

# Validity and Reliability Assessment Physical Literacy-Physical Competence Domain (APL-PCD) in East Priangan, Indonesia

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**Abstract** The research was completed to design an instrument to assess physical literacy in the physical competence domain of elementary schools (APL-PCD). The prior research led to the development of an assessment tool for physical literacy consisting of three tests: the Traditional Indonesian Assessment Movement and Agility (TIAMSA), the Progressive Aerobic Cardiovascular Endurance Run (PACER), and the Sit-Up. On the other hand, the validity and reliability values still need to be thoroughly evaluated. Validity and reliability tests need to be carried out because there currently needs to be an appropriate physical literacy assessment available in the East Priangan region of Indonesia. As a result, the primary purpose of this research was to investigate the validity and reliability of the APL-PCD. The validity of the product was evaluated by the application of Doolittle's method of statistical analysis. Aiken's V formula was utilized to evaluate the reliability of each item. Researchers consulted three industry professionals as part of a content validity investigation to assess whether or not the APL-PCD product could be considered legitimate. The test-retest methodology was applied when the reliability of something was being evaluated. The sampling was carried out with a specific goal in mind. The sample was drawn from a larger population of 258 pupils, with 122 students from each of the five elementary schools in the East Priangan district. The validity and dependability of the APL-PCD led to

extremely high standards of appropriateness, comfort, and security being met. The APL-PCD has a very high validity value for males, coming in at 1.017, in addition to good dependability. The result was 0.937 when referring to females. The value for high reliability in males is found to be 0.747%, while in females, it is found to be 0.606%. As a result, the APL-PCD can be considered a test instrument to evaluate physical literacy in the physical competence area. Because of these findings, it will be much simpler for educators to assess students' physical literacy accurately.

**Keywords** Physical Literacy, Assessment, Validity, Reliability

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## 1. Introduction

Education is an effort undertaken by the Government and society to improve the overall quality of individuals and the human resources available. In Indonesia, education is carried out through teaching and learning to enhance students' emotive, cognitive, and psychomotor capacities [1,2]. Education is carried out not only to grow students' cognitive abilities but also to improve students' social abilities and physical motor skills. One of education's primary goals is to develop students' cognitive abilities [3].

The goal of the learning process in Physical Education (PE) classes is to help students improve their physical motor skills. Direct learning experiences are emphasized in physical education classes to facilitate the growth of student's physical fitness, movement skills, critical thinking abilities, social skills, reasoning, emotional stability, moral action, healthy lifestyles, and an introduction to clean environments [4]. Therefore, in its application, physical education learning should emphasize direct practice to get students moving and provide a more meaningful educational experience. Physical literacy is a skill cultivated by participating in physical education.

Literacy is comprehending and processing information and analyzing and responding to what one reads. Literacy was formerly defined as just the capacity to read and write [5]; however, as time progressed, the definition of literacy expanded to encompass a broader range of skills and activities. Physical Health Education (PHE) in Canada and Australia [6] is one of the organizations that has established a literacy issue. PHE is one of the organizations that, in recent years, has elevated the topic of physical literacy, which has become the primary emphasis of PE [7]. Other organizations from various nations have also developed a literacy topic. A person's ability to build the motivation, confidence, physical competence, knowledge, and understanding that they need to engage in physical activity at a level done throughout their life is called physical literacy [8,9]. Physical Literacy is defined as a picture that each individual is expected to be able to do and develop. The ability to assess the physical literacy skills of students can be measured in various ways, including tests, measures, and evaluations. However, the situation reveals that physical education teachers in Indonesia, particularly in the East Priangan region, use testing equipment while evaluating students' performance [10,11]. Therefore, some people still rely on their intuition while making decisions.

