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From Flipped Classroom to Personalised Learning as an Innovative Teaching Methodology in the Area of Sports Management in Physical Activity and Sport Sciences

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Abstract: Application of new methodologies at Spanish universities is essential to improve the teaching–learning process, although their implementation for the initial training of students is not common. The aim of this study was to use the flipped classroom (FC) methodology in the sports management area of the bachelor's degree in Physical Activity and Sport Sciences (DPASS). Students (n = 370) from private (n = 284) and public (n = 86) universities participated in different activities, ending with the completion of a survey in which the impact of an FC was analysed in three dimensions: (1) interaction, (2) learning, and (3) methodology and resources. The results show significant differences concerning ownership (private universities are more highly rated than public universities). In terms of gender (with no significant differences), the female students had a better perception of the FC. The most highly valued aspects in the dimensions were as follows: (1) they are more likely to collaborate with their classmates (3.95 + 1.05); (2) learning is more active and experiential (3.69 + 0.86); and (3) with an FC, they spent more time than in other subjects. The most used device was laptop (68.4%). This pioneering study is of relevance to faculty members in the field of sports as it enhances students' engagement with their learning development.

Keywords: university sports students; new educational trends; learning methodology; education; flipped classroom

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1. Introduction

In the 21st century, the role of students and new information and communication technologies (ICT) is becoming more important in the learning process [1,2]. In this way, the flipped classroom (FC) methodology created in 2012 by Jonathan Bergmann and Aaron Sams [3] is becoming important by inverting what is worked on at home and what is done in the classroom. In this regard, in face-to-face sessions, students have an opportunity to become more active and interactive through group activities rather than passively listen to lectures [4]. Furthermore, Martínez-Olvera et al. [5] stress that faculty members and students can interact, complementing pre- and post-activities to fully benefit from classroom work [6].

In this methodology, students become the ones who manage their learning time [7] with the material provided, while the faculty performs tasks such as problem solving, learning through discussion, practical tasks or other higher-order thinking activities to guide their students' learning [8]. Another characteristic of the FC methodology is the collaborative process that takes place among students, instilling in them greater autonomy, commitment to study, and responsibility [9–12].

Studies where the FC methodology is used have shown significant benefits, highlighting satisfaction [13], level of engagement [14], motivation [15–18], and improvement in academic performance [19–24].

In this sense, the FC methodology is increasingly being implemented in higher education as faculty members are faced with a continuous challenge of involving students in the classroom in order to increase the effectiveness of the teaching–learning process, where the faculty–student interaction, teaching–learning process, and the resources used must be analysed [25–27]. Undoubtedly, the FC methodology and the emphasis it places on promoting autonomous student work does not only have a positive impact on student learning, but also guides them toward personalised learning, which is ultimately one of the objectives of higher education. "The demand for personalised learning does not find an adequate response in technology or in current practices" [28]. On the other hand, the declaration of the European Higher Education Area has revealed the need to personalise teaching as one of the lines of work to respond to the demands of today's society [29].

1.1. Interaction between Teacher and Students

Galway et al. [30] indicated that with the FC methodology, there are greater possibilities for interaction among students. In turn, Akçayir and Akçayir [31] showed that the FC favours collaborative learning through participatory peer teaching among students. This collaborative environment makes students with different potentials cooperate in learning by reinforcing the interaction between them [32,33].

Since faculty members spend less time in the classroom explaining the subject matter [34], they can spend more time with their students, interacting with them and guiding them in the learning process [35]. Ryan and Reid [36] reported that with the FC, there are greater possibilities for interaction between faculty and students. It is worth noting that studies that analyse gender indicate that female students tend to be more proactive than male students when implementing the FC methodology [37].

1.2. Learning Process

There are multiple questions related to the criteria or variables to determine the ideal teaching styles in higher education that promote personalised and contextualised learning styles for professional specialisation [38]. Studies show that university students prefer the FC methodology over the traditional one [39,40] and that students feel that they lead and temporalise their learning, thus increasing their satisfaction [41].

When providing previous material for the training of students, faculty members can personalise it according to the characteristics of the students, providing them with individualised attention [5], facilitating different learning paces [42], and even favouring the interculturality of the classroom [43]. In this way understanding will be better, producing a greater initial motivation for the subject to be tackled. Sánchez-Cruzado [41] highlighted the empowerment of students to decide how to manage their time, thus achieving greater autonomy [44], which should not be confused with loneliness, as students should perceive support and monitoring from their classmates and faculty at all times [41]. Along the same lines, Chickering and Gamson [45] indicated that the greatest motivation in university students' learning was produced by repeated interaction with their faculty.

Ichinose and Clinkenbeard [46] showed that there are few studies on the FC that statistically analyse the differences that can occur in the learning process according to gender. Authors such as Kadry and El Hami [47] and Gross et al. [48] indicate a certain advantage for female students, in this case, in the areas of calculus and thermodynamics, respectively. It is, therefore, considered necessary to increase the number of studies that address this issue and in different areas of learning, such as in university studies in the DPASS, where the number of female students is far from being equal to the number of male students.

