

The innovative proportional norm to evaluate the students in Practical tests in the department of Athletics

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- Abstract:

Evaluating students in practical tests is an essential process in the physical education faculties. There is no objective norm that is based on scientific basis for evaluating the students, especially for athletics' courses practical exams, which is fair and deals with each student individually. Therefore, the author created an innovative proportional norm and tested its reliability, objectivity and accuracy in order to evaluate the students in athletics practical exams individually. The survey research was used. The (172) participants were selected by deliberate manner of students in the first year (male) of Physical Education Faculty of Sadat City University. The Scientific base of the proportional norm's equations is calculating the student's degree using proportion, while the degree is divided into two parts, each represents 50% of the test degree as follows: The first part of the degree: according to the achieved distance or the time. The student's raw degree represented the extreme and the highest raw degree represented the mean (as a reference). The second part of the degree: according to the technical performance of the event by using evaluation matrix of the skill to optimal performance skill. The results emphasized the stability and the reliability of the equations and the justice of evaluating students according to a scientific method.

Keywords: Athletics, evaluate, proportional norm, Practical tests.

- Introduction:

The educational process and its development occupy the top concerns of countries; the progress of nations is measured by the level of education of their children. Education is the base of the renaissance and

locomotive of progress; we must consider the basis of evaluation to develop the education process by scientific and correct manner.

The evaluation is the process that gives a meaning to

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the results of the measurement through the Judgment on these results by using some criterions or norms. (14:2)

It is the process by which we give degrees or meanings of special significance for the data from the application of the measurement tools. (8:21)

The important categories of the evaluation according to the method used are the self-evaluation and objective evaluation. It is categorized according to the timing of the application into a preliminary evaluation, structural evaluation, cumulative evaluation and following evaluation. Despite the types of evaluation are different, the most important in physical education and sport fields are the structural evaluation and cumulative evaluation. (2:8), (5:39), (8:72), (9:132), (12:178)

The main aim of the evaluation is to form a degree for a performance. The cumulative evaluation has been used to input the degree and the eligibility at the end of a program, a unit or a year. It uses the norms or reference criterions. (7:99)(11:6)

The norm explains the Raw Score that has been obtained in any test, which does not have mean itself unless there is a reference system. (5:234), (16:164)

The norms represent the values of Performance of special society in particular test, this special society of people called the standardization group, the standardization group is the normative values that parallel to the raw values which taken from tests. The norms enables each person to recognize his relative position reference to the group, the standardization is considered an important and necessary process to achieve the conditions of the perfect evaluation. (10:204), (15:5)

The importance of using norms increases when it is used with students whose study special courses, so it considers a useful manner to evaluate these students objectively. It is necessary to put norms levels with scientific basis to evaluate the level of performance. (1:7), (4:18-27)

Evaluation process requires long time and effort. It's procedures need great scientific background and proficiency with statistical

treatments, in order to evaluate the correct basis. Therefore, that is the reason that leads lots to leaves the evaluation. (13:42), (14:2-4)

The faculties of physical education interest in evaluating the students in practical tests for all courses, athletics courses have a characteristic rank among different courses because of it is importance, It is mainly for sports, it's events vary between running, jumping, and throwing. ((3:8),(6:5)

- Problem of the study:

There is no objective norm based on established scientific basis for evaluating the students of the Physical Education Faculty in athletics practical exams. The current evaluation method is lack of Justice, while the row data is being processed factiously then allocation norm degree for each category. For example, students who record (4m: 4.2m) in long jump test will get the same degree although the justice is in the necessity to give a norm degree to each raw degree.

Therefore, the author created a scientific, reliable, objective norm which is accurate and easy in order to evaluate the

students in athletics practical exams. It requires a minimum effort, does not waist time and deal with students individually not factiously.

Study Objectives:

1. Create an innovative proportional norm to evaluate the students in Practical tests in the Athletics department.
2. Achieve the Justice of evaluate students in Practical tests in the Athletics department.
3. Evaluate the students by Individual instead factiously of evaluation.

- Study Questions:

1. Is it possible to create an innovative proportional norm to evaluate the students in practical tests in the Athletics department?
2. Does the proportional norm achieve the justice in evaluating students in the practical tests in the Athletics department?
3. Is it possible to use the proportional norm individually?

- Scientific importance:

1. An objective, easy, and accurate norm for practical tests in Athletics department.

2. An innovative method for processing the students' raw degrees in Athletics department.

3. Adjusting some disadvantages of the relative norms.

- Application importance:

1- Calculate the student's degree by using the highest raw degree.

2- Individual evaluate not factiously for students to achieve the justice.

3- Novelty entrance to evaluate the students in all departments of Physical Education faculty.