The observations and interviews with some physical education teachers working in elementary schools in the east Priangan region indicate that physical education instructors are unfamiliar with Physical Literacy and the procedures for assessing Physical Literacy [10]. In a number of the educational institutions that were the focus of the investigation, some of the remarks made revealed that in addition to constraints in constructing or employing

learning instruments for sports, there were also challenges posed by educational resources that did not provide support for them. Because of this scenario, there may not be any assessment instruments available, making it impossible for teachers to evaluate their pupils' capabilities accurately.

Developing an assessment method that can measure the level of physical literacy of individual pupils is one way of addressing these issues. Instruments of assessment are tools that teachers can use to help them measure the skills of their students. Using instruments will enable educators to ascertain both the capability and the accomplishment of student learning, enabling the educator to ascertain whether or not the teaching process has been carried out appropriately [12,13]. Teachers are required to use assessment tools during the learning process to ensure that the assessment accurately reflects the abilities of the child rather than relying on observation alone [14,15]. Previous studies have shown that the APL-PCD that has been developed can provide instructors with assistance when conducting evaluations of the physical competency domain [10,16]. The results gained from earlier studies are compiled into a handbook called an APL-PCD test instrument. The CAPL-2 instrument, one of the physical literacy instruments established in Canadian elementary schools (17), inspired the APL-PCD instrument. The instrument was created by integrating elements from the Indonesian Physical Fitness exam (TKJI) as a sit-up exam with traditional games from the West Java region of Indonesia, specifically Engklek and Bancakan [1]. APL-PCD has the potential to be an engaging and user-friendly testing tool in the field, all while preserving the unique qualities of children and the joy that children in Indonesia experience in physical education.

The Traditional Indonesian Assessment of Movement and Agility (TIAMSA), the Progressive Aerobic Cardiovascular Endurance Run (PACER), and the Sit-Up Test comprise the APL-PCD. The Canadian Agility and Movement Skill Assessment (CAMSA) was the impetus for developing the Indonesian Traditional Agility and Movement Skills Assessment (TIAMSA), which modified CAMSA's agility movements by incorporating traditional games from the West Java region of Indonesia. Figure 1 shows the four stations that make up TIAMSA. These stations can be found at the appropriate locations.

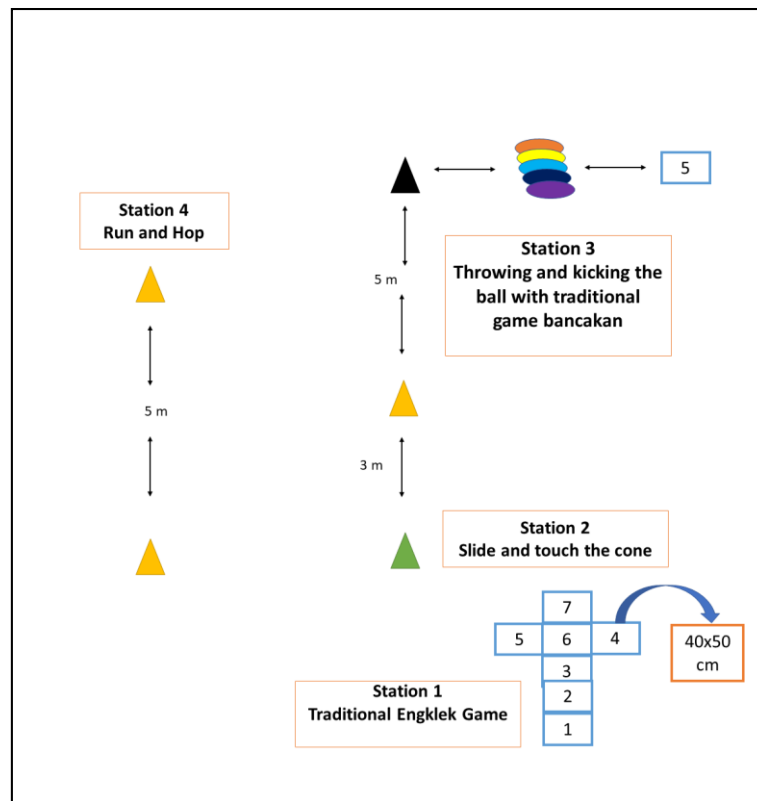


Figure 1. TIAMSA Series by Adding Implementation Information in Each Post

A traditional game from West Java can be seen depicted in the first post of Figure 2. The second move demonstrates a sliding motion, and the third demonstrates how the ball is traditionally kicked in the game of Bancakan (Indonesian Traditional Game). The most recent post is running in a hop-step-hop pattern.

