



# Investigation of the Effect of Mobile Learning of Giresun University Students on the Development of the Basic Skills of Table Tennis

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## Abstract

This research was conducted to determine the effect of mobile learning in the development of Table tennis basic mobility skills (Forehand, Backhand, Service). The research is an experimental study, and the pre-test / post-test model with the control experiment group constitutes the model of the research. It consists of 30 students, 15 control and 15 experimental groups studying at the Department of Physical Education and Sports Teaching in Giresun University for 8 weeks. " Table Tennis Skill Analysis Observation Form" and " Table tennis basic skills mobile learning program " were used in the experimental group to measure psycho-motor skills related to basic movements of both groups of table tennis balls as a measurement tool. The data obtained in the research were transferred to electronic medium and analyzed in SPSS (version 22) statistical package program. Mann Whitney U statistical technique was utilized in solving the data.

According to the results obtained at the end of the research, when the total psychomotor skill scores of Giresun University students, who formed the control and experimental groups, were compared, it was seen that there was a significant difference between the scores of both groups in favor of the experiment group ( $p > 0.05$ ). In conclusion, mobile learning methods and table tennis ground motion mobile training programs significantly increased the psycho-motor skills of the students. Therefore, it was supposed that the learning method was positively affected by using the mobile learning method.

**Keywords:** Mobile Learning, Psycho-Motor Skills, Table Tennis

## 1. Introduction

According to their ability to be employed, mobile technologies are devices that have a very high utilization rate in all areas of social life (Odabaş, 2011). These devices make it possible to access educational content, take advantage of dynamically generated services, and communicate with others without being confined to one place. This method of learning also boosts productivity and efficiency at work by quickly responding to each user's specific needs (Özdamar Keskin & Metcalf, 2011).

Two crucial variables in the teaching and learning process are the teacher and technology. The learning of students is significantly impacted by these two factors. Teachers, who now have a variety of responsibilities in education, need to be qualified to use technology and instruct students in using it for learning (Koç, 2004). As a result, educational technology refers to a systematic and holistic approach to the teaching and learning processes, and technological instruments and equipment appear to be one of the key components in this process (Yalın, 2003).

Given the features, benefits, and drawbacks of mobile learning technologies, it is reported that mobile learning is not a substitute for face-to-face education but rather a model that may support and enhance face-to-face education (Ergüney, 2017).

Technology should be taken into account while teaching both theoretical knowledge and psycho-motor skills to students in physical education and sports in order to improve success and quality in sports (Yücel & Devecioğlu, 2012). Theoretical and practical learning methods in the field of education can also be used outside the classroom environment with the easy accessibility and portability features of mobile technologies (Saran et al, 2009).

This academic research was conducted to determine the effect of mobile learning in table tennis teaching on the development of basic table tennis movement (Forehand, Backhand, Serve) skills of Giresun University students.

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## 2. Material and method

The pretest-posttest model with the control experimental group forms the basis of this research's experimental design.

### 2.1. Research group

The research was carried out with a total of 30 university students (Control Group 15 + Experimental Group 15) studying at the Department of Physical Education and Sports Teaching at Giresun University, Faculty of Sport Sciences, in the 2018-2019 academic year and who took the table tennis course.

### 2.2. Research process

Before starting the process of determining the effect of mobile learning on the development of table tennis basic movement skills (forehand, backhand, serve) in experimental and control groups consisting of 30 university students, a pre-test was applied. psychomotor levels of students. These are basic movement skills that need to be taught. The control and experimental groups, which included 30 students, were given typical training in the form of 90-minute lessons for ten weeks, starting the week after the pre-test. The students in the experimental group were given basic table tennis kicks with the "Table Tennis Basic Skills Mobile Learning Program", which was downloaded to their mobile devices (mobile phone-tablet) after the lesson and whenever they wanted. After the tenth week of the study, the post-test was applied to compare the psychomotor levels of the experimental and control groups.

