

# Developing Instruments to Measure Long Passing and Shooting Skills of the Football School Students of Medan City

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## Developing Instruments to Measure Long Passing and Shooting Skills of the Football School Students of Medan City

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### Abstract

The preliminary study gives the result that the Football School (SSB) trainers in Medan City do not yet have adequate long passing and shooting skill measuring instruments. They rely on observation only in assessing their students' achievement. Assessment that is based on observation has many weaknesses, one of which is the high element of subjectivity. This study aims to produce instruments to measure the students' long passing and shooting skills. This is a research and development study. The authors used experimental methods in this study through the following steps, (a) draft development, (b) validation, (c) small group tryouts, and (d) extended group trials. The small group tryouts were conducted three times and the extended group trial was administered once. In the extended group trial the authors involved 150 male students of 8 SSB. Based on factorial analysis (validity test) and test and retest (reliability test), the result is that the long passing and shooting instruments are valid ( $P < 0.001$ ) and reliable ( $R > 0.6$ ). Thus, this measuring instrument is very good for measuring long passing and shooting skills of the SSB students.

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## INTRODUCTION

Football game is known by all walks of life and is favored by most of the world community (Hidayat, 2017, p.5). According to FIFA (as cited in Ali (2011), the governing body of world football estimates that there are 265 million active players globally, while some 32 billion television viewers watch the 2006 World Cup final tournament held in Germany. Burgess & Gabbett (2013) state that football can be considered to be the most widely played game in the world. As proof of this popularity is that the World Cup, which is held every 4 years, attracts larger television viewers than the Olympics.

Traditionally, the majority of football players have for years been associated with the fact that football consists of four components, namely technique, tactics, physic, and mental (Danurwinda, et al., 2017, p.56), Erlangga Football Trainer (2017, p. 35), Scheunemann (2012, p.10). Win or loss is not determined by the prowess or carelessness of one or two players (Su'udi, 2010, p.5). The suggestion implies that football should be played in good cooperation and skill. However, good skills cannot be obtained easily, As stated by Su'udi (2010, p.6), the individual skill of a great and fascinating soccer player is the result of his hard work since childhood, not the one that comes by itself.

Several studies prior to this research need to be reviewed. The research, among others, was conducted by Rosch et al. (2000) who compile a long passing test. Participants perform long passing as far as 36m to the target of 10 x 10m in size. Participants get points if the ball is kicked into the target. Rostgaard et al. (2008) also construct a long passing test; participants conducted 10 times long passing experiments as far as 30m across the target area 10 x 5m in size; points (3, 2 and 1) are given to the participants.

Haaland & Holf (2003) construct a volleyball shooting test, the player receives the ball with his chest, controls it, and volleys it into the goal 10m away, the target is given a varying value. Reilly & Homes (1983) construct a shooting test from 8.1m distance to a target 3.6x 2.4m in size using the left foot (on the left) and the right foot if the participant is on the right, or can choose both feet if the ball is in the middle.

Participants score when the ball reaches the target. Rosch et.al (2000) compose two kinds of shooting tests, namely (a) shooting from a fixed ball to a target that is 16m away and an accurate player scores; (b) shooting from a ball fed by a test in front of the penalty spot and without direct control of shooting into goal divided into six different scoring sections.

Based on the preliminary studies it is evident that SSB trainers in Medan City do not have sufficient tools to evaluate the student achievement. Evaluation is only administered through observation, while the evaluation conducted through observation contains many weaknesses; one of which is the element of subjectivity. Nicholls & Worsfold (2016) report the results of their research that the level of poor observation accuracy of 6 elite trainers in the assessment of ten young soccer players in eight games through observation. This has significant implications for the assessment of talent identification. These findings reinforce the importance of performance analysis in providing accurate and comprehensive additional feedback in the coaching process. Based on that, the researcher is interested to develop a model of long passing and shooting skill measuring instrument for SSB students aged 14-15 years.

