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The Effect of a Challenge-Based Training Program Using Electronic Messaging Applications on the Development of Some Muscular Abilities of Students of the Department of Physical Education

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ABSTRACT

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The research aims to study **the effect of a challenge-based training program using electronic messaging applications** on the development of some muscular abilities (arms, abdomen, legs) among first-stage students in the Department of Physical Education/Faculty of Education – Shaqlawa at Salah Al-Din University. The researchers adopted the experimental method by designing two equal groups (experimental and control) with (24) students randomly selected from a population of (28) students. The experimental group underwent a 30-day training program through the (Telegram) application based on the principle **of challenge and group competition** with direct follow-up from the teacher, while the control group performed the same exercises individually without an electronic challenge. Basic exercises included (push-ups, abdominal exercises, and back squats), and pre and post tests were used to measure the improvement in muscular abilities. The results showed that there were statistically significant differences in favor of the post-tests in both groups, with a clear superiority for the experimental group, which indicates that **the use of the challenge through electronic messaging applications enhances commitment and motivation and achieves better results in developing muscular abilities compared to the traditional method**. The study concluded that the integration of modern technology in physical training represents an effective method to motivate students and raise their fitness level, and recommended the need to adopt challenge-based e-training programs in physical education colleges and departments.

Keywords:
E-Training, Challenge, Muscular Abilities, Messaging .Applications.

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1- Introduction to the Research:

1-1 Introduction and Importance of Research

Muscular strength is one of the essential elements for physical education students, as it plays a vital role in improving physical and athletic performance, and developing motor and skill abilities. It enhances the ability to endure physical exertion, and reduces the risk of injuries, allowing students to practice exercises and sports activities efficiently and safely. Developing muscular strength also contributes to improving balance and motor coordination, which is essential in various sports. In addition, having good muscle strength enhances self-confidence and self-discipline, which is reflected Positively on both academic achievement and athletic performance.

The introduction of the element of suspense is an important factor in the development of muscular strength in physical education students, as it helps to motivate them and increase their motivation for continuous practice. This can be achieved by incorporating challenge and competition through online training groups, as this approach allows students to interact with their peers, share experiences, and make gradual progress in an encouraging and stimulating environment. Online group exercises enhance team spirit and provide a fun element of challenge, which pushes students to do their utmost and achieve better results. Technology in training contributes to performance tracking and assistance, making the training experience more effective through texting." Instant messaging technology is a set of communication technologies that use text to communicate between two or more users, providing instant text transmission over the Cell Phone Network, and more advanced instant messaging can transmit files, conversations, and video" (Kim,H & others: 2014, 31-42)

Taking advantage of students' leisure time, especially during holidays and breaks from official time, is an ideal opportunity to promote physical activity and motivate them to exercise regularly. Neglecting exercises during these periods can lead to a decline in the level of physical fitness, so it is essential for the teacher to play an active role in communicating with students and encouraging them to exercise, especially muscular strength exercises that contribute to maintaining health and fitness. This can be achieved by developing simple training programs that can be implemented in the At home or in the gym, along with creating online communication groups to follow their progress and motivate them, which enhances their continuity and makes exercise part of their daily lifestyle.

The challenge is also a key factor in motivating students to perform physical exercises regularly, especially basic exercises such as push-ups, abdominal exercises, and back squats that do not require any equipment and can be practiced anywhere. These exercises contribute to building muscle strength, improving physical endurance, and enhancing overall fitness. By introducing the element of challenge, whether by setting daily goals or organizing competitions among students, they can increase their motivation and motivate them to make continuous progress. In their daily routine it helps them develop core strength, which is essential for athletic performance and overall health.

The spirit of challenge is of great importance to the athlete and to everyone in the field of physical education. Both Ayman Fayeq and Afrah Abdelkader, 2021 point out that "the higher the spirit of challenge, the more it has a positive impact on the results of the competitions. The fact that it is considered an essential part of the psychological structure of human beings, and it determines the features of his personality and his ability to give scientifically, to move towards

his goals that he has set, and to determine the level of his abilities, his energy, and the way he walks his life." (Iman Fayeq & Afrah Abdel Qadir, 2021, 209)

The importance of this study shows the need to integrate excitement and challenge in the development of muscular strength among physical education students, especially through the use of leisure time and practicing basic exercises that do not require equipment, such as push-ups, abdominal exercises, and back squats. The study also highlights the role of the teacher in motivating students to continue practicing sports, whether through direct communication or through online training groups, which promotes the spirit of competition and positive interaction. The application of these methods contributes to improving physical fitness. Promoting public health and establishing sports habits as a sustainable lifestyle, which reflects positively on students' academic and athletic performance.

