# The Effect of Google's Educational Applications on the Cognitive Achievement and some Volleyball Skills Performance

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The research aims at identifying The Effect of Google's educational applications on the cognitive achievement and some volleyball skills performance for the intermediate stage pupils. The researcher used the experimental design of two groups (26 intermediate stage pupils for each one) selected by intentionally way. The control group has been teached using (commands / lecture style) and the experimental one has been teached using Google's educational applications (Google classroom ، Google Drive ، Google presentations ، Google Document and Google Hangouts). The results indicated that there are statistically significant differences between the experimental and control groups in the skill level and cognitive achievement of the research variables for the experimental group, and surpassed the experimental group in the rates of improvement in skills performance with difference (overhead pass 197%, Underarm pass 78% and Underarm serve (47%) and the differences in the cognitive achievement level are (342%) for the experimental group also.

**Keyword**: overhead pass, underarm pass, underarm serve, Volleyball Rules.

## Introduction

Globalization adds new values to the educational system. The implications of globalization for teaching, learning and assessing are: the focus on abstract concepts; the use of the holistic understanding; the enhancement of the student's ability to manipulate symbols and the enhancement of the ability of learners to access, assess, adopt, and apply knowledge to think independently, to exercise appropriate judgment and to collaborate with others to make sense of new situations.

The modern learning methods aimed at exploiting the educated potential by using the multimedia that helps students to improve their Knowledge and motor skills, also it makes the learner more active and positive in the classrooms. So, it is necessary to use the learning methods in teaching sports, which are useful for self-learning and make the learner educational process axis allowing the opportunity and objectives (Zaghloul, al-Sayeh, 2001; Sorrentiono R., 2001).

Using software in learning the environment helps students to overcome the difficulties and challenges faced by students during mastering the skills. Students may learn the courseware anytime and anywhere at their own place, and it also helps to reduce the teachers' burden by reducing the time taken in teaching and learning sessions. And they gave fairly high evaluation and satisfaction of the courseware (Lesser, et al., 2010; Shariffudin. Rio et al., 2011).

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Also Google applications help the students to overcome the difficulties and challenges faced by students during mastering the skills. Students may learn the courseware anytime and anywhere at their own place, and it also helps to reduce the teachers' burden by reducing the time taken in teaching and learning sessions. And they gave fairly high evaluation and satisfaction of the courseware (Barbizon, Tara, 2007; Van, Chism & Weerakoon, Shrinika, 2012).

Google Apps has the most popular applications available as a part of their cloud and it allows pupils and teachers to create documents, share calendars, email, and chat, create web pages, videos, and more. It is secure as everything stays within the registered domain and cannot be accessed by people who do not have a login. It is an excellent tool to provide the e-learning. It works on any computer and many Personal Digital Assistants (PDAs) such as cell phones, iPhones, and netbooks. (Nevin, Roger, 2009; A& Johnson, L, 2010).

Also it's a powerful tool to develop knowledge and social skills. It is designed for Education to permit students to connect with the campus through emails, messaging, phone and video calls from a single interface. Students and staff can share ideas, collaborate and work together by using email, chat, voice and video calls. Plus the activities can be planned and managed efficiently by planning meetings and course schedules (Johnson, Maggie; Senges, Max, 2010 & Railean, 2012).

Through the previous and within the limits of the researcher readings and surveys on references, scientific researches and Internet sites , there is a need to make this study, as it will be one of the first researches on the subject of the use of computer clouding techniques using Google applications in volleyball . It's also a scientific serious attempt to take advantage of Google applications in teaching volleyball, in addition to take advantage of the tendencies and trends of Intermediate pupils about the positive use of the Internet.

**Purpose**

The purpose of the research is to identifying The Effect of Google's educational applications (Google classroom ، Google Drive ، Google presentations ، Google Document and Google Hangouts) on the cognitive achievement and some volleyball skills for the Intermediate pupils. This occurs only through the following steps:

- Identifying the effect of using both the traditional method and Google's educational applications on the level of cognitive achievement and skills performance of both the control and experimental groups.
- Identifying the differences between each of the control and experimental groups on the level of the cognitive achievement and skills performance.
- Identifying the rates of improvement between the control and experimental groups on the level of the cognitive achievement and skills performance.