### Long Passing Skills

Widoyoko (2017, p.43) states that a skill is a person's ability to perform a particular task or set of tasks. The classic definition of skill is the ability to obtain results with a high degree of certainty often with minimum energy and time or both (Knapp as cited in Ali, 2011). Among the basic football skills a football player must have is long passing and shooting. Martin (2011, p.39) states that long passing is a technique rarely practiced by many coaches. long and accurate passing, penetrating passing, especially forward to players who appear to receive it, and the ability to change the point of attack quickly and accurately is a necessity in modern games. Huijgen et al. (2013) state that in high-level soccer for young players, the combination of speed and precision is more important than speed alone.

To make a long passing in the field at a greater distance, you must throw it; this passing skill uses the back of a shoe, rather than the

inner legs (Mielke, 2007, p.22). The long passing or cross passing can be very effective especially since the rear players tend to keep their opponents with smaller number of players. Accuracy in carrying out this passing is very important because any errors will be taken into account (BoC, 2011, p.78).

According to Mielke (2007, p.22), the things to consider for doing long passing are (a) kick the ball at the bottom to provide adequate force, (b) tilt the body backwards when touching the ball, (c) force your feet as a pedestal slightly ahead of the ball and somewhat sideways, and (d) stretch out your arms to get the balance.

#### Shooting Skill

The fact that a football game should be won by putting in more goals than conceding is irrefutable (Danurwinda et al., 2017, p.14). The LA84 Foundation (2008, 124) states that in a game there are several opportunities to score; a good team will exploit this opportunity. Koger (2007, p.39) states that the skill to shoot the ball into the opposing goal is very important to score. If players cannot shoot the ball right into the opposing goal, they cannot win the game. According to Mielke (2007, p.67), from the point of view of the attack, the goal of football is to shoot into the goal.

DK (2011, p.96) states that football is meaningless without goals. In addition to a header or deflection which is a fortune, it is just shooting that score goals (DK, 2011, p.96). Scheunemann (2011, p.188) says it's meaningless when a player is able to feed and dribble well without being able to shoot well. Furthermore, Scheunemann (2011, p.188) states that the ability to shoot well is of course very important because playing football aims to score goals. Koger (2009, p.10) states that the team must be able to shoot and put the ball into the opposing goal. Some teams find that they are capable of shooting the ball towards the opposing goal but unable to put it into the goal.

Shooting is an effort that aims to put the ball into the opposing goal (FIFA, 2015, p.66). A shooting can be done after a final touch but can also be after stealing the ball in the attack. Another option is to shoot from a distance. All the techniques previously learned will not be of much use in a football game if they are not

equipped with good shooting skills. The LA84 Foundation (2008, p.124) states that shooting should be part of every training session. Many of us note that a team or a player capable of doing passing, dribbling, and heading well enough but cannot do the shooting well.

Avry (2015, p.66) states that shooting requires technical qualities (kicking the ball well and accurately), physical quality (explosive power, coordination, balance), and mental quality (determination, courage, confidence). The LA84 Foundation (2008, p.124) states that efforts to develop appropriate shooting technique is done through appropriate body mechanisms, accuracy, explosive power, and timeliness including another important aspect, i.e. the mental one. Koger (2009, p.10) claims that shooting practice will help develop players' confidence, but coaches should try to get them to practice shooting because it's better than nothing. It is very important for players to learn and improve all shooting techniques after practice of herding, controlling, and spinning through many repetitions (Schrener & Elgert, 2013, p.126).

The training activities are in principle the same as the learning activities. Someone is said to have attended training and learning when they have undergone change or improvement (Widoyoko, 2017, p.31). A program of course has a purpose and to know whether the program achieves its goals there must be an evaluation (Purwanto, 2014, p.1; Fenanlampir & Faruq, 2015, p.2). Furthermore, decisions in the evaluation are based on measurement results and criteria (Purwanto, 2014, p.2; Widoyoko, 2017, p.7). The ability to plan and conduct measurement activities and to utilize the information gained from these activities to make evaluations meaningful and accurate is critical to the professional success in the activity-based field you choose (Lacy, 2011, p.1).