1.2 Research Problem

Physical exercise is a key factor in maintaining physical fitness for physical education students, but periods of interruption, whether due to holidays or exceptional circumstances, lead to a decrease in their level of physical activity, which causes laziness and lethargy and affects muscle strength and overall athletic performance. This is due to the lack of a regular training environment, in addition to the lack of incentives and challenges that push students to continue practicing sports on a regular basis. Since students inherently need motivation and challenge to keep up with exercise, the lack of competition makes it difficult for them to commit to self-training. In contrast, the internet and instant messaging have become an effective way to connect and interact with individuals, allowing them to be used to design interactive training programs based on challenge and competition among students. Therefore, this study examines how to develop a training program to develop the muscular abilities of physical education students, by exploiting online sports challenges, where students can participate in individual exercises such as push-ups, abdominal exercises, and back squats, and compete with their colleagues outside of working hours to achieve the best results. Through this approach, an exciting training environment can be created that motivates students to continue in their exercises, even during breaks from official hours, enhancing their physical fitness and maintaining their level Athlete.

1-3 Research Objectives:

1. Building a Challenge-Based Training Program Using Electronic Messaging Applications in Developing Some Muscular Abilities of First Stage Students at the Faculty of Education in Shaqlawa / Department of Physical Education.
2. Identifying the Effect of a Challenge-Based Training Program Using Electronic Messaging Applications on the Development of Some Muscular Abilities of First Stage Students at the Faculty of Education in Shaqlawa / Department of Physical Education.

1-4 Research Hypotheses:

1. There were statistically significant differences between the results of the pre- and post-tests in the experimental and control groups in the development of the level of push-ups, abdominal exercises, and back squats in favor of post-tests.

2. There were statistically significant differences between the experimental group and the control group in the post-tests in the level of push-ups, abdominal exercises, and back squats in favor of the experimental group.

1-5 Research Areas:

1. Human Field: Students of the first stage for the academic year 2024-2025 in the Department of Physical Education, Faculty of Education (Shaqlawa), Salah Al-Din University.
2. Spatial Field: The closed hall in the Department of Physical Education, Faculty of Education (Shaqlawa), Salah Al-Din University.
3. Temporal Domain: 15-1-2025 to 18-3-2025

2. Research methodology and field procedures:

2-1 Research Methodology:

Choosing the scientific method to solve the research problem is essential, and the researchers used the experimental method to suit the nature of the research problem, by designing two equal groups.

2-2 Research Population and Sample:

The research population was determined by the deliberate method, represented by the students of the first stage in the Department of Physical Education at the Faculty of Education, Shaqlawa, at Salaheddin University for the academic year 2024-2025, which numbered (28) students. The research sample of (24) students was selected, as the sample number represents (85%) of the research population. The research sample was divided into two equal groups with (12) students for each group. The researchers then determined the experimental group and the control group by lottery.

2.3 Experimental Design:

The researchers conducted the experimental design of his current study in accordance with the experimental nature of the research in order to achieve the hypothesis and reach the results. "Proving hypotheses is through experimentation, which means that a researcher who wants to prove his hypothesis in this way needs to design by taking full measures, and this is what we call experimental design." (Nouri Al-Shouk and Rafi Al-Kubaisi: 2006, 66) and the special design was developed as shown in Table (1).

Table (1)

The experimental design of the study shows

After the experience	Independent variable	Before the experience	Totals	t

Post-testing For some muscular abilities	The challenge with the messaging app in groups	Pre-test For some muscular abilities	Experimental Group	1
	No individual challenge		Control Group	2

2-4 Homogeneity and parity of the research sample:

The researchers investigated the homogeneity and parity of the three research groups in the variables of weight, height, age, and some physical tests related to the skill under study on (1/2/2025 Saturday) in order to control these variables. In order to be able to attribute the differences between the results of the three groups, if any, to the independent variable (the challenge using electronic messaging applications) and not to other factors. Therefore, the researchers performed homogeneity in the variables of weight, height and age as shown in Table (2). Also, the parity procedure was performed in the tests (push-ups, abdominal exercises, back squats) for some of the studied muscular abilities of the arms, abdomen, and legs, as shown in Table (3).