1.3. Spanish University System

In the Spanish university system, there is a wide range of public and private degrees offered [49]. All of them aim for the best relationship with regard to the teaching–learning process, and they can be considered as two different models with similar objectives [49]. In Spain, in the last 15 years, there has been such a proliferation of private centres that their number has doubled, while public universities have suffered significant budgetary restrictions. Such a situation generates strong competitiveness and at the same time provides a wide educational supply. Although both types of institutions have evolved in aspects such as teaching modality (favouring online or blended teaching) and the supply of degrees and mobility programmes, there are substantial differences between them [49].

According to Domínguez and Gutiérrez [50], university education in Spain is mainly provided by the public sector, although private universities have increased their share of higher education provision. Moreno [51] indicated that one of the main interests of private universities is to offer degrees that are in high demand in the public sector since the high level of demand at public universities prevents many students from enrolling in them.

The access to public universities is based on a cut-off mark, which is obtained in national examinations called "Pruebas de Acceso a la Universidad (PAU)"; this mark is not a restriction at private universities as it does not exist [52]. This system rewards students with better grades regardless of their purchasing power as private university tuition fees are higher (3–4 times higher) than those of public universities and offer an educational alternative mainly to families with a higher purchasing power [41,50,53,54], as well as promote personalised student monitoring, that is, a system that can increase student performance but decrease their personal finances [41]. These considerations are similar to those in other Spanish-speaking countries [55–58].

Focusing on the degree in Physical Activity and Sport Sciences (DPASS), the White Paper organises it as basic and applied knowledge in different areas: teaching of physical activity and sports, sports training, physical activity and quality of life, and sports management and recreation, with the latter being the focus of the present study [59]. Recently, through the Resolution of 18 September 2018 of the General Secretariat of Universities, which published the Agreement of the Council of Universities of 17 September 2018, which establishes recommendations for the proposal by universities of verification reports of the official DPASS [60], nine new areas have been established: (1) biological and mechanical foundations of human motor activity, (2) behavioural and social foundations of human motor skills, (3) manifestations of human motor skills, (4) fundamentals of sports, (5) teaching of physical activity and sports, (6) physical exercise, physical condition, and physical–sports training, (7) physical activity and physical exercise for health and special populations, (8) sports organisation and management, and (9) external internships and final degree project.

Domínguez and Gutiérrez [50] confirmed that in the specific case of Spain, no studies have attempted to assess whether the performance of training acquired by individuals at private universities is comparatively higher than that acquired at public universities, although there is an abundance of literature that analyses university training from different perspectives. For this reason, the aim of this research was to study the implementation of the FC methodology in the area of sports management in higher education in the bachelor's DPASS at Spanish universities. To attain this objective, the following working hypotheses were proposed:

Hypothesis 1 (H1). *The perception of students is positive at both types of universities when implementing the FC.*

Hypothesis 2 (H2). *Private university students have a better perception of the FC than students at public universities.*

Hypothesis 3 (H3). *Female students have a better perception of the FC than male students.*

2. Materials and Methods

2.1. Participants

This is a descriptive cross-sectional study. The study population was constituted by the students from one private university (UCAM: San Antonio de Murcia University, Murcia, Spain) and one public university (UPO: Pablo de Olavide University, Sevilla, Spain) enrolled in academic year 2020–2021 in the bachelor's DPASS programme in the area of sports management, with a total of 470 students (112 from the public university (UPO) [61] and 358 from the private university (UCAM)). The sample consisted of 370 students (77.3% male students and 22.7% female students) with the mean age of 22.94 years (SD = 4.44), in the third and fourth year of the DPASS programme (Table 1). More male students than female students participated in the study due to the smaller presence of female students in this degree programme [62]. Regarding the ownership of the university, 23.2% of the students studied at the public university, 76.8%—at the private one, since, in this specific case, the private university offers more subjects related to the area of sports management than the public university. Through nonprobability purposive sampling, the students from both universities who were taking subjects in the area of sports management during that academic year were selected as the participants.

Table 1. Descriptive data of the participants.

Variables		*n*	%
Gender	Male	286	77.3
	Female	84	22.7
Ownership	Public	86	23.2
	Private	284	76.8
Subject	Management of Leisure, Rural Tourism, and Sports Programmes	7	1.9
	Sports Management and Planning	63	17
	Sports Equipment and Facilities	183	49.5
	Organisation of Sports Systems	71	19.2
	Sports Recreation	46	12.4

The subjects studied belong to the area of sports management. Regarding the subject of Sports Equipment and Facilities, there was a participation of 49.5% (UCAM—UPO), and the rest of the subjects, i.e., Organisation of Sports Systems (19.2%), Sports Management and Planning (17%), Sports Recreation (12.4%) and Management of Leisure, Rural Tourism, and Sports Programmes (7%), belonged only to UCAM.

No control group was used in this study. According to the literature [63–65], implementation of the FC methodology always shows significant differences from the traditional methodology, with the students participating in the FC highlighting a more positive perception.