Evaluation is a systematic and continuous process for collecting, describing, interpreting, and presenting information about a program to be used as a basis for making decisions, formulating policies, and preparing the next program (Widoyoko, 2012, p.6). According to Lacy (2011, 4), evaluation is the process of interpreting the measurement results and



determining the value. Evaluation can also be called an assessment. Evaluation and measurement are two terms that are not the same but interrelated. Measurement and evaluation are two sustainable activities. Evaluation is conducted after the measurement and evaluation decision is based on the measurement result (Purwanto, 2014, p.1). Lacy (2011, p.5) states that measurement is a technique necessary to evaluate. The measurement represents the status of a particular attribute or property and is a terminal process. Evaluation is a broader term that represents a more complex process than the other two. Meanwhile, Kerlinger (as cited in Purwanto, 2014) states that measurement is comparing something by its measuring instrument and then explaining numbers according to a particular system. According to Verducci (as cited in Widiastuti, 2011, p.2), measurement has important meaning to convey information about an object appropriately. Measurement must be precise, reliable, and objective, and the results should be expressed in numerical form showing the number of properties or attributes to be measured (Lacy, 2011, p.4).

Erlangga Football Trainer (2017, p.128) states that after the training in one season ends, you will need to assess the trainee's development according to the guideline you have provided. To be able to properly evaluate, the trainer must perform tests or measurements. Widiastuti (2011, 5) states that measurements made in sports or sport education are based on: (1) measurement objectives, in accordance with the narrow range of objectives we measure; (2) scientific views closely related to sporting progress; (3) sports values is not known prior to the measurement; (4) benefits to improve the program; (5) professionalism (trained and experienced personnel).

#### Principles, Purposes and Significance of Measurements

In order for the implementation of an evaluation program to work, we need to know some of the principles of measurement and evaluation. According to Fenanlanpir & Faruq (2011, p.9), these principles must (1) be align with the educational or training philosophy; (2) be carried out in accordance with the objectives;

(3) position testing as part of the measurement and measurement is part of the evaluation; (4) interpret the results of testing in the context of individual development as a whole which includes the physical, intellectual, emotional, social and moral aspects; (5) be guided by the basic assumption that all attributes in a person can be tested and measured; (6) know the initial ability to be compared with the results of subsequent tests; (7) use a valid or reliable test or test tool as this will affect the evaluation results.

There are many reasons why a trainer needs to conduct testing and measurement. Measurements that are merely to obtain data or information will only be a waste of time, effort, and cost. According to Lacy (2011, pp.5-8), the benefits of measurement are for diagnosis, classification, achievement, improvement, motivation, program evaluation, public relations, and prediction. According to Widiastuti (2011, pp.5-8), the significance of test and measurement is to determine status, clarification, diagnosis and guidance, motivation, improvement of teaching, and teacher (coach) assessment, methods, and materials. Meanwhile, according to Fenanlanpir & Faruq (2011, p.4), measurement and evaluation aims to (1) grouping, (2) assessment, (3) motivation, and (4) research.

A teacher or trainer should always be able to choose a good measuring instrument so that it can produce appropriate educational or coaching decisions as well (Fenanlanpir & Faruq, 2011, p.7). A measurement or test must fulfil certain requirements for the measurement to be properly classified. Arikunto (2013, p.72) states that a test is considered to be good if it meets five requirements, that is to have validity, reliability, objectivity, practicability, and economy. Meanwhile, according to (Purwanto, 2014, p.153), the conditions that must be met to make a good measuring instrument relate to validity and reliability.

The word 'Validity' is a noun, while 'valid' is an adjective. If the data are generated from a valid instrument, then it can be said that the instrument is valid because it can provide a picture of the data correctly in accordance with reality or real circumstances (Arikunto, 2013,

p.73). According to Anastasi & Urbina (as cited in Purwanto, 2014, p.114), validity relates to whether the test measures what to measure and how well he does it. Azwar (2016, p.8) states that validity means the extent to which an accuracy of a test or scale performs its measurement function.

