

Research Article

Effectiveness of Physical Literacy Program on the Enhancement of Skill-Related Fitness Performance of Senior High School Students

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Abstract: This study, “Effectiveness of physical literacy program on the enhancement of skill-related fitness performance of senior high school students” assessed the effectiveness of physical literacy program on the enhancement of skill-related fitness performance of the senior high school students. Eighty students performed the skill-related fitness such as power, agility, balance, and speed. Single group experimental research of pre-test-post-test design was utilized. The Revised Physical Fitness Manual was utilized as research instrument. Procedures of the pre-test and post-test were provided. They performed with supervision of any adult in their homes. The level of fitness in power was “Good”, agility was “Fair, balance and speed skills was “Needs Improvement”. It was concluded that there is a significant difference between the pre-test and post-test performance of the participants in power, balance, and speed; while there is no significant difference in agility skill. The implementation of the physical literacy program during this pandemic may be reviewed to determine whether students can perform expected physical activities or follow the procedures. The content of the physical literacy program during this pandemic may be revisited to determine whether all activities can be performed with little supervision. Since it was determined that the physical literacy program has been effective particularly in the enhancement of power, balance and speed, the program may be continued with a minimal modification to increase the level of fitness of students. Other agility improvement tests may be included in the improvement plan.

Keywords: Physical Literacy Program, Skill-related Fitness Performance, Level of Fitness.

Introduction

In the Philippines where freedom from poverty is a must, education serves as one of the means to obtain such freedom. Formulating policies on education becomes one of the major concerns, therefore, of the law-making bodies. Policies have already been implemented and the most recent is anchored on Republic Act No. 10533 or the “Enhanced basic Education Act of 2013”. RA 10533 Section 2 declares a policy which says that the state shall establish, maintain, and support a complete, adequate, and integrated system of education relevant to the needs of the people, the country and society-at-large.

Section 4 of the same Republic Act stated the enhanced basic education program that encompasses at least one year of kindergarten education, six years of elementary education, and six years of secondary education. It further clarified four years of junior high school education and two years of senior high school education. Four career tracks are included among the choices of students upon enrolment such as: Academic, TVL/TVE, Arts and Design, and Sports. All of these aims to prepare

students to be more productive persons in their chosen careers, thus, every program leads towards ensuring that students become competently literate and competitive in their chosen fields.

In the City of Binan, there are eight senior high schools but only one stand-alone SHS offers Sports Track, that is, Binan City Senior High School–Sto. Tomas. Students enrolled in this track are either physically fit and inclined to careers that require more physical activities or directly connected to any sports as players or just sports-minded students. But like in the other tracks, students' literacy is also expected among the students of sports track. They are expected to become physical literate. What is physical literacy? Coaches as well as teachers have highlighted physical literacy as a major outcome of quality programming. Bailey (2020) wrote: "The term physical literacy (PL) has been widely used in policy and practice discourses, engaging sport, physical activity, and physical education communities." Lundvall (2015) also wrote: "In physical education, (PE) the word physical literacy has become part of the discussion among PE educators, and to some extent also among those working with athlete development." Whitehead (2019) emphasized: "Physical literacy can be described as the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for commitment in physical activities for life." The Australian Sports Commission also described physical literacy as "A lifelong holistic learning acquired and applied in movement and physical activity contexts. It reflects ongoing changes integrating physical, psychological, cognitive and social capabilities. It is key in helping us lead healthy and fulfilling lives through movement and physical activity."

Physical literacy does not only aim to improve students' physical and sports abilities but also to prepare them for life, proving that education is not for life but life itself, as John Dewey stated it. It is believed that physical activities may lead students to have healthy and fulfilling lives. The Department of Education through its Order 34, s. 2019, stressed that the learners' peak of presentation can only be executed by having a healthy and strong body. They need to get involved into active routine by having regular physical activities to improve their health and quality of life. Preparing students to be more physically active involves activities to ensure that their physique is attuned with their future personal and professional careers and preferences. Thus, fitness testing and basic exercises programming are just basic requirements that students of sports track shall undertake. This is actually one of the specialized subjects under the sports career track. Examples of things that students must learn while taking this subject include but not limited to the following testing skill-related fitness parameters such as power, agility, balance, and speed.