The cardiorespiratory endurance capacity of our subjects was evaluated with the help of the PACER test during the APL-PCD. Longmuir et al. [12,17,18] show the PACER test is appropriate for assessing the cardiorespiratory capacity of children between the age of 8 and 12. In addition, participants are required to run 15 or 20 meters at a pace that is gradually increased throughout the test. Figure 2 demonstrates how the PACER metric determines the runner's overall distance covered during the race.

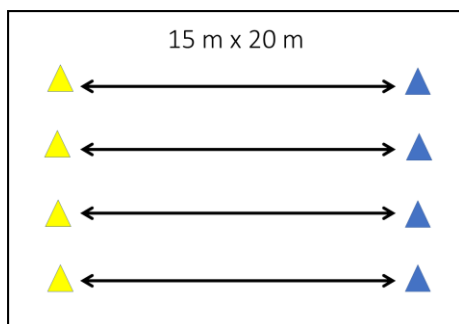


Figure 2. PACER running tracks

The PACER distance is either 15 or 20 meters, depending on the audio transmission speed, which begins at 8.5 kilometers per hour and will increase by 0.5 kilometers per hour.

A beginner's stance is used for the sit-ups, in which the participant sits supine on the floor with their knees bent at a ninety-degree angle and their hands put beside their ears. The time limit for the exercise is thirty seconds, and the participant must complete the exercise within the allotted amount of time. See Figure 3.

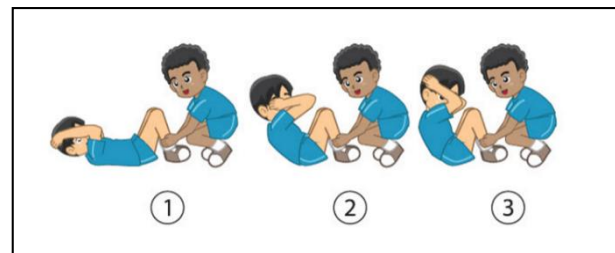


Figure 3. Sit-ups for children

The number of sit-ups that youngsters can complete is used to gauge their overall muscle mass. They are predicated on the observation that children of age to attend primary school are still in a stage of development during which they have not yet acquired little muscles or general health. The general population generally has poor health and is prone to illness; they are fragile and have little

endurance.

According to the findings of the research conducted by Fathiyati [10] APL-PCD assessment tool can accurately measure the students' physical literacy skills within the physical competence area. It's just that in prior research, validity and reliability weren't put through their paces in quite the same way as they are now. Therefore, this research aims to evaluate the viability of goods produced with appropriateness, convenience, and safety goals.

## 2. Materials and Methods

Purposive sampling, also known as nonprobability sampling, is a technique that can be used to determine a sample depending on variables. This technique was used to determine the sample included in this study. Take into consideration that there are 53 male pupils and 69 female students. Refer to Leavy development research should have a population of more than 40. The sample criteria include students in grades four to six or those aged eight to twelve years old. The entire population of children had obtained permission from parents and schools through official letters, then coupled with the issuance of a research ethics letter from Semarang State University.

Doolittle's statistical analysis was used to measure the product's validity in this study. When all of the test items have been associated with one another, the validity of the test battery may then be assessed by calculating the overall correlation coefficient [19]. To determine the product validity of APL-PCD, researchers conducted a content-validity analysis with three experts. These experts included specialists in the field of physical education (PE), specialists in the field of tests and measures, and experienced physical education teachers. The validity of each item is determined using Aiken's V formula, which does this by calculating the content-validity coefficient [20]. Validity test steps can be seen in Figure 4.

