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Use of social networks for international collaboration among medical students

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Abstract
Introduction: The collaboration between professionals from different countries has become a claim in the globalised world where we live. In this scenario, collaborative social networks play a fundamental role in bringing people from different territories together in the same virtual space that it favours the exchange of information.
Objective: To analyse the use and integration of social networks to favour international collaboration between medical students from the University of Granada (Spain) and the University of Sheffield (UK).
Methodology: A quantitative methodology has been used using a questionnaire developed ad hoc to quantify the degree of student satisfaction after participation in the collaborative social network. The sample was composed of 110 students of the degree in medicine, 74 from the University of Granada and 36 from the University of Sheffield.
Results: We find high percentages according to the improvement of learning from collaboration, as well as the relevance for the exchange of information and collaborative work between countries.
Conclusion: This type of experience highlights the need to collaborate from digital networks with health professionals from other countries to improve student learning and know different methods and systems of action that improve daily medical practice.
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Uso de redes sociales para la colaboración internacional entre estudiantes de medicina

Resumen

Introducción: La colaboración entre profesionales de diferentes países se ha convertido en un reclamo en el mundo globalizado donde vivimos. En este escenario, las redes sociales colaborativas juegan un papel fundamental al reunir a personas de diferentes territorios en el mismo espacio virtual para favorecer el intercambio de información.

Objetivo: Analizar el uso y la integración de las redes sociales para favorecer la colaboración internacional entre estudiantes de medicina de la Universidad de Granada (España) y la Universidad de Sheffield (Reino Unido).

Metodología: Se ha utilizado una metodología cuantitativa empleando un cuestionario ad hoc para cuantificar el grado de satisfacción del estudiante después de participar en la red social colaborativa. La muestra estuvo compuesta por 110 estudiantes del grado de medicina, 74 de la Universidad de Granada y 36 de la Universidad de Sheffield.

Resultados: Encontramos altos porcentajes de acuerdo con la mejora del aprendizaje a partir de la colaboración, así como la relevancia para el intercambio de información y el trabajo colaborativo entre países.

Conclusiones: Este tipo de experiencia resalta la necesidad de colaborar desde redes digitales con profesionales de la salud de otros países para mejorar el aprendizaje de los estudiantes y conocer diferentes métodos y sistemas de actuación que mejoran la práctica médica diaria.

Introduction

Social networks have become an element of our day-to-day life, not only for leisure time but also for other purposes, such as access to information and the establishment of networks of contacts with people from all over the world for academic and/or professional purposes. The connection between different people through the network with the same objective is generating collaborative learning where physical and temporal barriers do not matter.

These virtual environments stand out for their dynamism and ease for the exchange of information that allows students to generate common meanings and, therefore, develop a collective intelligence.[1] In the universities around the world, ICTs are being applied in the teaching of students, according to the paradigm shift in which the student is an active part of their learning. To which are added the demands of the labour market about the importance of generating collaborative networks between professionals from the same field and other areas (interdisciplinary). However, the use of social networks in teaching implies the participation and guidance of teachers as support for students.[2]

On the other hand, the importance of collaborative learning among health professionals lies in research such as the one carried out on collaborative learning in retention of knowledge taught in ethics and professionalism in a class of general medicine[3] with 38 students of final MBBS, which states that collaborative learning has a greater effect on the retention of knowledge than individual learning. Social networks are a stimulus to promote collaborative learning, since the application of digital networks in the University allows working in a group and in collaboration.[4] In the same line, Trujillo et al.[5] state in their study that 78% of students affirm that the use of a virtual network improves the teaching-learning process and that social networks favour collaborative work.

In the field of medical studies social networks play a fundamental role for collaborative learning, since access to information and knowledge of other professionals in the field of health affect continuous medical learning.[6] Thus, several previous investigations[7,8] on the use of social networks to improve learning in medical studies highlight its positive and beneficial use. In this sense, the research about the creation of a Facebook group with 300 students of physiology,[8] highlight there was self-regulation of learning by the students, collaborative learning and the improvement of class attendance. Similarly, in the work of Ratib et al.[7] confirms that social networks are suitable for the exchange of information between groups of health professionals and doctors.

In summary, the use of social networks to generate collaborative work groups is a successful practice for improving the learning of university students of medicine. This learning will have an impact on their subsequent professional performance in line with some countries such as Denmark and Sweden, where it is already common practice for family doctors to share information and knowledge through collaborative learning groups.[9]

Method

The research project developed is framed within a quantitative methodology, with a descriptive character.[10] The purpose of this study was to analyse the use and integration of social networks to promote international collaboration among medical students from the University of Granada (Spain) and the University of Sheffield (UK). The sample has

Table 1 Factor analysis with extraction principal component analysis method.