2.2. Instruments and Material

The questionnaire designed by Driscoll [66] was used for the development of this study. The questionnaire consists of 21 items structured in three dimensions and questions about the demographic profile: (D1) student–teacher interaction (five items), (D2) learning process (seven items), and (D3) methodology and resources employed (five items). For responses in D1 and D2, a Likert scale was used (1 = strongly disagree and 5 = strongly agree). Four sociodemographic profile questions (gender, age, ownership, and subject) were also included.

To assess the psychometric properties of the scales, exploratory factor analysis (construct validity) was conducted using the varimax principal component method. This was carried out using the Kaiser–Meyer–Olkin test of sampling adequacy (KMO = 0.927) and Bartlett's test of sphericity (X_2 = 3115.617; gl = 120; $p < 0.001$). After factor rotation using the varimax method with Kaiser rotation, the items were grouped into three dimensions, all of them with factor loadings above 0.665. The items corresponding to D1 and D2 saturate a single

component that corresponds to the proposed dimensionality. Therefore, the distribution of the items is logical, and factorial validity could be confirmed. After this analysis, the confirmatory factor analysis was confirmed.

The internal consistency of the dimensions referring to interaction (D1, five items) and learning (D2, seven items) was analysed using Cronbach's alpha, showing good reliability (α = 0.86 and α = 0.91, respectively). A coefficient greater than 0.70 is acceptable and sufficient [67], suggesting that the scale used in this study is reliable. The dimension concerning methodology and resources (D3, five items) does not apply since its variables are not determined with a Likert scale.

2.3. Procedure

During academic year 2020–2021, the faculty responsible for the subject chose a topic to implement the FC methodology. In each subject belonging to the area of sports management, students worked in groups. Each group was made up of a maximum of 4–5 students, who grouped themselves freely and had to carry out four tasks:

(a) One week before the class in which the subject matter would be discussed. The students had to read the documentation provided by the faculty individually beforehand. Afterwards, as a group, they had to prepare three–four questions and/or doubts about the information they had read. A representative of the group, and also prior to the first theoretical class, had to send the questions/doubts to the faculty. In this way, the latter could review, select, and group the questions/doubts, which would then be debated in class.

(b) At the end of the first theoretical class where all the doubts and queries previously expressed by the students had been solved, the group had to meet again in person or virtually outside class hours to prepare and deliver a summary including the main ideas of the subject tackled. The maximum length of this summary would be 1–2 pages.

(c) In the same way and having finished the first lesson, the group began with the development and preparation of an infographic. Each group, in coordination with the faculty, chose a specific section of the subject analysed in class that was of interest for subsequent presentation. In order to avoid duplication, the virtual platform of the classroom was used, where each group indicated the chosen topic and the rest of the groups tackled another topic or complemented some aspects of something that had already been indicated. This task ended when the group presented its infographic during the next theoretical class to ensure that all the groups were present and the doubts were solved.

(d) This experience ended with the completion of a short test consisting of 10 questions on the contents addressed in the initially read document.

The development of the sections (a–d) had an overall mark out of 10 points. Then, each faculty member included it where appropriate in each subject, and for all the subjects, it had the same value of 10% in the overall computation of the final grade for the subject. The 10 points were subdivided between each section individually, with the marks for (a,b) being two points (one point for the submission of doubts and one point for the submission of the summary); (c) six points (development and presentation of the infographic), and (d) two points (evaluation examination).

2.4. Data Analysis

The distribution of the data was analysed using the Lilliefors significance correction of the Kolmogorov–Smirnov test, resulting in a value of less than 0.05. Therefore, the data did not follow normality assumptions, and nonparametric statistical tests were used for the corresponding analysis of the data. In order to address the objective of the study, two types of analysis were carried out. Firstly, descriptive analysis of the quantitative variables (mean and standard deviation) was performed. Secondly, exploratory factor analysis (construct validity) was conducted using the varimax principal component

method using the Kaiser–Meyer–Olkin test of sampling adequacy and Bartlett's test of sphericity. After this analysis, the confirmatory factor analysis was confirmed using Amos v24 software. Finally, Mann–Whitney U-test and Pearson's χ^2 were used to analyse the variables according to the respondent's gender and university ownership. Statistical analysis was performed with the SPSS® Statistics v.27.0 package (IBM, Armonk, NY, USA).

3. Results

The results of this research are presented below according to the different dimensions that make up the questionnaire: D1, interaction (five items); D2, learning (seven items); and D3, methodology and resources (five items). Similarly, the relationship between the variables was analysed according to the gender of the respondents and the university where they studied.

3.1. Analysis of the Faculty–Student and Student–Student Interaction Variables

The mean DPASS of agreement regarding the variables comprising the dimension related to faculty–student and student–student interaction was 3.63 ± 0.90. As is shown in Table 2, the variables that stood out positively were "*I am more likely to collaborate with my classmates*" (3.95 ± 1.05) and "*My interactions with my classmates during class are more frequent and positive*" (3.82 ± 1.09). On the other hand, the variable with the lowest level of agreement was "*My teacher takes into account my strengths, weaknesses, and interests*" (3.26 ± 1.20).

