MOBILE TECHNOLOGY AS A POCKET EDUCATIONAL TOOL IN HIGHER EDUCATION

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Abstract

The development of smart devices has meant great technological changes and educational advances. Technologies have reached a greater role in teaching to provide new useful complementary support tools. The use of smartphones in classroom can have many advantages if proper methodologies are implemented. The objective of this research is to demonstrate the effectiveness of the use of smartphones as a tool in the classroom, offering additional benefits thanks to the visual feedback provided in the teaching-learning process. The sample of the study is composed of sixty students of the first year of the Physical Activity and Sport Sciences Degree of the University of Alicante. Participants were randomly divided into a control and an experimental group. During seven weeks, the control group learned technical gestures thanks to the teacher's instructions in a classical way. In the same period, in the experimental group, the students recorded themselves with smartphones when executing practice to receive a feedback and a later visual analysis of how they were performing. Statistically significant differences ($p<0.001$) were found in the improvement of technical dexterity both in the control group and in the experimental group. However, the experimental group, which received feedback with mobile technology, improved more than the control group ($p<0.05$), which only received verbal feedback. This study shows that mobile technology can be used a useful tool to improve technical skills, as long as students are educated in correct use.

Keywords: Innovation, technology, research projects.

1 INTRODUCTION

The development of smart devices has meant great technological changes and educational advances [1]. Technologies have reached a greater role in teaching to provide new useful complementary support tools. These tools can be used to support the improvement of teaching skills by teaching the student to be more responsible in their own learning and by offering options to investigate, produce and collaborate [2].

The use of mobile technology in classroom is still a subject with much debate in teaching centres. Mobile applications are a relatively new tool in relation to the applicability and usefulness in health and physical activity [3]. Using smartphones in classroom can have many advantages, but is necessary to teach how to use them, restricting the form, purpose and time of use. Some studies have shown the high distraction of the students when they used smartphones during classes [4]. College students and faculties have negative attitudes towards smartphones in classroom and are in favor of the formal policies that govern their use [5]. This requires an adaptation process to establish rules of use and to educate students to interpose in front of the fears of the educational community: level of attention, dispersion and inappropriate use. The work of teachers of higher education has a great impact on students, so they must teach the right way in the use of technological resources to solve problems that are found effectively and improve their skills in the development of the activities [2]. Institutions of higher education have new challenges as many teachers are oblivious to the high use of smartphones in class with the respective impact on the student [6].

On the other hand, there are also numerous benefits to using mobile devices to teach motor learning concepts. The practical activities carried out on mobile devices can be a useful tool for students and teachers [1]. The vast majority of university students have smartphones and use them regularly as conventional phones and as pocket computers thanks to the tools they offer [7]. Students use smartphones for their learning activities even though this technology is not formally included in the curriculum. This could be an opportunity for the teaching staff to use this tool to improve the learning needs [8]. Recent studies have validated the use of different mobile applications for biomechanical analysis in sports disciplines. The digital camera, available on any smartphone, is being increasingly integrated by teachers and students in their work [9]. Today, only a smartphone or tablet is needed but recently, to carry out this type of analysis, high-cost instrumentation, equipment and platforms and
difficult transportation were necessary. Studies have shown an increase of improvement in sports technical skills after the use of video recording as a means of visual feedback [10], [11]. In addition, the benefits of performing feedback instantaneously have been demonstrated. Students or athletes will improve their skills and their decision making will be more effective. Also taking the precaution of not becoming dependent on visual support, the technology can be used only as a support to the explanations in those moments that are considered necessary [12].

However, despite the popularity of mobile applications, its efficiency to improve learning has not yet been clearly demonstrated. There is no scientific evidence of studies that have used smartphones as a complementary tool for learning in practical classes in Sports Science, with first-year students and without restrictions on their use. This study does not refer to mobile learning or educational methodologies that use mobile technology to teach at any time or place. The objective of this research is to demonstrate the effectiveness of the use of smartphones as a tool in classroom, offering additional benefits thanks to the visual feedback offered in the teaching-learning process.

2 METHODOLOGY

2.1 Sample

The sample of the study is composed of sixty students of the first year of the Physical Activity and Sport Sciences Degree of the University of Alicante. Participants were randomly divided into a control group \( n=27 \) and an experimental group \( n=33 \). For seven weeks, the control group learned technical gestures thanks to the teacher's instructions. Meanwhile, in the experimental group the students recorded themselves with smartphones when they did the practice to receive a feedback and a later visual analysis of how they were doing it.

2.2 Instrument

During the sports practice, the control group was not allowed to use any smartphone, tablet or any device to record themselves. On the other hand, the students of the experimental group were able to use video recording tools of their smartphones or tablets to record themselves while doing the practical activities, and in this way, to be able to see and analyze their technical gestures. Finally, a Samsung VM-HMX20 Full HD camera (1920x1080, 30 fps) was used in the video recordings of the pre-test and post-test to evaluate the technical ability of each of the participants.