Table (2)

Shows the results of differences in weight, height and age in the two research groups for the purpose of homogeneity

Significance	Sig.	t	Control Group		Experimental Group		Unit of Measurement	Variables	t
			±	Going to-	±	Going to-			
Immoral	0,408	0,858	6,617	64,80	15,001	**67,40**	**kg**	**Weight**	**1**
Immoral	0,422	0,821	5,911	174,50	7,601	**172,10**	**Poison**	**Length**	**2**
Immoral	0,157	2,034	13,425	254,70	13,172	**266,80**	**Year**	**Age**	**3**

* Significant at the significance level ≤ 0.05.

The above table shows that the significance level of weight, height, and age variables respectively was as follows (0.408, 0.422, and 0.157), which is greater than the error ratio (0.05), which indicates that there are no differences between the experimental and control groups in the variables of weight, height and age, which indicates the homogeneity of the research sample.

Table (3)

The results of the differences between the pre-tests in the tests (push-ups, abdominal exercises, and back squats) in the two research groups for the purpose of equivalence

	Sig.	t	Control Group	Experimental Group	Variables	t

Significance			±	Going to-	±	Going to-		
Immoral	0,817	0,234	9,97	25,58	4,83	26,33	Push-ups	1
Immoral	0,545	0,615	6,01	31,58	4,51	30,25	Abdominal exercises	2
Immoral	0,377	0,902	8,80	33,33	5,83	36,08	Back squat	3

* Significant at the significance level ≤ 0.05.

The above table shows that the significance level of the variables of the physical tests (push-ups, abdominal exercises, and back squats) respectively was as follows (0.817, 0.545, 0.377), which is greater than the error ratio (0.05), which indicates that there are no differences between the experimental and control groups in the studied tests. This thus demonstrates the parity of the experimental and control groups.

2-5 Methods, Tools and Devices Used in the Research:

- The sources are Arabic and foreign.
- Test and measure.
- Weighing scale.
- Tape measure.
- Electronic stopwatch.

2-6 Tests used in the research:

The researchers' standardized tests for the research variables (push-ups, abdominal exercises, and back squats) were approved by the researchers, by reviewing the sources and references.

1. Strength Endurance Test (Arms): (Muhammad Sobhi Hassanein: 2000, 226)

- Test Name: Bending the Arms of Tilted Prone (for boys).
- Performance Specifications: From the inclined procrastination position, the tester bends and draws the arms to the maximum number possible.
- Conditions: The straightness of the body must be maintained during the performance, it is not allowed to stop to rest during the performance, the elbows must be fully bent and enclosed to their maximum extent, any violation of the conditions will cancel the attempt.
- Registration: Records the number of correct attempts made by the laboratory.

2. Strength Endurance Test (Abdomen): (Muhammad Sobhi Hassanein: 2010, 241)

- Test name: Squat.
- The purpose of the test is to measure the skin of the abdominal muscles.
- From the lying position, the squats and coffins are intertwined behind the neck, noting that the torso is bent until the tester touches the knees in the forehead. Repeat the performance as many times as possible.
- Conditions: Must not stop during performance.
- Registration: The number of correct attempts made by the laboratory is recorded.

3. Strength Endurance Test (Legs): **(Ali Salman Abdel Tarfi: 2013, 76)**

- Test Name: Strength Endurance Test for Full Leg Muscles from a Standing Position in 60 Seconds.

- Objective of the test: to measure the strength tolerance of the muscles of the legs.
- Tools: Small playground, electronic stopwatch, mat.
- Test Description: From a standing position, bend the legs and fully fold them and count the number in 60 seconds.
- Conditions: No pause is allowed during the performance, the laboratory is allowed to perform a simple repetition before the test, and the laboratory is allowed to move forward and backward during the performance.
- Recording: Counts the number of times you bend and stretch your legs in 60 seconds.

2.7 Exploratory Experiment:

The exploratory experiment on the mechanism of implementing the program was conducted on 4/2/2025 on Tuesday, before the implementation of the main experiment. The program was performed on the same research sample, but using a different exercise than the three core exercises. The main objective of the exploratory experiment was to:

- Identify how students respond and perform to the required exercise.
- Ensure that all students have internet access.
- Check the appropriateness of the time of the challenge, as it was agreed to be implemented in the evening period.

The results showed that all students interacted positively within the group, using the purpose-built Telegram application.

2-8 Pre-Tests:

Prior to the start of the main experiment, pre-tests were performed for the three muscular abilities (endurance and strength of the arms, abdomen, and legs) in both the experimental group and the control group. This consisted of the following tests: bending the arms from inclined procrastination, sitting from reclining, and full squats from a standing position. These tests were carried out on 1/2/2025 (Saturday), with an emphasis on adjusting the conditions of the experiment in terms of place, time, devices and tools used.

