

USING INSTAGRAM IN THE SPORTS BIOMECHANICS CLASSROOM

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The main objective of the investigation was to evaluate the change in perception of students in the use of Instagram as a learning medium for qualitative biomechanical analysis as a part of their undergraduate sports science programme. 106 undergraduate students filled out a questionnaire on the use of smartphones, social networks and Instagram in a biomechanics classroom before and after participating in an assignment. The results of our study show the change in perspective in the participants about the use of social networks to do assignments, specifically in Biomechanics (PRE 3.0 ± 1.4 vs POST 3.6 ± 1.1 , $p < 0.001$). Also, their opinions on the effects of privacy did not change (PRE 3.1 ± 1.1 vs POST 3.0 ± 1.0 , $p = 0.51$). The results indicate that Instagram could turn into a powerful resource in undergraduate sports science education programs complementing traditional learning tools to facilitate learning.

KEYWORDS: social media, social networks, qualitative analysis, higher education, educational tools.

INTRODUCTION: Approximately since 2000, the internet has become a household utility bringing about a big change in the areas of communication, work and education. 42% of the global population uses social networks (Chaffey, 2018), with this percentage being higher in Spain (86%) (The Social Media Family, 2018). Social networks are popular with people aged between 18 to 39 years (The Social Media Family, 2018) and those belonging to this age group are known as "digital natives" (Boyd, 2007). Among the social networks, Instagram is the fastest growing social network in the world, being the most popular social network amongst the millennial population (The Social Media Family, 2018), but its use as a learning platform in undergraduate education is limited (Salomon, 2013). Research has shown that social networks could improve student motivation, affective learning, creativity (Dowson, Tan & McWilliam, 2011) and classroom climate (Mazer, Murphy, & Simonds, 2007). Specifically, the use of social networks in the classroom has shown to improve inter-peer communication (Stewart, 2015) both inside (agreement of 70% amongst the participants) and outside the class (agreement of 82% amongst the participants) (Brady, Holcomb, & Smith, 2010).

Instagram is a more visual platform, allowing users to upload pictures and videos (Al-Bahrani and Patel, 2015). It has the potential to be a great learning medium considering that students retain information better when it is presented visually (Levie and Lentz, 1982). Moreover, this graphical interface of Instagram could be useful in facilitating learning in biomechanics, a subject which is essentially based on the analysis of movement. Qualitative analysis forms the basis of any biomechanical analysis in sport and involves the evaluation of sporting movement mainly through recorded videos.

Hence, the main objective of the investigation was to evaluate the change in perception of students in the use of Instagram as a learning medium for qualitative biomechanical analysis as a part of their undergraduate sports science programme.

METHODS: 106 undergraduate students (males=80, females=26) aged 22.21 ± 4.22 years (range: 19-48 years) participated in this study. They filled out a questionnaire before and after undertaking an assignment on qualitative analysis of a sporting action of their choice. Approval for the research was obtained from the university ethics committee.

The pre-questionnaire included questions divided into five different categories: i) the use of smartphones; ii) using a smartphone as a learning medium; iii) using social networks as learning mediums; iv) the use of Instagram as a learning platform (Only the students who had Instagram accounts answered these questions); and v) the privacy of social networks.

As a part of the assignment, the students had to carry out a qualitative biomechanical analysis of a sports movement of their choice, basing their analysis on the guidelines indicated by (Knudson, 2007a) previously taught in class. The explanation of qualitative analysis was done

over two theoretical-practical classes, each lasting 1h 40min where they were taught about the how to develop a structured framework of analysis (Bartlett, 1997). This required them to follow the four stages of biomechanical analysis (Knudson, 2007b; Knudson and Morrison, 2002): preparation, observation, evaluation and diagnosis and intervention. Emphasis was given to the phases of preparation and observation, and the students submitted an initial needs analysis and establishing critical features of the movement through the Blackboard® virtual learning environment (Blackboard Inc., Washington D.C., USA).

The students had three weeks to submit the entire assignment as a single post on Instagram which involved the four stages of qualitative analysis. For this part of the assignment, the students were required to create a private account on Instagram (Kassens, 2014). They were free to use relevant emojis, hashtags, other tools offered by Instagram (like Super Zoom, Rewind etc.), and could use other applications and software to prepare their post as long as it did not exceed the restrictions of a single post of Instagram (a maximum of 10 photos and/or videos per post, with a video not lasting over 59 seconds). During these three weeks, the students could clarify their doubts about qualitative biomechanical analysis or the use of Instagram with the professor.

Once the deadline passed, the students filled in a post questionnaire, which had the same questions of the initial survey, with the omission on the section on smartphone usage. Eleven questions (Table 1), which were answered on a 5-point Likert-type scale, where 1= completely disagree with the statement, and 5= completely agree with the statement, were compared using the non-parametric U-Mann Whitney test with significance set at $\alpha = 0.05$.

