences on these measures between the two classrooms. The intervention was conducted by using The Schoolwide Enrichment Model–Reading which is an enrichment approach to reading instruction and strategy development designed to increase self-regulated learning and reading achievement and is based upon foundational work by Vygotsky (1978). In short, results indicated that students who used self-regulation created a better learning environment and were better suited for learning than those who did not use self-regulation.

These intervention studies are all somewhat similar to the present study in the sense that all use a training program to both increase the use of self-regulation and improve a certain performance measure. The study by Cleary et al. (2008) is particularly similar because it utilizes Zimmerman's cyclical model (2008) in developing the training program. The environmental setting is different in the present study, (taking place in a soccer arena) and participants are possibly at greater risk of being subject to interferences than would be the case in a classroom. Self-regulated learning and performance development in soccer has, to my knowledge, not been studied previously, but the fact that students who become accustomed to using self-regulated learning strategies improve their academic performance in contrast to students not accustomed to this type of learning makes it interesting to research whether the same results will appear in a soccer setting.

The present study utilizes a single-case research design mainly because of the difficulty of recruiting elite players. In addition, changes in performance will most likely be a result of the intervention and not accidental factors if the graph of the baseline level changes following the introduction of the intervention. This is accomplished by having subjects who are yet to receive the intervention acting as controls by continuing to demonstrate the consistency of external variables. Another advantage is the elimination of the need to withdraw the intervention to determine whether performance trends will return to levels pre intervention. Several other similar studies have used the single-case research design (e.g., Blair, Hall and Leyshon, 1993; Hamilton & Fremouw, 1985; Jordet, 2005; Landin & Hebert, 1999; Marlow, Bull, Heath & Shambrook, 1998; Mellalieu, Hanton and O'Brien, 2006; Shambrook and Bull, 1996; Wanlin, Hrycaiko, Martin, & Mahon, 1997; Ward & Carnes, 2002). The fact that elite players are difficult to access; numbers of participants are usually low, which in some cases could be a disadvantage. On the other hand the present study has high ecological validity because of the real-world setting. The present study uses a questionnaire to track the players' progress which is based on existing reliable and valid questionnaires (paper in preparation, Ripegut; Toering et al. 2009). Video recording of practice sessions are used when evaluating and tracking changes in performance with the ball.

The present study focused on the metacognitive processes of self-regulation and was based upon Zimmerman's (2008) three-phase model where the learning cycle is divided

into three different stages; the forethought phase, the performance phase and the self-reflection phase. The intervention in the present study was developed to cover the different stages; before practice (planning), during practice (self-monitoring) and after practice (evaluation and reflection). This is in line with Zimmerman's model (2008) where athletes develop a plan beforehand, mentally track their performance while practicing, and evaluate and reflect on their performance after practice. The main purpose of the present study was to test whether the intervention worked as intended, making the players more self-aware of their actions in training and try to influence and increase their use of self-regulation in daily soccer practice. In addition, the study looked at whether the self-regulation training program would affect the players' performance with the ball. This was done because of the importance of linking the use of self-regulation to on-field performance.

2.0 Methods

2.1 Participants

The study initially involved three male elite adolescent soccer players. One of the participants, however, got injured just prior to the start of the intervention period, and therefore had to be excluded from the study. The two remaining players were 17 and 19 years of age respectively. These two players were part of a professional soccer club in the Norwegian Premier Division and one of them had, at the time of the intervention, recently been part of the national team for his age group. In addition, both players had been training regularly with the clubs' professional team. Both players are part of the reserve team, playing in the Norwegian 2nd division, practicing 5 times a week. In addition they are practicing 3 times a week at the football program at their high school, accumulating a total of 14.5 hours of organized team practice per week. No aspects of the study were revealed or discussed with outside parties.

2.2 Research Design

A single-subject multiple-baseline design was implemented (e.g. Hrycaiko & Martin, 1996). This design works primarily as an AB design where the baseline ("A") is tracked, and then a type of treatment ("B") is implemented. The change in performance is shown to be a result of the intervention and not accidental factors if the graph of the baseline level changes following the introduction of the intervention. It was suggested by Kazdin (1984) that the multiple-baseline-across-individuals supersede the AB design because the intervention is implemented to different subjects at different points in time. This is accomplished by having subjects who are yet to receive the intervention acting as controls by continuing to demonstrate the consistency of external variables. Another advantage is the elimination of the need to withdraw the intervention to determine whether performance trends will return to levels pre intervention. Consequently, this process will obliterate the danger of gaining 'corrupt' data from subjects who continue to use elements of the intervention procedure (Shambrook & Bull, 1996).

The baseline periods were randomly predetermined for each participant due to time constraints. Though admittedly this might not be the ideal procedure, still a three trial baseline as recommended by Barlow and Hersen (1984) was established. Because of various circumstances both players were filmed a total of four times during the baseline

sampling. However, for the second player two of these recordings were made as player number one received the intervention. This introduction of a treatment staggered over time ensured that the changes in performance were due to the treatment rather than to uncontrolled variables (Kazdin, 1982). The order of participants was also determined at random.

2.3 Procedure

A professional Norwegian soccer club based in the Oslo area was approached to recruit participants for this study. The club's senior team is currently playing in the Norwegian Premier Division, thus the participants were regarded as elite-players. After the club gave permission to contact the players for taking part in the study, parents were contacted and both players and parents gave their written consent for participating.

The intervention focused on four aspects of self-regulation looking at influencing the players' planning, self-monitoring, self-evaluation and reflection. The purpose was to increase the players' awareness of learning processes before, during as well as after practice. The author functioned as instructor having extensive knowledge on self-regulation in addition to working daily as a soccer coach. The intervention was carried out three times a week and split up in two separate sessions; one before practice and one after practice. The session before practice consisted of planning and self-monitoring, while the session after practice focused on self-evaluation and reflection.

Approximately 10-15 minutes was used both before and after practice in quiet surroundings one on one with the instructor. At no point did the intervention interfere with the on-field practice.

Long and short questionnaire

The self-regulation questionnaire (paper in preparation, Ripegut) was completed once pre intervention and post intervention in quiet surroundings with the author present. A shorter version of the self-regulation questionnaire was also developed in order to shorten the completion time. This was done because of school commitments immediately after practice. This version was completed after each practice session during the intervention period in order to track changes in the participant's use of self-regulation aspects during this period.

The long and short version questionnaire can be found in appendix A and B, respectively.

Video recording

Data was collected from practice games at regular training sessions. Seven of the nine practice games recorded consisted of 8v8 (7 outfield players and 1 goalkeeper on each team) on regular sized goals (7.32m x 2.44m) and a field of 50m x 30m. The last two practice games consisted of 4v4 on regular sized goals (7.32m x 2.44m) and a field of 32m x 17m. Each practice game played on the larger pitch lasted for 15-20 minutes, while the games played on the small pitch lasted for 5-8 minutes. All practice games were recorded by the author using a JVC Everio video camera (model nr: GZ-MG142E). The two subjects were both filmed 4 times prior to the start of the intervention in order to establish a baseline. Thereafter the participants were filmed in 3 and 4 times respectively during the intervention period. All recordings were uploaded on a computer and games were analyzed using Windows Media Player on a big screen TV (52”).

2.4 Self-regulation intervention

Before practice (Planning and self-monitoring)

When one is preparing to perform at ones desired level, either the learner or instructor has to analyze the upcoming task in order to set applicable practice goals and strategies for attaining those goals (Ericsson, 1996). In this study, players knew in advance the setup of practice and which tasks would be included. Given this prior knowledge, the players could analyze the learning tasks and as a consequence make the goal setting process more specific in terms of intended actions or outcomes (Locke & Latham, 2002). The process of self-monitoring refers to mentally tracking one’s performance, which is a process used more systematically and effectively by experts compared to non-experts (Kitsantas & Zimmerman, 2002)

Planning

Firstly, the players were asked what their goal(s) for the forthcoming practice was. They were asked to describe their goal(s) and why they had set this particular goal. In addition, players were asked how they intended to reach their goal(s), by describing the strategies they would put in place. Examples of questions asked: ‘What is your goal for today’s practice?’ and ‘How do you plan to attain this goal?’

Self-monitoring

Secondly, the players were asked how they would track their performance during practice and make sure they were making progress towards attaining their goal. The players were also asked how they would make sure that the strategies were implemented during practice.

After practice (Self-evaluation and reflection)

When evaluating and reflecting on the quality of one’s own performance, the standards the players set for themselves will be crucial. When standards are too high or too low, the learning process and performance will diminish (Schunk, 1983). Consequently self-evaluations are not automatic outcomes of performance but, rather, depend on an individual’s selection and interpretation of an appropriate criterion (Bandura, 1991).

Meanwhile, reflection can help future experts cultivate mechanisms they can use to improve their performance. The way to use and process information is continually acquired by future experts, which helps them attain greater control over performance aspects deemed significant (Ericsson, 1998).

Evaluation

At the end of practice the players were asked to evaluate their performance during practice in relation to the practice goal(s) and strategies they had set beforehand. Examples of questions used were: “Did you reach your practice goal?” or ‘Was the strategy you developed effective?’

Reflection

The players were also asked to reflect on their performance by contemplating reasons for success and/or failure during practice in relation to their practice goal. In addition, players were asked if and how they would use the knowledge they gained during practice in preparation for the next practice session. Examples of questions used were: ‘What do you think caused you to succeed in attaining/not attaining your practice goal?’ or ‘Did you gain any new knowledge from this practice and how will you use this information when preparing for your next practice?’

A complete list of the questions used in the intervention can be found in appendix B, while all the answers can be found in appendix D.

2.5 Procedural reliability

The term procedural reliability refers to the reliability when applying standardized tests and scoring procedures (Hinderer & Hinderer, 2005). If procedural reliability is established, it will increase the probability that changes in performance are due to indubitable changes in status, and not due to external circumstances. Failing to do so could result in concluding that the treatment was effective when, in circumstance, the change came as a result of a change in the experimenter’s behavior. This means that the treatment given to the participants must be assessed continuously to make sure that the treatment is applied as intended and that behavioral changes are in fact due to the treatment. When this is done properly it helps to certify treatment integrity, increase research replicability and strengthen interpretation of results (Hrycaiko & Martin, 1996).

In this study procedural reliability was established by having the players fill out a short questionnaire after each practice session. The purpose of this questionnaire was first to document that the players in fact implemented and used the different parts of the intervention in their daily training. It provided important data both on changes in the use of self-regulatory aspects as well as changes in perceived performance. Secondly the questionnaire worked as a tool to foster further or increased use of the different self-regulatory aspects. The elite status of the players in addition to limited time available due to school commitments immediately following the practice sessions it seemed vital

that such a questionnaire should be specific, meaningful, and quick to complete. The questionnaire consisted of 7 questions covering the four aspects of self-regulation included in the training program: planning, self-monitoring, evaluation and self-reflection.

2.6 Social Validity

Social validity (first introduced by Wolf, 1978) refers to the degree that behavior-change efforts impact favorably upon consumers and is sometimes called ecological validity. It determines the social importance and whether the treatment goals, procedures and outcomes are of acceptable standards (Foster & Mash, 1999).

According to Martin and Hrycaiko (1983) social validity helps to make certain that the experimenter does his job of helping the participants in the best possible manner. Therefore a post intervention questionnaire was provided to the participants in order to evaluate social validity. The questionnaire was based on the three questions asked by Hrycaiko & Martin (1996) of whether the effects of the treatment was helpful to the participants, if procedures used were acceptable and the extent of satisfaction experienced by the participants. The questionnaire was based on Jordet (2005) and contained 8 questions, with response alternatives in a Likert scale format of 1 to 7 (e.g.: 1 = not at all, 4 = somewhat, and 7 = very much).

The social validity questionnaire can be found in appendix C.