- Terminology of study

1- Proportional norm:

"It is a norm that specifies the level of the person within the group according to three axes; the raw score, the highest

raw score in the group, and test degree based on the proportional rule". (By the author)

2- Practical tests of Athletics Department:

"To perform athletics events, whether to running, throwing or jumping in order to measure the student mastery of those skills". (By the author)

- The Procedures:

- Methodology:

The survey research was used.

- Study participant:

(172) male participants were selected by deliberate manner of students in the first year (2012 - 2013) of Physical Education Faculty of Sadat City University:

Table (1)

Arithmetic mean, median, standard deviation and Skewness of sample for basic variable of the studN= 172

Variable	Unit of measurement	mean	Median	Std. deviation	Skewness
length	Cm	174.30	175.00	3.60	-0.63
Weight	Kgm	71.58	71.00	2.05	0.62
Age	Year	18.44	18.00	0.55	0.55
Long jump	m	3.88	3.90	0.41	0.20
Shot put	m	10.44	10.00	1.50	0.20
100 m sprint	Sec.	14.05	13.82	1.25	1.42

Table (1) indicates that value of the sample's Skewness for the pre measurements used

to measure homogeneity reached ± 3 and this confirms sample homogeneity.

- Application time:

It was on Saturday 4th in May 2013 during the practical tests.

- Research Tools:

A computer with excel program to carry out a special calculation for proportional norm, statistical program (SPSS) to carry out the statistical operations, a tape measure and stopwatch.

- Study implementation steps:

1. All competitions are treated on the basis of performance output.
2. Clarify the scientific basis to the equation of proportional norm.
3. Forming the equations which calculate degree of the practical tests in Athletics department.
4. Test the validity of the equations.
5. Test the reliability and stability of the proportional norm

- Scientific base of the proportional norm's equations:

The new concept based on calculating the student's degree using proportion, to be the degree is divided into two parts, each representing 50% of the test degree as follows:

The first part of the degree: according to the

achieved distance or the time. The student's raw degree represented the extreme and the highest raw degree represented the mean (as a reference). The highest raw degree of each test would equal ($\frac{1}{2}$ of the test degree).

The second part of the degree: according to technical performance of the event, using proportion of Total student's degrees in technical performance evaluation matrix of the skill to optimal performance skill, where the student's matrix degree represented the extreme and the optimal performance represented the mean (as a reference). The optimal performance of each test would equal ($\frac{1}{2}$ test degree).

Technical performance evaluation matrix of the skill has two axis, the vertical represents the technical phase of the event, and the horizontal represents the body segments (Head - trunk - arms - legs). For each segment-body's right position one degree, and zero for wrong position. The summation of degrees would be multiplied by the half of the test's maximum degree. The optimal performance equal ($4 \times$ Number of phases), number (4)

is constant because it represents the four basic body segments.

The total student's degree in the test equals the summation of first and second part of the calculation.

- Results and Discussion:

- The equation to calculate the first part of degree of field tests:

Student's raw score in the test First part of degree of field test = ----- $\frac{1}{2} \times \text{test degree} \dots \text{Equation (1)}$ Highest raw score in the group for the same test

**Student's raw score is a distance or height for throwing or jumping tests in meter and/or centimeters.

the student. The highest raw score in the group for the same test was (12 m). Test's degree would be (20) according to equation (1):

For example: (9.6 m) is a shot put test result that recorded by

$$\text{First part of Student's degree} = \frac{9.6}{12} \times (\frac{1}{2} \times 20) = 8 \text{ degree}$$

The second part of the degree by using technical performance

evaluation matrix for the same student, for example (Table 1):

Table (1)

technical performance evaluation matrix for shot put

Phases \ Parts	Head	Trunk	Arms	Legs	sum
Caught and carrying tool	1	1	0	1	3
Preparation	1	1	1	1	4
Crawling	0	1	1	0	2
Throwing	1	1	0	1	3
Follow up	1	1	0	0	2
Sum	4	5	2	3	14

Summation of The student's degrees in the matrix Second part of Student's degree = ----- $\times \frac{1}{2} \text{ test degree} \dots \text{Equation (2)}$
--

$$4 \times \text{number of technical performance stages of the event}$$

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$$\text{Second part of Student's degree} = \frac{\text{-----}}{20} \times \frac{1}{2} 20 = 7 \text{ degree}$$

The total student degree in the Test = 8 + 7 = 15 degree

- The equation to calculate the first part of degree of track tests:
Equation (1) would be inverted as a reason of the characteristics of track test, where the shortest time duration represents the best.