Table 2. Degree of agreement regarding faculty–student interaction.

Items	$\bar{X}$ (SD)	Gender		*U*	*r*	*p*	Ownership		*U*	*r*	*p*
		Female	Male				Private	Public			
I am more likely to collaborate with my classmates	3.95 (1.05)	3.79 (1.25)	3.99 (0.97)	11,337.50	0.043	0.410	3.94 (1.08)	3.97 (0.94)	12,004.00	0.013	0.801
My interactions with my classmates during class are more frequent and positive	3.82 (1.09)	3.79 (1.23)	3.83 (1.04)	11,780.50	0.015	0.779	3.84 (1.13)	3.76 (0.93)	11,163.00	0.066	0.206
My interactions with the teacher during class are more frequent and positive	3.69 (1.08)	3.76 (1.11)	3.67 (1.07)	11,330.00	0.043	0.408	3.78 (1.08)	3.38 (1.04)	9372.00	0.178	<0.001 ***
I think that with the flipped classroom, my teacher can get to know me better	3.43 (1.18)	3.26 (1.24)	3.48 (1.16)	10,711.50	0.081	0.119	3.54 (1.22)	3.06 (0.96)	8929.00	0.203	<0.001 ***
My teacher takes into account my strengths, weaknesses, and interests	3.26 (1.20)	3.23 (1.32)	3.27 (1.16)	11,947.00	0.004	0.938	3.35 (1.22)	2.97 (1.08)	9874.00	0.144	0.005 **

Note: Significance level, ** $p < 0.01$, *** $p < 0.001$.

No statistically significant differences were found according to the gender of the respondents. However, significant differences were detected according to the type of university where they studied in relation to "*My interactions with the teacher during class are more frequent and positive*" ($p < 0.001$, $r = 0.178$), "*I think that with the FC, my teacher can get to know me better*" ($p < 0.001$, $r = 0.203$) and "*My teacher takes into account my strengths, weaknesses, and interests*" ($p = 0.005$, $r = 0.144$), with these variables showing a higher degree of agreement for the private university students compared to the lower values obtained by the public university students.

In relation to the results of the level of agreement according to gender and the ownership of the university where they studied (Table 3), the male students from the private university showed a higher score in all the items, detecting statistically significant differences in "*My interactions with the teacher during class are more frequent and positive*" ($p = 0.001$, $r = 0.175$), with respect to "*I think that with the flipped classroom my teacher can get to know me better*" ($p = 0.001$, $r = 0.176$), and in relation to "*My teacher takes into account my strengths, weaknesses, and interests*" ($p = 0.006$, $r = 0.039$). Concerning the female students, those who studied at the private university showed a higher degree of agreement in three of the five items under analysis, finding statistically significant differences with respect to "*I think that with the flipped classroom, my teacher can get to know me better*" ($p = 0.043$, $r = 0.105$). However, the female students at the public university showed a higher degree of agreement with regard to items "*I am more likely to collaborate with my classmates*" (4.06 ± 0.97) and "*My interactions with my classmates during class are more frequent and positive*" (3.94 ± 1.09), with no statistically significant differences detected in any case.

Table 3. Student–faculty interaction according to gender and ownership.

Items		Ownership		*U*	*R*	*p*
		Private	Public			
I am more likely to collaborate with my classmates	Male	4.01 (0.99)	3.94 (0.94)	7055.50	0.039	0.447
	Female	3.72 (1.31)	4.06 (0.97)	504.00	0.040	0.446
My interactions with my classmates during class are more frequent and positive	Male	3.87 (1.08)	3.71 (0.89)	6580.50	0.082	0.113
	Female	3.75 (1.27)	3.94 (1.09)	539.00	0.018	0.722
My interactions with the teacher during class are more frequent and positive	Male	3.77 (1.07)	3.33 (1.02)	5552.00	0.175	0.001 **
	Female	3.81 (1.12)	3.59 (1.12)	496.00	0.043	0.393
I think that with the flipped classroom, my teacher can get to know me better	Male	3.59 (1.19)	3.13 (0.97)	5523.50	0.176	0.001 **
	Female	3.39 (1.29)	2.76 (0.90)	394.50	0.105	0.043 *
My teacher takes into account my strengths, weaknesses, and interests	Male	3.38 (1.18)	2.94 (1.07)	5904.50	0.142	0.006 **
	Female	3.27 (1.37)	3.06 (1.14)	503.50	0.039	0.451

Note: Significance level, * $p < 0.05$, ** $p < 0.01$.

3.2. Analysis of the Student Learning Variables

The mean degree of agreement with the variables that make up the dimension related to student learning was 3.69 ± 0.86. As is shown in Table 4, "*Learning is more active and experiential*" (3.89 ± 1.06) and "*I can show what I have learnt in a variety of ways*" (3.78 ± 1.02) stood out positively. On the other hand, the variable with the lowest level of agreement was "*I can choose the type of materials that best suit my way of learning*" (3.54 ± 1.14).