2.7 Instruments

2.7.1 Measures for self-regulation

Self-regulation Questionnaire

The self-regulation processes examined in the questionnaire were *reflection*, *evaluation* and *planning*. These processes were assessed using a self-regulation questionnaire (Ripegut, 2011)

After the completion of an activity, individuals who self-regulate well will look back and reflect on their performance, looking at both positive and negative involvements and trying to use the knowledge they gain to further improve their performance in the

future. The reflection subscale consisted of 11 items. An example of an item is: “After each practice I look back and reflect on both positive and negative actions”.

Participants responded to the items on a 5-point rating scale: (1) Never, (2) Seldom, (3) Sometimes, (4) Often, and (5) Always. High scores on the reflection subscale indicated a high level of reflection on strengths and weaknesses after each practice session, and using this knowledge when preparing for future practices.

At the end of practice, individuals who self-regulate well will compare their performance to the goal they set before practice and evaluate the rate of success. The evaluation subscale consisted of 6 items. An example of an item is: “After each practice I think back and determine whether I reached my practice goal”. Participants responded on a 5-point rating scale: (1) Never, (2) Seldom, (3) Sometimes, (4) Often, and (5) Always. High scores on the evaluation scale indicated a high level of evaluation on actions performed during practice in relation to the practice goal (Ripegut, 2011).

Before starting an activity to enhance performance, individuals who self-regulate well plan how to accomplish this. They compare their level of skill with the requirements of the task and try to match the two (Toering et al., 2009). The planning subscale consisted of 7 items. An example of an item is: “I set an individual goal before each practice”. Participants responded on a 5-point rating scale: (1) Never, (2) Seldom, (3) Sometimes, (4) Often, and (5) Always. High scores on the planning scale indicated a high level of planning, meaning that the player sets a specific goal(s) before practice in addition to having developed strategies on how to attain the pre-set goal(s) (Ripegut, 2011).

The questionnaire was issued separately to the players on the last day of baseline filming and again on the last day of the intervention.

Short questionnaire

Because the purpose of the intervention was to enhance the players’ self-regulation there was a need for assessing changes each week. To make this less time consuming a shortened version of the questionnaire was developed. According to Bloom, Fischer and Orme (2003), the appropriate questionnaire used in single-research design should display good reliability and validity, be short, and should not require too much energy

to be filled out in order to be completed frequently. The questionnaire consisted of a single page which was filled out by the participants after each practice session and included questions which covered the self-regulation aspects of planning, self-monitoring, evaluation and reflection. This short version of the questionnaire was based on a reliable and valid long version (Ripegut, 2011).

This version of the questionnaire was used both to gather data for analysis in addition to further foster the player's use of self-regulatory processes.

2.7.2 Measures for performance

Performance with the ball

Games during practice were recorded three times a week and analyzed by the author and an independent and experienced soccer coach. The independent coach has seven years of experience from coaching youth teams from age groups U-12, U-13, U-14, U-15 and U-19. In addition he has a bachelor degree from the Norwegian School of Sport Sciences, specializing in the coaching role. Based on the analysis the player's performance with the ball was graded using a scale from 1 to 7, in which 1–3 was considered low performance, 4 intermediate performance, and 5–7 good performance. Poor performance was rated as actions leading to unnecessary loss of ball possession either through a failed dribble or an incomplete pass. Intermediate performance was rated as actions leading to keeping possession of the ball, either through a support pass, a transversal pass or through receiving a throw-in or goal-kick. Good performance was rated as actions leading to keeping possession of the ball through a pass in the attacking direction, setting up a goal scoring opportunity or scoring a goal. Actions leading to a reclaiming (e.g., a tackle) possession of the ball were also considered as good performance. This grading method was based on the one used by Jordet (2005) for grading performance with the ball in his perception study. Although as Jordet correctly points out, there is no scientific basis for this particular performance analysis instrument, it has been recognized by soccer scientists and top level soccer coaches as adequately reliable to support practice with elite level players (Olsen & Larsen, 1997).

Player grading of overall performance

The players were also asked to grade their own performance during the practice games immediately after the practice was completed using a self-report scale ranging from 1-10.

2.8 Data analysis

The author and an experienced soccer coach independently analyzed every ball possession for both participants. The number of possessions was 161 for player one and 101 for player two, equaling a total of 262 ball possessions. Inter-observer reliability (IOR) scores were determined for performance with the ball. The overall score gave a 95 % agreement. The lowest observed score was 71 %, while the highest score was 100 %. The literature usually suggests 80 % to be acceptable (e.g. Kazdin, 1994), thus IOR scores in this study were determined as acceptable. Instances where the IOR was below 100 %, the discrepancies were no more than one point on the scale. The reasons for these disagreements were because some situations gave room for subjective measuring. An example of a situation would be whether to consider the pass as transversal or as a pass in the attacking direction. The reliability was strengthened by using the average score of the two analysts' when analyzing the final data. The data graphs were analyzed visually. According to the literature (e.g. Hrycaiko and Martin, 1996) the presence of one or more of the following factors will increase the likelihood of an effect having taken place; (1) a steady baseline performance or a baseline in the opposite direction of the intended effect of the intervention, (2) reproducing the effect within and across participants, (3) a low number of data points overlapping between baseline and intervention periods, (4) effects appear quickly following the onset of the intervention, and (5) a substantial effect compared to baseline. The above criteria's was used to analyze the graphs in the present study. The ability to take into account the number one (1) factor mentioned above was restricted due to time limitations.

SPSS (Statistical Package for the Social Sciences) was used to analyze the long questionnaire and measure changes from pretest to posttest. The program computed descriptive statistics, providing the mean score for reflection, evaluation and planning both pre- and post-intervention. The scores were then compared from pre- to posttest.

In the short questionnaire, a self-report scale from 1-10 was used to measure changes on the following variables; the players confidence to follow their preset strategy, self-monitoring throughout practice, practice value and the players own evaluation of their performance. The self-report scores were then transformed into a diagram chart, using Microsoft Office Home and Student Excel 2007, showing and comparing the score for each variable throughout the intervention period. In addition self-report goal attainment scores (0-100 %) was transformed into a diagram chart using the same software program.

3.0 Results

In this section the performance measure is presented first, comparing the two players. Secondly, the analysis for the questionnaire is presented with mean scores for the three self-regulation processes, as well as the career goals of each player. Further, the self-regulation variables from the logbook is presented in successive fashion first for player one and then for player two, making it easier to compare the two.

3.1 Performance with the ball

Figure 1 shows changes in the players' performance with the ball following the intervention period. Both participants improved their performance (see Figure 1). Player one improved his performance from a mean of 4.16 during baseline to a mean of 4.37 during the intervention period. The effect was immediate with only one overlapping data point between the baseline and the intervention, increasing the likelihood of an affect having taken place (Hrycaiko and Martin, 1996). Player two improved his performance from a mean of 4.33 during baseline to a mean of 4.52 during the intervention period. The effect was immediate, with only one overlapping data point. It is important to note that the number of ball possessions varied a great deal for both players during baseline as well as during the intervention period. During the baseline period player one had a mean of 32 ball possessions, ranging from 14 to 49. During the intervention period player one had a mean of 11 ball possessions, ranging from 6 to 17. Player two had a mean of 12.5 ball possessions during baseline, ranging from 6 to 22. During the intervention period player two had a mean of 12.75 ball possessions, ranging from 8 to 17.

The graphs also show a negative correlation between ball possessions and performance for player one during the intervention period. On the contrary, for player two, the number of ball possessions is more stable, indicating no correlation between ball possessions and performance.

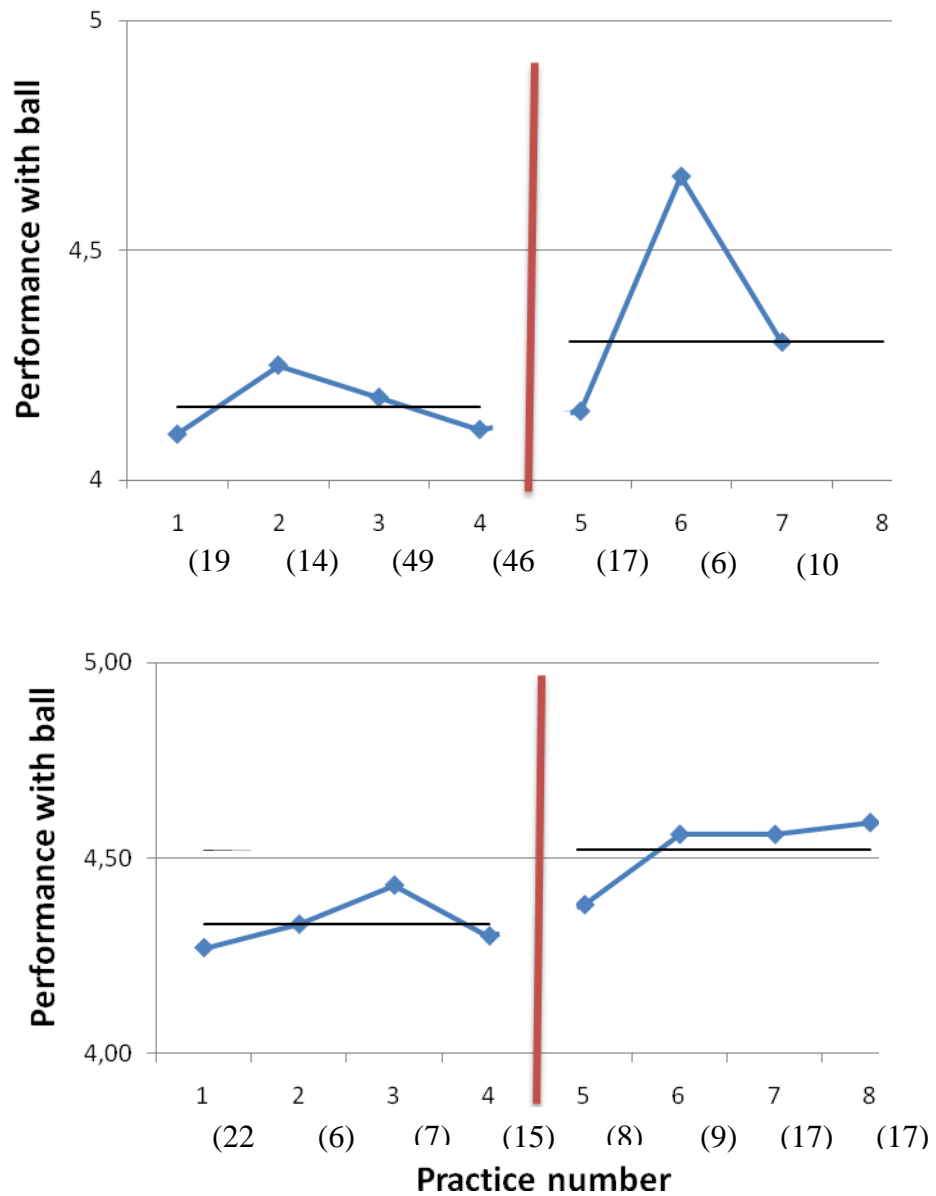


Figure 1. Mean performance score for each player in each practice. The red line indicates the onset of the intervention period. The numbers in brackets (n) are the total number of ball possessions during each practice game.

