

Effectiveness of an Educational Strategy on Performance level of Underhand Serve in Volleyball Under Covid 19 (Corona) Precautionary Measures

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Abstract

The study aimed to design an educational strategy based on using Flipped Learning style Under Covid 19 (Corona) Precautionary Measures and monitor its effect on skillful Performance level in volleyball (Underhand serve skill) for faculty of physical education female students. the researchers used the experimental method by the experimental design of the two groups (experimental and controlled group) using pre-post measurements, the study was conducted on a sample of (120) female students with 21.20% of the total population in the year 2020/2021, results indicated that the educational strategy using flipped learning style led to a higher level of skillful Performance under research in volleyball compared to the explanation and presentation method.

Keywords: Volleyball, Flipped learning, Underhand serve.

Introduction

In light of the Covid 19 (Corona) pandemic and the consequent preventive measures and home quarantine, the world, especially education institutions, is in an inevitable necessity to change their priorities. We must look to the future with a more dependent view on technology and make the most of it to achieve effectiveness, efficiency and mitigate losses during crises, especially since our Arab region is always fraught with dangers at various levels. (Z, FinDev Gatem 2020)

Working to provide alternatives for methods, techniques and content are very important means to find alternative paths for learners, so the efficient teacher is the more flexible one to move between different strategies and methods with what suit its objectives and the teachers' responses towards the skills that they must perform. In addition, the teacher is the designer of the educational environment. (Mohamed & Moustafa, 2004), (Moustafa, 2003)

Modern tools, techniques, modern educational strategies and advanced learning concepts have emerged to help us provide effective learning that is appropriate for each student's abilities. There are large numbers of learners working to transform their learning process upside down by replacing their classes and traditional lectures with educational videos. This process is known as flipped learning or flipped classes and has been described as the future of education by many interested in the development of teaching methods and strategies. (Davis 2012)

In addition, technology has contributed to changing lifestyles among individuals through the rapid spread of smart mobile technology, making teachers and educators think of developing a new technology-based approach to solving some of the challenges and constraints they face in education. This has convinced educators that The teaching system is unable to achieve long-term learning goals. There are other methods of learning that are more effective and help to keep information for long periods compared with the lecture, including the flipped learning strategy. (Bergmann, Sams 2012)

Baker (2010) generally is credited with conceptualizing the flipped learning paradigm, although other teachers have used the inverted instructional method with success (Lage & Platt, 2020; Lage, Platt, & Treglia, 2020). In 1995, Baker, a professor at a small private university in Ohio with access to a school-wide Internet site, asked his communication students to view his PowerPoint slides prior to coming to class. He wanted the students to absorb the fact-based content ahead of time so that he could focus on the 2 students' in-class active learning. He "saw the 'Flip' as a way of addressing the 'covering the content' debate" (Baker, 2010, p. 3) and believed that it allowed him to quickly disseminate direct instruction while preserving class time for active learning. He presented the idea for the concept at various conferences until the moniker "the flipped learning" (Baker, 2010, p. 3) took hold. (Lage & Platt, 2020), (Lage, Platt, & Treglia, 2020), (Baker 2010)

The flipped learning is a blended learning model characterised by the expectation that students are exposed to content before class so they are prepared for active learning in class. Active learning strategies have been shown to improve student engagement and present a variety of opportunities for formative assessment and feedback. (Bergmann, Sams 2019)

The potential benefits of flipped learning:

- By providing students with the material to gain a basic level of knowledge and understanding before class.
- Classroom time can be used to deepen learning and develop higher-level cognitive skills.
- One of the core objectives of flipped learning is to move students away from passive learning and towards active learning where students engage in collaborative activity, peer learning and problem-based learning.
- Within this context, the role of the teacher shifts towards that of facilitator and coach by empowering students to take control of their own learning.
- The use of technology further enriches the flipped learning process and promotes skills that are essential for 21st-century learning (e.g. [digital literacies](#)) where the [flipped classroom approach](#) within education is only becoming more popular among educators in both K-12 and higher-ed environments. (Hamdan,

McKnight, P., McKnight, K. and Arfstrom 2013)

Guidance on how to use the flipped classroom model, (Justin 2016) are as follows:

Step 1: Empower the Student

In this step, you should focus on creating a student-centered learning environment. By doing this, the teacher becomes more of a guide to the learning. (Justin 2016)

Step 2: Utilize Technology

With your learning management system in place, you allow students to easily access the course material at any point in time and from any location. Post videos of lectures, share the educational group or online study guides and reading materials, insert audio, images, and any media you can think of for students to access. (Justin 2016)

Step 3: Always Evaluate

Having your program in place is one thing – you also need to keep an eye on how it is performing by regularly evaluating learning outcomes and adapting accordingly. If monitored properly, you should see a positive impact on performance over time.