No statistically significant differences were found according to the gender of the respondents. However, significant differences were detected according to the university where they studied in relation to "*I can show what I have learnt in a variety of ways*" ($p = 0.032$, $r = 0.111$), "*In class, we work more on critical thinking*" ($p < 0.001$, $r = 0.191$), "*I am more capable of making decisions on how to learn*" ($p = 0.006$, $r = 0.144$), "*I have better access to learning materials and contents*" ($p < 0.001$, $r = 0.190$), and "*I can choose the type of materials that best suit my way of learning*" ($p = 0.012$, $r = 0.130$). As in the dimension related to interaction, the variables show a higher degree of agreement among the private university students as opposed to lower values obtained by the public university students.

In relation to the results of the level of agreement according to the gender and the ownership of the university where they studied (Table 5), the male students at the private university showed a higher score in all the items, with statistically significant differences detected in "*In class, we work more on critical thinking*" ($p = < 0.001$, $r = 0.196$), with respect to "*I am more capable of making decisions on how to learn*" ($p = 0.013$, $r = 0.129$), in relation to "*I have better access to learning materials and contents*" ($p = 0.001$, $r = 0.171$), and "*I can choose the type of materials that best suit my way of learning*" ($p = 0.006$, $r = 0.142$). However, the female students from the public university showed a higher degree of agreement with regard to

item "*Learning is more active and experiential*" (4.06 ± 0.75), with no statistically significant differences detected.

Table 4. Degree of agreement regarding the learning process.

Items	$\bar{X}$ (SD)	Gender		*U*	*r*	*p*	Ownership		*U*	*r*	*p*
		Female	Male				Private	Public			
Learning is more active and experiential	3.89 (1.06)	3.93 (1.12)	3.88 (1.05)	11,527.00	0.031	0.553	3.92 (1.08)	3.80 (1.00)	11,140.50	0.067	0.194
I can show what I have learnt in a variety of ways	3.78 (1.02)	3.79 (1.17)	3.78 (0.97)	11,549.50	0.029	0.572	3.83 (1.05)	3.63 (0.89)	10,445.50	0.111	0.032 *
In class, we work more on critical thinking	3.69 (1.03)	3.65 (1.20)	3.70 (0.98)	11,816.00	0.012	0.812	3.79 (1.03)	3.36 (0.98)	9166.50	0.191	<0.001 ***
I am more capable of making decisions on how to learn	3.68 (1.07)	3.51 (1.26)	3.72 (1.01)	11,121.50	0.056	0.279	3.74 (1.10)	3.45 (0.97)	9917.50	0.144	0.006 **
I have better access to learning materials and contents	3.68 (1.04)	3.67 (1.23)	3.69 (0.98)	11,647.50	0.023	0.658	3.79 (1.03)	3.34 (1.00)	9186.50	0.190	<0.001 ***
I can learn at my own pace	3.58 (1.15)	3.49 (1.30)	3.61 (1.11)	11,559.50	0.028	0.587	3.64 (1.14)	3.38 (1.20)	10,658.00	0.096	0.064
I can choose the type of materials that best suit my way of learning	3.52 (1.14)	3.33 (1.32)	3.57 (1.08)	10,978.50	0.064	0.215	3.59 (1.15)	3.28 (1.1)	10,102.00	0.130	0.012 *

Note: Significance level, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5. Learning process according to gender and ownership.

Items		Ownership		*U*	*r*	*P*
		Private	Public			
Learning is more active and experiential	Male	3.93 (1.05)	3.74 (1.05)	6661.50	0.075	0.146
	Female	3.90 (1.19)	4.06 (0.75)	568.50	0.001	0.991
I can show what I have learnt in a variety of ways	Male	3.83 (0.99)	3.62 (0.92)	6489.50	0.092	0.077
	Female	3.82 (1.25)	3.65 (0.79)	467.00	0.062	0.234
In class, we work more on critical thinking	Male	3.82 (0.97)	3.33 (0.93)	5343.50	0.196	<0.001 ***
	Female	3.70 (1.21)	3.47 (1.18)	498.50	0.043	0.411
I am more capable of making decisions on how to learn	Male	3.80 (1.02)	3.49 (0.96)	6075.00	0.129	0.013 *
	Female	3.57 (1.32)	3.29 (0.98)	461.50	0.064	0.214
I have better access to learning materials and contents	Male	3.80 (0.95)	3.33 (1.01)	5612.00	0.171	0.001 **
	Female	3.75 (1.27)	3.35 (1.00)	431.50	0.083	0.111
I can learn at my own pace	Male	3.68 (1.07)	3.39 (1.19)	6471.50	0.091	0.078
	Female	3.52 (1.32)	3.35 (1.22)	515.00	0.032	0.532
I can choose the type of materials that best suit my way of learning	Male	3.67 (1.06)	3.28 (1.10)	5909.00	0.142	0.006 **
	Female	3.34 (1.37)	3.29 (1.16)	540.00	0.017	0.736