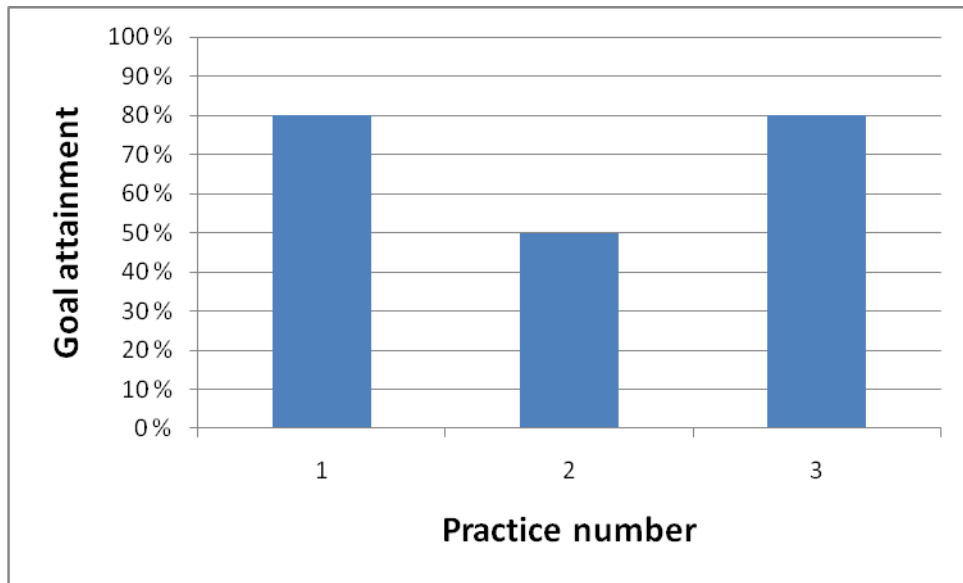


Figure 2. Goal attainment scores for player one using a self-report scale from 0-100 % after each practice during the intervention period.

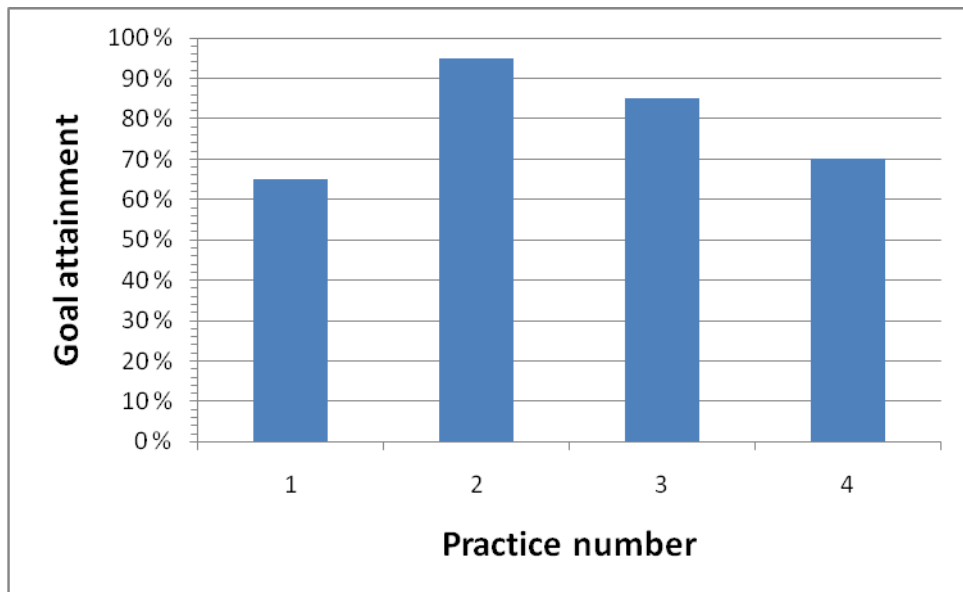


Figure 3. Goal attainment scores for player two using a self-report scale from 0-100 % after each practice during the intervention period.

3.2 Long Questionnaire

Before completing the long questionnaire, both players were asked to write down two personal goals that they were currently trying to achieve in their soccer career. This was done at the end of the baseline period and again at the end of the intervention period.

Player one reported having set the following goals:

Pre-intervention goals

“My goal is to become part of the first team”

“Be able to become a part of the national team”

Post-intervention goals

“Become better at my passing game”

“Improve my perception”

Perception, in this case, means the ability to visually search the surroundings to pick up important clues on how best to solve future actions with or without the ball. Both pre-intervention goals are outcome oriented, while both post-intervention goals are process or mastery oriented goals. This indicates a shift in player one’s behavior from being outcome oriented to becoming more process- or mastery-oriented during the intervention period. All four goals are non-specific, having no apparent strategy or plan for how to accomplish these goals. While the pre-intervention goals are long term goals, the post-intervention goals are short term or perhaps daily practice goals.

Player two reported these goals:

Pre-intervention goals

“Become a part of the first team”

“Become a professional player abroad”

Post-intervention goals

“Become a part of the first team within my junior years”

“Long-term, become a professional player abroad”

Both pre- and post-intervention goals are outcome-oriented. However, it is interesting to note that the number one goal has shifted from being non-specific to being specific. The player added “...within my junior years” as when he expects to become a member of the first team. All four goals are long term goals.

Table 1

Mean scores for player one on the self-regulation variables pre- and posttest.

Variable	Pretest M	Posttest M
Reflection	3,27	3,18
Evaluation	3,83	4,00
Planning	2,86	3,29

Table 2

Mean scores for player two on the self-regulation variables pre- and posttest.

Variable	Pretest M	Posttest M
Reflection	3,73	3,82
Evaluation	4,00	4,00
Planning	3,14	3,29

The mean scores for player one showed a slight increase on the evaluation score and a larger increase on the planning score, while the reflection score slightly decreased from pretest to posttest. For player two, there was a slight increase in both reflection and

planning scores, while the evaluation score remained the same. None of the changes were significant for either player.

3.3 Logbook

The complete logbook can be found in appendix D.

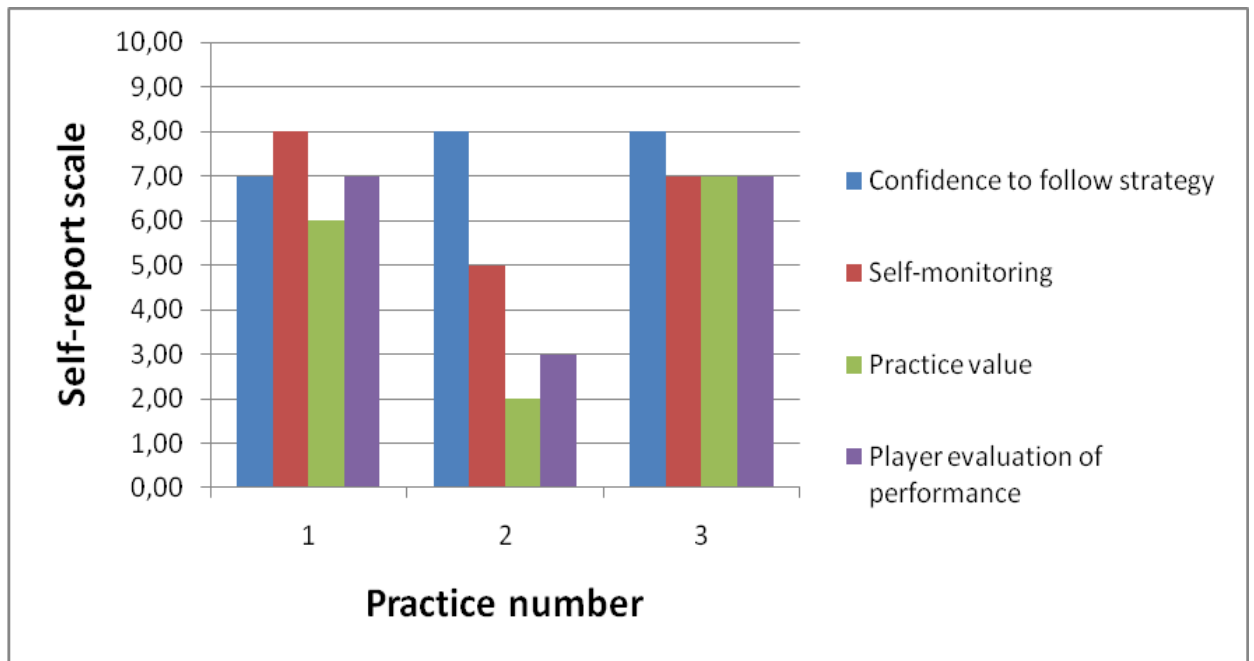


Figure 4. An overview of the self-report scale scores given by player one at the end of each practice

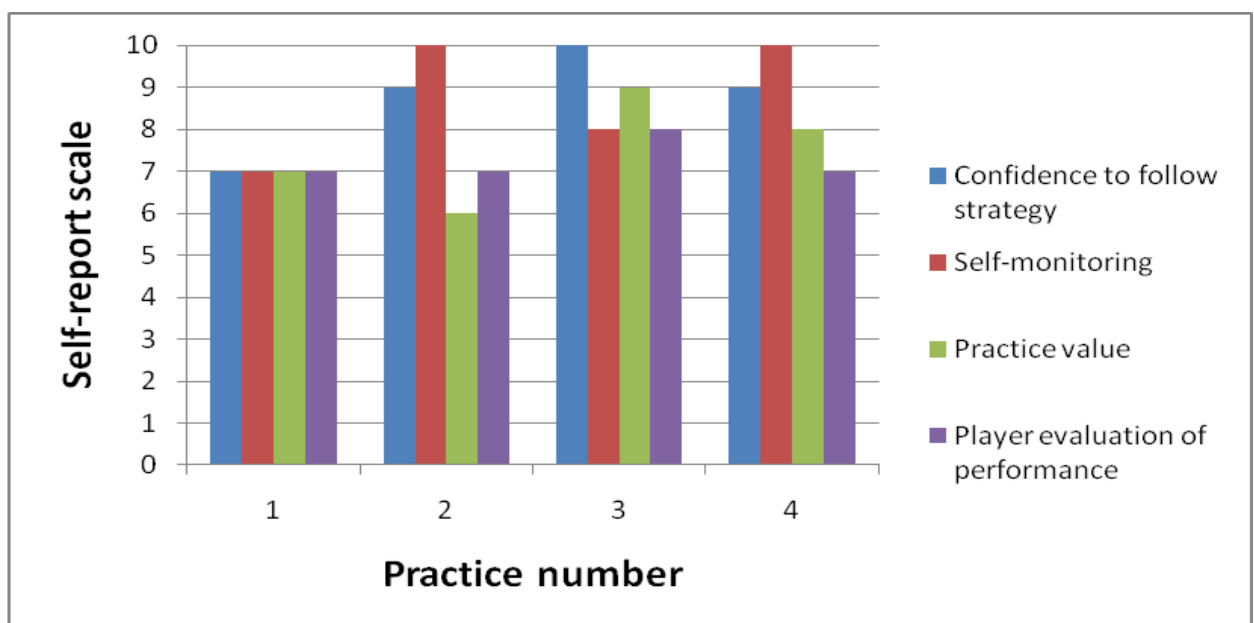


Figure 5. An overview of the self-report scale scores given by player two at the end of each practice

3.3.1 Planning

Player one

The planning part consisted of six questions asked before practice regarding goal setting and strategy use for attaining preset goals. Some of the answers are presented below.

Player one reported setting process-oriented goals before each practice as well as using himself and his “best performance” as a reference point when developing those goals. He set identical goals for all three practices.

“passing quality and 1v1”

1v1 refers to offensive or defensive situations where the player is isolated with only one opponent in the near vicinity. When being asked how he planned to reach these goals player one reported the following for practice one through three.

“perception”, “think it through before practice starts” and “perception”

The confidence to follow this plan or strategy varied (see figure 2), and reasons for lack of confidence was reported as.

“because of uncertainty over teammates” and “I don’t know”

Player two

Player two also reported setting process-oriented and using himself as a reference point when developing those goals. He set the following goals from practices one through four.

“perception”, “passing quality”, “passing quality” and “passing quality and 1v1 headers”

When asked on which strategy he would use to attain his goal(s) the following was reported for practices one through four respectively.