2.3 Procedure and design

For seven weeks, the control group learned technical gestures thanks to the teacher's instructions. The teacher made the corrections to the students while they were doing the practice giving indications of the gestures made in a wrong way, as well as emphasizing those movements that they were able to do well. On several occasions, the students worked in pairs with the aim of being able to correct each other, once they were familiar with the realization of technical movements. Meanwhile, in the experimental group the students recorded themselves with smartphones when they did the practice to receive a feedback and a later visual analysis of how they were doing it. At each break, the students analyzed the videos individually, and sometimes in pairs or groups, while checking if the guidelines given by the teacher had been carried out, or if on the contrary some error was being made in the technical gesture. In order to check the improvement in technical skills, a pre-test was done on the first day of class, before any explanation, and a post-test on the last day.

2.4 Statistical analysis

Results were analyzed with the statistical analysis software SPSS v.22. With the aim to determine whether the quantitative variables kept the criterion of normality, and the most suitable contrast hypothesis, a Shapiro-Wilk statistical test was made. To compare if there were significant differences between groups, the student's t test was used. Statistically significant differences were searched \((p<0.05)\) in the dexterity acquired between the control and experimental groups.
3 RESULTS

The results of the evaluations of the technical skills of the control group and the experimental group are presented below. Secondly, the statistical analysis of both the comparison of results and the differences between both groups are shown.

Table 1. Descriptive data of the average scores obtained in the tests.

<table>
<thead>
<tr>
<th></th>
<th>Pre-test</th>
<th>Post-test</th>
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<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Min</td>
</tr>
<tr>
<td>Traditional (n=27)</td>
<td>3.13±1.36</td>
<td>1.25</td>
</tr>
<tr>
<td>Mobil technology (n=33)</td>
<td>3.36±1.18</td>
<td>1.25</td>
</tr>
</tbody>
</table>

Table 1 shows the average results of the tests of both groups in a scale of 0 to 10 points. The students of the control group obtained an average score of 3.13 ± 1.36 points in the pre-test. This average grade was very similar to that of the students of the experimental group where they used the video recording with the smartphone, with 3.36 ± 1.18 points. However, the difference between both post-tests was higher. The control group obtained an average of 6.24 ± 1.11 points, while the experimental group reached an average of 7.72 ± 1.52 points.

The distribution of the scores reached by the students is shown in Figure 1. It can be seen that the distribution of the pre-test of control group and experimental group was quite similar. The minimum score reached by both groups was 1.25 points and the maximum score was 5.50 points in the control group and 5.75 points in the experimental group. However, in the post-test, the scores of the control group are concentrated between 4 and 8 points while in the experimental group they are concentrated between 6 and 10 points. The minimum score reached in the post-test of the control group and the
The experimental group was similar, 4.25 and 4.50 points respectively. However, the maximum in the control group was 8.50 points while in the experimental group it was 9.75 points.

The statistical analysis shows statistically significant differences ($p<0.001$) between the pre-test and the post-test both the control group and the experimental group. The experimental group, which received feedback with mobile technology, improved technical dexterity more than the control group, which only received verbal feedback, finding a statistically significant difference of $p=0.006$.

4 DISCUSSION AND CONCLUSIONS

This study shows that mobile technology can be used as a useful tool to improve technical skills, as long as students are educated in correct use. In addition, the learning results have improved without an exhaustive monitoring in relation to if they used smartphones for other things that could produce distraction in practice. In fact, some students shared their videos among themselves and published them on social networks to show their achievements. Any experience that leads students to a solid understanding of the learning contents will allow the student to make better decisions [1], and the teacher must take advantage of all those things that keep the student active and motivated.

Providing feedback in an effective and timely manner is a very important element for professionals in the field of motivation because it will facilitate expectations of optimal use of the time allocated in class [13]. Thanks to the fact that the camera is in the pocket integrated in the mobile phone, it marks the great difference regarding the use and accessibility that existed in the past [14]. In the same way as in the present study, also the results of studies in other areas of knowledge indicated that video recording increased students’ learning about the teaching-learning process skills [9]. McCarthy [15] also concluded in his study of the evaluation of written, auditory and video feedback, that the latest was quite appropriate since the students also had access to the internet and could collect information easily and quickly favoring the improvement of knowledge. Similarly, the results of studies and tests completed in different thematic areas showed that video feedback simplifies and increases the efficiency of response to students’ work, giving the opportunity to achieve a higher level of knowledge and a higher quality of knowledge [16].

In conclusion, the use of mobile as a tool in higher education has proved useful in improving the skill of technical movements without the need to exhaustively control whether students used the mobile phone for other purposes that could distract you from the task. Future lines of research should be oriented to analyze whether establishing restrictions on the use of the mobile phone as a work tool is really necessary and if it leads to an increase or decrease in the improvement of knowledge or technical sports skill, evaluating what is really it motivates the student when he uses this tool.

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REFERENCES