**Hypotheses**

- There are significant statistical differences between the pre and post measurements of the control group on the level of cognitive achievement and skills performance in favor of the post measurement.
- There are significant statistical differences between the pre and post measurements of the experimental group on the level of cognitive achievement and skills performance in favor of the post measurement.
- There are significant statistical differences between the measurements of the control group and the experimental group on the level of the cognitive achievement and skills performance in favor of the experimental group.
- There are differences in the percentage of improvement between the control and experimental groups on the level of the cognitive achievement and skills performance.

## Method

**Participants**

The research community was Qurtoba Intermediate School in Riyadh - Kingdom of Saudi Arabia (the academic year 2014/2015). And the research sample contained 63 pupils (chosen intentionally) and divided as following:

Eleven pupils in pilot study in order to conduct transactions of the scientific tests which are used in the study, and make sure that students have the ability to use Google educational applications .And the Main study sample which divided into two groups (26 pupils per each ), the control group has been teached by using (commands / lecture style) and The experimental group has been teached by using the educational Google Apps (Google Drive, Google presentations, Google Document, Google Forms and Google Hangouts) .

**Measures**

**Cognitive test**

The cognitive test was designed by the researcher to measure the cognitive achievement level of the research sample in accordance with the curriculum of volleyball in the Intermediate school (Kingdom of Saudi Arabia ) and it contains four axes ( overhead pass , Underarm pass , Underarm serve and volleyball rules )

The Difficulty Index was analyzed (0.18: 0.47) and Discrimination Index was ( 0.53 : 0.87 ) . And test Validity was analyzed by Content Validity .As the correlation coefficient between the degree of each statement and its total axis score was between (0.491: 0.745) and the correlation coefficient between total axis scores and the total test scores was between (0.513: 0.701) which shows the test validity. The test Reliability: It was analyzed by the Internal Consistency Method. As the correlation coefficient between the Odd and even phrases was between (0.537: 0.732), and Cronbach's alpha coefficient was between (0.706: 0.821), indicating that the test has a high coefficient of stability.

**Skill performance tests:**

According to the references survey of the related studies, the following skill tests have been identified:

- Overhead pass: frequent overhead pass on the wall test \ passes
- Underarm pass: frequent underarm pass on the wall test \ points
- Underarm serve : Rasel Lang Serve test \ points

The test Validity was analyzed by the Discriminant Validity between pilot study sample and school volleyball team. The results show that there is a statistically significant difference between groups in the skill tests for the benefit of the distinctive group. And the Reliability was analyzed by the Test Retest Method. And the time lag was (7 days). The results show that there is a statistically significant difference between (0.801: 0.832).

**Google's educational applications**

The researcher used five Google's educational applications (Google classroom ، Google Drive ، Google presentations ، Google Document and Google Hangouts). And every pupil has his own account

**Google Classroom:**

It is used to manage the classroom (send announcements and start class discussions instantly, Share resources with each other, provide answers to questions on the stream, create, review and mark assignments)

**Google Drive:**

It is used as external storage to upload files (pictures, videos, lectures….et.)

**Google Presentations:**

It is used to upload presentations and share them with groups.

**Google Document:**

It is used to upload and share the pupil's works with others for peer editing, and make forms and tests.

**Google Hangouts:**

It is used to make conferences and chatting (writing, sound and video) which provide effective discussion in learning, especially peer-to-peer discussions (under the watchful eye of the teacher)

**Procedure**

**Pilot study:**

It aims at conducting the transactions of scientific tests which are used in the study, and making sure that students have the ability to use Google educational applications.

**Main Study**

The experiment was applied for ten weeks, two units per week, six units for the selected volleyball skills (overhead pass, Underarm pass, and Underarm serve) and two unites for the volleyball rules.