“mental focus”, “focus on technique”, “make safe choices”, and “be tougher mentally and make good choices”

Player two also reported varying confidence to follow this plan (see figure 4), giving reasons such as.

“I can forget”, “I don’t know” and “I’m not sure why”

3.3.2 Self-monitoring

Player one

The self-monitoring part consisted of three questions, being asked before practice, on how the player would track his performance in relation to his practice goal throughout the practice session. In addition, at the end of each practice session, the players were asked to evaluate how well the self-monitoring process worked (see figure 2 and 3). Some of the answers are presented below.

Player one provided the following answers on how he would track his performance during practice.

“continually think of mistakes I make” and for practice two and three: *“use breaks to think through what I did well and what I need to improve”*

There was no clear link between self-monitoring scores and the answers given above. However, there seems to be an unusual relationship between the performance score (4.66) and the self-monitoring score (5) after the second practice session. The performance score is the highest recorded for player one, while the self-monitoring score is the lowest reported.

Player two

Player two gave the following answers from practices one through four respectively.

“by being extra concentrated”, “monitor myself all the time”, “I will think through my performance often” and *“I will constantly evaluate myself”*.

When the player self-reported top score, 10, on the self-report scale he used the words; “all the time” and “constantly” before practice began with regards to how he would track his own performance during practice, while when scoring lower on the self-report scale the player used the words; “often” and “extra”. This suggests that the choice of words before practice could give some indication to how thoroughly the player would track his own performance during practice.

3.3.3 Evaluation

Player one

The evaluation part contained six questions asked after practice. These questions focused mainly on goal and strategy achievement. In addition the players completed a short questionnaire consisting of seven questions.

When asked to explain why he didn't achieve total goal achievement (see Figure 3), player one gave the following answers from practices one through three respectively.

“I was thinking too much about my goal”, “Poor performance by my teammates and I lost the spark to play well”, and “I was focused on my practice goal”.

When asked whether he changed strategy during the practice he reported that he was thinking less about his goal because he felt it interfered with his performance. It is important to note that after the second practice session, player one acknowledged that he shouldn't be affected by the (poor) performance of his teammates. As could be seen for self-monitoring there is a curious relationship between performance score (see Figure 1) and the self-report scores on practice value, player evaluation (see Figure 2) and goal attainment (see Figure 3). The performance score is the highest recorded, while the self-report scores on the three measures are comparatively lower than what would be expected.

When asked what positives he gained from each practice (one through three), the player stated the following.

“1v1 defensively and offensively”, “Good passes”, and “1v1 offensively”.

When asked which improvements needed to be made, the player focused on minimizing the number of touches on the ball before passing as well as to avoid being negatively affected by the behavior of teammates.

Player two

Player two provided these answers when asked to explain lack of goal achievement from practices one through four.

“The practice didn’t fit my goal”, “I had some passes of poor quality, but that was mostly because I chose the wrong options”, “The field was small and space was limited. A lot worked well, but I made some unnecessary mistakes”, and “I was too weak 1v1. My passing game was OK, but I need to focus more on passing to the appropriate foot”.

The goal attainment graph (see Figure 5) corresponds well with the answers given above, especially the first practice session where the player reported that the practice was less relevant to his preset goal.

When asked whether he changed strategy during the practice he reported having done this once because of a small and narrow pitch size which differed substantially from the other three practices.

When asked what positives he gained from each practice, player two stated the following.

“The long pass and pass completion”, “Passing quality and organizing”, “I became familiar with the small pitch and had good passing quality”, and “I became tougher”.

When asked on which improvements needed to be made, player two provided the following answers.

“Perception and long pass”, “Become tougher defensively 1v1”, “My passing game can become better”, and “I need to be more thorough when passing the ball”.

3.3.4 Reflection

Player one

The reflection part consisted of six questions being asked after each practice session. The questions focused mainly on which thoughts occurred during practice and what sort of feelings the players experienced.

When reflecting on performance, the players were asked if they thought through what they did well during practice as well as if they thought about possible changes to improve performance. Player one answered yes to these questions after each practice, adding remarks as *“Yes, I thought about mistakes”* and *“Yes, the angle on my foot during a pass”*.

When asked which thoughts occurred when succeeding player one reported feeling confident and experiencing a “good feeling”. When not succeeding with a task or action player one reported the following answers.

“Angry. Pissed off”, and “I become irritated”.

These answers indicate that the player is having problems with redirecting his negative emotions towards a plan or strategy on how to improve future performance.

The last part of the reflection process asked which changes, if any, the players would make in preparation for their next practice. Player one gave these answers from practices one through three respectively.

“I will try to feel what is right instead of thinking too much”, “I will try not to be affected by the performance of my teammates”, and “Continue like I did today”

To a similar question asking what the player would change to improve his next performance player one provided answers focusing on concentration and focus.

Player two

Player two also answered “yes” when asked if he thought through his performance during practice and possible improvement which needed to be made, without elaborating further.

Feeling confident was also reported as the most common feeling when succeeding with a task or action. Thoughts when not succeeding were different than for player one as they contained a strategy for how to improve future performance.

“I became extra focused”, “I tried to focus more”, “I became irritated and focused on making better choices”, and “I think to myself that I need to become more agitated”.

When asked which changes the players would make in preparation for his next practice, player two reported the following from practices one through four respectively.

“Try to be better at setting a specific goal”, “No, I will try to set a goal before practice and monitor it as thoroughly as possible without it interfering with the rest of my game”, “No, I felt my focus was good and I tried to get that good feeling”, and “Yes, I will only set one goal to make it easier to focus on that”.

Compared to the goal attainment graph (Figure 5), the answers seem to correspond well with the self-report score.

To a similar questions, asking which changes the player would make to improve his next performance, player two gave the following answers;

“I will set a specific goal”, “Better the balance between monitoring myself and letting go”, “No, not much to change”, and “Only set a single goal”.

4.0 Discussion

The goal of this single-case intervention study was to establish whether a self-regulation training program would affect elite soccer players' performance and use of self-regulation processes in their daily soccer practice. The self-regulated learning aspects were planning, self-monitoring, evaluation and reflection. The results provided some encouragement to the self-regulation intervention's effect on the players' performance with the ball. The graph analysis showed an immediate positive effect for both players and only a total of one overlapping data point between the baseline and the intervention phase, indicating that the intervention may have resulted in improved performance with the ball for both participants. However, the results must be interpreted with some caution given the large variations in the number of ball possessions. The small sample size also adds to this caution when interpreting the results.

The analysis of the questionnaire showed that none of the players significantly increased their score on reflection, evaluation or planning (self-monitoring was not included in the questionnaire). Apart from a slight decrease in player two's score on reflection, both players either slightly increased or remained stable from pre to post intervention. Results from the logbook indicate a different approach to the intervention, where player two gives more elaborate answers throughout, while player one is vaguer and elaborates less. One could argue that there is a slight tendency for increased use of the self-regulation processes, but no definitive conclusions can be drawn.

4.1 Performance with the ball

Performance with the ball was analyzed by video-recording practice games and evaluating each ball possession. It is important to note that this is a subjective measurement and therefore the reliability and validity of the procedure is not as strong as one could hope. Player two performed at a higher level than player one did during the baseline period. Apart from one score, the same is seen during the intervention where player two increases and stabilizes his performance well above the mean score of player one. Although player one has the highest recorded performance score during the intervention, this must be interpreted with some caution because of the low self-report scores on self-monitoring, practice value and player evaluation. The major reason being the contradiction between the player's own experience of performance compared to the

actual performance results when analyzed. However, an explanation could be the low number of ball possessions (see Figure 1) creating an artificially high performance score compared to practice sessions where the total number of ball possessions was substantially higher. Apart from this one incident it is hard to give definitive answers, based on self-regulated learning processes, to why player two outperformed player one on every recording both during the baseline and intervention period. However, several clues are found in the logbook, where player two for the most part seems to give more reflective and detailed answers. The next paragraph will go through each self-regulation process, trying to give some explanation as to why these two players performed the way they did.

4.2 Self-regulation processes

4.2.1 Planning

Player 1

With regards to planning, player 1 set identical process-oriented goals (“passing quality” and “1v1”) before each practice. This shows that the player is prepared to work on certain specifics during practice, making the evaluation process afterwards easier as he can reflect back on positives and negatives in relation to his preset goal. If he didn’t develop a preset goal, the evaluation process would be much more difficult and the learning output would arguably be of lesser magnitude. At the same time, he reported specific (e.g., “perception”) but somewhat vague strategies on how to attain the preset goals. This indicates that he had thought through some of the important factors on how to attain his goals beforehand, but maybe not very thoroughly, stating nothing on how and when he will use “perception” to improve his passing quality. As reported by Zimmerman (1999), learners who are highly self-regulated will set specific process and outcome goals in addition to utilizing technique-oriented strategies. Results from the self-report scores on self-monitoring indicate that player 1 had trouble grasping the process and on how to implement it in a useful manner. A self-report score never exceeding 7 supports this. When asked, after the first practice session, which changes player one would make he reported this “I will try to feel what is right instead of thinking too much”. This indicates that he had a negative experience when trying to self-monitor his performance during practice and felt that it interfered with his performance. This could be part of an explanation as to why he reported relatively low

self-monitoring scores. There is also a negative correlation between self-monitoring and performance on the second practice session, where the performance score is the highest recorded while the self-monitoring score is the lowest recorded. This could be due to the fact that the experience during the first practice session deterred the player from mentally tracking his performance as he felt this would have a negative effect on performance.

Player 2

Player 2 set one goal (e.g., “passing quality”) before each practice, except for the last practice session where he developed two goals. The preset goals are all process-oriented and indicate that the player has prepared himself on what he is to focus on during the upcoming practice. Regarding strategy development, player 2 developed short and specific strategies on how he intended to attain the pre-set goal(s). For example; “mental focus” or “focus on technique”. This gives an indication that the player is able to focus both on the detailed technique needed to execute a specific action, as well as the importance of being mentally present when executing the given action. The self-report scores on self-monitoring were high and there seems to be a relationship between high self-report scores and choice of words before practice. Words like “all the time” and “constantly” produce top score, while “extra” and “often” produce lower scores. This indicates that the preset strategy is an important indication for how well the player will track his performance during practice.

Looking at differences between the players, there was a difference in goal setting where player two only set one practice goal (except for the last practice where he set two goals), while player one set two practice goals. Player 2, immediately after the last practice commented that having two goals to focus on affected his focus and concentration during practice. Player 1, setting two goals before each practice, never mentioned this being disturbing in any way. As for the type of goals developed there were no differences. Both players set process-oriented goals. This has been shown in several studies to be more effective than outcome goals, both in sports (Zimmerman & Kitsantas, 1996), as well as in academia (Schunk & Swartz, 1993).

4.2.2 Evaluation

Player one

Player 1 does not go into depth when evaluating his performance. His answers are usually short and lacking substance. Such as when being asked if he reached his preset goal, player 1 answered “almost”, “no” and “yes” without elaborating on reasons why. Questions regarding goal attainment as well as the self-report scores show that player 1 never fully reached his preset goals. Answers to lack of goal attainment show that player 1 focused on non-controllable factors such as poor performance of teammates as a reason for not attaining his goal, indicating a lack of ability to self-regulate. When asked about strengths and weaknesses in performance during the previous practice session, player 1 reports drawing something positive from each practice session, in addition to being concise on what need to be improved for next practice. With regards to the effectiveness of the preset strategy, player 1 reported being affected (distracted) by teammates (after the second practice session) and therefore losing his focus and concentration, which in turn had a negative effect on performance. These results indicate that the player is unable to retain his focus and concentration when his teammates aren't performing at the level he expects them to. This could also indicate that the preset strategies aren't comprehensive enough, unable to cope with a situation where non-controllable factors are involved.