Researchers use the test-retest method for the determination of product reliability. This can be achieved by conducting several rounds of testing on the instrument with respondents [21]. There is no difference in the instrument or the responders; the only difference is in the time. The reliability of an experiment can be determined by calculating the correlation coefficient between it and an additional experiment. If the correlation coefficient is found to be positive and statistically significant, the instrument is considered to be dependable. validity test steps can be seen in Figure 5.

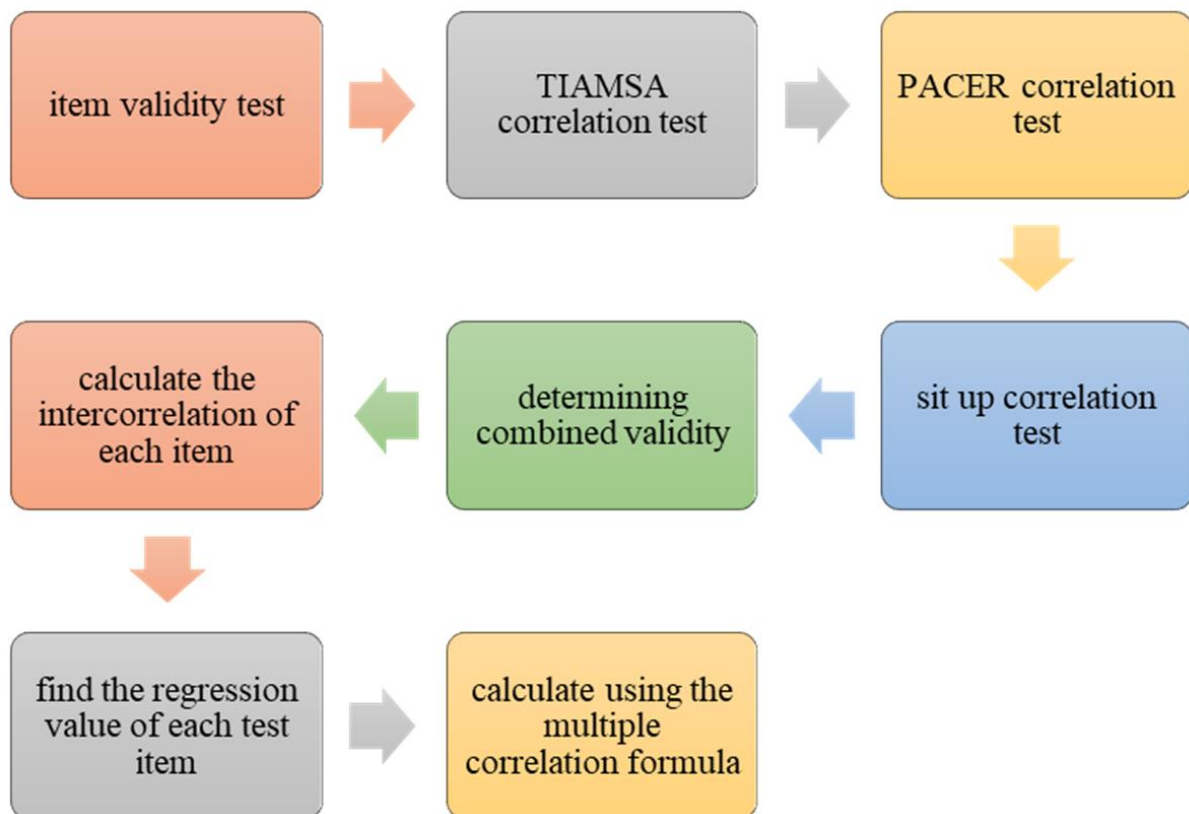


Figure 4. Validity test steps

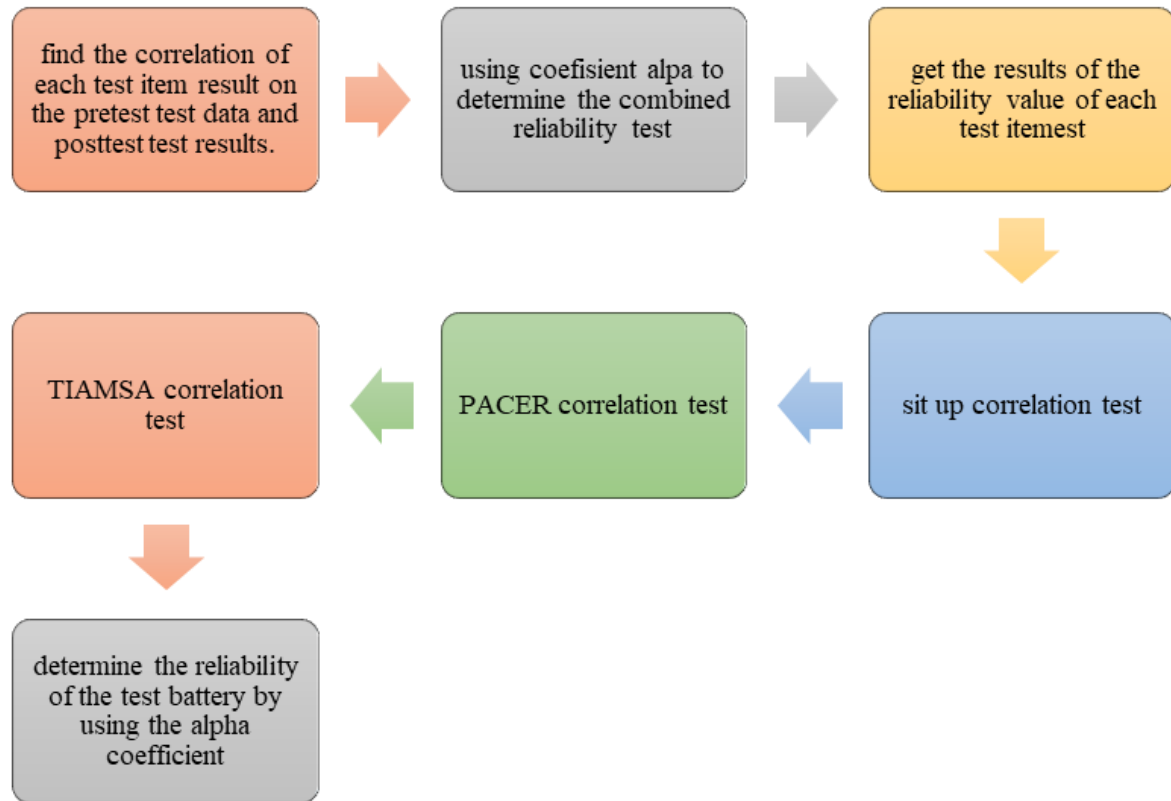


Figure 5. Reliability test steps

### 3. Result and Discussion

#### 3.1. Validity Test

The validity test results are obtained from each test item's results with the total correlation coefficient analysis score with the composite score. The results obtained from each test item are described in Table 1.

Table 1. Results of the validity test

Test Item	Boys or Girls	Validity	Criteria
TIAMSA	Boys	0.517	Moderate
	Girls	0.378	Low
PACER	Boys	0.732	High
	Girls	0.602	Moderate
Sit Ups	Boys	0.688	High
	Girls	0.801	High

From the table above, the test results of the validity of the test items are known that the results of testing the Traditional Indonesian Assessment Movement and Agility (TIAMSA) correlation with the total score of men obtained a value of  $r = 0.517$  with "sufficient" criteria. In contrast, the TIAMSA correlation value with the total women's score obtained a value of  $r = 0.378$  with "low" criteria. The results of testing the correlation of PACER

with the total score of men obtained a value of  $r = 0.732$  with "high" criteria. In contrast, the correlation value of PACER with the total score of women obtained a value of  $r = 0.602$  with "sufficient" criteria. The results of testing the correlation of sit-ups with the total score of men obtained a value of  $r = 0.688$  with "high" criteria. In contrast, the correlation value of sit-ups with the total score of women was  $r = 0.801$  with "high" criteria.