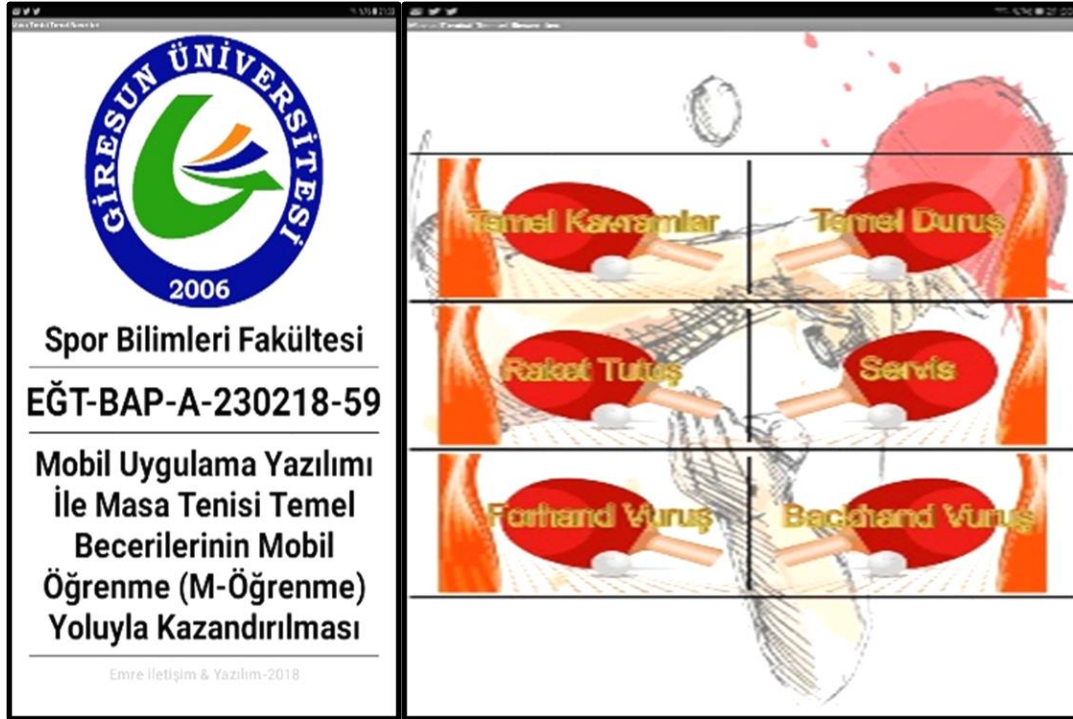


Figure 1. Table tennis basic skills mobile learning program overview and basic information display image.



Figure 2. Table tennis basic skills mobile learning program basic posture display image.



Figure 3. Table tennis basic skills mobile learning program forehand, stroke display image.



Figure 4. Table tennis basic skills mobile learning program serve display image.



Figure 5. Table tennis basic skills mobile learning program basic concepts and racket grip display image.

## 2.4. Analysis of data

Statistical analyzes of the data obtained within the scope of the general purpose of the research, according to the sub-problems to be solved, were made using the 22.0 version of the SPSS program. The pre-test and post-test scores of the psychomotor levels of table tennis basic movement skills of the control and experimental groups consisting of 30 students were compared using the Mann-Whitney U test and it was checked whether there was a difference. It was observed that there was a statistically significant difference between the two scores.

### 3. Findings

The problem of the research carried out on Giresun University Physical Education and Sports Teaching Department students is to investigate whether there is a significant difference in the psychomotor levels of students' basic movement skills to determine the effect of mobile learning on basic movement development.