Note: Significance level, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

3.3. Flipped Classroom Methodology and Resources

According to the results related to the time spent by the students on homework or assignments in the FC methodology, 45.1% (n = 167) of the students highlighted that it was the same as for other subjects, although 32.7% (n = 121) and 10.3% (n = 38) indicated that they spent considerably more time and much more time, respectively. In this regard, statistically significant differences were found according to the type of university ($\chi^2 = 18.432$, gl = 4, $p < 0.001$, $\varphi_c = 0.233$), with the students at the public university spending

much more time than in other subjects in 19.8% of the cases compared to 7.4% at private universities. Statistically significant differences were also observed according to gender ($\chi^2 = 10.612$, gl = 4, $p = 0.031$, $\varphi_c = 0.169$) where, again, the percentage of time spent on other subjects was twice as high for the female students (17.9%) as for the male students (8%).

Regarding the time spent in front of the screen in the case of video-viewing tasks, almost half of the respondents (n = 174, 47%) detailed that this added slightly more time compared to other activities involving YouTube, social networks, games, etc., with no statistically significant differences detected according to the gender or university ownership.

In relation to the device, they used to work with the FC methodology resources, the majority of the students (n = 253, 68.4%) used a laptop, in addition to 18.38% of those who used this and other devices, such as a desktop computer, a tablet, and/or a phone.

Finally, regarding the time they could spend daily watching videos and the approximate duration of the videos in the methodology implemented, the majority of the students (n = 230, 62.2%) stated that they had 10–15 min or less per day, while in 91.6% of the cases, the duration of the videos used in the implementation of the project was less than 15 min.

According to H1, "*The perception of students is positive in both universities when implementing the FC*", the findings show that the mean degree of agreement regarding the variables comprising dimension I related to faculty–student and student–student interactions was 3.63 $\pm$ 0.90, and the one concerning student learning (dimension II) was 3.69 $\pm$ 0.86. Regarding dimension III, the students spent the same time on homework or assignments in the FC methodology than for other subjects (45.1%), and the time spent in front of the screen was slightly longer compared to that spent on other activities for almost half of the respondents (47%). The laptop was the device they used to work with the FC methodology resources for the majority of students (68.4%). Finally, most of the students (62.2%) stated that they had 10–15 min or less per day to watch videos in the FC methodology.

Hypothesis (H2): "*Students at private universities have a better perception of the FC than students at public universities*". In dimension I, the results were higher in four of the five items for the private university students, and in three of them, statistically significant differences were found. Concerning dimension II, in all the seven items, the results were also higher for the private university students, and, again, in five of them, statistically significant differences were detected. Regarding dimension III, statistically significant differences were detected ($\chi^2 = 18.432$, gl = 4, $p < 0.001$, $\varphi_c = 0.233$) based on the ownership of the university, with the students at public universities spending much more time on homework or assignments in the FC methodology than in other subjects, compared to the students from private universities. Concerning the device they used to work with the FC methodology resources, the laptop was the most used by students of both the public (74.4%) and the private (74.7%) universities; regarding the time they could spend per day watching videos (10–15 min or less per day), it was slightly longer for the students of the private university (33.1%) compared to those of the public university (31.4%). In the cases detailed above, no statistically significant differences were detected.

Hypotheses (H3): "*Female students have a better perception of the FC than male students*". In dimension I, no statistically significant differences were found according to the gender of the respondents. Nevertheless, higher results in four of the five items for the male students were detected. Regarding dimension II, higher results were found in five of the seven items for the male students than for the female students, and, again, no statistically significant differences were detected. In relation to dimension III, statistically significant differences were found according to gender ($\chi^2 = 10.612$, gl = 4, $p = 0.031$) as the female students spent much more time on homework or assignments in the FC methodology than in other subjects, which was twice as high for the female students (17.9%) as for the male students (8%). Concerning the time spent in front of the screen in video-viewing tasks, 47.9% of the male students detailed that this added slightly more time with respect to other activities, compared to 44% of the female students. In relation to the device they used to work with the FC methodology resources, the laptop was the most used by both the female (72.6%)

and male students (67.1%). Finally, regarding the time they could spend per day watching videos and the approximate duration of the videos (10–15 min or less per day), a higher percentage of the male students could spend a maximum of 15 min on these tasks (63.7%), compared to 57.2% of the female students. In all these cases, no statistically significant differences were detected. This hypothesis was not fulfilled.

4. Discussion

The literature indicates that the FC methodology offers positive academic outcomes after a decade of research [20,21,68]. In line with Akcayir and Akcayir [31], the study shows that the FC can not only enhance students' learning and promote their confidence, but also provides more active and collaborative learning, which is reflected in the fact that the participating students highlighted that learning was more active and experiential, as well as that their possibilities to collaborate with other peers were greater. Along the same line, different studies [69,70] affirm that the benefits on learning are rather related to the fact that students learn through models and methodologies focused on active learning, which is reflected in the present study in the greater number of interactions with classmates, taking place in a more frequent and positive way.