A test or measuring instrument can be said to be highly valid when the tool performs its measuring function, which is appropriate to the purpose of the measurement. Tests that produce data that are irrelevant to the purpose of measurement are said to have low validity. A valid measuring instrument is not only able to express the data correctly but must also provide a careful picture of the data (Widiastuti, 2011, p.9).

The term 'reliability' comes from the word 'reliable' which means to be trusted. Sometimes there are others who use another term for reliable. There is even an expert who means it with fixed words. Reliability is also called stability or dependability (Usman & Setiyadi, 2009, p.287).

Reliability refers to a series of measurements or a set of measuring instruments that has consistency when the measurements made with this set are done repeatedly (Sugiyono, 2009, p.137). Although the term reliability is synonymous with many other terms such as consistency, reliability, trustworthiness, stability, stability, etc., the central idea embodied in the concept of reliability is the extent to which a measurement process can be trusted (Azwar, 2016, p.7). Reliability is the extent to which the results of a measurement can be trusted and measurement results can be trusted if a number of measurements on the same subject provides relatively similar results (Widiastuti, 2011, p.11).

Based on the principles, objectives, benefits and requirements of the above measurements, the SSB trainer must perform tests or measurements. By administering the tests, the trainer has accurate data to conduct an evaluation of his/her students and the results of the evaluation become a starting point to take the next steps.

## METHODS

This research is focused on the development of football skills measurement on the SSB. The approach employed in this research is research and development. It is a research approach used to produce a specific product and test the effectiveness of the product (Sugiyono, 2014, p.297). The research procedures adopted in this study include (1) preliminary study stage which includes (a) library study, (b) data analysis of the results of the preliminary study and description of field data, and (c) preparation of initial product design of measuring instrument to be developed; (2) development stage. The draft was distributed to experts to be corrected and subsequently revised. The revised draft results were discussed in focus group discussions (FGDs) involving experts. The revised draft of the measuring instrument was ready to be tried out; (3) testing the measuring instrument. Tryouts were conducted on several SSBs with experimental methods. The above procedures are shown in Figure 1.

After the draft was revised in accordance with the results of expert validation and FGDs, the measuring instrument was tried out three times in small groups and once in large groups. The trial runs from August 2014 to September 2015. The first small group trial involved 56 students, the second trial involved 12 students and the third 21 students. Revisions were made after the trials; the revisions were based on data analysis, notes, and advice from experts and trainers.

In this research there are two kinds of data: qualitative and quantitative data. The qualitative data were obtained from the beginning to the end of the research and were immediately recorded into the form of writing and analysis without waiting for the research activities to be completed. The quantitative data were collected to examine the effectiveness of the application of the developed measuring instruments. The data collected through the experiments on the small and large groups were primary since the main purpose of this study is discovering the design of the measuring instruments. The subjects of this study were SSB

students of Medan City, among others SSB Gumarang, SSB Kenari, SSB Patriot, SSB Bhineka, SSB Bima, SSB Mandiri, SSB Putra Melati, SSB Perfect Unimed, and SSB Tasbi.

The trial proceeded with revisions so that this measuring instrument can illustrate the true skills of the trainees. After all the data had been collected, the data were tested for validity and reliability. To test the validity of the data, the researchers use the ever increasing persistent ways. Sugiyono (2015, p.270) states that the test of data validity in qualitative research includes test credibility (internal validity), transferability (external validity), dependability (reliability), and confirmability (objectivity). Furthermore,

Sugiyono states the testing of credibility of the data is administered with extension of observation, improvement of perseverance, triangulation, and discussion with peers, negative case analysis, and member-check. Things that happened during the testing process were always under the researcher's attention. Increasing perseverance means making observations more thoroughly and continuously. In this way, data certainty and sequence of events were recorded exactly and systematically (Sugiyono, 2015, p.272). All the data were carefully examined by noting, marking, removing or reducing them.