For the purpose of this study, only these skill-related fitness parameters were included since these were doable with little supervision from any adult while the students did these in the comfort of their homes. Each of these activities was recorded via video and pictorial documentation to ensure that the students performed them properly. First, student's power was measured. It was done by performing standing-long jump which aimed to determine the level of his/her leg muscles' strength. Second, student's agility was measured through his/her performance of hexagon agility test. Through this test, the level of quickness and other skills of a student like balance, speed, strength, coordination as well as resistance were determined. The hexagon shape put a challenge to student in order to improve his movement from different directions as fast as he could. Third, student's ability to maintain a certain level of equilibrium while in standing or moving. To determine student's level of balance, the stork balance stand test was performed. Lastly, student's ability to move in one direction in the shortest period determined his/her speed. In this case, a performance of 40-meter run measured his/her running speed. After giving the instructions for each activity, the students were asked to record their performances and send proof of their performance to their teacher.

The researcher decided to conduct this study to determine whether the students can still perform effectively and efficiently with little supervision the fitness testing and basic exercises programming despite the challenges amidst this pandemic. This further aimed to determine whether the physical literacy program on the enhancement of students' skill-related fitness was effective. Thus, after

conducting the pre-test at the start of the first semester, the researcher gave the students various interventions that would enhance their skills in power, agility, balance and speed. For power, the students were given exercises that they had to perform in their own pace such as step-test, foot works, cycling (if applicable) and other exercises that students could perform while observing health protocols. The students were required to perform activity like Zumba to enhance their agility skill. They were given simple exercise like standing in one leg for increasing minutes to develop their balance skill and endurance. They were also encouraged to perform home activities that could improve their balance. For speed, students were required to do short distance brisk walking. They were also asked to jog in place so that they could still perform the activity at the comfort of their homes.

All above mentioned experimental interventions were given as part of the physical literacy program aside from the standards stipulated in the DepEd Order 34, s. 2019 with the end in mind that the skill-related fitness performance of senior high school students would be improved. The effectiveness was measured by acquiring the mean score performance of the students and by determining whether there was a significant difference before and after the implementations of physical literacy program in testing skill-related fitness in terms of speed, power, agility, and balance. An improvement plan for physical literacy program in testing skill-related fitness was proposed based on the results of this study.

Material and Methods

Single group experimental research design of pre-test-post-test research design was utilized in this study to determine the effectiveness of physical literacy program on the enhancement of skill-related fitness performance of senior high school sports track students. The first feature of this research design was the use of a single group of participants, that is, the group of Grade 11 and 12 sports track students who were enrolled at Binan City Senior High School–Sto. Tomas Campus. This signifies that all of them, that is, one hundred one (101) students were considered as participants and treated as parts of a single condition, which means that all of them were given similar tests which in this case are the skill-related physical fitness in terms of power, agility, balance, and speed. The second feature of this research design is a linear ordering. It requires the assessment of a dependent variable before and after a treatment is implemented. In this case, all participants were given pre-test which means that they were instructed to conduct and record their performance in standing long jump (power), hexagon agility test (agility), balance stork stand test (balance), and 40-meter sprint (speed). All these tests were aligned with the objectives of the physical fitness test as stipulated in the DepEd Order 34, s. 2019. Pre-test and post-test of similar skill-related fitness were performed to determine the effectiveness of the physical literacy program by calculating the difference between the participants’ performance before and after the implementation of the program.

Results and Discussion

The following presentations show the results of the performance of the participants in four skill-related fitness such as power, agility, balance, and speed.

