



**THE EVALUATION OF THE AEROBIC AND ANAEROBIC  
CAPACITIES AS A SETTER FOR DIGITAL ACHIEVEMENT AND  
AS AN INDEX FOR SELECTING AND GUIDING  
THE BEGINNER'S ATHLETICS**

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**Abstract:**

The research aims to the physiological side from the athletics beginner's training according to scientific basics and principles which is must include the measurements and testing operations because of its selection processes importance and to determine the results, evaluate the current level of the players, and how do they should be in future. Through the capacity assessment and adopted to determine the level of digital achievement and takes it as an index to guide athletics beginners for its various events and this is what we sought to search in it in athletics beginners category (16-17). For Algerian west clubs (210 athlete by 33.92% from the origin community) relying on some special field measurements and down to highlight the connectivity relations and comparison of the aerobic and anaerobic capacities with the digital achievement for the various practiced events and to reach the goals of the research we used the descriptive method with a survey style. After testing and collecting and processing the information, it was reached to detect the level of the aerobic and anaerobic capacities for the beginners, we found the relationship of these capacities with the digital achievement in various practiced events besides the existence of differences between the beginners in some capacities because of the different events within the per class (jogging, jumping, throwing).

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## 1. Introduction

In the light of the level of the achievements of our athletes against the stunning development in breaking records for athletics competition which is linked with the progress of the biological requirements (physiological) permanently, according to the scientific foundations and principles which its axes should include on the measuring and test operations due to its active role in the selection and identifications of the results and it stands on the current level of the players and what do they should be in future and that what is confirmed by Mohammed Soubhi Hasnanine as that *"tests are the appropriate way to make comparisons between athletes and the existence of levels and standards will make it easier to make comparisons and it makes it more honest and objective"* (Hasnanine, 1987) and Issam Abd el Khlaek confirms that there is a close coordination between the results of the physiological measurements and the predicting with the sporting excellence in various sports activities and the physiological studies have helped to identify the player's preparations for the performance of speed, power and endurance contests in the light of important physiological indicators which allow us to predict in the field of sports selection (Abdelkhalek, 2005).

The fact that the training loads suffered by the athlete during the athletic competition in athletics events leads to the occurrence of physiological and chemical changes within the muscle cells and that's to declare the necessary energy of the athletic performance and it gets different according to the requirements of the type of activity and the athlete's capacities. And under the excellence of the athletics, because of its various events, it is totally different in its energy system (aerobic and anaerobic and the mixed between these two lasts) and in the light what is written above, it is clear that is necessary to link between the special athlete features and the efficiency requirements specially the energetic ones and that's necessary to rise the level of sports and to reach the upper ones through the assessment of aerobic and anaerobic capacities and adopted to determine the level of the digital achievements and takes it as an index to guide athletics beginners for its various events.

And it is clear from all what it had written that the sport progress needs to keep abreast with the scientific research to solve all the problems related to achieving the desired objectives of the training process. It is that makes our research have a scientific importance in terms to determining the physiological indicators in field, which reflects the work of the functions of the internal organs of the body according to the type the

practiced activity. At the same time it is gaining importance in the process represented by the adoption of some simple measurements and tests to assess aerobic and anaerobic capacities of the athletics beginners (16-17 years old), in order to be adopted in the selection and identification of the procedures and stand on the current level of operations for the players and what they should be in the future and this is according to the physiological preparations of the person (capacities) according to the requirements of the activity (athletics events) especially the physiological ones and more particularly the energetic.

### **Research problem**

The process of combining the characteristics of the individual athlete and the requirements of the sports specialty that requires those characteristics is a fundamental step in the way of upgrading sports and access to high levels, although the full knowledge of the importance of early detection and selection of the talented athletes, against the stunning development in breaking records for athletics, and the high level of performance, has become one of the biggest problems which face the experts in sports and sometimes can even affect irremediably the carrier of the athlete.

While longer to discover the physiological characteristics which is characterized by the individual and then directed him to a certain effectiveness which commensurate with his biological properties will lead to improved level of sporting excellence through sports competitions with the economy in money and effort that goes with individuals who aren't that good in any activity or practice that limited their ability in this activity or that, and that can be done by measuring or test equipment decisiveness (musculature, circulatory system, breathing, etc. or some capabilities that reflect the work of these devices (aerobic and anaerobic capacities) as they guide the athlete to the appropriate effectiveness which matched with his physiological capacities.

