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Assessment of a Journal Club by Veterinary Medicine Degree Students

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Abstract

Students from faculty Veterinary Medicine of Cordoba, Spain are offered a huge variety of activities focused on acquiring day-one skills (skills expected of new veterinary graduates). Professors from Animal Physiology, Obstetric and reproduction and Animal Production decided to involve their students in a Journal Club (JC) to motivate them to perform bibliographic searches in different databases, to gather information about current veterinary issues and discuss aspects related to the information found. The aims of this activity were: first, to promote the reading of scientific papers, second to incentive open debates, third, to encourage critical thinking in different areas of knowledge in veterinary science in a relaxed atmosphere for students, and fourth, to try to get students excited about learning. The hypothesis of this research was that the JC could be an adequate blended learning resource to use with the students of these courses in Veterinary Degree. This activity was not intended to improve knowledge of the students but to experience a difference type of learning. It has been concluded that this experience is very interesting to initiate undergraduate students for scientific culture in order to have an easy experience in their.

Introduction

Blended learning is characterized by combining in-person and on-line learning. This methodology does not mean that students assimilate more contents but that they do so in a different way and, thus, are trained in decision-making, information access, relevant information discrimination, producing new information from their search in databases, and the application of all this to real life situations. The blended learning methodology encourages students to develop these skills as part of their learning process, something that is being imposed in the university context [1], making it an inherent feature of quality education [2]. As for educational advantages it can be said that: it prevents students' isolation since they are in touch with the teacher and their work team; spatio-temporal flexibility; easy access to material: and improvement in academic results [3,4].

Theoretical Background

In recent years it has been observed that students of Veterinary Medicine degree studies discard the use of textbooks and scientific articles to enhance their knowledge of the theoretical contents presented in the classroom. They limit themselves to studying the information prepared by their teachers in Power Point presentations, which are on the Moodle platform. It has been demonstrated that this is not the way to study if students wish to increase their academic production [5-7]. Teachers have admitted that Power Point presentations are inclined to lead students to believe that all the information available is found in them, so that they adopt a passive attitude in the theory classes and do not take notes or show any motivation. Furthermore, they do not use any textbooks or scientific publications but simply study the material found in Moodle Virtual Platform [8].

In the Faculty of Veterinary Medicine in Córdoba, Spain, it is obligatory to offer students not only theory classes but also activities designed for the acquisition of the day-one or new graduate competences [9]. Taking this into account, it was thought that the "Journal Club" (JC) could be an ideal blended activity to

inspire students to read scientific texts, and to introduce them to information-searching. A JC is a group of individuals who meet regularly to discuss and assess recent works related to science or philosophy [10]. It is a highly effective tool in post-graduate training [8] and in professional spheres [11]. However, although JC is not new to degree students, and even in the literature consulted it has been verified that JC exists as a theory section independent of those given regularly in the classroom [12-15], it had not been employed with degree students at the Córdoba University Veterinary Faculty.

Purpose and Research Questions

The aims of this activity were to:

1. Initiate students in the reading of scientific articles, promoting their critical thought in the area of Physiology;

2. encourage their capacity to discuss scientific themes starting from their reflections on their reading.

The specific questions of this research are:

a) What is the influence of gender and age on this type of blended activity?

b) Will JC be well valued by the students?

Method

The Activity's Context

A total of 90 voluntary students, 58 women and 32 men, taking the degree in Veterinary Medicine at the Faculty in Córdoba took part in this activity (Table 1). All of them were enrolled in 2nd-year Animal Physiology (AP). On the first day of classes they were explained in detail the norms of the JC. The students ages ranged between 19 and 21 and all of them gave their written consent to publish the results obtained in this research.

Table 1: Distribution of the students in relation to the discriminative variables.

GENDER	ABSOLUTE VALUE	AGE	% TOTAL
WOMEN	58	19	42
WOMEN		20	13
WOMEN		21	3
MEN	32	19	22
MEN		20	9
MEN		21	2

The activity was organized as follows:

1. On the first day the rules were presented and the dates of the oral presentations per group, chosen randomly by the teacher, were assigned.