2.9 Main Experience:

The main experiment was conducted on 8/2/2025 on Saturday and the program was implemented for 30 days and the experiment was completed on 9/3/2025 on Sunday, where during the program period, the experimental group and the control group exercised on (push-ups, abdominal exercises, back squats) with the difference of the method of application only, the training curriculum of the experimental group was as follows:

- The training program of the experimental group was based on the principle of challenge using the messaging application (Telegram).
- A group (group) for students has been formed under the supervision of the teacher, through which he follows up on the students' daily performance.
- The student begins by determining his basic level in the three exercises (push-ups, abdominal exercises, and back squats) through pre-tests.
- The student determines the starting level by half of the number of repetitions reached in the pre-test.

- On the first day, the student performs half of the specified number, and then increases one repetition the next day for each exercise.
- The student continues daily increment (one repetition per exercise) throughout the program (30 days).
- If a student is unable to increase on a day, they are allowed to repeat the number of repetitions they completed the previous day.
- Illustrative example: If the student's level in the pre-stress test is (30 times), the first day starts with (15 times). With the daily increase, after 30 days it reaches (45 times).
- After completing the daily training, the student writes the word "done" in the group, mentioning the number of repetitions he has reached in the three exercises.
- To add suspense and motivation, the student is allowed to share short videos demonstrating their performance, which fosters the spirit of competition among colleagues.

As for the control group, it was as follows:

- She was subjected to the same exercises (push-ups – abdominals – back squats).
- Each student starts from half of their level that has been determined in the pre-tests.
- The student has the freedom to perform exercises and increase repetitions without the obligation of a challenge system or group participation.
- The instructor follows up the implementation of the program by setting a time period (one month) to complete the exercises, without direct intervention or supervision through messaging applications.

2.10 Post-Tests:

After the completion of the main trial period on Sunday 11/3/2025, post-tests were conducted in the three tests, taking into account the provision of the same conditions as the pre-tests.

2.11 Statistical Methods:

The researchers used the following statistical methods using SPSS software:

- Arithmetic mean
- Standard deviation
- T-test for independent samples.
- T-test for threaded samples.

3- Presentation, analysis and discussion of the results:

3-1 Presenting and analyzing the research results in the pre- and post-tests of the experimental and control groups in the tests (push-ups, abdominal exercises, and back squats) and discussing them:

Table (4)

Shows the arithmetic media, standard deviation, and the value of (v) calculated for the pre- and post-tests of the two research groups in the tests (push-ups, abdominal exercises, and back squats).

Statistical significance	Sig.	T Al-Muhtasiba	Post-testing		Pre-test		Research Groups		t
			±	Going to-	±	Going to-			
Moral	0,000	15,072	2,32	42,16	4,83	26,33	Experimental	Push-ups	1
Moral	0,000	8,412	6,79	36,16	9,97	25,58	Officer		
Moral	0,000	19,030	2,43	46,50	4,51	30,25	Experimental	Abdominal exercises	2
Moral	0,000	6,749	3,39	39,08	6,01	31,58,	Officer		
Moral	0,000	13,239	3,43	49,16	5,83	36,08	Experimental	Back squat	3
Moral	0,000	7,110	5,12	43,08	8,80	33,33	Officer		

* Significant at the significance level ≤ 0.05.

In Table (4), it is clear that there are significant differences between the mean scores of the pre- and post-tests in the experimental and control groups in the test (push-ups, abdominal exercises, and back squats) and in favor of the post-test in the two groups, and that the significant levels in the two groups are less than (0.05), which indicates that there is an improvement in the level of muscular abilities of the arms, abdomen and legs in the experimental and control groups. Thus, the alternative hypothesis is accepted by the existence of differences between the pre- and post-tests as imposed by the two researchers.

This shows good improvement for both the experimental and control group in all three muscular abilities (arms, abdomen and legs). This suggests that both programs (traditional and experimental) contributed to the development of students' muscular abilities, which is to be expected given that students exercised regularly during the pilot program. However, it appears that the differences in improvement between the pre- and post-test were greater in the experimental group, supporting the researchers' hypothesis that the use of a challenge-based training program with electronic messaging applications enhances the development of muscular abilities compared to the non-challenge method individually. This can be explained by the fact that the element of challenge increases the motivation of the students, and the constant communication through the applications allows the trainer to follow up with the students, which reflects positively on the results. These results are consistent with previous studies that have indicated that training programs combined with technology achieve greater improvements in muscular strength and endurance due to increased commitment and regular practice.