In fact, in one study, (<http://echo360.com/case-study/unc-chapel-hill>) 200 teachers using flipped learning, and 85% of them saw an overall increase in grades. (Justin 2016)

Step 4: Foster a Learning Community

Just posting your content online or will not guarantee that it is effective. You should do everything in your control to foster a community among the students. Encourage interaction with the content that is posted, ignite discussions, and solicit feedback. (Justin 2016)

Accordingly, in the flipped model (the flipped learning), direct instruction and fact-based content is delivered via video lectures that students watch outside the classroom, while activities and active-learning strategies are conducted inside the classroom. In other words, students do homework and activities at school and hear traditional lectures at home via videos. (Lajoie, Azevedo 2016)

On the other hand, the researchers observation during their work at the Faculty of physical education that methods and means used to learn learning skillful aspects in volleyball lacks the motivation of the learner and the desire to learn more skills, as period after using these methods the learner sense monotony and boredom, these traditional methods doesn't commensurate with what the world reached of technological uses and applications in the educational process.

Also, through the practical observation, the researchers noted that overhead, underhand serve skill's performance level for the students in is characterized by

randomness, poor performance and lack of coordination in motor sequence, and students cannot develop a correct perception of the skill in mind which leads to weak performance level.

Thus, this study is an attempt to teach students with one of the most modern educational strategies in the field of volleyball teaching, by designing an educational strategy based on using flipped learning style for studying its effect on volleyball motor skill's learning.

Research objective:

The main aim of this study was designing an educational strategy based on using flipped learning style and monitor its effect on skillful Performance level in volleyball (Underhand serve skill) for female students of physical education faculty.

Research hypothesis:

1. There are statistically significant differences between the pre-and post-measurements for experimental group (flipped learning style group) in the skillful level under research in favor to the post measurement.
2. There are statistically significant differences between the pre-and post-measurements for the controlled group (explanation and presentation style group) in the skillful level under research in favor to the post measurement.
3. There are statistically significant differences in post measurements between the two experimental, controlled groups (flipped learning style, explanation and presentation style) in the skillful level under research in volleyball in favor to the experimental group (flipped learning style).

Methodology

Method:

The experimental approach was used for two groups, one experimental and the other controlled, using pre- post measurements for each group.

Research sample:

The research society consisted of (566) female students of the third class students in faculty of physical education for girls, Helwan university for the academic year 2020/2021. The basic sample was randomly selected from the female students of the research community. The total number of the sample was (120) female students with 21.20% of the total population, and the sample was divided as follows:

- Experimental group: uses the educational strategy using flipped learning style in skillful aspects under research, (60) students.
- Controlled group: uses the traditional method “explanation and presentation style” in skillful aspects under research, (60) students.

And (24) students of the total research community and outside the basic

research sample as exploration sample. Thus, the basic sample and outside the basic research sample consisted of (144) female students by 25.44% of the total population.

Tools:

1. Data recording forms: (Appendix 1): Forms for recording the measurements and data for the sample: name, age, height, weight, fitness test scores, and the skillful test score under research in volleyball.
2. Tools and devices: Restameter device for measuring height and weight, distance tape measure, Bearings, medical balls, tennis balls, volleyballs, volleyball court.
3. Fitness elements tests: (Appendix 2, 3) The fitness elements tests for the the underhand serve skill was identified through the following references: (Ahmed Rady 2013), (Zaki 2012), (Farid et al. 2012), (Mohamed, Hamdy 2005), (Mohamed Alhefnawi 2013), (Ayman 2006), (Tarek, Ayman 2006), (Mohamed, Ayman 2005), (Ayat 2016), (Rehab et al. 2013)

These references were used to identify:

- Fitness elements needed to perform the skill under research .
- Measurement tests for the fitness elements (physical tests).

The experts' opinion (Appendix 7) was reviewed. The experts pointed out that the fitness elements (accuracy, strength, capacity, coordination, and flexibility) Shown in Appendix (2).