## Results

**1st hypothesis result:**

**Table (1) Means Differences for Control Group between Pre and Post Measurement in the Level of Cognitive Achievement and Skills Performance (N = 26)**

| variables | Item | points | Pre- measurement | | Post- measurement | | Mean Deference | T test | df |
|---|---|---|---|---|---|---|---|---|---|
| | | | Mean | SD | Mean | SD | | | |
| Skills performance | overhead pass | 15 | 1.69 | 1.12 | 7.46 | 2.73 | 5.77 | 10.04 | 0.000 |
| | Underarm pass | 50 | 15.65 | 5.43 | 29.81 | 7.23 | 14.15 | 8.27 | 0.000 |
| | Underarm serve | 120 | 38.19 | 11.78 | 74.23 | 31.60 | 36.04 | 5.19 | 0.000 |
| Cognitive achievement | overhead pass | 7 | 1.04 | 1.25 | 3.27 | 1.54 | 2.23 | 7.30 | 0.001 |
| | Underarm pass | 7 | 0.73 | 0.96 | 3.77 | 1.88 | 3.04 | 6.99 | 0.001 |
| | Underarm serve | 7 | 0.81 | 1.39 | 2.88 | 2.61 | 2.08 | 3.24 | 0.003 |
| | volleyball rules | 9 | 0.62 | 0.85 | 4.15 | 2.13 | 3.54 | 8.83 | 0.000 |
| | Total | 30 | 3.19 | 2.97 | 14.07 | 5.27 | 10.88 | 8.82 | 0.000 |

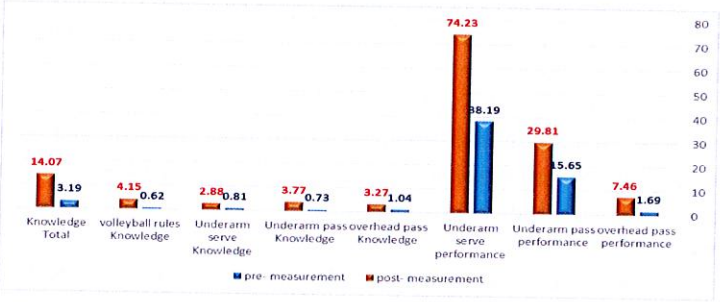


**Figure (1) Pre and Post Measurement means for the control group in the level of cognitive achievement and skills performance**

It is illustrated through Table (1) and figure (1) that there are significant differences between pre and post measurement Means for the control group in the level of cognitive achievement and Skills performance for the benefit of post measurement. As all values (t) calculated is greater than Tabulated value at the level of significance (0.05).

**2nd hypothesis result**

**Table (2) Means Differences for Experimental Group between Pre and Post Measurement in the Level of Cognitive Achievement and Skills Performance (N = 26)**

| variables | Item | points | pre- measurement | | post- measurement | | Mean Deference | T test | df |
|---|---|---|---|---|---|---|---|---|---|
| | | | Mean | SD | Mean | SD | | | |
| Skills performance | overhead pass | 15 | 1.58 | 1.14 | 10.08 | 1.96 | 8.50 | 20.80 | 0.000 |
| | Underarm pass | 50 | 14.04 | 4.17 | 37.73 | 6.83 | 23.69 | 15.92 | 0.000 |
| | Underarm serve | 120 | 38.62 | 15.13 | 93.04 | 14.74 | 54.42 | 11.51 | 0.000 |
| Cognitive achievement | overhead pass | 7 | 1.12 | 1.14 | 5.88 | 2.03 | 4.77 | 10.81 | 0.001 |
| | Underarm pass | 7 | 0.77 | 1.21 | 6.15 | 1,80 | 5.38 | 12.74 | 0.001 |
| | Underarm serve | 7 | 0.92 | 1.35 | 6.12 | 1,45 | 5.19 | 12.18 | 0.001 |
| | volleyball rules | 9 | 0.58 | 0.81 | 8.31 | 1.64 | 7.73 | 22.44 | 0.001 |
| | Total | 30 | 3.38 | 2.85 | 26.46 | 5.52 | 23.08 | 18.18 | 0.001 |