Component	Value			Sums of saturations to the square of the extraction			Sums of saturations to the square of the rotation		
	Total	% variance	% accumulated	Total	% variance	% accumulated	Total	% variance	% accumulated
1	2.258	22.578	22.578	2.258	22.578	22.578	1.687	16.869	16.869
2	1.308	13.077	35.655	1.308	13.077	35.655	1.608	16.083	32.952
3	1.125	11.252	46.907	1.125	11.252	46.907	1.343	13.431	46.383
4	1.060	10.602	57.509	1.060	10.602	57.509	1.113	11.126	57.509
5	.985	9.848	67.357						
6	.894	8.936	76.293						
7	.861	8.608	84.900						
8	.688	6.880	91.781						
9	.476	4.671	96.452						
10	.355	3.548	100.000						

been composed of 110 students of the degree in medicine, in specific 41 women and 69 men divided into 74 of the University of Granada and 36 of the University of Sheffield.

Regarding the instrument, an ad hoc questionnaire was applied based on Likert scale of 4 levels (totally disagree, disagree, agree and totally agree). The questionnaire was composed of 66 items and was structured in 3 dimensions referring to student expectations, use of ICT and assessment/satisfaction. In relation to reliability, it was obtained $\alpha = 0.843$ points in the Cronbach's Alpha test and 0.801 in the Guttman's test two halves, so the internal consistency of the instrument is quite high.

For the statistical analysis, it was used the SPSS quantitative analysis software version 24. A factorial analysis was performed using the PCA method with Kaiser variable rotation ''Varimax'', to highlight those areas of prevalence and the possible groupings of the factors that make up the questionnaire. Prior to the factor analysis, Bartlett's sphericity test includes a chi-square of 424.15, 43 gl., With a significance of .000 and a KMO index of 0.68 points, being more than acceptable based on statistical criteria.[11]

The principal component method used explains the total variability of each component, in this sense 4 factors explain the questionnaire (training in ICT and social networks, use of learning platform, expectations of the learning community and assessment of collaborative work and virtual tutorials), with 10 variables that present a total of 57.509% of the variance (Table 1).

Results

If we look at the most significant results about the collaboration through the social networks of the students of both universities. First, regarding the problems derived from the use of the social network, the majority of responses are concentrated in none (68.1%), although the biggest problem has been the one derived from the connection to the network (43.8%). To a lesser extent, the difficulties detected by medical students have been related to ignorance (31.3%), access issues (28.2%), tasks (12.4%) and contact with tutors (8%) (Fig. 1).

On the other hand, the assessment of students has been very positive (94.5%) regarding the learning that has been
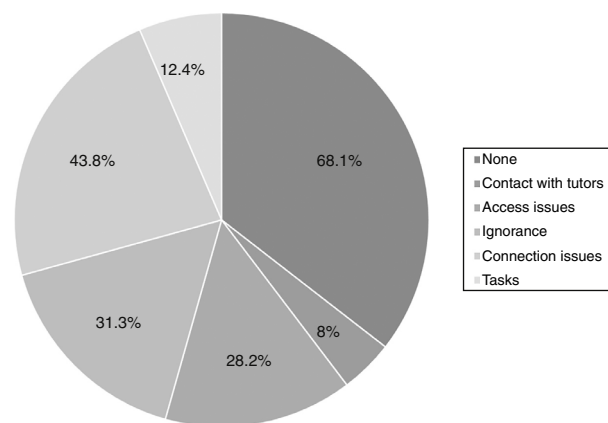
Figure 1 Main problems of students with the use of the social network.
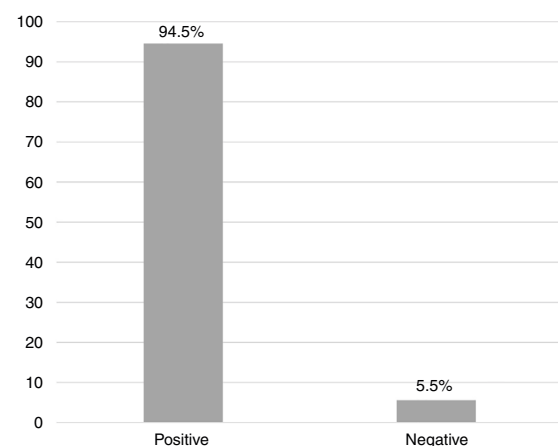
Figure 2 Valuation of learning perceived by medical students from the use of the social network.

generated from the collaboration between universities in the social network, while only 5.5% state that it has been negative (Fig. 2).