The next step is to determine the combined validity by calculating the intercorrelation of each test item by correlating each test with another test. The results can be seen in Table 2.

Table 2. Intercorrelation Results

Correlations		TIAMSA	PACER	Sit up
TIAMSA Pi	Pearson Correlation	1	.110	.095
	Sig. (2-tailed)		.375	.443
	N	67	67	67
PACER Pi	Pearson Correlation	.110	1	1
	Sig. (2-tailed)	.375		
	N	67	67	67

The results obtained from the Werry Doolittle worksheet were used to find the multiple correlation values. After obtaining the value from the results of the Werry Doolittle worksheet, the researchers then looked

for the regression value of each test item—the calculated regression value obtained from the calculation results in Table 3.

**Table 3.** Regression Value TIAMSA

**Correlations**

		TIAMSA	T_Score
TIAMSA Pa	Pearson Correlation	1	.517**
	Sig. (2-tailed)		.000
	N	51	51
T_Score	Pearson Correlation	.517**	1
	Sig. (2-tailed)	.000	
	N	51	51

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Table 4.** Regression Value PACER

**Correlations**

		PACER	T-score-Pa
PACER	Pearson Correlation	1	.732**
	Sig. (2-tailed)		.000
	N	51	51
T score	Pearson Correlation	.732**	1
	Sig. (2-tailed)	.000	
	N	51	51

Correlation is significant at the 0.01 level (2-tailed).

**Table 5.** Regression Value PACER

**Correlations**

		Sit Up	T_Score
Sit Up	Pearson Correlation	1	.688**
	Sig. (2-tailed)		.000
	N	51	51
T-Score	Pearson Correlation	.688**	1
	Sig. (2-tailed)	.000	
	N	51	51

\*\* . Correlation is significant at the 0.01 level (2-tailed).

In table three to five regression value is a method that serves to predict the effect of three functional variables, namely TIAMSA, PACER, and Sit-ups. table 3 shows that the male regression value on TIAMSA is 0.565, PACER is 0.573 and Sit Ups is 0.437. With a difference in regression value that is not far away, it means that each test has the same average value of variables and optimizes the operational efficiency of the test.

**3.2. Validity and Reliability Test**

Researchers used the test-retest method by looking for

the correlation of each test item result on the pretest measurement data and the results of the previous research posttest measurement. After knowing the reliability of each test, the alpha coefficient to determine the combined reliability test was analyzed. The results of the reliability value of each test item are in Table 6.

**Table 6.** Reliability Battery Test

Test Item	Boys or Girls	Validity	Criteria
TIAMSA	Boys	0.731	High
	Girls	0.674	High
PACER	Boys	0.680	High
	Girls	0.022	Low
Sit Ups	Boys	0.830	Very High
	Girls	0.821	Very High

The table shows the results of the reliability test of the test items. The men's TIAMSA has a reliability value of 0.731 with "high" reliability criteria, and the women's TIAMSA has a reliability value of 0.674 with "high" reliability criteria. Test item reliability results showed that men's PACER had a reliability score of 0.680 with 'high' reliability criteria, and women's PACER had a reliability score of 0.022 with 'low' reliability criteria. The reliability test results of the test items showed that the men's sit-ups have a reliability value of 0.830 with "very high" reliability criteria, and the women's sit-ups have a reliability value of 0.821 with "very high" reliability criteria. After each test item has known its reliability value, the next step is to determine the reliability of the test battery using the alpha coefficient domain statistics approach. The results obtained from calculating the reliability of the APL-PCD Battery are presented in Table 7.