2. The groups were constituted freely by the students, facilitating a better interaction between each other. 15 working groups were formed, each of 6 students.

3. Then, after searching for information, an article was selected and uploaded to Moodle. Each group chose and presented two articles related to the Teaching Manual. Review articles were not admitted. The group leader uploaded them in PDF to the on-line platform Moodle so that the teachers could decide if they were acceptable. Córdoba University possesses resources for accessing to the electronic library (databases, electronic journals, catalogues, e-books, etc.) either from any computer on the campus (Wi-Fi) or by external access to the university network using the Virtual Private Network (VPN).

4. Review of the article and acceptance by the teacher.

5. Once the article was accepted, the group studied it in depth to attempt to understand it and transmit its contents to their peers and to the teacher during the oral presentation.

6. Preparation of the draft of the Power Point presentation. In each oral presentation it was obligatory to answer the following questions: What is the hypothesis? What future projects do this line of research offer? What are the strengths and weaknesses of the research?

7. The draft is uploaded to Moodle in Power Point format three days before the oral presentation.

8. Correction by the teacher and feedback to the group.

9. Each group expounded its results in the JC in two sessions at separate times. All the members of the group had to be thoroughly acquainted with the article (introduction, hypothesis and objectives, material and methods, results, discussion and conclusions) since the teacher had informed the group that the presentation from each of its members would be random.

10. For the evaluation, an analytical type of scoring was used to reduce subjectivity in the final evaluation. Items related to the article presented and others related to its oral presentation were valued.

11. Filling in the second survey on student's satisfaction.

12. Valuation of the results and conclusions.

As the duration of the practice classes in the area of Physiology is of 3 hours, it was decided to use the last 30 minutes of each session for the JC. Each group had 15 minutes to make their oral presentation and another 15 to debate with the teacher, who acted as a moderator, and with their fellow companions. The activity was done weekly during the 30 weeks of the academic year. The percentage of the JC over the final score was of 20%. The students who did not take part performed another parallel activity that was evaluated with the same percentage.

Instrument and Procedure

A satisfaction questionnaire made ad hoc was designed. The students filled in the survey anonymously once the academic year was over. The questionnaire consisted of two discriminative variables (gender and age) and eleven evaluative ones on the degree of satisfaction with the JC demonstrated by the students (Table 2). A section for free comments was also included. The degree of satisfaction was scored at a scale of 1 to 5, where 1, 2, 3, 4 and 5 mean "very dissatisfied", "dissatisfied", "not very satisfied", "satisfied" and "very satisfied", respectively.

Table 2: Global means and standard deviation (SD) of the evaluative variables.

Variable	Media	SD
To promote motivation for reading scientific articles	3.7	0.9
To learn how to read, interpret and review scientific literature in a critical way	4.18	1.38
To learn how to understand statistical studies	2.55	0.29
JC is an active methodology	3.87	0.93
To learn how to detect the strengths and weaknesses of an article	3.23	0.48
To improve the ability to evaluate and communicate results and conclusions	4.05	1,10
To trigger debates and critical discussion	4.14	1.12
It would have been useful to have a check list	4.48	1.52
In general, I am very satisfied with the activity	4.34	1.54

Data Analysis

For the interpretation of the results, the means and the global typical deviations were obtained and per discriminative variable, using the programme Statistical Analysis System University Edition (SAS Institute Inc., Cary, NC, USA).

Results

With regard to the discriminative variables, a predominance of the female (64%) over the male sex (36) was observed, and, also, 71% of the students were under 20 (Table 1).