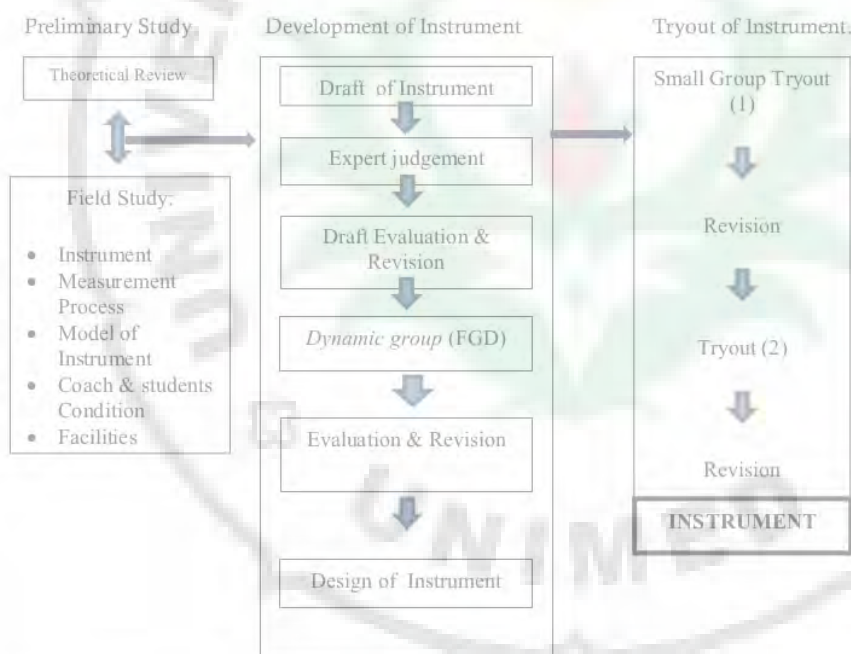


Figure 1. Research framework of measuring instrument development

## RESULTS AND DISCUSSION

### Result of the Needs analysis

From the result of the needs analysis and field findings it was found that the evaluation was directed to the observation students only. The questionnaire distributed to trainers and parents provides evidence that the measuring

instruments to assess the students' skills of long passing and shooting of is basically needed.

### Results of the initial development

The draft that had been designed was validated by three soccer experts, two A AFC licensed coaches, a soccer lecturer, three evaluation experts, and two experts on tests and

measurements. The experts' notes on the initial draft are (1) each test item must be completed with a description of the assessment, (2) the use of the term is consistent (in terms of testees); (3) the language forms need to be improved; (4) it is necessary to determine the time to work on each item rather than just the total time, and (5) the test officer should be trained first.

These measuring instruments were designed in a test battery and performed by individual students. The students started to do the test from a 2 x 2m square box and this test consists of two sections, the first section was for long passing and the second was for shooting.

After a testee was in the square box, the officer gave the signal to start with the cues of "ready" and "yes". When the signal is "yes", the testee started the test with a long passing to the target three times, and then he continued with the shooting at the target wall three times as well. The goals on the long passing and shooting were divided into three segments, namely 3, 2, and 1 scores. In addition, the time was also recorded using a stopwatch. The testees tried to obtain high scores as quickly as they could. The initial scheme of the measuring equipment development is shown in Figure 2.