In line with Artal et al. [71], the students showed a more active attitude in the classroom and collaborative work, which fosters the development of competences such as teamwork and project management. There was also a greater number of positive interactions with the faculty during class, which, according to the studies by Li et al. [72] and Li and Yang [73], could have an important impact on the self-efficacy of university students in the flipped classroom and, therefore, improve their learning outcomes. It is also necessary to consider those results related to the lowest scores obtained, through which we could discover the shortcomings of the implemented method. The students indicated as the least valued variable the one in which they expressed whether the faculty considered their strengths, weaknesses, and interests. A low score on this variable could mean that they did not perceive a significant change with respect to the traditional model. Recent studies [74,75] point toward personalised learning (PL) in the form of flexible itineraries to be shared by a team of faculty members and offered to students to ensure that they participate in the construction of their own itinerary, either by selecting and organising the sequences that will compose it or by participating in the design, delivery, and evaluation of some of these sequences.

Therefore, PL could be a complementary methodology to achieve the proposed objectives. According to Schwartz [76], learners should be provided with the flexibility to enhance their skills to analyse data critically. The specific goal of using PL is to promote further knowledge in student activities. Students are responsible for selecting suitable tools and designing content for their environments to promote their learning better [77].

It is relevant to highlight that, through this research in higher education, this tool designed by Driscoll [66] has been validated and that it has been used for other educational stages, as is the case of applying it to university education in the DPASS programme. The exploratory factor analysis carried out confirms the psychometric properties of the scales, and the three dimensions obtained factor loadings above 0.665. The items corresponding to D1 and D2 saturate a single component that corresponds to the proposed dimensionality. Therefore, the distribution of the items is logical and factorial validity could be confirmed. After this analysis, the confirmatory factor analysis was confirmed.

Although studies claim that the FC methodology improves student interaction with both faculty and peers [78–80], no studies have been published comparing its effectiveness considering university ownership, which could be a novel and interesting contribution of the present study. The results indicated a greater interaction between the faculty and the students at the private university, which could be related to the higher expectations of the students at the private university, toward a closer and more individualised treatment from the faculty, which could be fulfilled with the implementation of this methodology.

In this sense, it is claimed that a private university could have some associated advantages in terms of different teaching methodologies, a wider bilingual supply, smaller classes, and, therefore, more personalised treatment of students [49]. Along these lines, the study by Danker [34] indicates that the application of greater faculty flexibility in their relationship with students offers greater learning opportunities with high feedback. Taking this flexibility into account, as commented in the previous paragraph, it is necessary to consider the least valued variables in the interaction of faculty with students, in which being able to choose the type of materials that best adapt to their teaching style and learning from the students were the least scored variables. Delving into the weaknesses of the study could lead us to finding interesting ways that could be directed at the personalisation of learning (PL) in order to ensure that students with diverse needs can achieve higher levels of learning if they receive personalised instruction and supports tailored to their unique needs and build on their strengths [81].

With regard to the perception of learning, the data show that it was more active and experiential, and the students were able to show what they learned in different ways; thus, the students in this study agree with those who prefer this methodology over traditional lessons and perceive that they learn more and better with this class dynamic, increasing their academic performance [82–84] as well as improving their access to content and materials, allowing them to work at their own pace. Similarly, they consider that their learning is more active and experiential and that the faculty considers their strengths, weaknesses, and interests when planning activities, as reflected in previous studies [80,85]. It is interesting to highlight the lower scores in order to know the improvements that could be implemented. The students perceive that the possibility of choosing the type of materials that best fit their way of learning could be improved, which could be due to a problem that was already taken into account by Attwell [86], who questioned the role that the teachers and institutions would play if students develop and control their own online learning environments for themselves. In line with what was stated in previous paragraphs and in order to take into account the improvable aspects of this project, personalised learning could be considered as a way for the role of students in the classroom to become that of active and self-directed creators of content as they can select their own sources of information [87].

When studying the learning that the students obtained, and as occurred in the interaction dimension, the students at the private university perceived to a greater extent than the students at the public university that: (1) they could show what they had learned in different ways; (2) they worked more on critical learning in class; (3) they had more possibilities to make decisions on their way of learning; (4) they had better access to learning materials and content; and (5) they could choose the type of materials that best suited their way of learning. The results are in line with those of the studies that affirm that the FC increases academic performance and improves the understanding of subject content compared to the traditional teaching [6,88–90]. In this sense, it is shown that the FC adapts to learning needs and favours the personalisation of teaching [91–93]. It also favours autonomous learning, facilitating the acquisition of strategies for learning to learn [94,95]. Taking into account the differences depending on the ownership of the university, an interesting line of study opens up since, although the similarities and differences with respect to the management of both models in Spain are known [49,50], there have been very few studies regarding the effectiveness of implementation of similar methodologies. The results obtained in the present study could be precisely related to the differentiating characteristics of both types of university, among which we could indicate, as done in the introduction, that the faculty at the private university work as employees of a company and promote a personalised follow-up of students [41] as well as the smaller number of students in the classrooms of the private university with respect to the public university.