Considering that the most important causes of sports' low achievement and the digital level in athletics events is not meant to determine the exact requirements of the particular type of activity from the physical (functional) side, as well, as the random beginners guide to the specialization without examining the capacities of the athlete, especially aerobic and anaerobic ones, this what makes us ask many questions related to the problem which are:

- What is the athletics beginners' level of aerobic and anaerobic capacities and the digital achievements?
- What is the relationship that matches the aerobic and anaerobic capacities with the digital achievement in the various practiced events?

- Do aerobic and anaerobic capacities among the beginners vary according to the different events within the same row?

### **Hypotheses:**

- Beginner's' level and digital achievement for all the different events doesn't rise for a higher level;
- There is a relationship between the aerobic and anaerobic capacities and the digital achievement of the various athletics events (jogging, jumping, and throwing);
- Aerobic and anaerobic capacities vary between athletics beginners depending on the different events per class.

### **Method**

#### **Participants**

**Community:** athletics beginners (16-17) in the West Algerian area (619)

**Search sample:** Athletics beginners (16-17) for the active in the west of Algeria, 210 athletes representing 33.92% of the original community.

**Exploratory experience:** It included the following:

- Identify the specific testing of the aerobic and anaerobic capacities through a Sneaking which is applied at the National Center for Sports Medicine in the capital, with some interviews with coaches and some doctors in the jurisdiction;
- Tipping tests through the form included field tests for anaerobic capabilities Alhoaiha, presented to the specialists, including Professor George Cazorla and Professor Riad Ali al-Rawi and Dr. Ben si Kadour Habib.

**Home search experience:** it was done according to the following steps:

- Develop a calendar as the dates of the tests on the sample for the various clubs;
- Preparation assistants (trainers, students) optimized to control the experiment with to bring all supplies;
- After explaining what we would like to do for athletes and its purpose, we measured the following indicators (pulse, pressure, vital capacity) to ensure full readiness for the athletes before the tests began;
- Carry out the tests in the following order:
  - Test (Sargent) to assess the ability of anaerobic short (less than 10 sec)
  - Test (RAST) to assess the medium anaerobic capacity (20-50) s.
  - Test (step) to assess the long-anaerobic capacity (60-120) s.
  - Test (Navette) to assess aerobic capacity (Vo<sub>2</sub>max).

So all tests were individual, except the navette test where the implementation is set to increase competitiveness and maximization of the potential of sport, also it will be a period of time which is not less than 10 minutes between the test and the other;

- Results are recorded in a special form to each athlete in order to facilitate the process of unloading and processing the results.

### Showing analysis and discussion of the results

**The first hypothesis is:** which indicates that the level of budding digital capabilities of the various events and their achievement does not rise to the higher level. In our treatment of the results, it has been the use of the arithmetic mean and standard deviation in the standard (test) as a means of statistical, we found the following:

**Table 1:** The arithmetic mean and standard deviation of different capacity by events practice

Variables Events	Digital achievement		Aerobic capacity (ml/kg/d)		Long Anaerobic capacity (watt)		Medium Anaerobic capacity (watt)		Short Anaerobic capacity (kg.m/s)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
100	11.98	0.41	45.4	5.71	392.7	32.3	524	28	72.2	7.25
200	32.91	0.69	46.1	4.9	391.4	28.4	529.8	22.47	74.8	6.42
800	1.93	0.27	49.8	5.4	414.3	28.71	513.1	33.3	74.2	7.7
1500	4.2	0.11	47.8	5.84	405.7	30.79	520.6	29.45	71.8	7.35
Long jump	5.82	0.35	44.1	5.64	379	37.43	512.6	28	77.1	8.25
Triple jump	12.6	0.54	44.5	5.55	379.8	41.1	515.4	31.17	77.2	8.26
Shot put	12.36	0.44	43.1	5.14	363.9	37.88	505.6	32.72	70.7	7.03
Discus	37.6	2.02	42.4	4.86	384.9	35.19	511.4	37.14	69.8	6.43

Through the Table 01, we find the greatest value for the ability of aerobic and anaerobic capacity long the practitioners of the effectiveness of 800 m worth 49.8 (ml / kg / d) and 414.3 (W), respectively, and that on the average, compared to the limits of this test standards, and greater value to the ability of the anaerobic medium practitioners of the effectiveness of 200 m worth 529.8 (W) This value is in the range of above average compared to the existing standards for this as well as The biggest value of the ability of anaerobic short-term effectiveness of the practitioners worth jumping 77.2 (Cg.m / s)

and that, on average, compared to the limits of this test standards and this is due to the fact that the athlete jumping are characterized by explosive force of lower limbs While the digital delivery of various events practice level does not rise to the high level and be the reason to see the preparations and possibilities in athletes, which is based primarily on these capabilities.