Objective 1

To enable the interpretation of the first objective "to initiate students in the reading of scientific articles, promoting critical thought in different areas of knowledge", in the survey, four evaluative variables were taken into account: to promote motivation for reading scientific article; to learn how to read, interpret and review scientific literature in a critical way; to learn how to understand statistical studies; JC is an active methodology. The global results obtained (Table 2) demonstrated that the JC triggers enthusiasm for reading scientific texts, helps students to interpret and review them critically, and is considered to be an active methodology. The aspect worst valued was that of understanding text statistics. It was clearly observed that the women in all the age groups valued the first two variables best (Table 3 & Figure 1). In the variables 'to promote motivation for scientific reading', 'to learn how to understand statistical studies' and 'consideration of the JC as an active methodology' , an increasing trend was observed in a positive valuation with the increase in age of the students, both the men and the women (Figure 1).

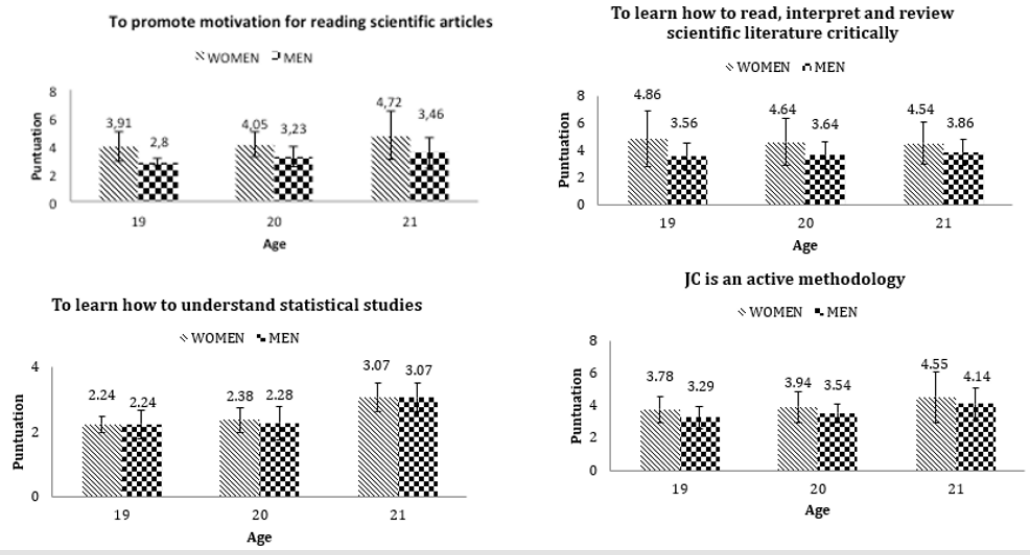

Figure 1: Effects of gender and age on the variable considered in objective 1.

Objective 2

The second objective "To promote the ability to discuss science by taking as a starting-point reflections made on the reading done", has been valued in the survey under the following premises: to learn how to detect the strengths and weaknesses of an article, to improve the ability to evaluate and communicate the results and conclusions, to learn to trigger debates and critical discussions. The results revealed that, in general, the students valued positively the items 'to improves the ability to evaluate and communicate the results and the conclusions' and to learn to trigger debates and critical discussion on what was read'. However, they found difficulty in learning to detect the strengths and weaknesses of an article. With respect to gender, it was seen that the women valued the debate and the critical discussion better than the men. However, no clear differences were found in 'to learn how to detect strengths and weaknesses in an article', 'to improve the ability to evaluate and communicate the results and conclusions (Table 3). Both in the men and in the women, the older students were those who valued best those last 2 items (Figure 2). Finally, the activity was highly valued by all the students (Table 2). The men and women coincided in that it would have been useful to have had a check list when doing it, but the general satisfaction with the activity was greater in women than in men in all the age groups (Table 3 & Figure 3). Finally, the free comments made by the students are presented in Table 4.