The experts also pointed to the most appropriate tests for measuring these physical elements, which obtained an agreement rate higher than 75%. as follows:

- Aiming at overlapping rectangles test. (accuracy)
 - The fist strength using the dynamometer test. (Strength)
 - push a medical 3 kg ball a distance test. (Capacity)
 - Through tennis ball on wall and receive it test. (Coordination)
 - Trunk bending forward down (standing. folding) test. (Frontal Flexibility)
 - Trunk bending up (inclined lying) test from Prone falling position. (Background flexibility). Appendix (3).
4. Skillful test (underhand serve): Through the following scientific studies and references: (Ayman 2006), (Tarek, Ayman 2006), (Mohamed, Ayman 2005), (Ayat 2016), (Rehab et al. 2013), (Afaf et al. 2014), (Mohamed, Hamdy 2005) The skillful test was determined to measure the level of performance of the underhand serve, Appendix (4). In addition, the expert opinion (Appendix 6) was used to determine the tests to measure the skill, Experts agreed to the test of (underhand serve accuracy for specific places) as shown in Appendix (5).

Table (1)
Validity and stability of physical and skillful tests

N= 24 (test validity), N= 12 (test stability)

Variables	unit	Distinct N ₁ =12		Non distinct N ₂ =12		Mean differences	T. value	
		M	±SD	M	±SD			
Underhand serve test	Degree	12.54	1.96	7.49	2.21	5.05	7.96*	
Accuracy	Degree	5.43	0.85	3.73	2.06	1.70	5.59 *	
Strength	Kg	24.01	1.15	22.30	2.33	1.71	5.73 *	
Capacity	meter	4.95	0.45	3.97	0.43	0.98	2.25 *	
Coordination	Degree	4.87	0.86	3.23	0.44	1.64	2.83 *	
Flexibility	Frontal	Cm	7.63	1.04	5.25	1.28	2.38	4.84 *
	Background	Cm	29.74	1.96	25.51	1.95	4.23	9.51 *

Variables	unit	1 st		2 nd		CC	
		M	±SD	M	±SD		
Underhand serve test	Degree	7.49	2.21	7.51	2.24	0.94*	
Accuracy	Degree	3.73	2.06	3.72	2.05	0.92*	
Strength	Kg	22.30	2.33	22.28	2.31	0.93*	
Capacity	meter	3.97	0.43	4.00	0.48	0.91*	
Coordination	Degree	3.23	0.44	3.26	0.45	0.93*	
Flexibility	Frontal	Cm	5.25	1.28	5.27	1.23	0.93*
	Background	Cm	25.51	1.95	25.55	1.97	0.95*

The value of *t*-table at a significant level (22, 0.05) = 2.07 (two directions), the *t*-value (cc) at a significant level (10, 0.05) = 0.648 (two directions) Spearman

It is clear from Table (1) that there are statistically significant differences between the two distinct and non- distinct groups, indicating the validity of the tests. It is also evident that there is a correlation between the first and second applications indicating the stability of the tests.

The educational strategy design:

The educational strategy was designed as shown below:

- 1- The goal is to design an educational strategy using the flipped learning style to know its effect on the performance level of the underhand serve skill in volleyball.
- 2- The skillful aspect was determined by the test under research. (Appendix 4)
- 3- The educational strategy content was determined of flipped learning style through the following scientific references (Ayman 2006), (Tarek, Ayman 2006), (Mohamed, Ayman 2005), (Ahmed 2007), (Suzanne 2007), (Ayat 2016), (Rehab et al. 2013), (Afaf et al. 2014), (Mohamed, Hamdy 2005), (Zaki 2012), (Farid et al. 2012), (Mohamed Alhefnawi 2013), (Mahmoud “good education” 2016), (Mahmoud “structure and policies” 2016) by including some multimedia; videos, pictures and texts in an educational group on WhatsApp Messenger in

the name of "flipped learning students" contains skillful aspects of the underhand serve in volleyball. WhatsApp Messenger was chosen because of dealing ease with it and the spread of its use in mobile phones between students. Therefore, the possibility of easily browsing at any time and from anywhere.

- 4- The stages of the technical performance of the underhand serve skill were described (preparatory, main and final stage) (appendix 6)
- 5- The educational style used in the educational strategy was the individual learning method or self-learning through using of each student for the educational group by individually.
- 6- The experts' opinion (appendix 7) of the educational strategy using flipped learning style was reviewed and agreement was obtained on the validity of the educational strategy and the educational group for the underhand serve skill in volleyball.
- 7- The educational strategy using flipped learning style was tested on a sample of the exploratory study to determine the suitability of the strategy for the sample. This experiment resulted in the clarity of all the contents of the educational strategy among the sample students of the exploratory study.