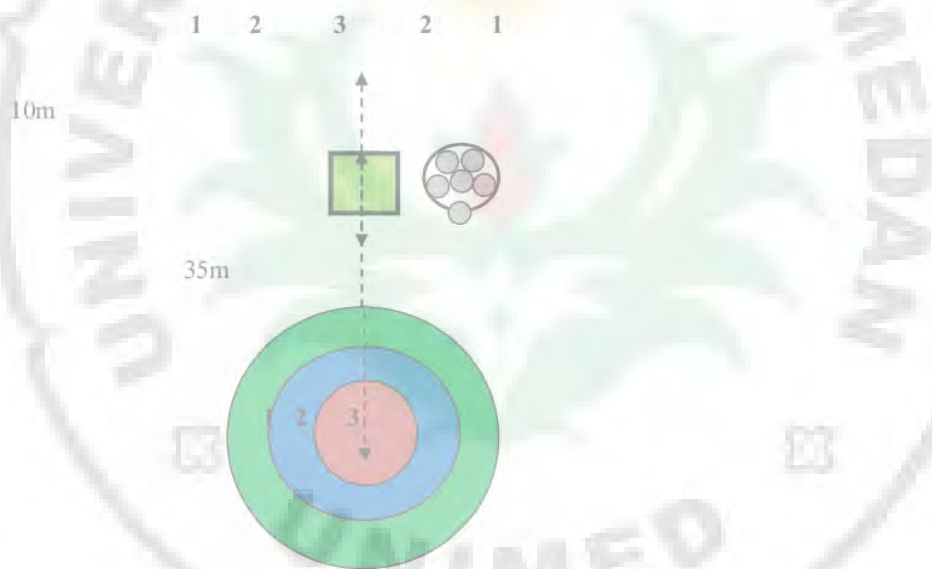


Figure 2. The initial scheme of the measuring instrument development

**Result of the Trial**

The development of measuring instruments for long passing and shooting skills

must meet the validity and reliability test. The results of the validity and reliability test are presented in Table 1.

Table 1. Result of validity test

No	Skill	Category	Tryout Phases							
			1st Tryout		2nd Tryout		3rd Tryout		Large Group	
			r	Not e	r	Note	r	Not e	r	Note
1	Long passing	Score	0.770	V	0.825	V	0.843	V	0.834	V
		Time	0.548	V	0.832	V	0.814	V	0.833	V
2	Shooting	Score	0.734	V	0.825	V	0.899	V	0.900	V
		Time	0.870	V	0.947	V	0.862	V	0.927	V



The above data show that the results of the measuring instrument has fulfilled the requirements. of the validity test. The first test, the second test, the third test and the large group are valid (V) so that the validity

**Table 2.** Reliability test results

No	Tryout	Caregory	Reliability Scores	Criteria
1	1st Tryout	Score	0.299	Unreliable
		Time	0.651	Reliable
2	2nd Tryout	Score	0.756	Reliable
		Time	0.373	Unreliable
3	3rd Tryout	Score	0.901	Reliable
		Time	0.906	Reliable
4	Extended Group Tryout	Score	0.843	Reliable
		Time	0.931	Reliable

The data above show that the 1st test gives an unreliable score but with reliable timing so that the measuring instrument is improved and tested in the 2nd tryout. The 2nd test data show that the score is considered reliable but the timing is not reliable so that the measuring instrument is revised again and tested in the 3rd trial. The 3rd trial shows that both the score and the timing are reliable so that the measuring instrument passed the reliability test.

Subsequently, the measuring instruments were tested on large samples; the results show that both the score and the timing are valid (V) and reliable. Thus, it can be inferred that the developed instruments could be used to measure long passing and shooting skills in soccer. The chronology of developing the instruments for measuring the students' long passing and shooting skills during field trials is shown in Table 3.

The data above show that the instruments had undergone changes and improvements (revisions) from the 1st trial to the last one. Comparison of the initial draft and the final one is presented in Table 4.

Based on the data analysis, the measuring instruments for long passing and shooting skill

produced in this research are valid and reliable. The students who have the ability of accurate and fast long passing and shooting are to get high scores. Zago, et.al (2014) state that skilled players take less time to complete the tests because they are able to control the ball while running through shorter paths. Luxbacher (2010, p. 79) states that scoring success depends on several factors. Among the factors is the ability to shoot strongly and accurately with one foot. Furthermore, Luxbacher (2010) says that although goals are often the result of a team effort, players who consistently complete attacks by obtaining goals are rare and valuable team members. This confirms that players with accurate shooting will be able to score goals and this player is indispensable in the team.