Considering the students' perception of the methodology and resources of the FC, it is worth noting the percentage of the students (32.7%) who indicated that dedication to homework took them considerably more time compared to other subjects, with the students from the public university standing out over those from the private university, and female

students over male students. The results are in line with one of the basic characteristics of the FC; by transferring the processes of content transmission outside the classroom, making students responsible for acquiring the content before attending the master class with the aim of using the class time to work on practical and applied aspects, in which they need more detailed guidance from the faculty [68,78,96,97] and where the use of different devices can help in this work [71,98,99]. In this way, class time is freed up to create active and meaningful learning situations, such as facilitating student participation, asking questions, and active discussion, problem solving, application of ideas, experiments, and evidence, thereby ensuring that lectures are more entertaining and interactive [68].

With respect to gender, studies on students' perceived self-efficacy as a function of gender in language learning [100] stand out, in which female students increased their individual confidence to produce a specific performance while participating in the FC. In the field of engineering [101], the FC methodology model has a direct impact on students' grades, especially for female students, who showed significant differences when compared to the male students in the same group, as is the case in the field of psychology [102]. Considering the lower presence of female students in the DPASS programme and, specifically, their low orientation toward subjects related to sports management, future studies should delve into the benefits for the teaching–learning process based on gender through an innovative methodology, such as the FC.

Taking into account the information presented above, the lower number of female students who study Physical Activity and Sport Sciences in Spain compared to male students may be a limitation when carrying out this type of studies since, far from increasing, it seems that, in recent decades, their number has decreased, and it is expected that it will continue to do so [103]. It should also be considered as a limitation that the number of students participating in the study was greater at the private university than at the public university. Therefore, the number of students from public universities should be increased and, consequently, the number of participants from the public sector should also be increased. For this reason, the scientific community in the field of sports management is urged to apply this FC methodology in their lessons.

5. Conclusions

This study is a pioneering study in the area of sports management in university higher education in the bachelor's DPASS. The use of the FC has different particularities, especially the collaborative nature between peers, experiential learning, increased autonomy in the student's learning process, and the greater role of critical thinking. Furthermore, this research confirms that Driscoll's [66] questionnaire is a suitable and valid tool to be implemented in the bachelor's DPASS.

With regard to the first dimension linked to the interaction variables (mean, 3.63 ± 0.90), we can highlight that no significant differences were observed in terms of gender. On the contrary, significant differences were detected in terms of university ownership, highlighting variables "*My interactions with the teacher during class are more frequent and positive*" ($p < 0.001$) and, "*I think that with the FC, my teacher can get to know me better*" ($p < 0.001$), with these variables showing a higher degree of agreement among the private university students compared to the lower values obtained by the public university students ($p = 0.005$)

With regard to the learning dimension (second), the mean was 3.69 ± 0.86, and no differences were detected in terms of gender, although there were differences in terms of university ownership, with significant differences ($p < 0.001$) concerning "*In class, we work more on critical thinking*" and "*I have better access to learning materials and content*", with a higher degree of agreement among the private university students.

Statistically significant differences were also identified in relation to "*I can show what I have learnt in a variety of ways*" ($p = 0.032$), "*I am more capable of making decisions on how to learn*" ($p = 0.006$), and "*I have a possibility to choose the type of materials that best suit my way of*

learning" ($p = 0.012$), again, with a higher degree of agreement among the private university students than among the public university students.

To conclude with the third dimension, there were significant differences in terms of tenure and gender in the variable related to the time that the students spent on homework in the FC methodology, with the public university students ($\chi^2 = 18.432$, df = 4, $p = 0.001$, $\varphi_c = 0.223$) and the female students spending more time on homework than in other subjects ($\chi^2 = 10.612$, df = 4, $p = 0.031$, $\varphi_c = 0.169$). In relation to the device they used to work with the FC methodology resources, no statistically significant differences were detected according to gender or university ownership.

As was expected, the perception of student evaluation was positive at both universities when implementing the FC (H1) as opposed to the traditional learning. Regarding H2 (students at private universities have a better perception of the FC than students at public universities), it was demonstrated in most of the variables in the three analysed dimensions, also obtaining statistically significant differences in nine variables. When comparing the data between the male and female students (H3), the female students had a better perception of the FC than the male students, with no statistically significant differences in dimensions I and II. However, the perception was more positive and statistically greater for the female students regarding the time spent on homework or assignments in the FC methodology than in other subjects, the time spent in front of the screen in the case of video-viewing tasks, the laptop as the device they used to work with the FC methodology resources, and watching videos in the FC of 10–15 min or less per day.

Finally, the results also showed an improvement in the teaching experience of the faculty through the use of these open methodologies, which do not only help students retain learned knowledge and information, but also promote critical thinking skills.

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