Application of the educational strategy using flipped learning style:

The educational strategy was implemented on the basic study sample according to the time distribution, as shown in appendix (8) and the following table:

Table (2)

Time distribution of the program content for the two research groups			
Content	Time		
Program Duration	10 weeks		
Unit Number	10 Units		
Unit time	90 m		
	Introductory	Main	Final
	20 m	60 m	10 m

- The time distribution was standardized for the two groups, and the difference was only in the learning method for each group.
- The experimental group was learn by the educational strategy using flipped learning style through, the first; students reading and seeing the explanation, information and educational videos of the skillful aspects of the underhand serve skill in volleyball on the educational group (for example, at home). Then, implementation of the students for what was seen in the court in college.
- The traditional group was learn by through the explanation and presentation method where the researcher first explains and presents information and knowledge about the technical aspects of the underhand serve skill in volleyball. Then, implementation of the students for what was seen in the court in college.

Moderation of sample distribution:**Table (3)**

Distribution moderation for basic and exploratory research sample

N= 144

Parameters	Unit	Statistical analyses			
		Mean	Median	SD	SK
Age	year	20.30	20.00	0.43	2.09
Hight	Cm	165.20	165.00	1.43	0.42
Wight	Kg	69.50	69.00	4.56	-0.33
Physical Tests:					
Accuracy	degree	3.76	3.80	1.09	-0.11
Strength	Kg	22.26	22.30	2.19	-0.05
Capacity	meter	4.08	4.00	0.42	0.57
Coordination	degree	3.25	3.30	0.43	-0.35
Flexibility	Frontal	5.19	5.00	1.24	0.46
	Background	25.52	26.00	1.99	-0.72
Skillful Test:					
Underhand serve test	degree	7.58	8.02	2.23	-0.59

Table (3) shows that the values of Skewness coefficients ranged from $\pm (3)$, indicating the moderated distribution of the basic and exploratory sample.

Sample equivalence (Pre- measurement):**Table (4)**

Equivalence of the two research groups (tribal measurements)

N= 120

Parameters	Experimental group (the educational strategy) 60= ₁ N		Controlled group (explanation and presentation) 60= ₂ N		Mean Differences	T	
	M	SD \pm	M	SD \pm			
	Age	20.31	0.44	20.32			0.45
Hight	165.22	1.45	165.20	1.44	0.02	0.97	
Wight	69.52	4.58	69.51	4.57	0.05	1.06	
Physical Tests:							
Accuracy	3.77	1.10	3.75	1.09	0.02	0.99	
Strength	22.27	2.20	22.25	2.21	0.02	0.97	
Capacity	4.10	0.44	4.09	0.42	0.01	0.84	
Coordination	3.27	0.45	3.25	0.44	0.02	1.00	
Flexibility	Frontal	5.20	1.23	5.21	1.25	0.01	0.87
	Background	25.53	2.00	25.55	2.01	0.02	0.98
Skillful Test:							
Underhand serve test	7.60	2.24	7.63	2.26	0.03	1.01	

T Table value at a significant level (118, 0.05) = 2.00 (two directions)

Table (4) shows that all the values of the previous variables are not statistically significant, indicating that there are no statistically significant differences and thus the equivalence of the two research groups.

Results

Table (5)

Significance of the mean differences between the pre- post and post-post measurements of the two groups (experimental and controlled group) in the level of Underhand serve performance in volleyball

Parameters	Experimental group (the educational strategy) 60= ₁ N				Mean Differences	T value
	Pre		Post			
	M	±SD	M	±SD		
Underhand serve	7.60	2.24	12.44	1.99	4.84	8.87*
Parameters	Controlled group (explanation and presentation) 60= ₂ N				Mean Differences	T value
	Pre		Post			
	M	±SD	M	±SD		
Underhand serve	7.63	2.26	10.64	1.94	3.01	6.67*
Parameters	Post measurement 120=N				Mean Differences	T value
	Experimental		Controlled			
	M	±SD	M	±SD		
Underhand serve	12.44	1.99	10.64	1.94	1.80	3.91*

T Table value at a significant level (59, 0.05) = 1.68 (one direction)

T Table value at a significant level (118, 0.05) = 2.00 (one direction)

Table (5) shows statistically significant differences between Pre-Post measurements of both two experimental groups, as well as in post measurements between the two groups at a significant level of 0.05.

Discussion

First research hypotheses: (the educational strategy using flipped learning style)

The results of Table (5) show that there are statistically significant differences between pre and post mean values of the experimental group (the educational strategy using flipped learning style) where the value of calculated (t) (8.87) are greater than the value of table (t) at a significant level (0.05), which indicates the higher level of skillful performance of Underhand serve skill for the post measurement.