**Table 7.** Reliability Battery Test

Variables		Reliability Value	Criteria
APL-PCD	Boys	0.747	high
	Girls	0.606	high

Based on the table, the results of the test battery reliability value obtained by male reliability have a value of 0.747 with "high" reliability criteria. As for the results of the reliability value of the female test, it has a value of 0.606 with "high" reliability criteria. These results show that APL-PCD has accuracy and accuracy in determining the extent to which children can obtain the degree of physical literacy of the physical competence domain of students in elementary school with predetermined criteria.

After researching to determine the feasibility of the APL-PCD instrument developed and determine the level of validity and reliability of the test instruments that have been made, the results of this study suggest that CAPL has a different level of validity between the results

achieved by boys and girls, with the age of the students also influencing this, even though the researcher's testing apparatus yielded the same findings, specifically that the validation value for males is 1.017, placing them in the highest high category. Regarding the validity of women, it has a value of 0.937 and falls into the highly high category. The development that is being carried out by researchers such as TIAMSA aims to enhance children's motor skills. One way is to enhance children's physical literacy by playing traditional sports and games in primary schools, such as cricket [22]. This strategy aims to promote students' Physical Literacy. The results improved because the typical game domain was adjusted to make it more likely to motivate children to engage in movement activities. The impact of these findings is the same as that of the findings from this study.

Following an awareness of the validity and reliability of APL-PCD, all stakeholders must have the same understanding of assessment in PE learning. The implementation of the physical evaluation at the primary school level has not been carried out correctly and consistently from class to class. The increase in the grade level of pupils did not significantly impact the students' physical competence, daily movement activities, confidence, motivation to participate in sports, or knowledge and comprehension consistently [7,23]. There is still a widespread misunderstanding regarding the purpose of many testing tools, namely whether they are designed for assessment or evaluation. Tests can be utilized in various ways, including assessing and improving programs, recording student learning progress, and many other essential aspects of teaching and learning. Based on this idea, tests are not limited to evaluating and assessing. Still, they can be administered at the beginning of physical education as an assessment to promote learning progress.

Assessments and measurements for categorization, evaluation, motivation, and research can be grouped according to gender, age, interests, etc. Evaluation to chart the progress of the results [24,25]. Encouragement to foster greater levels of zeal and consciousness throughout the learning process. In this context, the process of organizing inquiries is called research. These objectives the teacher sets can be interpreted in a few different ways. They include providing feedback to improve the teaching and learning process, defining a more specialized type of instruction for students still falling short, and identifying the level at which they will be raised to a better level.

The assessment process is an ongoing procedure that gathers information on students' learning outcomes to reach a conclusion based on specific criteria. In the context of the educational process, tests, in their broadest sense, serve both as a mechanism for collecting data and as a foundation upon which to build an evaluation. The processes of picking tests, measuring scores, and assessing them based on a comparison scale are all part of the assessment, which integrates all of other

implementations. As a result, the APL-PCD produces a reliable evaluation for use by educators in determining students' levels of physical literacy within the domain of physical competence. Because of this advancement, educators will be able to give a mode of instruction that emphasizes not only students' physical capabilities but also the provision of experiences that are meant to be applicable in day-to-day life. The researchers recommend that a larger population and sample be used to assess whether APL-PCD is feasible. As a result, adequate financing for this research from either the public or private sector is required.

## 4. Conclusions

The APL-PCD Test criteria resulted in very high-criteria test validation and reliability values, which amounted to 1.017 for men and 0.937 for women. The reliability obtained by the APL-PCD Test in high criteria amounted to 0.747 for the male test and 0.606 for the female test. So the APL-PCD test is feasible and acceptable for elementary school children aged 8-12 years in the East Priangan region, Indonesia.

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