Table 1. Pre-test mean scores of students in skill-related fitness test

Skill-related Fitness	Mean	SD	Skewness	Level of Skill-Related Test Fitness
Power	138.13 cm	18.83	-1.617	Good
Agility	21.31 sec.	33.60	2.073	Needs Improvement
Balance	32.93 sec.	34.63	1.476	Needs Improvement
Speed	20.38 sec.	28.57	3.284	Needs Improvement
Legend: Power: 126 cm – 150 cm (Good); Agility 21-25 sec (Needs Improvement); Balance 1-40 sec (Needs Improvement); Speed>7.8 sec (Needs Improvement).				

Table 1 shows that only power reached the “Good” level of skill-related fitness, while agility, balance, and speed were marked with “Needs Improvement” level of skill-related fitness. This means that the participants’ power skill (138.13) centimeters (SD 18.83) with its affixed mean score and SD gained the highest level of skill-related fitness.

Table 2. Post-test mean scores of students in skill-related fitness test

Skill-related Fitness	Mean	SD	Skewness	Level of Skill-Related Test Fitness
Power	141.40 cm	17.70	-1.699	Good
Agility	17.97 sec.	26.89	2.653	Fair
Balance	28.46 sec.	31.34	1.875	Needs Improvement
Speed	20.54 sec.	28.51	3.290	Needs Improvement

Legend: Power: 126 cm – 150 cm (Good); Agility 16-20 sec (Fair); Balance 1-40 sec (Needs Improvement); Speed >7.8 sec (Needs Improvement).

Table 2 reveals improved performance compared with the pre-test particularly in two skill-related fitness tests, i.e., power and agility. The participant’s power skill during the post-test was sustained in “Good” level of skill-related fitness with its affixed mean score (141.40 cm) (SD 17.70). The participants’ agility skill as presented in this post-test mean score has improved with its affixed mean score (17.97 sec.) (SD 26.89) which means that the level of skill-related fitness of participants’ agility is “Fair”. The participants’ balance skill was sustained in the level of skill-related fitness marked as “Needs Improvement” with attached mean score (28.46 sec.) (SD 31.34). Similarly, participants’ speed skill remained in “Needs Improvement” level with its mean score (20.54 sec.) (SD 28.51).

In the study conducted by Sabin and Marcel (2016), it was stated there that the development of psychomotor skills like coordination and speed when combined could improve the agility skill of an individual. It was also stated in the study that agility is an important characteristic of motor development. An individual who had developed this skill was expected to display a quality of maintaining and controlling his or her body position while changing position. Determining how physical education was being practiced and how learners develop combined coordination and speed skills were the points Sabin and Marcel had considered in their study. They worked with two groups, i.e., the experimental group which included 16 students, and the control group which included 19 students. They chose to use a set of six agility tests that analyze the main components of agility like speed of movement, lateral movement, balance, coordination: Illinois agility, agility t-test, agility cone, box drill, AFL agility, arrowhead agility test and so on. Then after using specific programs to develop speed and coordination, they used the same tests and the result of their study showed that skills like speed, coordination and agility were developed easier by the experimental group compared with the other group. They further found out that there was a significant difference within the experimental group both in the initial and in the final tests. Such study supports the results of this study which imply that there is a significant connection among the speed, balance, and agility skills.

Table 3. Test of significant difference between pre-test and post-test performance of students in power

	Assessment	Mean	Difference	df	t-value	p-value
Power	Post	141.40cm	3.27	79	7.076**	.000
	Pre	138.13cm				

**p-value ≤0.01 (highly significant); *p-value ≤0.05 (significant)

Table 3 illustrates the level of skill-related fitness of the participants in the conduct of standing long jump which tested the participants’ power skill. The result shows that the mean score for the post-test was 141.40 centimeters while the mean score for the pre-test was 138.13 centimeters. This means

that the participant’s power skill was sustained in “Good” level of skill-related fitness, but it increased by 3.27 cm., i.e., the difference between the post-test mean score (141.40 cm) and pre-test mean score (138.13 cm). The result shows that there is a significant difference between pre-test and post-test performance of students in standing long jump with its affixed p-value (.000) which is less than the assigned significance value of 0.05. This posited the effectiveness of physical literacy program on the enhancement of skill-related fitness performance of senior high school students particularly the power skill which was tested through the conduct of standing long jump.