Player 2

Player 2 generally gave extensive answers to questions during the evaluation process. An example being, when asked for reasons why his goal attainment didn't reach 100 % player 2 answered “I had some passes of poor quality but that was mostly because I chose the wrong option” and “The field was small and space was limited. A lot worked well, but I made some unnecessary mistakes”. This indicates that player 1 believes evaluation is an important aspect if he is to continue his development as a player. When reporting that the preset strategy didn't work as intended, player 2 reported having changed strategy during practice.. The player reported the following when asked if he changed strategy during the practice; “Yes. Changed my focus to perception”. He reported doing this because of the narrow and small sided pitch. This suggests that the player self-regulated by being able to adjust the strategy or goal when the environment

and conditions changed. This shows that adaptation is an important self-regulation process. This is supported by findings of Kitsantas and Zimmerman (2002) who showed that expert volleyball players were better at self-regulating than non-experts and novices on twelve different self-regulatory measures including adaptation. Answers to lack of goal attainment also provide a picture of player two being able to self-regulate, focusing on himself and the behavior or processes needed to improve future performance (e.g., “I was too weak 1v1. My passing game was OK+, but I need to focus more on passing to the appropriate foot”). Several studies, including one on basketball free-throw, support the importance of being process-oriented, finding that multiphase training of self-regulation processes resulted in improved performance and made players more process oriented with regards to strategic planning, and when evaluating and reflecting on performance (Cleary, Zimmerman & Keating, 2006).

The evaluation process indicated a difference in the use of self-regulation processes between the players. The most notable difference was what the players focused on when not attaining their preset goals. An example is when player 1 focused on the poor performance of teammates, while player 2 was process-oriented and looked for solutions he himself could implement to improve future performances. This could indicate that player 1 has trouble focusing on himself and his own performance when teammates are performing below what he expects. There are no similar examples on the part of player 2.

Player 1 seemed less able to evaluate thoroughly on his performance either because lacking motivation or not understanding the process. On the contrary, player 2 gave the impression of having given the evaluation process considerable thought, providing extensive answers and showing a genuine interest for the process. As motivation is seen as an important factor of being a self-regulated learner (Phillips & Hutchinson, 2006), the results from this study indicate that player 2 is more likely to profit from this project. A similarity between the players is that there seems to be a strong correlation between the self-report scores on practice value and player evaluation. The scores never differ by more than one point. This indicates that practice value is closely related to perceived performance and vice versa. This means that performing well has a strong value to the players.

4.2.3 Reflection

Player 1

As for the reflection process, player 1 provided short and somewhat vague answers, lacking substance. This is exemplified when being asked for reasons why he succeeded in attaining his goal; “a clear goal” or “concentration”. This is also evident when asked for reasons why he succeeded on certain tasks, rarely providing answers consisting of more than one word. This suggests that the reflection process hasn’t been extensive enough when reflecting on his performance. When asked for reasons not succeeding or thoughts on how to improve when not succeeding, player 1 uses the word “mistakes” on multiple occasions, in addition to becoming “angry” and “pissed off”. Thinking of mistakes is important when self-regulating, if those mistakes are used to improve on future performance. In this case, however, the player seems unable to use mistakes in an appropriate manner, becoming frustrated and developing a negative focus instead of concentrating on how to improve on his next performance. Contradictory to this, when asked which changes he would make in preparation for the next practice (after the second practice session), player 1 reported that he would try to focus more on his own performance, and not be distracted by the poor performance of his teammates,. This indicates that the player has reflected well on his performance and developed a strategy on how to improve if a similar situation should occur in the future. Although there seems to be some contradiction, there are indications that player 1 is profiting somewhat from the reflection process.

Player 2

Player 2 provided clear-cut reasons when asked why he succeeded on certain tasks (e.g., “I made the right choices/options”, and “I was thorough and always present”). This suggests that he had thought through his actions several times before providing an answer. When asked for reasons not succeeding or thoughts on how to improve when not succeeding, player 2 reported that mistakes made him extra focused and concentrated and seemed to have a strategy or plan on how to improve (e.g., I became irritated and focused on making better options” and “I think to myself that I need to become more agitated”). When asked which changes he would make in preparation for the next practice, player 2 reported answers such as “No, I will try to set a goal before

practice and monitor it as thoroughly as possible without it interfering with the rest of my game” and “Yes. I will only set 1 goal to make it easier to focus on that”. This shows the ability to reflect on both thought processes and the methods used (Glaser & Chi, 1988; Zimmerman, 2006)

According to Ertmer and Newby (1996) reflection is one of the essential processes to achieve expert learning, translating knowledge in to action, enabling the possibility of gaining strategic knowledge from certain activities. The present study show distinct differences in the use of the reflection process between the two players. Player 1 reports on several occasions that he is focusing on mistakes as well as reporting negative emotions when asked questions on thoughts occurring when not succeeding. These are signs of lack of concentration on performance and preset goals (e.g., Winne & Perry, 2000). In addition, this could indicate that the strategies developed beforehand are not comprehensive enough to be able to avoid both internal and external disturbances. The ability to create and use strategies, aimed at avoiding such disturbances has been proved important to preserve concentration, effort and motivation while performing a task (e.g., Corno, 2001; Winne, 1995). Although these studies are done in academia, there is no reason to believe that this is not as important or even more important while performing soccer specific tasks or actions. In two studies comparing experts with non-experts, Cleary and Zimmerman (2001) and Kitsantas and Zimmerman (2002), found that experts create and use better strategies during practice than their counterparts. One could argue that this is apparent in player two who when experiencing failure, reported that this made him extra concentrated and focused on making better choices, which is typical behavior of those using self-regulated learning according to the academia study mentioned above. Reflection is also shown by Ericsson (1998) to be important as it allows athletes to continuously process and use information, which in turn makes it easier to focus on the most important aspects of performance. Thus, this will help athletes to perform at their highest level in addition to further improve through practice and competition (Ericsson, 2003). In Toering et al. (2009) the reflection process was found to be a distinguishing factor between elite and non-elite players. Elite players tended to score higher on reflection than non-elite players, indicating that reflection is important if one is to reach the elite level in soccer. The reflection scores in the current study do not indicate this process being more important than the other two. However, the answers given in the logbook show that both players (especially player two) benefits

from continuously processing information as it allows them to focus on the most important aspects of performance.

4.3 Character study

The two players taking part in this study appeared from the start to be of different character. Player two seemed interested and curious from the onset, while player one gave the impression, without saying, of lacking motivation for this type of project. This feeling was reinforced throughout the intervention period, where player two usually gave more extensive answers to both oral and written questions and seemed more likely to elaborate on answers without encouragement. Motivation to learn is stated by several researchers as an important part of being self-regulated (e.g. Phillips & Hutchinson, 2006). This motivation was apparent in player two, while player one instead either lacked motivation, had trouble understanding the process, or needed more time for the intervention to work.

4.4 Limitations and practical implications

The current study is not without limitations. The use of self-report questionnaires is a limitation as self-report questionnaires only gives a subjective grasp of self-regulation. In addition, the practice set-up was variable. This resulted in varying pitch size, different number of players on each team, varying playing time and large variations in the number of ball possessions. The latter seems to have directly affected the performance score on at least one occasion (see Figure 1, player one and practice session number 6). The small sample size is also a drawback of the current study, making it difficult to make any generalizations. Consequently future research is warranted to enhance understanding of the influence of self-regulation of learning on soccer performance. Future research should include a larger number of participants and a more stable practice set-up, although this is difficult when dealing with elite players in professional clubs. The ecological validity of this study is strong as it utilizes real-world settings and does not interfere with the on-field practice in any way. The use of elite players is also a notable strength as elite players are hard to access, the sample is ecological valid and the interest for studies on elite-players is usually much higher than for non-elite.

Findings in the present study also imply some practical implications for both players and coaches. Reflection has been shown in previous studies to be an important factor for high-level soccer performance (e.g. Toering et al., 2009). The present study also indicates the importance of players reflecting on performance in order to derive advantages such as crucial knowledge and information to perform at their highest level in addition to accelerating the learning process itself. Therefore it is vital that coaches reiterate the importance of the reflection process both in training and competition. Basically coaches need to encourage players to think about these processes themselves, without being directly involved. The present study indicates that reflection is the key self-regulation process as both players provide answers showing that they benefit from this process with regards to extracting the most important information vital to improving performance. The same results have been found in several expertise studies by Anders Ericsson (1998; 2003). Hence, as the self-regulation processes are directly interconnected, it would be reasonable to believe that reflection will influence the planning and evaluation processes in a positive manner.

In conclusion, this study shows that both players improved their mean performance with the ball from the baseline period to the intervention period. Whether this is due to the intervention or not is difficult to be conclusive on, but there are indications that the self-regulation training program played some part in the improvement of performance. In addition, the questionnaire scores increased slightly from pre- to post-intervention indicating that the self-regulation training program was helpful in developing the use of self-regulation. Answers from the logbook as well as from the short questionnaire suggest that player two plans, evaluates and reflects more thoroughly than player one. Therefore one could argue, although not strongly, that player two has a better understanding of the self-regulated learning processes and utilizes them in a better manner than does player one. Summed up, the current study, showed promising results and should be researched further in future studies.

5.0 References

- Baer, D. M., Wolf M. M., & Risley T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavioral Analysis*. 1(1): 91–97.
- Bandura, A. (1977) *Social Learning Theory*. New York: General Learning Press.
- Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes* 50 (248-287).
- Bandura A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*. 28, 117 - 148.
- Barlow, D.H. & Hersen, M. (1984). *Single case experimental designs: Strategies for studying behavior change*, Second edition. New York: Allyn & Bacon.
- Baumeister, R. F. & Vohs, K. D. (2007). *Journal Compilation*. Blackwell Publishing.
- Baumeister, R. F., & Vohs, K. D. (2004). *Handbook of self-regulation: Research, theory, and applications*. New York: Guilford Press.
- Beneke W. M. & Harris. M. B. (1972). Teaching self-control of study behavior. *Behavioral Research & Therapy* 10 (1972), pp. 35–41.
- Blair, A., Hall, C., Leyshon, G. (1993). Imagery effects on the performance of skilled and novice soccer players. *Journal of Sports Sciences*, 1466-447X, Volume 11, Issue 2, 1993, Pages 95 – 101.
- Bloom, B. S. (ed). (1985a). *Developing Talent in Young People*. New York: Ballentine Books.
- Bloom, B. S. (1985b). Generalizations about talent development. In B. S. Bloom (ed.), *Developing talent in young people* (pp. 507-549). New York: Ballantine Books.

Bloom, M., Fischer, J., & Orme, J.G. (2003). *Evaluating practice. Guidelines for the accountable professional*. New York: Allyn & Bacon, Pearson Education, Inc.

Boekaerts, M. , & Corno, L. (2005). Self-regulation in the classroom: A perspective on assessment and intervention. *Applied Psychology: An International Review*, 54 (2), 199– 231.

Butler, R. & Neuman, O. (1995). Effects of Task and Ego Achievement Goals on Help-Seeking Behaviors and Attitudes. *Journal of Educational Psychology* 1995, Vol. 87, No. 2, 261-271.

Butler, D. L. & Winne, P. H. (1995). Feedback and Self-Regulated Learning: A Theoretical Synthesis. *Review of Educational Research* 1995 65: 245

Encyclopedia Britannica. (2008)"Overview of Soccer"
(<http://www.britannica.com/EBchecked/topic/550852/football>).

Britton, B. K., & Tesser, A. (1991). Effects of time management practices of college grades. *Journal of Educational Psychology*, 83, 405-410.

Chambliss, D. F. (1988). *Champions: The making of Olympic swimmers* New York: Morrow.