**Table 1.** Mann-Whitney U test results regarding the psychomotor domain pretest scores of the groups of 30 students.

| Pre-test Variables | Groups       | N  | Mean±Std     | P     |
|--------------------|--------------|----|--------------|-------|
| Forehand           | Control      | 15 | 35.53 ± 3.66 | 0.103 |
|                    | Experimental | 15 | 31.47 ± 5.89 |       |
| Backhand           | Control      | 15 | 33.13 ± 4.76 | 0.021 |
|                    | Experimental | 15 | 28.47 ± 6.19 |       |
| Serve              | Control      | 15 | 34.07 ± 6.33 | 0.466 |
|                    | Experimental | 15 | 32.07 ± 4.23 |       |

In Table 1, as a result of the Mann Whitney U test applied to determine whether the pre-test scores of the students show a significant difference according to the variable of the psycho-motor domain pre-test averages, the mean forehand skill of the control group was  $35.53 \pm 3.66$ , the mean of forehand of the experimental group was  $31.47 \pm 5.89$  and the statistical difference between the arithmetic mean of both groups was  $p < 0.05$ . The backhand skill average of the control group was  $33.13 \pm 4.76$  the backhand average of the experimental group was  $28.47 \pm 6.19$ , and the statistical difference between the arithmetic averages of both groups was  $p < 0.05$ . Again, the serve skill average of the control group was  $35.53 \pm 3.66$ , the serve average of the experimental group was  $31.47 \pm 5.89$ , and the statistical difference between the arithmetic averages of both groups was  $p = 0.466$ . Since the significance values of the arithmetic mean of forehand and serve skills of the groups were  $p > 0.051$ , while there was no statistically significant difference between the control and experimental groups according to the pre-test results, the arithmetic mean of the backhand skill was found to be  $p < 0.05$ . According to these results, although the backhand skill level of the control and experimental groups is slightly different, the psycho-motor domain skills of the table tennis basic movements of both groups are generally seen to be at equal levels.

**Table 2.** Mann-Whitney U test results regarding the psycho-motor post-test scores of the groups of 30 students.

| Post-test Variables | Groups       | N  | Mean±Std      | P     |
|---------------------|--------------|----|---------------|-------|
| Forehand            | Control      | 15 | 62.93 ± 4.46  | 0.000 |
|                     | Experimental | 15 | 70.00 ± 3.74  |       |
| Backhand            | Control      | 15 | 56.53 ± 4.57  | 0.001 |
|                     | Experimental | 15 | 64.53 ± 5.64  |       |
| Serve               | Control      | 15 | 64.87 ± 5.50  | 0.004 |
|                     | Experimental | 15 | 69.40 ± 13.26 |       |

As seen in Table 2, as a result of the Mann Whitney U test applied to determine whether the post-test scores of the students show a significant difference according to the variable of the psycho-motor domain post-test averages, the mean forehand skill of the control group was  $62.93 \pm 4.46$ , the mean of forehand of the experimental group was  $70.00 \pm 3.74$ , and the statistical difference between the arithmetic mean of both groups was  $p = 0.000$ . The backhand skill average of the control group was  $56.53 \pm 4.57$ , the backhand average of the experimental group was  $64.53 \pm 5.64$ , and the statistical difference between the arithmetic averages of both groups was  $p = 0.001$ . Again, the serve skill average of the control group was  $64.87 \pm 5.50$ , the serve average of the experimental group was  $69.40 \pm 13.26$ , and the statistical difference between the arithmetic averages of both groups was  $p = 0.005$  it is seen that there is a statistically significant difference between the control and experimental groups according to the post-test results ( $p < 0.05$ ). According to this result, it can be said that the psycho-motor domain skill levels of table tennis basic movements of the experimental group students increased statistically in favor of the post-test, that is, their table tennis basic movement skills developed better.

## **4. Discussion and conclusion**

The developed application, it is aimed to investigate whether the basic movement skills of the students make a significant difference in their psycho-motor levels to determine the effect of mobile learning on the development of table tennis basic movement skills (forehand, backhand, serve).

In this study, according to the pretest results, the forehand skill score of the control group was  $35.53 \pm 3.66$ , while the experimental group score was  $31.47 \pm 5.89$ . In the posttest, the mean forehand skill of the control group was  $62.93 \pm 4.46$ , while the mean forehand skill of the experimental group was  $70.00 \pm 3.74$ .