In addition to the shooting skill, a measured long passing skill is a skill that must be possessed by football players. Luxbacher (2010, p.55) states that the player's ability to pass the ball accurately and at the right pace is a very good thing to create a successful combination of attacks. The speed of the ball path should not be too fast or slow, the ball must be played strongly to the teammates' feet but not too difficult to control.

**Table 3.** Records of measurement tool development

Test Types	Small Group Tryout			Large group Tryout
	1st Tryout	2nd tryout	3rd truout	
Long Passing	Target distance 35m Target Radius for the score of 3 is 3m, 2 is 4,5m, 1 is 6m Passing is repeated 3 times	Target distance 30m Target Radius for the score of 3 is 2m, 2 is 4m, 1 is 6m	Target distance 25m	
Shooting	Target Radius for the score of 3 is 80cm, 2 is 100cm, 1 is 122cm Shooting is repeated 3 times	Target Radius for the score of 3 is 40cm, 2 is 80cm, 1 is 122cm Shooting is repeated twice		

**Table 4.** Changes in the scheme of the measuring instrument between initial and final design

Initial Development	Final Development
Target distance of long passing is 35m	Target distance of long passing is 25 m
Long passing is repeated 3 times	Long passing is repeated twice
Target distance of long passing is 3m for the score of 3, 4.5m for the score of 2, and 6m for the score of 1	Target radius for long passing is 2m for the score of 3, 4m for the score of 2, and 6m for the score of 1

Russell, Bent<sup>2</sup>, & Kingsley (2010), in his research entitled *Reliability and Construct Validity of Soccer Skills Tests That Measure Passing, Shooting, and Dribbling*, reported that shooting measurements are valid and reliable in measuring soccer skills. Cripps, Hoppe<sup>3</sup> & Joyce (2015) in their research entitled *Inter-Rater Reliability and Validity of the Australian Football League's Kicking and Handball Tests* also reported that in kicking and ballooning skills there is strong validity and reliability. Similarly, Cripps, Hopper, & Joyce (2015) in the *Inter-Rater Reliability and Validity of The Australian Football League's Kicking and Handball Tests* report that in kicking and ballistic skills there is strong validity and reliability.

Ali (2011) drew up Loughborough Soccer Shooting Test, participants ran to a cone, turned and returned to pass the ball to the bench and shot to the target as far as 16.5m (minimum shooting speed of 64km/h). After the player

shotsprints passing the line of 6 yards (4.5m) to finish each shot, ten shots were performed per experiment with points and the average time taken for each shot.

Vieira, Vito<sup>3</sup> & Rodrigo (2017) in the research entitled *Construct Validity of Tests That Measure Kick Performance for Young Soccer Players Based on Cluster<sup>3</sup> Analysis* reported that five tests demonstrate a reasonable construct validity and can be used to predict the accuracy (penalty kicks, free kicks, rolling ball kick and volleyball test to the wall and the ability to spin on the ball (free kick and corner kick) when kicking the ball.

Zaldy (2015) in his research entitled *Development of the Football Game Appraisal Instrument in the Learning of Physical Education, Sport and Health on Elementary School Students* reported the results of his research, which is an assessment instrument in a valid soccer game with a reliability coefficient of 0.64.

Bekris & Gioldasis (2016) in their research entitled Juggling Test Battery aims to develop a juggling test battery and the result is that effective juggling tests to improve basic soccer techniques skills. That is, the test battery has good validity and reliability.

Based on the results of the effectiveness test of the model and the theoretical studies underlying the development of this measuring instrument it proved that the empiric product results in the form of a model of SSB students skills is very effective. This is indicated by the results of the test of validity and reliability which is high enough.

## CONCLUSION

Based on the data obtained from the observation, field trials and discussion of research results, it can be concluded that measuring instruments for long passing and shooting skills has been prepared for 14-15 year old students of SSB Medan City.

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