Cleary, T. J. & Zimmerman, B. J. (2001). Self-Regulation Differences during Athletic Practice Experts, Non-Experts, and Novices *Journal of Applied Sport Psychology*, 13: 185–206, 2001.

Cleary, T. J., Zimmerman, B. J., Keating, T. (2006). Training physical education students to self-regulate during basketball free throw practice. *Research Quarterly for Exercise and Sport*; Jun 2006.

Cleary, T. J., Zimmerman, B. J., & Keating, T. (2006). Training physical education students to self-regulate during basketball free-throw practice. *Research Quarterly for Exercise and Sport*, 77,251–262.

- Cleary, T., Platten, P., & Nelson, A. (2008). Effectiveness of the self-regulation empowerment program with urban high school students. *Journal of Advanced Academics*, 20, 70 – 107.
- Cote, J., Baker, J., & Abernethy, B. (2007). Practice and Play in the Development of Sport Expertise. In R. Eklund & G. Tenenbaum (Eds), *Handbook of Sport Psychology*, (pp. 184-202; 3rd edition). Hoboken, NJ: Wiley.
- Ericsson, K.A., Krampe, R.T., & Tesch-Römer, C. (1993). The role of deliberate practise in the acquisition of expert performance. *Psychological Review*, 3, 363-406.
- Ericsson, K. A. , & Kintsch, W.(1995).Long-term working memory. *Psychological Review*, 102, 211–245.
- Ericsson, K. A. (Ed.) (1996a). *The road to excellence: The acquisition of expert performance in the arts and sciences, sports, and games*. Mahweh, NJ: Erlbaum.
- Ericsson, K.A. (1996b). The acquisition of expert performance: an introduction to some of the issues. In K. A. ERICSSON (Eds.). *The road to excellence: the acquisition of expert performance in the arts and sciences, sports, and games* (pp. 1-50). Mahwah, NJ: Erlbaum.
- Ericsson, K. A. (1998). The scientific study of expert levels of performance: General implications for optimal learning and creativity. *High Ability Studies*, 9, 75–100.
- Ericsson, K. A. (2003). Development of elite performance and deliberate practice. In J. L. Starkes & K. A. Ericsson (Eds.), *Expert performance in sports: Advances in research on sport expertise* (pp. 49–83). Champaign, IL: Human Kinetics.
- Ertmer, P. A., & Newby, T. J. (1996). The expert learner: Strategic, self-regulated, and reflective. *Instructional Science*, 24, 1–24.
- Ford, Paul R., Ward, Paul, Hodges, Nicola J. and Williams, A. Mark (2009). The role of deliberate practice and play in career progression in sport: the early engagement hypothesis', *High Ability Studies*, 20: 1, 65 — 75.

Foster, S. L. & Mash, E. J. (1999). Assessing Social Validity in Clinical Treatment Research Issues and Procedures. *Journal of Consulting and Clinical Psychology*, June 1999 Vol. 67, No. 3, 308-319.

FIFA. (2001). Info Plus, Federation Internationale de Football Association. Approximately 250 million footballers worldwide.

Galton, F, Sir (1979). *Hereditary genius: An inquiry into its laws and consequences*. London: Julian Friedman Publishers. (Originally published in 1869).

Ghaye, A. & Ghaye, K. (1998). *Teaching and Learning Through Critically Reflective Practice*. London: David Fulton.

Glaser, R. and Chi, M. (1988). Overview in M. Chi, R. Glaser, & M. Farr (Eds.), *The Nature of Expertise* (pp. xv-xxvii). Hillsdale, NJ: Erlbaum.

Gustin, W C. (1985). The development of exceptional research mathematicians. In B. S. Bloom (Ed), *Developing talent in young people* (pp. 270-331). New York: Ballantine Books.

Hamilton, S, A., Fremouw W, J. (1985). Cognitive-behavioral training for college basketball free-throw performance. *Cognitive Therapy and Research*, Vol. 9, No. 4, 1985, pp. 479-483.

Hayes, J. R. (1981). *The complete problem solver*. Philadelphia, PA: Franklin Institute Press.

Helsen, W., F., Starkes, J., L & Hodges, N., J. (1998). Team sports and the theory of deliberate practice. *Journal of Sport and Exercise Psychology*, 20, 12-34.

Hinderer, S. R. & Hinderer, K. A. (2005). Principles and Applications of Measurement Methods. In DeLisa, J. A., Gans, B. M. & Walsh, M. E. (Eds.). *Physical medicine and rehabilitation: principles and practice*, Volume 1, chapter 53, p. 1147.

- Hodge, T. & Deakin J., M. (1998) Deliberate practice and expertise in the martial arts: The role of context in motor recall. *Journal of Sport and Exercise*.
- Housand, A., & Reis, SM (2008). Self-regulated learning in reading: Gifted pedagogy and instructional settings. *Journal of Advanced Academics*, 20, 108–136.
- Hrycaiko, D., & Martin, G. L. (1996). Applied research studies with single-subject designs: Why so few. *Journal of Applied Sport Psychology*, 8, 183–199.
- Hyllegard, R. & Bories, T., L. (2009). Deliberate practice theory: Perceived relevance, effort, and inherent enjoyment of music practice: Study II. Western Illinois University.
- Jordet, G. (2005) 'Perceptual Training in Soccer: An Imagery Intervention Study with Elite Players', *Journal of Applied Sport Psychology*, 17: 2, 140 — 156.
- Kalinowski, A. G. (1985). The development of Olympic swimmers. In B. S. Bloom (Ed.), *Developing talent in young people* (pp. 139-192). New York: Ballantine Books
- Karabenek, S. A. (1998). *Strategic help-seeking: Implications for learning and teaching*. Mahwah, NJ. Lawrence Erlbaum Associates.
- Kazdin A. E. (1982). *Single-case research designs: Methods for clinical and applied settings*. New York: Oxford University Press.
- Kazdin A. E. (1984). Statistical analyses for single-case experimental designs. In Barlow D. H., Hersen M. (Eds.), *Single case experimental designs: Strategies for studying behavior change* (2nd ed.; pp. 258-324). New York: Pergamon.
- Kirschenbaum, D.S., Humphrey, L.L., & Malett, S.D. (1981). Specificity of planning in adult self-control: An applied investigation. *Journal of Personality and Social Psychology*, 40, 941-950.
- Kirschenbaum, D. S. Malett, S. D., Humphrey, L. L., & Tomarken, A. J. (1982). Specificity of planning and the maintenance of adult self-control: One-year follow-up of a study improvement program. *Behavior Therapy*, 13, 232-240.

Kirschenbaum, D.S., Tomarken, A.J., & Ordman, A.M. (1982). Specificity of planning and choice applied to adult self-control. *Journal of Personality and Social Psychology*, 41, 576-585.

Kitsantas, A. & Zimmerman, B. J. (2002) 'Comparing Self-Regulatory Processes Among Novice, Non-Expert, and Expert Volleyball Players: A Micro analytic Study', *Journal of Applied Sport Psychology*, 14: 2, 91 — 105.

Kitsantas, A. & Zimmerman, B. J. (2002). 'Comparing Self-Regulatory Processes Among Novice, Non-Expert, and Expert Volleyball Players: A Micro analytic Study', *Journal of Applied Sport Psychology*, 14: 2, 91 — 105.

Kitsantas, A., & Zimmerman, B. J. (2006). Enhancing self-regulation of practice: the influence of graphing and self-evaluative standards. *Metacognition and Learning*, 1, 201–212.

Kolovelonis, A., Goudas, M. & Dermitzaki, I. (2010). The effect of different goals and self-recording on self-regulation of learning a motor skill in a physical education setting. *Learning and Instruction* (2010) 1 – 10.

Lan, W.Y. (1998). Teaching self-monitoring skills in statistics. In D.H. Schunk & B.J. Zimmerman, (Eds.) *Self-regulated learning; from teaching to self-reflective practice* (86–105). New York: The Guilford Press.

Landin, D., & Hebert, E. P. (1999). The influence of self-talk on the performance of skilled female tennis players. *Journal of Applied Sport Psychology*, 11, 263-282.

Ley, K., & Young, D.B., (1998). Self-regulation behaviors in underprepared (developmental) and regular admission college students. *Contemporary Educational Psychology* 23, 42–64.

Locke E. A. & Latham G. P. (2002). Building a Practically Useful Theory of Goal Setting and Task Motivation. *American Psychologist* Vol. 57, No. 9, 705–717

- Marlow, C., Bull S.J., Heath, B. & Shambrook C.J. (1998). The Use of a Single Case Design to Investigate the Effect of a Pre-performance Routine on the Water Polo Penalty Shot. *Journal of Science and Medicine in Sport* 1(3): 143-155.
- Martin, G. L., & Hrycaiko, D. (1983). Effective behavioral coaching: What's it all about? *Journal of Sports Psychology*, 5, 8-20.
- Mellalieu, S, D., Hanton, S., O'Brien, M. (2006). The effects of goal setting on rugby performance. *Journal of applied behavioral analysis*, 2006, 39, 257-261.
- Monsaas, J. A. (1985). Learning to be a world-class tennis player. In B. S. Bloom (Ed.), *Developing talent in young people* (pp. 211 -269). New York: Ballantine Books.
- Naglieri, J. A. (1997). *Naglieri nonverbal ability test*. San Antonio, TX: The Psychological Corporation.
- Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press
- Nicholls, A. R., Polman, R. C. J., and Holt, N. L. (2005). The effects of an individualized imagery intervention on flow states and golf performance. *Athletic Insight*, March, Vol 7, Issue 1.
- Olsen, E., & Larsen, Ø. (1997). Use of match analysis by coaches. In T. Reilly, J. Bangsbo, & M.Hughes (Eds.), *Science and football III* (pp. 209–220). London: E & FN SPON.
- Page-Voth, T. , & Graham, S. (1999). Effects of goal setting and strategy use on the writing performance and self-efficacy of students with writing and learning problems. *Journal of Educational Psychology*, 91, 230–240.
- Pajares, F. (2005). Self-efficacy beliefs during adolescence: Implications for teachers and parents. In F. Pajares & T. Urda (Eds.), *Adolescence and education*, pp. 345, Vol. 5: *Self-efficacy beliefs of adolescents*. Greenwich, CT: Information Age Publishing.

Perry, N. E., & VandeKamp, K. J. O. (2000). Creating classroom contexts that support young children's development of self-regulated learning. *International Journal of Educational Research*, 33, 821-843.

Perry, N., Phillips, L., & Hutchinson, L. (2006). A comparison of experienced and beginning teachers' support for self-regulated learning. *Elementary School Journal*, 106, 237-254.

Ramdass, D. H. & Zimmerman, B. J. (2008). Effects of self-correction strategy training on middle school students' self-efficacy, self-evaluation, and mathematics division learning. *Journal of Advanced Academics*, 20, 18-41.

Schmeichel, B. J., & Baumeister, R. F. (2004). Self-regulatory strength. In R F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp.84-98). New York: Guilford Press.

Schneider, W., & Pressley, M. (1997). *Memory development between two and twenty*. Mahwah, NJ: Lawrence Erlbaum Associates.

Schunk, D. H. (1983). Developing children's self-efficacy and skills: The roles of social comparative information and goal setting. *Contemporary Educational Psychology*, 8, 76-86.

Schunk, D. H., & Swartz, C. W. (1993). Goals and progress feedback: Effects on self-efficacy and writing achievement. *Contemporary Educational Psychology*, 18, 337-354.

Schunk, D. H. & Zimmerman, B. J. (Eds). (1998). *Self-Regulated Learning: From Teaching to Self-Reflective Practice*. New York: Guilford Press

Shambrook, C, J., Bull, S, J. (1996). The use of a single-case research design to investigate the efficacy of imagery training. *Journal of Applied Sport Psychology*, 1533-1571, Volume 8, Issue 1, 1996, Pages 27 – 43

Simon, H. A., & Chase, W G. (1973). Skill in chess. *American Scientist*, 61, 394-403.