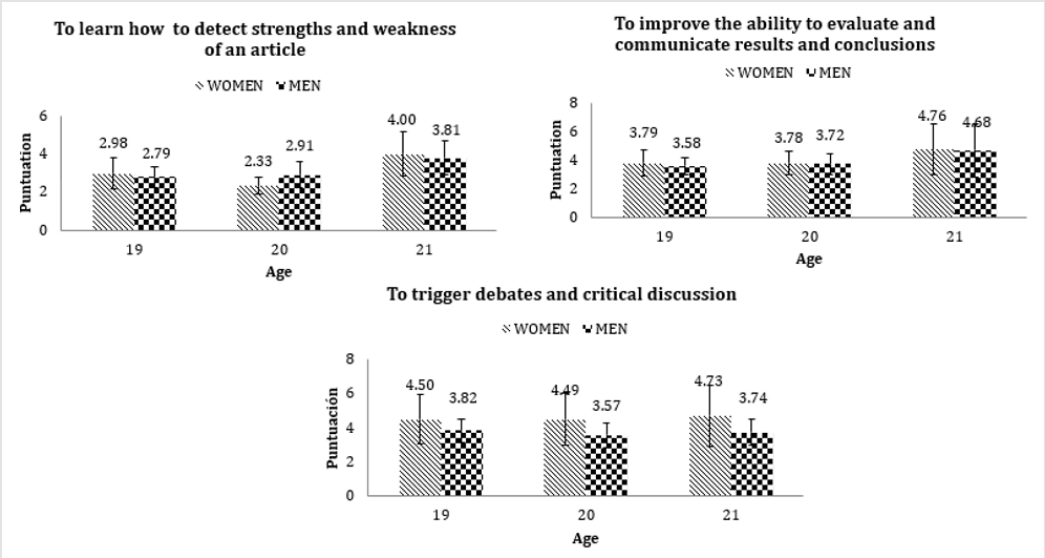

Figure 2: Effects of gender and age on variable considered in objective 2.

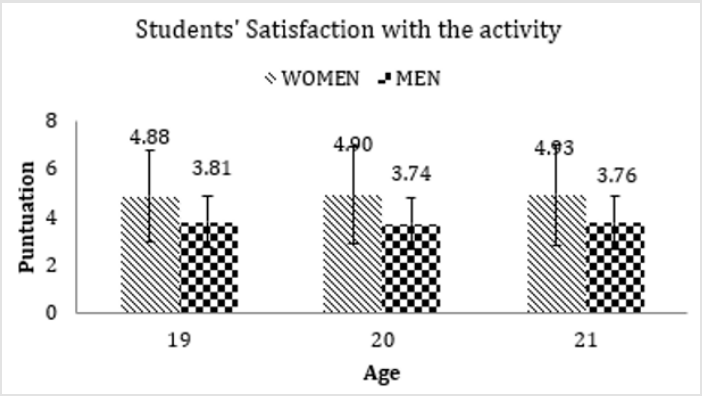

Figure 3: Degree of satisfaction of the students surveyed.

Table 3: Means and Standard deviation (SD) of the evaluative variables taking into account gender.

Variable	Gender	Mean	SD
To promote motivation for reading scientific articles	1	4,23	1,18
	2	3,16	0,63
To learn how to read, interpret and review scientific literature in a critical way.	1	4,68	1,77
	2	3,69	1,73

To learn how to understand statistical studies	1	2,53	0,33
	2	2,11	0,47
JC is an active methodology	1	4,09	1,12
	2	3,66	0,74
To learn how to detect strengths and weaknesses of an article	1	3,25	0,67
	2	3,20	0,52
To improve the ability to evaluate and communicate results and conclusions	1	4,11	1,16
	2	3,99	1,03
To trigger debates and critical discussions	1	4,57	1,60
	2	3,71	0,74
It would have been of great use to have a check list	1	4,54	1,58
	2	4,42	1,46
In general, I am very satisfied with this activity	1	4,90	2,01
	2	3,77	1,09

Note: 1 Women; 2: Men.

Table 4: Free Comments expressed in the final survey by the students (n=61).