3-3 Presentation and analysis of the research results in the post-test between the experimental and control groups in tests (push-ups, abdominal exercises, and back squats) and their discussion:

Table (5)

Shows the results of the differences in the post-tests in the tests (push-ups, abdominal exercises, and back squats) between the experimental and control groups

Significance	Sig.	t	Control Group		Experimental Group		Variables	t
			±	Going to-	±	Going to-		
Moral	0,012	2,894	**6,79**	**36,16**	**2,32**	**42,16**	**Push-ups**	**1**
Moral	0,000	6,151	**3,39**	**39,08**	**2,43**	**46,50**	**Abdominal exercises**	**2**
Moral	0,002	3,416	**5,12**	**43,08**	**3,43**	**49,16**	**Back squat**	**3**

* Significant at the significance level ≤ 0.05

Table (5) shows that there are statistically significant differences between the experimental and control groups in the post-tests of both exercises (push-ups, abdominal and back squats) where the significance level was respectively (0.012, 0.000, and 0.002) which is less than the error ratio (0.05) and this indicates that there are differences between the experimental and control groups and in favor of the experimental group, after referring to the arithmetic median of the tests. Thus, the alternative hypothesis is accepted as it was imposed by the existence of statistically significant differences between the experimental group and the control group.

The researchers attribute these results to the training program's adoption of challenge and competition through electronic messaging applications, which increased students' motivation and commitment to performance. The mechanism of feedback and group interaction also contributed to improving continuity and discipline in the implementation of exercises. These results are consistent with the findings of the study *of JJungreitmayr*, S.& other *(2022).*, which showed that "the training program based on an electronic application has contributed positively to improving muscle strength and flexibility in women over the age of 60."

4. Conclusions and Recommendations:

4.1 Conclusions:

Through the results, the following conclusions were reached:

- The results showed a positive change in the tests in both the experimental and control groups, indicating an improvement in muscular capabilities, but the amount of development was greater in the experimental group. Thus, it is proven that the use of innovative training methods supported by technology can increase the level of commitment and motivation of students, which reflects positively on the development of basic muscular abilities more than the traditional method.

- The superiority of the experimental group over the control group in all the post-tests, it can be concluded that the challenge-based training program represents an effective and innovative method in improving basic muscular abilities, making it applicable and generalized in the field of physical education.

4.2 Recommendations:

Through this study, the researchers made the following recommendations:

- Adopting the challenge-based training program using electronic messaging applications as one of the modern methods for students of physical education colleges and departments.
- Employing modern technology and electronic applications in the training and educational process because of its effective role in raising students' motivation and increasing their commitment to training and education.
- Design similar challenge-based training programs that target other physical elements (e.g., flexibility, speed, respiratory cyclic endurance).
- Encourage trainers and physical education professors to use the method of combining traditional training and e-training to achieve better results compared to traditional methods only.
- Conducting future studies on the impact of e-training programs on different age groups (pre-university or older age groups), to show the generality of the results.
- Benefiting from electronic messaging applications as a means of continuous follow-up and evaluation for students during the implementation of training programs, in order to enhance self-control and feedback.

Sources:

- Iman Fayeq Saleh and Farah Abdulqader Abbas, The Spirit of Challenge and its Relationship to the Orientation to Competition among Archery Players in Baghdad Clubs: (Published Research, Al-Mustansiriya Journal for Sport Sciences, Al-Mustansiriya University, Baghdad, Volume 3, Issue 3, 2021).
- Ali Salman Abdel Tarfi, Applied Tests in Physical Education: Physical-Motor-Skill: (Baghdad, Dar Al-Kutub and Documents, 2013).
- Muhammad Sobhy Hassanein, Measurement and Evaluation in Physical and Sport Education, Volume 2: (Cairo, Dar Al-Fikr Al-Arabi, 4th Edition, 2000).
- Muhammad Sobhi Hassanein, Measurement and Evaluation in Physical and Sport Education, Volume 1: (Cairo, Dar Al-Fikr Al-Arabi, 4th Edition, 2001).
- Nouri Al-Shawk and Rafi Al-Kubaisi, A Researchers' Guide to Writing Research in Physical Education: (Baghdad, Dar Al-Kutub, 2006).
- Kim,H & others؛ Effects of mobile instant messaging on collaborative learning processes and outcomes: (the case of south Korea, IFETS,17, 2014)
- Jungreitmayr, S. & others ; (2022). *Effects of an App-Based Physical Exercise Program on Selected Parameters of Physical Fitness of Females in Retirement: A Randomized Controlled Trial*. Frontiers in Physiology, 13, 821773. https://doi.org/10.3389/fphys.2022.821773