RESULTS: After performing the task, the students' perception changed on the use of social networks to do their classroom assignments. Specifically, they favourably evaluated the possibility of doing assignments through social media ($p=0.001$), their preference on doing assignments through social media ($p<0.001$), and their preference in using Instagram over the virtual learning environment ($p<0.001$). Their perceptions on the use of smartphones as a studying and learning medium did not change ($p>0.05$), and neither did their opinion on privacy of social networks ($p>0.05$).

DISCUSSION: This is the first study which evaluated the use of Instagram in the teaching of Biomechanics. The results indicate that an introduction of familiar devices and tools in teaching undergraduate students could motivate them and facilitate learning in conjunction with traditional teaching methods.

There was a change in perspective in the participants about the use of social networks to do assignments both in general, and specifically in Biomechanics. The task required the students to do a qualitative analysis of a sport of their choice, and the results show that the tools offered by Instagram not only helped them carry out the task easily and motivated them in the process, as indicated by the results in which they preferred using Instagram to a traditional virtual learning environment. These results were similar to those obtained by Shafer, Johnson, Thomas, Johnson, & Fishman (2018), who found that students of radiology were more motivated by carrying out a task on Instagram. This study further corroborates the finding that the use of social media in the classroom could enhance learning experiences in graduate students (Sugimoto, Hank, Bowman, & Pomerantz, 2015), although its use and research into its effectiveness is still in the early stages (Sobaih, Moustafa, Ghandforoush, & Khan, 2016). It is important to highlight the lessons taught with them must be well-planned (Grosbeck, 2009) using the right methodologies (Hamid, Chang, & Kurnia, 2009) keeping in mind the diversity of the students. Considering that the task required a simple video analysis, the fact that the theoretical base was previously taught over the course of two lessons, making the use Instagram easier for the task assigned.

Table 1: Responses to the questions which were common in both questionnaires.

Question	Pre/Post	Mean \pm Std. Dev.
One can study using a smartphone.	Pre	2.5 \pm 1.4
	Post	2.8 \pm 1.2
One can do assignments exclusively using a smartphone or a tablet.	Pre	2.4 \pm 1.3
	Post	2.6 \pm 1.2
A smartphone or tablet can replace traditional books.	Pre	3.0 \pm 1.4
	Post	3.2 \pm 1.3
A smartphone or tablet can replace traditional PCs.	Pre	2.8 \pm 1.3
	Post	2.9 \pm 1.1
One can do assignments using social networks.	Pre	2.7 \pm 1.3*
	Post	3.2 \pm 1.0*
I would like to do class assignments using social networks.	Pre	3.0 \pm 1.4*
	Post	3.6 \pm 1.1*
One can do Biomechanics assignments using Instagram instead of using a Virtual Learning Environment.	Pre	2.9 \pm 1.3*
	Post	3.5 \pm 1.1*
Tools offered by Instagram (Boomerang, Superzoom o Hyperlapse) can be useful in observing and analyzing movements in sport.	Pre	3.3 \pm 1.1
	Post	3.6 \pm 1.1
The use of social networks might negatively affect students who are introverts.	Pre	3.0 \pm 1.2
	Post	3.0 \pm 1.2
Social networks can distract students instead of helping them when doing an assignment.	Pre	3.7 \pm 1.0
	Post	3.6 \pm 1.1
Doing assignments on social networks could generate excessive information.	Pre	3.1 \pm 1.1
	Post	3.0 \pm 1.0

Std. Dev.=standard deviation, *indicates a significant difference in the pre and post questionnaires.

From the initial questionnaire, it is clear that they used the social network on a regular basis, and the final questionnaire their method of using the social network did not change during the course of the task, indicates their familiarity with the different tools that Instagram offers and used it to their advantage in carrying out the task and appear to have understood the difference in using a private and professional account. On similar lines, their familiarity with Instagram made did not change their perception about the dangers of privacy on the social network. This indicates that although previous studies mention the fomentation of creativity, increase in motivation and improvement in inter-personal relations by the use of social networks, one must be careful about its implementation. Students have concerns about using personal accounts for educational purposes, and if one were to implement an activity using social networks, and Instagram in particular, it must be done through new accounts specifically created for this purpose.

CONCLUSION: This initial study showed the positive effect using Instagram as a part of the Sports Biomechanics classroom to present qualitative biomechanical analysis. Instagram could turn into a powerful resource in undergraduate sports science education programs assisting the learning of movement patterns in sport qualitatively, given its popularity among the youth and its main visual characteristics, and hence become the perfect complement to existing teaching methods.

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