- Soberlak, P. & Cotè, J. (2003). The Developmental Activities of Elite Ice Hockey Players. *Journal of Applied Sport Psychology*, 15: 41-49.
- Sosniak, L. A. (1985). Learning to be a concert pianist. In B. S. Bloom (Ed.), *Developing talent in young people* (pp. 19-67). New York: Ballantine Books.
- Toering, T. T., Elferink-Gemser, M. T., Jordet, G. and Visscher, C.(2009) 'Self-regulation and performance level of elite and non-elite youth soccer players', *Journal of Sports Sciences*, 27: 14, 1509 — 1517, First published on: 04 December 2009 (iFirst).
- Töering, T., Elferink-Gesmer, M., Jordet, G., Jorna, C., Peppin, G-J., Visscher, C. (2011). Self-regulation of practice behavior among elite youth soccer players: An exploratory observation study. *Journal of Applied Psychology*, 23, 110-128
- Vealey, R. S., & Greenleaf, C. A. (2006). Seeing is believing: Understanding and using imagery in sport. In J. M. Williams (Ed.), *Applied sport psychology: Personal growth to peak performance* 5th ed. (pp. 285-305). Mountain View, CA: Mayfield Publishing.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: MIT Press.
- Wallingford, R. (1975). Long distance running. In A. W. Taylor & FLandry (Eds.). *The scientific aspects of sports training* (pp. 118-130). Springfield, IL: Charles C Thomas.
- Wanlin, C. M., Hrycaiko, D. W., Martin, G. L., Mahon M. (1997).The effects of a goal-setting package on the performance of speed skaters. *Journal of Applied Sport Psychology*, Volume 9, Issue 2, September 1997, pages 212 – 228.
- Ward, P. & Carnes, M. (2002). Effects of posting self-set goals on collegiate football players' skill execution during practice and games. *Journal of Applied Behavior Analysis*, 35(1), 1-12.

- Weinstein, C.E. and Mayer, R.E., 1986. The teaching of learning strategies. In: Wittrock, M. Editor, 1986. Handbook of research on teaching Macmillan, New York, pp. 315–327.
- Welford, A. T. (1968). Fundamentals of skill. London: Methuen.
- Winne, P. H. & Perry, N. E. (2000). Measuring self-regulated learning. In P. Pintrich, M. Boekaerts, & M. Zeidner (Eds.), Handbook of self-regulation (p. 531-566). Orlando, FL: Academic Press.
- Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis*, 11, 203–214.
- Woodworth, R. S., & Schlosberg, H. (1954). *Experimental psychology*. New York: Holt, Rinehart & Winston.
- Young, B. & Salmela, J. (2002). Perceptions of training and deliberate practice of middle distance runners. *International Journal of Sport Psychology*, 33, 167-181.
- Zimmerman, B. J., & Martinez-Pons, M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal*, 23, 614-628.
- Zimmerman, B. J., & Martinez-Pons, M. (1988). Construct validation of a strategy model of student self-regulated learning. *Journal of Educational Psychology*, 80, 284-290.
- Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology*, Vol. 81, No. 3, 329-339.
- Zimmerman, B. J., & Schunk, D. H. (Eds.). (1989). *Self-regulated learning and academic achievement: Theory, research, and practice*. New York: Springer-Verlag.
- Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist*, 25, 3-17.

Zimmerman, B. J., & Bandura, A. (1994). Impact of self-regulatory influences on writing course attainment. *American Educational Research Journal*, 31, 845-862.

Zimmerman, B. J. & Paulsen, A. S. (1995) Self-monitoring during collegiate studying: An invaluable tool for academic self-regulation. Pintrich, Paul R. Ed., *Understanding self-regulated learning* (pp. 13-28). North Zeeb Road, Ann Arbor, Michigan: New Directions for teaching and Learning.

Zimmerman, B. J., & Kitsantas, A. (1996). Self-regulated learning of a motoric skill: The role of goal setting and self-monitoring. *Journal of Applied Sport Psychology*, 8, 69–84.

Zimmerman, B. J., & Kitsantas, A. (1997). Developmental phases in self-regulation: Shifting from process goals to outcome goals. *Journal of Educational Psychology*, 89, 29-36.

Zimmerman, B. J. (1998). Academic Studying and the Development of Personal Skill: A Self-regulatory Perspective. *Educational Psychologist* 33 (2/3) 73-86.

Zimmerman, B. J. (1999). Attaining self-regulation: A social-cognitive perspective. In M. Boekaerts, P. Pintrich, & M. Seidner (Eds.), *Self-regulation: Theory, research, and applications*. Orlando, FL: Academic Press.

Zimmerman, B. J. (2006). Development and Adaptation of Expertise: The Role of Self-Regulatory Processes and Beliefs. In Ericsson, K. A., Charness, N., Feltovich, P. J. & Hoffman, R. H (Eds), *The Cambridge Handbook of Expertise and Expert Performance*.

Zimmerman, B. J. (2008). Investigating Self-Regulation and Motivation: Historical Background, Methodological Developments, and Future Prospects. *American Educational Research Journal*. March 2008 vol. 45 no. 1 166-183.

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APPENDIX A – Self-regulation questionnaire

Hei!

Først vil vi gjerne takke deg for din deltakelse i dette forskningsprosjektet.

Dette er et spørreskjema med spørsmål om deg og fotball. Det er svært viktig at du svarer på **alle spørsmålene**, slik at dine svar blir behandlet på riktig måte. Les nøye gjennom teksten over spørsmålene. Disse tekstene gir deg viktig informasjon om de følgende spørsmålene.

Det er både flervalgsspørsmål og åpne spørsmål. Ved flervalgsspørsmålene må du **kun velge ett svar**, hvis ikke det er poengtert at du kan gi mer enn ett svar. Dersom du skulle sette ring rundt feil svar, bruk en pil til å peke ut det riktige svaret. På de åpne spørsmålene bruker du det ledige rommet der det er stiplet linje.

Det er helt avgjørende at du er **ærlig** og gir dine **egne meninger** på spørsmålene. Det finnes ikke noe rett eller galt svar. Svarene dine vil være helt anonyme, de vil ikke bli diskutert med andre personer (venner, foreldre, trenere).

LYKKE TIL!

Generelle spørsmål

1. Hva heter du? (For- og etternavn)

.....

2. Hva er din fødselsdato? /Når er du født? (dd. mm.åååå)

.....

3. Hvilket nivå forventer du å nå i din framtidige fotballkarriere?

.....

4. På linjene under, skriv ned to personlige mål som du for tiden prøver å oppnå i din fotballkarriere.

Mål 1:

.....

Mål 2:

.....

Eksempel:

Etter hver trening spiser jeg en banan.

Aldri

Sjelden

Noen ganger

Ofte

Alltid

1. Etter hver trening tenker jeg tilbake og evaluerer (vurderer) om jeg gjorde de riktige

Disse spørsmålene har fem svaralternativer som du kan velge fra. Les spørsmålene nøye og ikke hopp over noen spørsmål. Ring rundt det svaret som passer best for deg. Det er ikke noe rett eller galt svar! Dette er de fem svaralternativene:

Aldri =

*Hvis du **aldri** gjør dette, eller hvis svaralternativet **ikke passer** for deg **i det hele tatt**.*

Sjelden=

*Hvis du **sjelden** gjør dette, eller hvis svaralternativet **ikke passer** for deg.*

Noen ganger =

*Hvis du **noen ganger** gjør dette, eller hvis svaralternativet **verken passer eller ikke passer** for deg.*

Ofte =

*Hvis du **ofte** gjør dette, eller hvis svaralternativet **passer** for deg.*

Alltid=

*Hvis du **alltid** gjør dette, eller hvis svaralternativet **passer svært godt** for deg.*

tingene for å bli en bedre spiller.

Aldri

Sjelden

Noen ganger

Ofte

Alltid

2. Jeg har et klart individuelt mål før hver trening.

Aldri Sjelden Noen ganger Ofte Alltid

3. Etter hver trening tenker jeg tilbake på situasjoner jeg opplevde under treninga, og bruker denne informasjonen til å trene på spesifikke situasjoner aleine eller med andre.

Aldri Sjelden Noen ganger Ofte Alltid

4. Hvis jeg ikke skjønner trenerens forklaring, spør jeg treneren om det.

Aldri Sjelden Noen ganger Ofte Alltid

5. Før hver trening planlegger jeg hvilke ferdigheter jeg ønsker å jobbe med på treningsøkta.

Aldri Sjelden Noen ganger Ofte Alltid

6. På hver trening bruker jeg informasjon fra kamper jeg har sett på TV/internett/live til å bli en bedre fotballspiller.

Aldri Sjelden Noen ganger Ofte Alltid

7. Før hver trening planlegger jeg handlingene mine i forhold til målet jeg vil oppnå i løpet av treningsøkta.

Aldri Sjelden Noen ganger Ofte Alltid

8. Under trening spør jeg om hjelp, hvis jeg trenger hjelp for å forbedre min fotballprestasjon/mine fotballferdigheter.

Aldri Sjelden Noen ganger Ofte Alltid

9. På hver trening bruker jeg informasjon fra bøker, aviser og intervjuer om toppspillere til å utvikle meg til en bedre spiller.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

10. Jeg følger med på mine prestasjoner på hver trening, slik at jeg kan se hvilke ferdigheter (taktiske, tekniske) jeg må forbedre.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

11. Etter hver trening tenker jeg tilbake og vurderer (evaluerer) om jeg har gjort de rette tingene for å nå mitt treningsmål.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

12. På hver trening tenker jeg både på mine styrker og svakheter i fotball og måter jeg kan forbedre dem på.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

13. Under hver trening sjekker jeg om jeg har framgang på ferdighetene mine.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

14. Jeg kjenner mine styrker og svakheter, og på hver trening planlegger jeg hvordan jeg kan forbedre dem.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

15. Etter hver trening tenker jeg tilbake og vurderer (evaluerer) om jeg har nådd mitt treningsmål.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

16. Under hver trening følger jeg med på fotballprestasjonene mine i forhold til mitt treningsmål (slik at jeg ser hvor jeg står).

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

17. På hver trening prøver jeg å identifisere mine sterke sider og finne måter jeg kan gjøre disse sterke sidene enda bedre.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

18. Hvis treneren endrer en øvelse vi holder på med og jeg ikke forstår endringen, spør jeg om treneren kan forklare.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

19. På hver eneste treningsøkt jobber jeg med mine styrker og svakheter fordi jeg tror på mitt potensial som fotballspiller.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

20. Jeg kommer tidlig til hver trening, for å jobbe med spesifikke ferdigheter.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

21. Etter hver trening tenker jeg på hva jeg gjorde rett og galt under treningsøkta.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

22. Under trening sier jeg ifra hvis jeg ikke forstår eller er enig med lagkamerater eller treneren.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

23. På hver trening fokuserer jeg på mitt treningsmål.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

24. Under hver trening sjekker jeg hva jeg fortsatt må gjøre for å nå mitt treningsmål.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

25. På hver trening har jeg en plan på hvordan jeg kan nå mitt treningsmål.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

26. Jeg blir igjen etter hver trening, for å jobbe med spesifikke ferdigheter.

Aldri **Sjelden** **Noen ganger** **Ofte** **Alltid**

27. På hver trening prøver jeg å identifisere mine svakheter og tenke på hvordan jeg kan forbedre disse.

Aldri

Sjelden

Noen ganger

Ofte

Alltid

28. Etter hver trening tenker jeg tilbake på spesifikke situasjoner under treningen og hva jeg gjorde rett eller galt.

Aldri

Sjelden

Noen ganger

Ofte

Alltid

TAKK FOR DIN DELTAKELSE!