Comments	Number of students making comment	%
JC has improved my understanding of the reading of scientific articles	20	33
I need more practice in Statistics to understand the results with any clarity	28	46
I have suffered from great stress when presenting my work due to stage fright	13	21

Discussion

Remarks from the Teachers

This is the first time in the subject Animal Physiology of the Veterinary Medicine degree course that a blended activity has been organized to initiate students in the reading of scientific articles to promote critical thought and boost their capacity to hold discussions on science starting from that reading. The JC provides a suitable environment for finding out the latest scientific advances, for going into depth into the design and statistical study of the investigation and teaching skills related to critical thought. The JC is frequently found in the sphere of medicine, in which clinical cases and experimental education contexts are addressed [16,17]. Once the academic year was over, the Animal Physiology teachers met to comment on the JC activity and draw some conclusions on the results obtained.

They observed that:

a) The first time that the groups uploaded the draft of their presentation to Moodle, they committed many errors due to their inexperience in handling scientific literature;

b) Each of the groups learnt from the feedback received from the teachers as was demonstrated in the second draft presented before the oral communication;

c) The teachers expected it to be easy to select and read scientific articles. However, as the students wrote in the survey, it would have been more useful to have given them a check list to guide them as to how to select and read the articles so that they could gradually develop their own techniques [18]. Linzer & Hupart (1987) described the importance of helping the students choose articles of some relevance for their participation in a JC until they obtained the necessary experience.

Influence of Age and Gender

More women than men took part in the activity. In general, in all the Veterinary Medicine faculties in Europe, 60% of the students are women and the rest are men. To be specific, in that of Córdoba, the cause of this imbalance between the 2 genders may be due to the entrance system based on "numerus clausus" (150), which defines the number of places offered to students in each academic year. This procedure is aimed at keeping up the standards of quality when training future veterinarians. The 150 students with the best transcripts are selected every year, and year after year the women coincide in having better grades than the men. [19] described the existence of a slight inclination towards women having a better academic performance than men. However, [20] concluded that it cannot be 100% guaranteed that academic performance depended on gender. What can be affirmed is that all this has engineered a change in the Veterinary Medicine profession. Years ago, it was an eminently male one, in which women hardly had any place [21].

In our experiment, the women were seen to be more motivated towards scientific literature than the men. It is known that being motivated gives one the impetus to broaden knowledge in the area of study [22]. The lack of motivation in the men may perhaps

be due to their not having become aware, as some of them said posteriori (personal communications), that JC could be beneficial for the acquisition of new knowledge on Animal Physiology [23]. In addition, the survey revealed that, in general, the women felt more satisfied than the men for having taken part in the JC. Namely, they answered that they were more satisfied than the men with regard to how it encouraged their motivation for reading scientific literature, how they learnt to read, interpret and review it critically, and how it triggered debate and discussion [24]. defined satisfaction as a way to evaluate the correlation found between expectations and perceptions. Student satisfaction indicates the quality of the educational process [25]. For the teaching staff involved in university teaching it is important that the students should feel satisfied with the teaching that they receive since this influences the academic results obtained once the subject being studied has finished [26]. consider that the stability of the university depends on student satisfaction. With regard to age, it has been verified that, as the students became more mature, so they tackled the JC better. This is related to the experience acquired due to being exposed to a similar situation in other academic years. Furthermore, with age, their learning capacity evolves. Therefore, it is important to provide students with activities that permit them to become involved, to think, draw conclusions, etc. [27].

Comments from the Students

From the comments made by the students at the end of the survey, it stood out that they considered that the exercise improved their reading understanding of scientific articles. This demonstrated that they were capable of transmitting their reflections on what they had read. This understanding favoured the students' autonomy as it permitted them to tackle heterogeneous meaningful learning concepts [28]. It was also observed that they needed more practice in statistics to enable them to understand the results with any clarity. This might be due to not having designed the investigation themselves, so that they felt confused when attempting to understand the variables investigated in the article selected [29]. This response led to the reflection that the students did not apply their theoretical knowledge to a practical case. It is essential for the students to be able to put the evidence in the article in practice [30]. In other areas of knowledge this same weakness in students has been reported [31]. The students also answered that they had been greatly stressed due to stage fright. It is frequently found that students do not wish to make oral presentations because they do not know how to do so and have no confidence in themselves, particularly those in the first academic years. This is because they lack any previous experience [32].