Botagariyeva, *et al.*, (2016), in their attempt to determine its effectiveness, conducted an analysis study using a game like method during physical training classes. Their study verified the effectiveness of the existing curriculum which is practically beneficial for teachers as well as coaches for they can use the findings to improve student sports achievements. Lin *et al.*, (2015) conducted study to examine the result of eight weeks training having extra weight on the performance of standing long jump. Their conclusion that training increased the participants’ standing long jump performance implied that a physical literacy program such as this may be adapted to further enhance the skills of senior high school students in standing long jump.

Table 4. Test of significant difference between pre-test and post-test performance of students in agility

	Assessment	Mean	Difference	df	t-value	p-value
Agility	Post	17.97sec	-3.36	79	1.340	.184
	Pre	21.31sec				
**p-value ≤0.01 (highly significant); *p-value ≤0.05 (significant)						

Table 4 displays that in the conduct of hexagon agility test which tested the participants’ agility skill, the result shows that the mean score for the posttest was 17.97 seconds while the mean score for the pre-test was 21.31 seconds. This means that the participant’s agility skill has improved from “Good” level of skill-related fitness to “Fair”. The difference of -3.36 seconds indicates that there was an improvement in the performance of participants in agility skill-related fitness. The result shows that there is no significant difference between pre-test and post-test performance of students in hexagon agility test with its affixed p-value (.184) which is greater than the assigned significance value of 0.05. This denied the effectiveness of physical literacy program on the enhancement of skill-related fitness performance of senior high school students particularly the agility skill which was tested through the conduct of hexagon agility test.

In the study of Azmi and Kusnanik (2018), they found out that SAQ could increase speed, agility, and acceleration. This inferred that the set forth ideas of any intervention to improve the skill-related fitness of the players could be effective. Similarly, the respondents' alertness skills were also improved after the implementation of the physical literacy program.

Table 5. Test of significant difference between pre-test and post-test performance of students in balance

	Assessment	Mean	Difference	df	t-value	p-value
Balance	Post	28.46sec	-4.47	79	2.282*	0.25
	Pre	32.93sec				
**p-value ≤0.01 (highly significant); *p-value ≤0.05 (significant)						

Table 5 exposes the result of the conduct of balance stork stand test which tested the participants’ balance skill. The result shows that the mean score for the posttest was 28.46 seconds while the mean score for the pre-test was 32.93 seconds. This means that the participant’s balance skill has improved although the level of skill-related fitness remained in “Needs Improvement”.

The difference of -4.47 seconds indicates that there was an improvement in the performance of participants in balance skill-related fitness. The result shows that there is a significant difference between pre-test and post-test performance of students in balance stork stand test with its affixed p-value (.025) which is less than the assigned significance value of 0.05. This affirms the effectiveness of physical literacy program on the enhancement of skill-related fitness performance of senior high school students particularly the balance skill which was tested through the conduct of balance stork stand test.

Acar and Eler (2019) conducted a study on effect of balance exercises on speed and agility in Physical education lessons. In this study, they investigated the effects of 8-week balance exercises on the speed and agility of students in physical education lessons. There were seven hundred eighty-nine students who participated in the study, and they all joined voluntarily. Two groups were formed by having 399 students as experimental group and 390 students as control group. The experimental group was given balance training program 3 days a week for 8 weeks, while the control group participated only in physical education lessons. Before and after taking exercise program, students' height, body weight, and body fat ratio measurement were taken. As part of the exercise program, the following activities were included: flamingo balance test, 20 m speed test and Illinois agility test. Using SPSS 16 program, the data were analyzed and evaluated, and with the significance value of 0.05, it was concluded that balance exercises had a positive effect on speed, agility and balance performance. Their findings support the result of this present study which states that the physical literacy program was effective in the enhancement of the skill-related fitness of the participants in terms of balance.