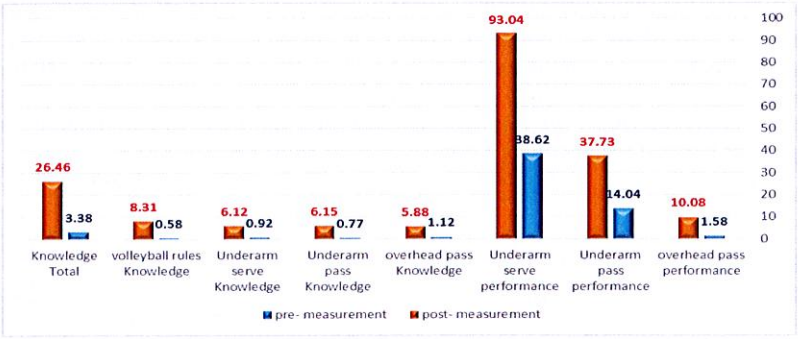


**Figure (2) pre and post measurement means for the experimental group in the level of cognitive achievement and skills performance**

It is illustrated through Table (2) and figure (2) that there are significant differences between pre and post measurement Means for the experimental group in the level of cognitive achievement and Skills performance for the benefit of post measurement. As all values (t) calculated is greater than Tabulated value at the level of significance (0.05).

**3rd hypothesis result:**

**Table (3): Means Differences between Control and Experimental in the Level of Cognitive Achievement and Skills Performance (n = 26)**

| variables | Item | points | Control group | | experimental group | | Mean Deference | T | df |
|---|---|---|---|---|---|---|---|---|---|
| | | | Mean | SD | Mean | SD | | | |
| Skills performance | overhead pass | 15 | 5.77 | 2.93 | 8.50 | 2.08 | 2.73 | 3.87 | 0.00 |
| | Underarm pass | 50 | 14.15 | 8.73 | 23.69 | 7.59 | 9.54 | 4.20 | 0.00 |
| | Underarm serve | 120 | 36.04 | 35.41 | 54.42 | 24.11 | 18.38 | 2.19 | 0.03 |
| Cognitive achievement | overhead pass | 7 | 2.23 | 1.56 | 4.77 | 2.25 | 2.54 | 4.73 | 0.00 |
| | Underarm pass | 7 | 3.04 | 2.22 | 5.38 | 2.16 | 2.35 | 3.87 | 0.00 |
| | Underarm serve | 7 | 2.08 | 3.27 | 5.19 | 2.17 | 3.12 | 4.04 | 0.00 |
| | volleyball rules | 9 | 3.54 | 2.04 | 7.73 | 1.76 | 4.19 | 7.93 | 0.00 |
| | Total | 30 | 10.88 | 6.29 | 23.08 | 6.47 | 12.19 | 6.89 | 0.00 |

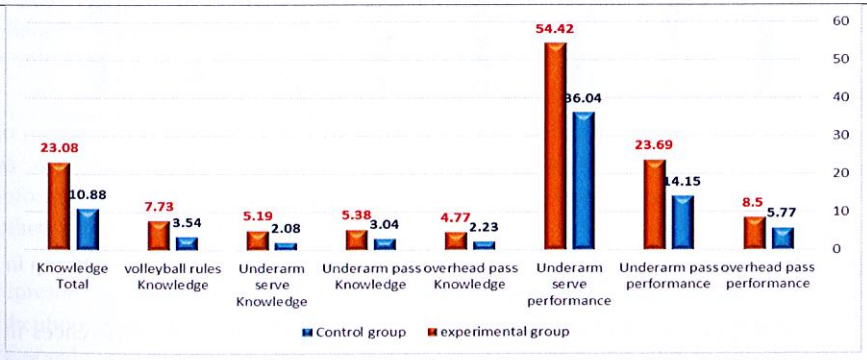


**Figure (3) Means differences between control and the experimental group in the level of cognitive achievement and skills performance**

It is illustrated through Table (3) and figure (3) that there are significant differences between control and the experimental group in the level of cognitive achievement and Skills performance for the benefit of experimental group. As all values (t) calculated is greater than Tabulated value at the level of significance (0.05).