APPENDIX B – Self-regulation training program and short questionnaire

Intervention

Self-regulation training program

Self-regulation can be defined as cyclical efforts to optimize cognitive, motivational, and behavioral processes leading to one's goal attainment (Schunk & Zimmerman, 1998).

This “training program” was meant to increase the players' awareness of learning processes before, during, as well as after practice. The goal was, therefore, to improve the players' metacognition and ability to regulate their behavior.

All of the questions written below are not meant to be asked before or after every practice session. The questions with a number in front of it are standard questions which are always used, and then the questions with a letter in front are meant as progressive questions depending on which answers the players give to the standard question. As a player gets accustomed to using self-regulation processes one may not need to ask a lot of questions as the player will automatically elaborate on his thoughts without incitement. This is though just an assumption and may only apply to certain players or maybe none at all.

Regarding the questions used in this intervention there are main questions (with a number in front) which are always asked. The questions with a letter in front are additive questions which are used depending on the answers given by the participants.

Before training

Use 5-10 minutes before each training to discuss the players' goals and strategies for attaining those goals.

Planning

Ask which goal(s) the players have set for today's practice session and how they plan to achieve those goals. If the player has not set any goals, he is to be encouraged to do so before each practice session. Use the questions below to help trigger this process.

- 1) "What is your goal for today's practice?"
 - a. "To whom or what do you compare yourself to when creating your practice goal?"

- 2) "How do you plan to accomplish this goal?"
 - a. "Have you developed a strategy you will use to accomplish the goal(s) you have set?"

- 3) "On a scale from 1-10 how confident are you that you will carry this through?"
 - a. If not 10, why?

Self-monitoring

You are to make the players aware of the importance of self-monitoring. Encourage the players to mentally track their performance while they are practicing the task. This can be a challenging process which the players find troubling or even interfering with their performance at the beginning, but which hopefully will result in positive ramifications in the long run. Use the following questions to help trigger this process.

- 1) "How will you track the development of your performance relative to your goal?"
 - a. "How will you make sure you follow the strategy you set up before practice?"
 - b. "How will you be able to focus on only the critical aspects of achieving your goal while shutting out irrelevant information?"

After practice

Use 5-10 minutes after the training session is over to discuss today's practice with the players.

Evaluation

The goal here is to make the players understand the essence and importance of self-evaluation. It's important to communicate to the players that the standard they evaluate themselves on must neither be too high nor too low. If it's too high they will eventually feel incompetence and a decrease in self-efficacy, if it's too low the challenges will be too easy and no improvement will occur. Both instances have shown to effect performance in a negative direction. Use the questions below to foster evaluation.

- 1) "Did you reach your practice goal?"
 - a. "Two positive things you achieved during this practice?"
 - b. "Two things you need to improve during the next practice?"
- 2) "Did you follow the strategy you set before practice?"
 - a. "Did the strategy you used work as you intended it to?"
 - b. "Did you change strategy during practice and if so, why?"

Reflection

Inform the players of the importance of reflecting on their thoughts while they practiced. Reflection is a key process in self-regulation as it will determine which adjustments will be made and how these adjustments will be put in place leading up to the next performance. Making the players think and reflect on the key aspects of performance in relation to their goal(s) is therefore paramount in order to make the right kind of adjustments that will influence the upcoming performance in a positive manner. The questions below are meant to foster this process.

- 1) "What do you think caused you to succeed in attaining/not attaining your practice goal?"
 - a. "Did you think through what you did well during practice?"

- b. “Did you think through what you had to do to possibly improve your performance?”
 - c. ”Which thoughts occurred when you succeeded with a certain skill or task and why?”
 - d. “Which thoughts occurred when you didn’t succeed with a certain skill or task and why?”
- 2) “What will you adjust in order to improve your next performance and which changes will you make in preparation for your next practice?”

STANDARD SHEET TO FILL IN AFTER EACH PRACTICE SESSION

1) Did you set a practice goal (s) before today's practice session? Yes No

2) From 0-100 %, how successful were you in reaching your goal?

3) If you were not a 100% successful, why?

4) On a scale from 1-10 how much did you benefit (gain) from this practice? /10

5) How will you grade your overall performance in today's practice on a scale from 1-10?
/10

6) Will you make any adjustments in preparation for your next practice and if so, why?

APPENDIX C – The social validity questionnaire

1. Tror du planlegging av treningen har betydning for din prestasjon?

1 2 3 4 5 6 7

Ingen betydning

Stor betydning

2. Tror du at å ha et klart mål før treningen har betydning for prestasjonen?

1 2 3 4 5 6 7

Ingen betydning

Stor betydning

3. Hvor flink var du til å sette deg mål før trening tidligere?

1 2 3 4 5 6 7

Lite flink

Veldig flink

4. Hvor flink er du til å sette deg mål før trening nå?

1 2 3 4 5 6 7

Lite flink

Veldig flink

5. Tror du planlegging og evaluering/refleksjon kan gjøre deg til en bedre fotballspiller på sikt?

1 2 3 4 5 6 7

I liten grad

I veldig stor grad

6. Har treningen (f. eks sette seg mål) virket forstyrrende på noen måte?

1 2 3 4 5 6 7

Ikke forstyrrende

Veldig forstyrrende

7. Har du blitt en bedre fotballspiller i løpet av denne perioden?

1 2 3 4 5 6 7

I liten grad

I veldig stor grad

8. Hvor fornøyd er du med den treningen vi har gjort og resultatet av den?

1 2 3 4 5 6 7

Lite fornøyd

Veldig fornøyd

APPENDIX D – The logbook

Player 1

SHORT QUESTIONNAIRE

Question	7.3	9.3	25.3
If your goal attainment didn't reach 100%, what was the reason?	I was thinking too much on my goal	Poor performances by teammates and I lost the spark to play well	I was focused on my practice goal
Will you make any changes in preparation for your next practice session?	I will try to feel what is right instead of thinking too much	I will try not to be affected by the performance of my teammates	Continue like I did today

Logbook

Planning

Question #	7.3	9.3	25.3
What is your goal for today's practice?	Passing quality and 1v1	Passing quality and 1v1	Passing quality and 1v1
To whom or what do you compare yourself to when creating your practice goal?	Myself and my best performance	Myself and my best performance + Arsenal-Barcelona (night before)	Myself and my best performance
How do you plan to accomplish this goal?	Perception	Think it through before practice starts	Perception

Have you developed a strategy you will use to accomplish the goal(s) you have set?	It happens automatically	No	It happens automatically
On a scale from 1-10 how confident are you that you will carry this through?	7 -Because of uncertainty over teammates	8 -Don't know	9 -No answer

Self-monitoring

Question #	7.3	9.3	25.3
How will you track the development of your performance relative to your goal?	Continually think of mistakes I make	Use breaks to think through what I did well and what I need to improve	Use breaks to think through what I did well and what I need to improve
How will you make sure you follow the strategy you set up before practice?	It happens automatically	No answer	It happens automatically
How will you be able to focus on only the critical aspects of achieving your goal while shutting out irrelevant information?"	I'm always focused	Extra concentration and focus	Remind myself to be focused

Evaluation

Question #	7.3	9.3	25.3
Did you reach your practice goal?	Almost	No	Yes
Two positive things you achieved during this practice?	1v1 defensively and offensively	Good passes	1v1 offensively
Two things you need to improve during the next practice?	Fewer touches on the ball and think less	Not be affected by teammates	Fewer touches on the ball
Did you follow the strategy you set before practice?	Yes!	Became too affected/distracted by teammates	Yes
Did the strategy you used work as you intended it to?	Partly	No answer	Yes
Did you change strategy during practice and if so, why?	Yes, less thinking	No	No

Reflection

Question #	7.3	9.3	25.3
What do you think caused you to succeed in attaining/not attaining your practice goal?	A clear goal/too many mistakes	No answer/Lack of motivation	Concentration/too careless at times
Did you think through what you did well during practice?	Yes.	Yes. Point of impact on the ball	Yes.

Did you think through what you had to do to possibly improve your performance?	Yes. Thought about mistakes	Yes. The angle on my foot during a pass	Yes
Which thoughts occurred when you succeeded with a certain skill or task and why?"	A good feeling-confidence	No answer	Increased confidence
Which thoughts occurred when you didn't succeed with a certain skill or task and why?"	-	Angry. Pissed off	I become irritated
What will you adjust in order to improve your next performance and which changes will you make in preparation for your next practice?	No adjustments	Think more of my own performance	Continue to be concentrated

Player 2

SHORT QUESTIONNAIRE

Question	21.3	23.3	25.3	30.3
If your goal attainment didn't reach 100%, what was the reason?	The practice didn't fit my goal	I had some passes of poor quality but that was mostly because I chose the wrong option	The field was small and space was limited. A lot worked well, but I made some unnecessary mistakes	I was too weak 1v1. My passing game was OK+, but I need to focus more on passing to the appropriate foot

Will you make any changes in preparation for your next practice session?	Try to be better at setting a specific goal	No, I will try to set a goal before practice and monitor it as thoroughly as possible without it interfering with the rest of my game	No. I felt my focus was good and I tried to get that “good feeling”	Yes. I will only set 1 goal to make it easier to focus on that
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Logbook

Planning

Question	21.3	23.3	25.3	30.3
What is your goal for today's practice?	Perception	Passing quality	Passing quality	Passing quality and headers 1v1
To whom or what do you compare yourself to when creating your practice goal?	Myself	Myself	Myself	Myself
How do you plan to accomplish this goal?	Mental focus	Focus on technique	Make safe choices	Be tougher mentally and make good choices
On a scale from 1-10 how confident are you that you will carry this through?	7-I can forget	9-Don't know	10	9-not sure why

Self-monitoring

Question	21.3	23.3	25.3	30.3
How will you track the development of your performance relative to your goal?	By being extra concentrated	Monitor myself all the time	I will think through my performance often	I will constantly evaluate myself
How will you be able to focus on only the critical aspects of achieving your goal while shutting out irrelevant information?	Think about the important things all the time	Unsure how	Balance between focusing on specific goal and general performance	Try to raise my focus

Evaluation

Question	21.3	23.3	25.3	30.3
Did you reach your practice goal?	To a certain degree	Yes. A bit too easy	Yes. I did well	50/50. Better after a while
Two positive things you achieved during this practice?	The long pass and pass completion	Passing quality and organizing	Became familiar with the small pitch and good passing quality	I became tougher
Two things you need to improve during the next practice?	Perception + long pass	Become tougher defensively 1v1	My passing game can become better	I need to be more thorough when passing the ball
Did you follow the strategy you set before practice?	-	Yes. It went well	Yes	Yes. Thought through it
Did the strategy you used work as you intended it to?	-	Yes	Yes. A good balance	Yes. I became tougher

Did you change strategy during practice and if so, why?	-	No	Yes. Changed my focus to perception	No
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Reflection

Question	21.3	23.3	25.3	30.3
What do you think caused you to succeed in attaining/not attaining your practice goal?	-	I focused on my goal	I made the right choices/options	I was thorough and always "present"
Did you think through what you did well during practice?	Yes	Yes	Yes	Yes
Did you think through what you had to do to possibly improve your performance?	Yes. Focus on technique	Yes. I thought about chosen options and the execution	Yes	Yes
Which thoughts occurred when you succeeded with a certain skill or task and why?"	Good feeling-confidence	Good feeling	Good feeling	Confidence
Which thoughts occurred when you didn't succeed with a certain skill or task and why?"	I became extra focused	To try to focus more	I became irritated and focused on making better options	I think to myself that I need to become more agitated

What will you adjust in order to improve your next performance and which changes will you make in preparation for your next practice?	I will set a specific goal	Better the balance between monitoring myself and “let go”	No. Not much to change.	Only a single goal
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