**The second hypothesis is:** which indicates that there is a direct correlation between the levels of aerobic and anaerobic capacities and the digital achievement of the various events Athletics (run, jump, and throw). And in our treatment of the results, it has been the use of the arithmetic mean and standard deviation and correlation coefficient Pearson statistical means and we found the following:

**Table 2:** The correlation coefficient between the aerobic and anaerobic capacities and the digital achievement of the practiced events

Capacities Digital achievement	Short anaerobic capacity (kg.m/s)	Medium anaerobic capacity (watt)	Long anaerobic capacity (watt)	Aerobic capacity VO2max (ml/kg/s)
100	-0.26	-0.1	-0.1	-0.11
200	-0.03	-0.45	-0.34	0.22
800	-0.37	-0.06	-0.15	-0.1
1500	-0.14	-0.05	0.11	-0.26
Long jump	0.39	0.38	0.58	0.13
Triple jump	0.77	0.38	0.94	0.38
Shot put	0.67	0.58	0.4	0.12
Discuss	0.65	0.71	0.82	-0.22

Through the Table 2 we find that they are correlation coefficient values vary in value that indicated the extent of the weakness and the strength of the link and differ in the signal, which indicates negative and positive this link, so for the discussion we will ignore weak links and through this we note that:

- There is an inverse correlation between the digital level of the enemy (100 m) and short anaerobic capacity, as well as between the digital level of the jogging (200 m) and the aerobic capacity (short and long) and the anaerobic capacity.
- There is an inverse correlation between the digital level of jogging (800 m) and anaerobic capacity short

This shows the positive relationship between these capabilities and processing with the practitioners of these events because the digital-level represented with cutted distance's time and achievement represented with minimal time to cut these distances,

when the ability increased, the time of the cutted distance will reduce thus the level of achievement will increase.

we also notes the existence of a positive relationship between the digital level for the long jump and various anaerobic capacity (short-medium- long), and the existence of a positive relationship between the digital level to the triple jump and the various capacities, as well as a positive relationship between the digital level to push the shot put and anaerobic capacity (short-medium) and the existence of a positive relationship between the level of achievement in the discus and various aerobic and anaerobic capacities.

And we infer from it that the digital level for these various capacities increase and decrease with this capacity increases and decreases, and this is what it has been agreed with the study of each of which devolves to the possibility of adopting these capabilities to improve and develop achievement and even predict the digital level in these activities.

The second hypothesis: which suggests that aerobic and anaerobic capacity between athletics' beginners vary depending on the different events per class (jogging, jump, throw). In our use of statistical which is represented in T Student, we obtained as follows:

**Table 3:** The comparison between short anaerobic ability events within the same class

Events Statistical values	100 m jogging	200 m jogging	800 m running	1500 m running	Long jump	Triple jump	Shot put	Discus
<b>T calculated</b>		0.25		1.82		0.06		0.39
<b>T tabulated</b>		1.66		1.65		1.68		1.69
<b>Statistical significance</b>		NS		S		NS		NS

Through the Table 3: note that all values of T tabular greater than T calculated which shows the lack of statistical significance that means there is no difference, except for the difference between the effectiveness of 800 m and 1500 m, where the calculated largest of spreadsheet proving statistical significance and it infer the existence of differences in short anaerobic capacity among practitioners of the effectiveness of 800 m and 1500 m.

**Table 4:** The middle compared to anaerobic capacity between events within the same class

Events Statistical values	100 m jogging	200 m jogging	800 m running	1500 m running	Long jump	Triple jump	Shot put	Discus
<b>T calculated</b>	1.01		1.84		0.06		0.51	
<b>T tabulated</b>	1.66		1.65		1.68		1.69	
<b>Statistical significance</b>	NS		S		NS		NS	

Through the Table 4: we note that all values of T tabular greater than T calculated which demonstrates the lack of statistical significance that means there is no difference, except for the difference between the effectiveness of 800 m and 1500 m, where T calculated is greater than T spreadsheet proving statistical significance and it infer the existence of differences in the medium anaerobic capacity between practitioners of the effectiveness of 800 m and 1500 m. Which indicates that the medium anaerobic ability differ with the difference of the middle distances' jogging events. And it can be adopted as an indicator to guide young people within this jurisdiction.