**4th hypothesis result:**

**Table (4): The Percentage of Improvement between the Control and Experimental Group in the Level of the Cognitive Achievement and Skills Performance**

| variables | Item | Control group | | | | experimental group | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | pre-measurement | post-measurement | Mean Deference | percentage of improvement | pre-measurement | post-measurement | Mean Deference | percentage of improvement | percentage of improvement Deference |
| Skills performance | overhead pass | 1.69 | 7.46 | 5.77 | 341% | 1.58 | 10.08 | 10.08 | 8.5 | 197% |
| | Underarm pass | 15.65 | 29.81 | 14.16 | 90% | 14.04 | 37.73 | 37.73 | 23.69 | 78% |
| | Underarm serve | 38.19 | 74.23 | 36.0 | 94% | 38.62 | 93.04 | 93.04 | 54.42 | 47% |
| Cognitive achievement | overhead pass | 1.04 | 3.27 | 2.23 | 214% | 1.12 | 5.88 | 5.88 | 4.76 | 211% |
| | Underarm pass | 0.73 | 3.77 | 3.04 | 416% | 0.77 | 6.15 | 6.15 | 5.38 | 282 % |
| | Underarm serve | 0.81 | 2.88 | 2.07 | 256% | 0.92 | 6.12 | 6.12 | 5.2 | 310% |
| | volleyball rules | 0.62 | 4.15 | 3.53 | 596% | 0.58 | 8.31 | 8.31 | 7.73 | 763% |
| | Total | 3.19 | 14.07 | 10.88 | 341% | 3.38 | 26.46 | 26.46 | 23.08 | 342% |

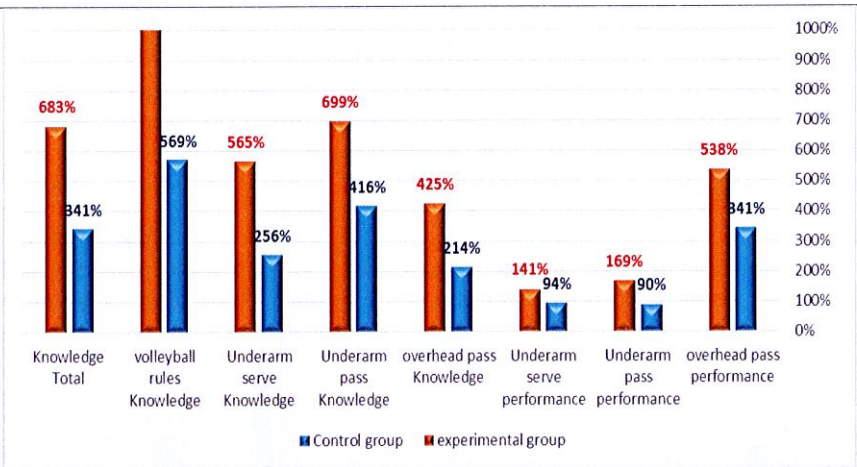


**Figure (4) the percentage of improvement between the control and experimental group in the level of the cognitive achievement and skills performance**

It is illustrated through Table (4) and figure (4) that there are differences in the percentage of improvement between the control and experimental group in the level of the cognitive achievement and Skills performance in favor of the experimental group.

## Discussion

### 1st hypothesis Discussion

It was illustrated by the table (1) and Figure(1) that there is a difference between the pre and post measurement means for the control group on the level of the cognitive achievement and skills performance for the benefit of the post measurement ,due to the effect of the teaching practice method (lecture, commands style), which helped to improve the performance skills and knowledge level of the pupils through the teacher verbal explanation and skills presentation (model) then the practice ,repetition and feedback .

teaching by using the command style increases the level of the performance cognitive achievement plus the repetition and feedback which give pupils more experience ( Kamel, Zakia and et al ,2002 ) .

Specific findings from the present study indicated that there is improvement in the skills performance and the cognitive achievement for the control group that used the traditional method of teaching , volleyball skills and some cognitive contents( Mustafa, Osman,2001 ; Khairy, Nahed,2002; Gazer, Muhammad,2004 ).

From the foregoing, we find that the first hypothesis which states that there are significant statistical differences between the pre and post measurement means for the control group on the level of cognitive achievement and skills performance in favor of the post measurement has been achieved.

### 2nd hypothesis Discussion:

It was illustrated by the table (2) and Figure(2) that there is a difference between the pre and post measurement means for the experimental group on the level of the cognitive achievement and skills performance for the benefit of the post measurement , due to the effect of using Google educational applications (Google Drive, Google presentations, Google Document, Google Forms ,Google Hangouts and Google classroom ) to help the pupils to understand better the contents of the volleyball skills and rules which contributed in the improved performance . Also it provided a very rich learning experience through the practice activities with feedback and made the pupils can browse the course content anytime and anywhere.