Table 6. Test of significant difference between pre-test and post-test performance of students in speed

	Assessment	Mean	Difference	df	t-value	p-value
Speed	Post	20.54sec	0.16	79	3.900**	.000
	Pre	20.38sec				
**p-value ≤0.01 (highly significant); *p-value ≤0.05 (significant)						

Table 6 shows the conduct of 40-meter sprint which tested the participants' speed skill. The result shows that the mean score for the post-test was 20.54 seconds while the mean score for the pre-test was 20.38 seconds. This means that the participant's speed skill did not improve with its affixed difference of 0.16. The level of skill-related fitness remained in "Needs Improvement". The difference of 0.16 seconds indicates that there was no improvement in the performance of participants in speed skill-related fitness. The result shows that there is a significant difference between pre-test and post-test performance of students in 40-meter sprint with its affixed p-value (.000) which is less than the assigned significance value of 0.05. This posited the effectiveness of physical literacy program on the enhancement of skill-related fitness performance of senior high school students particularly the speed skill which was tested through the conduct of 40-meter sprint.

The study of Mackala *et al.*, (2019) showed that there was a significant post-test improvement ($p < 0.05$) observed in the elite and sub-elite sprinters. Their findings likewise posited the idea that any intervention to enhance the skills of athletes could be effective. Although the result of this present study showed that there was a 0.16 second decrease in the performance of the participants, majority of studies show otherwise.

Summary and Conclusions

The conclusions drawn relative to the null hypothesis that there is no significant difference between the pre-test and post-test mean score performance of the students on their skill-related fitness has been partially achieved. It was inferred that some students might have followed the procedures in performing the assigned set of activities as interventions to enhance their skill-related fitness. First,

based on the findings, it was concluded that in terms of power (standing long jump), balance (balance stork stand test) and speed (40-meter sprint), there is a significant difference between the pre-test and post-test which means that the physical literacy program could enhance the performance of senior high school sports track students. It further provided an information that the provided interventions were effective in the enhancement of their power, balance and speed. On the other hand, it was also concluded that in terms of agility (hexagon agility test), there is no significant difference between the pre-test and post-test. It would mean that the physical literacy program had only little impact on the enhancement of the performance of senior high school sports track students in Binan City Senior High School–Sto. Tomas Campus. It was inferred that the conduct of hexagon agility test might have been affected by different factors such as the natural quickness or alertness of the students or it might have been affected by physical factors like sickness and the like while doing the activity. Other factors such as following proper procedures in the performance of agility test may likewise be considered. Based on the level of fitness in the conducted tests, it was also concluded that students' performance in power (standing long jump) and agility (hexagon agility test) is good and fair, while their performance in speed (40-meter sprint) and balance (balance stork stand test) needs improvement. This means that students' performance can still be improved if they were given comprehensive physical literacy program based on the crafted improvement plan which is the proposed output of this study.

Based on the findings and conclusions, the following recommendations are hereby listed:

(1) The content of the physical literacy program during this pandemic may be reviewed by the higher authority like School Heads and Master Teachers to determine whether students could properly perform their expected physical activities at home. (2) The implementation of the physical literacy program may also be assessed by the physical education teachers to determine whether the procedures stipulated in the Physical Fitness Manual Test can be performed with little supervision from their teachers. (3) Since it was determined that the physical literacy program has been effective particularly in the enhancement of power, balance and speed, it is recommended that the program may be continued with a minimal modification to increase the level of fitness of students. (4) Other agility improvement tests may be included in the improvement plan. More drills may be conducted with strict implementation. (5) In general, activities that can enhance students' performance in skill-related fitness may be included in the crafting of new physical literacy improvement plan to target at least a gradual improvement in their performance. (6) The process in the improvement plan may be done gradually to achieve "Good" level and eventually the "Very Good" level until such time that students achieve the "Excellent" level of fitness. (7) Other researchers may delve into another study relative to the findings of this study to determine the impact of an improved physical literacy program.

Conflicts of Interest

The authors declare no conflicts of interest.

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