The way to mature, from a scientific point of view, is to be able to communicate to experts on the subject and to the public in general the discoveries made in research works [33]. It has been proven that individuals who have normal anxiety levels incur in fewer errors in oral presentations than those who have stage fright [34]. It is recommendable for the students to rehearse their presentations in front of an audience before making the definitive one since this reduces their level of stress and increases their selfconfidence [35]. Organizing a JC not only implies that students reach a percentage of the final score, but also it trains them in skills needed in the labour market. Oral communication and presentations are transversal and instrumental skills that were addressed in this blended activity and that served to convey knowledge and exchange ideas [36]. It is important to get the student to develop communicative competencies and a vocation for all that is related to science since the first years of the degree so that they are able to learn scientific methods [37].

Although in the literature it is recommended to have a JC every month to prevent the students from losing interest [38-40], in this experiment it was done weekly as the activity was carried out in an annual subject. In view of the number of groups taking part, it would not have been suitable to use the format of one JC per month. The JC was evaluated with a marking system that permitted a rapid, consistent judging of the students [41]. supplied the marking system to the students so that, together with the teachers, they provided feedback at the end of the JC and identified the parts in which they had received negative scores. They concluded that this feedback helped the students to improve their next presentations [29]. recommended that all the students should receive the article one week before, have a previous knowledge of the topic and work on it in depth.

[42] carried out a similar activity with 3rd year Medicine students to compare it with traditional teaching, and they emphasized the positive impact that it had on the students' skills and attitudes. They concluded that the key elements of this intervention are:

1. The active participation of the students,
2. The clinical relevance of the exercises and
3. The directed comprehensive teaching

These conclusions are in agreement with those of the authors of this current research. The JC is a powerful educational tool for teaching the use of scientific literature [43,44]. It endows students with a greater confidence when defending the works that they have based on bibliographic references [45]. In addition, they learn to incorporate their knowledge into their investigation, demonstrating their creativity and entrepreneurship [46]. The responses obtained in the survey were corroborated insofar as the objectives proposed in this research were fulfilled and the students felt satisfied with having participated in it. This also coincides with [30] who, in their study, concluded that the JC promoted the critical thought skill in the students since they analysed the literature of their study area and introduced it as an educational experience. However, it should

be pointed out that satisfaction is influenced by individual factors like future expectations, and the learning and life styles of the students [47].

Limitations and Prospects for the Future

One of the limitations detected was that, in spite of creating a critical discussion, those attending the JC oral presentation often asked very superficial questions. In this experiment, it would have been of interest to send the article to be assessed every week to all the students taking part in each JC section. Besides, the authors should have sent its beforehand so that the students would have had clear expectations and a guide to what was really demanded of them [40]. To be honest, the authors admit that some parts of the JC were not well planned. Following [48], in the future it will be attempted to organize the elements necessary for the students not to have any difficulties with this activity.

Conclusion

The variables considered (gender and age) had a great influence on student motivation and learning. The JC as a learning method was very highly valued by the Veterinary degree students. It is a way to initiate them in reading scientific articles with a critical attitude. It also develops their capacity to discuss scientific matters according to their reflections on what they have read. It is recommended to include a check list until the students have a good understanding of JC dynamics, to send the scientific article to all the participants one week before the oral presentation so that the debate will be richer, and also to distribute the marking system. This activity is sustainable and transferable for its implementation in any degree course.

Highlights

1. The Journal Club promotes training in skills needed in the labour market.
2. The age and sex of the students influenced their attitude and motivation during the learning process.
3. The Journal Club is a satisfactory experience for Veterinary Medicine degree students.

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No potential conflict of interest is reported by the authors.

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