Regarding the score obtained in different dimensions related to the use of the social network, the positive average is verified in all of them with values above 4, oscillating the range between 0 and 5 points. Thus, in
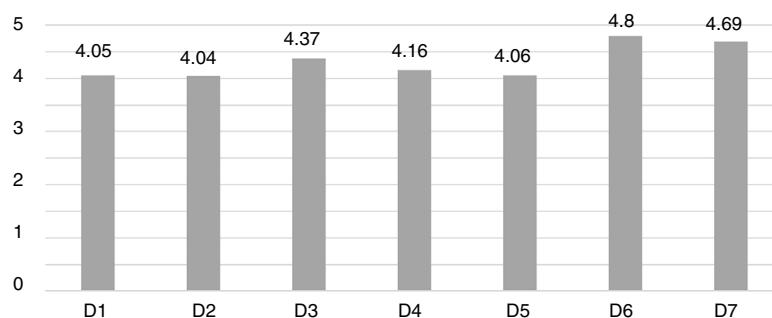
Figure 3   Score obtained in the different dimensions related to the use of the social network.
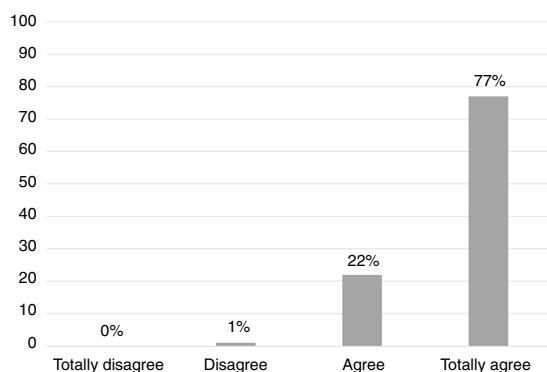
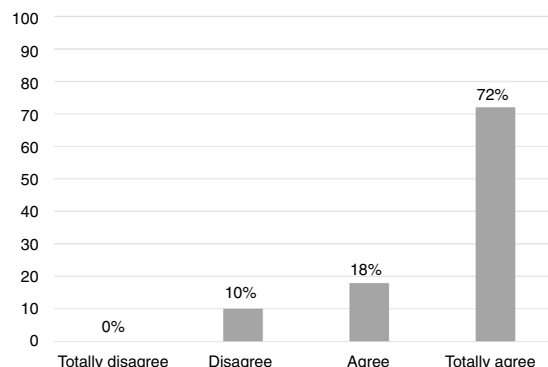**Figure 4**   Possibility of generating collaborative networks between students from anywhere.

Figure 5   Learning content through the social network.

dimension 1 ''adaptation of the social network for learning'' (D1) was obtained a value of 4.05 points, in dimension 2 ''relevance of the resources used to establish collaboration in the network'' (D2) 4.04 points, in dimension 3 ''collaboration among students'' (D3) 4.37 points, in dimension 4 ''planning of group activities'' (D4) 4.16 points, in dimension 5 ''involvement of teachers'' (D5) 4.06 points, in dimension 6 ''information exchange and collaborative work'' (D6) 4.8 points, being the factor that obtains the highest score and in the dimension 7 ''valuation of the social network to favour the collaboration of students from different universities'' (D7) 4.69 points (Fig. 3).

Regarding the possibility that allows the social network used to establish contact with medical students from anywhere in the world, with the purpose of collaborate on the same project, the answers are placed in a percentage of 99% agreement (77% totally agree and 22% agree) (Fig. 4).

Finally, the opinion of the students about the use of the social network to facilitate the learning of contents is collected, where a majority agreement percentage is obtained (90%), which is divided into 72% totally agree and 18% agree. On the contrary, only 10% state that they are disagree (Fig. 5).

Discussion

The results obtained show a similar scenario to that of previous research, which exposes the advantages and benefits of social networks to promote collaborative learning and information exchange between medical students from different

countries. In relation to the difficulties encountered in its application, the most notable internal difficulty is ignorance (31.3%), which denotes a lack of training in the students. In such a way, before that when applying some kind of collaborative social network it is necessary to impart a previous training for its use.

Regarding the improvement of learning based on collaboration between universities, 94.5% of students state that it has been a positive experience, in line with the results of the research by Trujillo et al.[5] where the majority of students affirms that the social network improves learning. This indicator is found in the adaptation dimension of the social network for learning (D1) with a value of 4.05 points (0 being the minimum and 5 the maximum).

On the other hand, students highlight the relevance of resources to establish collaboration in the network (D2) with a positive value of 4.04, so the application of social networks in the University are an excellent resource to favour collaboration.[4] If we look at the dimensions D3 (4.37), D6 (4.8) and D7 (4.69) all of them obtain scores close to the maximum value, confirming that the social network favours collaborative learning as in previous studies with medical students.[7,8]

Regarding the involvement dimension of the teaching staff (D5), the value obtained is high (4.06 points), it highlighting the need for teachers to become involved as a participant, moderating and guiding students' learning in the network.[2]

In the planning of activities (D4), the score of 4.16 points indicates that the social network facilitates planning among students, in the same way almost the whole (99%) is in agreement with the use of the social network to generate

collaborative networks among medical students from any place, thus allowing the exchange of information and the development of a collective intelligence.[1]

Finally, 90% of students agree with the improvement of learning through the use and participation in the collaborative social network, these results are similar to those of Dambal et al.,[3] explaining in both cases that collaborative learning has a greater effect on the retention of content than on an individual learning.

In summary, in this paper has been answered the purpose of analysing the use and integration of social networks to favour international collaboration among medical students from the University of Granada (Spain) and the University of Sheffield (UK). This study includes beneficial results in two ways, first as an improvement in the learning of medical students and second, as a collaborative network between countries, favouring the exchange of different methods and systems of action, but complementary, that can improve the practice daily medical.

Ethical disclosures

The authors declare that they have followed their institution's protocols, and all participants included in the study have given their written informed consent to participate in this study.

Conflicts of interest

The authors of this article declare no conflict of interest.

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