The pretest backhand skill average of the control group was  $33.13 \pm 4.76$ , the backhand average of the experimental group was  $28.47 \pm 6.19$ , the posttest backhand skill average of the control group was  $56.53 \pm 4.57$ , the backhand average of the experimental group was  $64.53 \pm 5.64$ .

Again, in the pretest, the mean of serve skill of the control group was  $35.53 \pm 3.66$ , the mean of serve skill of the experimental group was  $31.47 \pm 5.89$ , in the posttest; the mean of serve skill of the control group was  $64.87 \pm 5.50$ , the mean of serve skill of the experimental group was  $69.40 \pm 13.26$ . As can be understood from these results, a significant increase was achieved in favor of the experimental group in all three variables after the study ( $p < 0.05$ ) (Table 1-2).

In today's education and training process, in order to be a part of the information society, individuals must be able to constantly update their knowledge and skills, in other words, they must be lifelong learners (Ergüney, 2017). In the learning process with mobile devices, the interests and motivations of the learners can develop positively. Because learners can learn in a more attractive and motivating way thanks to mobile learning (Vinci & Cucchi, 2007). In this way, positive developments can be seen in the attitudes of learners towards learning environments (Cavus & Uzunboylu, 2009). Supporting the use of mobile devices with effective prompts has greatly contributed to the development of some metacognitive thinking skills (Kaysi, 2016).

Yilmaz et al. (2010) determined the attitudes and thoughts of physical education teacher candidates towards the use of technological tools and equipment in education. They stated that students' positive attitudes towards the use of technological tools in teaching activities developed positively.

Kilincarslan et al. (2017), in order to determine whether there is a significant difference in physical activity levels of sedentary desk-bound individuals gaining the habit of exercising through mobile learning, it was found that there was no significant difference between the two groups ( $p > 0.05$ ) when the total pre-test data of the individuals in the control and experimental groups were compared and the physical activity levels of the individuals were low, after 8 weeks of regular mobile exercise practice applied to the experimental group, it was reported that the physical activity levels of the experimental group increased significantly compared to the control group ( $p > 0.05$ ) in the total post-test result of both groups. As a result, it was reported that the mobile exercise application created with the mobile learning method increases the physical activity levels of sedentary individuals working at the desk.

In the study conducted by Sarialioğlu et al. (2017) to determine the effect of mobile learning on learning the basic movements of volleyball (overhand pass, bump pass, serve and dunk), when the total achievement scores of the students in the control and experimental groups were compared, it was determined that there was a significant difference between the scores of both groups ( $p > 0.05$ ). As a result, it is reported that the students who applied the mobile learning method showed successful results in the psycho-motor field and the students showed significant improvement.

This finding shows that the psycho-motor domain skill levels of the experimental group students' basic table tennis movements rose statistically in favor of the post-test. It may be claimed that the outcomes we found are consistent with the research carried out.

Understanding how students' motivation and engagement impact their learning is therefore becoming more and more interesting. Higher education institutions should use learning technologies to boost student enthusiasm and involvement in order to incorporate interventions on course content and assessments, such as exam revisions, with the hope that technology will aid this process. The psycho-motor domain skills of the students who used the mobile learning approach and the table tennis basic movements mobile training program showed a substantial improvement. This leads to the conclusion that, in addition to the traditional learning approach, the mobile learning approach also has a favourable impact on learning in table tennis training.

According to the results obtained at the end of the research, when the total psychomotor skill scores of students, who formed the control and experimental groups, were compared, it was seen that there was a significant difference between the scores of both groups in favor of the experiment group ( $p > 0.05$ ). In conclusion, mobile learning methods and table tennis ground motion mobile training programs significantly increased the psycho-motor skills of the students. Therefore, it was supposed that the learning method was positively affected by using the mobile learning method.

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