Pictures, animations and videos sequences assist the instructors and students to comprehend sports motions and technical/tactical actions as applied in game sports. One specific emphasis lies in the methodical organization of the learning process of sports techniques (Leser, Roland et al's, 2010).

Stated that using Google Apps through the electronic resource Provide pupils to represent and express their prior knowledge and share it and allow them to function as designers, using tools for analyzing the world, accessing and interpreting information, organizing their personal knowledge, and representing what they know to others (Hartnett, Eric & Regina, Koury, 2012).

Specific findings from the present study indicated that the student composition representing ideas simultaneously through Google applications increased the likelihood that students will acquire an understanding of complex information. It is a reasonable conjecture that using an even wider range of media will extend this effect. The same study also noted that students with a wide range of abilities readily mastered

these tools and were highly motivated by the opportunity to augment their writing with other media. That is, this increased the variety of expression which enhanced the attitudes as well .It was also noted that the level of student engagement was significantly higher amongst students with both high and low abilities (Alwashmi, Reem H,2010 ; Alshayaa, hessa M. and Alebead, Afnan,2015).

From the foregoing, we find that the second hypothesis which stated that there are significant statistical differences between the pre and post measurement means for the experimental group on the level of cognitive achievement and skills performance in favor of the post measurement has been achieved.

**3rd hypothesis Discussion:**

It was illustrated by the table (3) and Figure(3) that there is a difference between the control and experimental groups on the level of cognitive achievement and skills performance for the benefit of the experimental one .Also it makes it easy to track, update, and manage the online learners. Learning the management systems facilitates, reporting, succession planning and workforce development from one to another, and its activities incorporate all the three learning styles: auditory, visual, and kinesthetic which make the skills knowledge delivered more easy and effective .

Google Apps has significantly improved the pupils performance level and knowledge as it provide a common collaborative system that virtually supplies all the applications and the needed communication tools under one platform, and It make using technology easier as the computer environment is the same at school and at home (Nevin, Roger, 2009 ; Elena Railean,2012).

In addition to Specific findings from the present study indicated that using Google applications make teaching more active by providing platforms for the social construction of knowledge ,improving the efficiency of content delivery through Learning Management Systems and having an impact on the qualitative learning outcomes by providing engaging in the shared learning experiences and creating opportunities to help students to develop the tools they need to participate in complex that extend beyond the walls of the classroom (Shesen, Guo & Ganzhou, Zhang,2007 ; Michael , Rowe et al,2013 and Rowe, Michael et al,2013).

From the foregoing, we find that the third hypothesis which states that there are significant statistical differences between the different measurement means of the control group and the experimental group on the level of the cognitive achievement and skills performance in favor of the experimental group has been achieved.

**4th hypothesis Discussion:**

It was illustrated by the table (4) and Figure(4) that there is a difference in the percentage of improvement between the control and experimental groups on the level of the cognitive achievement and skills performance between control and experimental groups on the level of the cognitive achievement and skills performance for the benefit of experimental one , due to the features that characterize the teaching using Google educational applications that Provide pupils to achieve , represent, express their knowledge and share it . Also they allow them to function as designers, using tools for analyzing the world, accessing and interpreting information, organizing their personal knowledge, and representing what they know to others.

Google Apps can be useful to develop thinking, knowledge, skills and attitudes which make it easier than a collection of materials. Also it make learning environment contains an interesting activity that helps to archive objects and the both real and virtual learning style that gives students the ability to access, assess, adopt, and apply knowledge( Elena Railean,2012 ; Eteokleous, Nikleia & Ktoridou, Despo,2012).

This result agrees with the conclusions of the study by Shariffudin. Rio et al. (2011). The software was useful and effective through the significant improvement shown by the experimental group students, as it gave students a positive impact of the learning of the psychomotor skills. The students felt good, attracted and believed in the usage of the software, and they were interacted actively with the computer and showed interest in their learning session.

From the foregoing, we find that the fourth hypothesis which states that there are differences in the percentage of improvement between the control and experimental groups on the level of the cognitive achievement and Skills performance has been achieved.

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