**Table 5:** The comparison of long anaerobic capacity between events within the same class

Events Statistical values	100 m jogging	200 m jogging	800 m running	1500 m running	Long jump	Triple jump	Shot put	Discus
<b>T calculated</b>	0.19		1.62		0.06		1.82	
<b>T tabulated</b>	1.66		1.65		1.68		1.68	
<b>Statistical significance</b>	NS		NS		NS		S	

Through the Table 5: we note that all values of T tabular greater than T calculated which shows the lack of statistical significance that means there is no difference, except for the difference between the effectiveness of the shot put and the effectiveness of the discus, where T calculated larger than the table-driven, which makes the difference as an evidence and from it, we deduce the existence of differences in ability between long anaerobic practitioners shot put and discus. Indicating that the long anaerobic ability varies depending on the activities of the shooting.



**Table 6:** The comparison between aerobic capacity events within the same class

Events Statistical values	100 m jogging	200 m jogging	800 m running	1500 m running	Long jump	Triple jump	Shot put	Discus
T calculated	0.618		2.05		0.23		0.39	
T tabulated	1.66		1.65		1.68		1.68	
Statistical significance	NS		S		NS		NS	

Through the table (06): we note that all values of T tabular greater than T calculated which shows the lack of statistical significance that means there is no difference, except for the difference between the effectiveness of 800 m and 1500 m, where T calculated is greater than T spreadsheet proving statistical significance and it infer to the existence of differences in aerobic capacity among practitioners of the effectiveness of 800 m and 1500 m. Which indicates that the aerobic capacity varies depending on the middle distances jogging events.

## Conclusions

- Digital achievement of the various events practice level does not rise to the high level;
- There is an inverse correlation between the digital level of the enemy (100 m) and the short anaerobic capacity;
- There is an inverse correlation between the digital level of the jogging (200 m) and all of the short and long anaerobic capacity and aerobic capacity;
- There is an inverse correlation between the digital level of the jogging (800 m) and the short anaerobic capacity;
- There is an inverse correlation between the level of the digital Jerry (1500 m) and aerobic capacity;
- There is a direct correlation between the level of achievement in the discus and various aerobic capacities anaerobic;
- A positive relationship between the digital level and different aerobic and anaerobic capacities;
- The existence of differences in the anaerobic capacity (short-medium) and aerobic capacity among practitioners of the effectiveness of the 800 and 1500 m;
- The presence of anaerobic differences in ability between the practitioners of the long shot put and discus.

## Discussing hypotheses

**The first hypothesis:** which indicates that the level of emerging digital capabilities and their achievement of hiding events does not rise to the higher level. After analysis and discussion Table 1 to set the level of aerobic and anaerobic capacity, as well as digital achievement of the various events Practice, it found that the average aerobic capacity - anaerobic values for the various events on average compared to the limits of this test standards, while the digital achievement of various events practice level does not rise to the high level and be the reason to see the preparations and possibilities in athletes, which is based primarily on these capacities.

**The second hypothesis:** which indicates that there is a direct correlation between the level of anaerobic capacity-anaerobic and the digital achievement of the various athletics events (running, jumping, throwing). And the Table 2 set out to labs link this capacity level of achievement it turned out that there is a positive correlation between the capacity and the level of achievement and this is what agreed with all of Muhammad Amin Ramadan studies (1994 m) and Mr. Bassiouni (2002 m), which confirms the stability hypothesis.

**The third hypothesis:** that indicates that aerobic and anaerobic capacities vary between athletics beginners depending on the different events per class (jogging, running, jumping, throwing).

Through the tables (6,5,4,3) which included comparisons between practitioners events per specialization (jogging, running, jumping, throwing) in various capacities, and after analysis and discussion shows that the short and the medium anaerobic capacity and even aerobic capacity differ among practitioners of the activities of middle distance's running. Also, it has found that long-anaerobic capacity vary among practitioners of throwing events, making these differences indicate the stability of the second hypothesis.

## Recommendations

- Conduct tests in approved research on the various age groups within sports disciplines;
- The adoption of aerobic and anaerobic capacities as a factor for directing the activities best suited to beginners and determines the level of their achievement.
- Clubs' interest with the no practiced events by the age classes in athletics events.

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