The best record in the group of the same test

$$\text{First part of degree of track test} = \frac{\text{-----}}{\text{Student's raw score in the test}} \times \frac{1}{2} \text{test degree} \dots \text{Equation (3)}$$

For example: a student ran 100 m in (13 s), the best record in the same group is (11.7 s). Test's degree would be (20) according to equation (3) as the following:

11.7

$$\text{First part of Student's degree} = \frac{\text{-----}}{13} \times \frac{1}{2} 20 = 9 \text{ degree}$$

The second part of the degree by using technical performance evaluation matrix as follows:

Table (2)
technical performance evaluation matrix for 100 sprints

Phases	Parts	Head	Trunk	Arms	Legs	Sum
Take your place		1	1	0	1	3
Get ready		1	1	1	1	4
Pushing		0	1	1	0	2
Acceleration		1	1	1	1	4
Finish		1	1	0	1	3
Sum		4	5	3	4	16

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$$\text{Second part of Student's degree} = \frac{\text{-----}}{20} \times \frac{1}{2} 20 = 8 \text{ degree}$$

The total student's degree in the Test = 9 + 8 = 17 degree

- The Validity of the equations:

A correlation was calculated between the proportional norm degree and (T score) of the study participant in some tests of track and field. (Table 3):

**Table (3)
correlation between proportional norm degree and (T score) of study participant in some tests of track and field (n=172)**

Tests	proportional degree		T score		Correlation Value
	Mean	Std. Deviation	Mean	Std. Deviation	
Long jump	٧.٦١	٠.٨١	٥٠	١٠	+1
Shot put	٧.٤٥	١.٠٧	٥٠	١٠	+1
100 m sprint	٨.٦٧	٠.٧١	٥٠	١٠	-0.99

* Tabular (r values) at (0.05) is (0.087)

Table (3) showed the high significant correlation between T score and Output degree of equations 1 and 3 for the chosen tests of track and field at significance level (0.01). Therefore, the equations 1 and 3 are valid for application to evaluate students in Practical tests in Athletics department.

- Reliability of the equations:

The reliability refers to the extent of accuracy by which

the event is measured. The results of measurement are similar or convergent in measured for the manifestation of behavior in the case of an application twice on the same group.(9:144). To find the coefficient of reliability the tests were applied after a week, then found the Correlation coefficient between degrees the two applications results.

Table (4)
correlation between participant degree in the first and second application of the chosen tests of track and field (n=172)

Tests	First application		Second application		Correlation Value
	Mean	Std. Deviation	Mean	Std. Deviation	
Long jump	٧.٦١	٠.٨١	7.62	0.82	0.991
Shot put	٧.٤٥	١.٠٧	7.44	1.07	0.999
100 m sprint	٨.٦٧	٠.٧١	8.66	0.70	0.997

* Tabular (r values) at (0.05) is (0.087)

Table (4) indicated the high significant correlation between participant degree in the first and second application of some tests of track and field at significance level (0.05). Therefore, the proportional norm is reliable.

- Objectivity of the norm:

The Objectivity means that the degree is not affected

by changing the arbitrators, or the test gives the same result whatever the Laboratory (10:152). The Proportional norm depends on the codified mathematical relationship by the author. A correlation coefficient between the arbitrator's degrees was calculated. (Table 5)

Table (5)
significance of differences between the arbitrator's degrees for participant of the tests of Athletics Department (n=172)

Test	Measuring unit	First arbitrator		second arbitrator		T value	Sig level	sig
		Mean	Std. Deviation	Mean	Std. Deviation			
Long jump	Degree	٧.٦١	٠.٨١	٧.٦١	٠.٨١	0.000	1.000	Non sig
Shot put		٧.٤٥	١.٠٧	٧.٤٥	١.٠٧	0.000	1.000	Non sig
100m sprint		٨.٦٧	٠.٧١	٨.٦٧	٠.٧١	0.000	1.000	Non sig

* Tabular (T values) (0.05) is (1.646)

Table (5) showed that there are no differences between the arbitrator's degrees for participant by using the equation of proportional norm, which statistically significant at the level of (0.05). Therefore, the proportional norm is Objective, and would not be affected by the change of the arbitration.

- Conclusion:

1- The proportional norm equations achieve the justice in evaluating the students in the practical tests in Athletics department.

2- The proportional norm equations are valid, reliable and stable.

3- It could be a useful method for comparing the students' levels through undergraduate years through the average raw degree of each study year for the same events.

4- The differences between the proportional norm degrees related to the differences between the raw degrees.

5- The proportional norm enables the participant to recognize his position into/among the group with high accuracy.

6- The proportional norm is an easy and accurate method for evaluating the students in the practical tests in the Athletics department comparing to the traditional methods.

7- The mathematical model to calculate the proportional

degree for the students in practical tests in Athletics department is characterized by absolute objective depending on the available variable which is highest raw degree in the group.

8- The proportional norm deals with students individually not factiously.

9- It is possible to change the percentage of first part and second part of the test degree according to the vision of the professor or the regulation on the department.

- Recommendations:

1- Use the proportional norm for evaluates the students in Practical tests in the Athletics department.

2- Find how to apply the proportional norm to evaluate the students in practical tests in other departments.

3- Trend toward using accurate and easy applicable methods in student's evaluation.

4- Need to subordinate the practical tests to mathematical aspects so we can control of these tests digitally.

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