The researchers attributed the reason for these differences to the experimental variable only, which is represented in the educational strategy using

flipped learning style. The researchers also attributes the progress made to the experimental group to clarifying the performance of the skillful (underhand serve skill) through The educational videos on the educational group. Thus, the higher level of skillful performance for the experimental group (the educational strategy).

This is consistent with the studies of (Atkins 2020), (Jaster 2019), (Johnson & Renner 2016), the results of which indicate that flipped learning strategy contribute in a positive way in improving skillful performance, and active learning using technology through the educational group contributes positively to enhance skillful and physical variables under research.

Thus, the first hypothesis is achieved, which stated that there are statistically significant differences between the pre-and post-measurements for experimental group (the educational strategy using flipped learning style) in the skill level of underhand serve in volleyball in favor to the post measurement.

Second research hypotheses: (the traditional method “explanation and presentation style”)

The results of Table (5) show that there are statistically significant differences between pre and post mean values of the controlled group in skillful performance level under research in favor to the post measurement.

The researchers attributes the level of progress and improvement in these results to the experimental variable only, which is the use of the explanation and presentation style in skillful learning under research. This indicates that the presentation of learning in the explanation and presentation method has a positive effect on the skill level of underhand serve in volleyball, and knowledge of the skillful performance content through this style (explanation and presentation) that helps to form a clear picture by using of the explanation and presentation style of this skill (underhand serve skill).

The reason for these differences is that the style of explanation and presentation has led to the enhancement of performance during learning. Thus, benefit the students from the traditional method of teaching, and this indicates that learning by the explanation and presentation has a positive effect on skillful learning under research in volleyball.

This the previous results is consistent with (Ayat, Eman 2016), (Ayat 2009), (Zakia, Nawal and Mervat 2010) where they pointed out that the style of explanation and presentation has a positive effect on the learning of skills under research.

Thus, the second hypothesis is achieved, which stated that there are statistically significant differences between the pre-and post-measurements of the controlled group (explanation and presentation style group) in the skill level of underhand serve in favor to the post measurement.

Third research hypotheses:

The results of Table (5) show that there are statistically significant differences in post mean values between the two groups where the value of calculated (t) (3.91) are greater than the value of table (t) at a significant level (0.05), which indicates the higher level of skillful performance for the experimental group (the educational strategy group) than the traditional method (explanation and presentation group).

This indicates that the progress in the skillful performance level of the experimental group compared to the controlled group is due to the reliance on the educational strategy using flipped learning style and the diversity of video, images. Thus, the positive effect on the skillful performance level due to the effectiveness of the flipped learning style.

The researchers also explains the reason for these differences to the effect of the educational strategy using flipped learning style, which helped to raise the interest of students and motivate them to exert effort during the skillful performance. Also, these differences between the two groups indicate a better understanding of the skills under research and better assimilation. Thus, the effectiveness of flipped learning style of the experimental group compared to the control group.

Thus, the researchers attributes the progress in skillful performance level for the educational strategy group to relying on the flipped learning strategy and its various the instructional videos on the educational group, this led to the improvement in skillful performance level under research. Thus, the effectiveness of the educational strategy using flipped learning style compared to the traditional method “explanation and presentation style”.

Thus, it is clear from the above that the educational strategy has a positive effect on the performance level of underhand serve skill compared to the controlled group, and this is consistent with the study results (Meyer, Turner 2009), (Treglia, Platt 2019) which have pointed out that the using the flipped learning strategy leads to learning of different skills in a positive way compared to explanation and presentation style.

Therefore, the third hypothesis is achieved, which stated that there are statistically significant differences between the two groups (experimental, controlled group) in post measurements in skillful performance level under research (underhand serve skill) in favor to the experimental group (the educational strategy using flipped learning style).

Conclusion

- The educational strategy has a positive effect on the skillful performance level under research in volleyball.

- The explanation and presentation style has a positive effect on the skillful performance level under research in volleyball.
- The educational strategy using flipped learning style led to a higher level of skillful performance for the skill level of underhand serve in volleyball compared to the traditional method “explanation and presentation style”.

Recommendations

- Encouraging the use of the educational strategy using flipped learning style because of its effect in raising the level of skillful performance in volleyball.
- The need to holding seminars and lectures in the educational institutions to raise awareness of the importance of using flipped learning strategy in the educational process.

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