INTEGRATING SUSTAINABILITY INTO HIGHER EDUCATION THROUGH ACTIVE LEARNING

A CASE STUDY FROM UNIVERSIDAD REY JUAN CARLOS



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1. INTRODUCCTION

Ley Orgánica 2/2023 del Sistema Universitario (LOSU)

- Strengthen funding
- Boost research and knowledge transfer
- Promote stabilization processes for university faculty
- Encourage equity and equality
- Promote sustainability, combat climate change, and uphold the values of the Sustainable development Goals (SDGs)
- Actively promote teaching innovation





URJC2030 Project

Vice-Rectorate for Quality and Strategy

Project Goals

- Contribution to achieving the SDGs
- Teaching quality
- Research and knowledge transfer
- People and resources
- Institutional development, management, and good governance
- Green Office (created in 2010)







Green Office: Actions to Save Irrigation Water Móstoles Campus URJC





Green Office: Actions to Save Irrigation Water Consequences





Green Office: Actions to Save Irrigation Water Consequences



Green Office: Actions to Save Irrigation Water Consequences



Natural Laboratory to Study Soil Reaction to Drought













2. TEACHING METHODOLOGY PRACTICAL WORK. Green Campus Project

- Learning experience
 - Field practical classes and laboratory classes
 - Seminar for sharing results
- Active methodologies
 - Case-Based Learning
 - Cooperative Learning



PRACTICAL WORK Green Campus Project





SEMINAR FOR SHARING

N

PRACTICAL WORK Green Campus Project









URJC Escuela Superior de Ciencias Experimentales y Tecnología

PRACTICAL WORK. Green Campus Project Cooperative Learning

ANALYTICAL WORK		SEMINAR FOR SHARING RESULTS		
Group I	11	Group A	5 students 1 from Group I, 2 from Group II y 2 from Group III	105 °C 22 °C Ramp 25:00 °C/min 25:00 00.01
(Irrigated Soil)	11 students	Group B	5 students 2 from Group I, 1 from Group II y 2 from Group III	DIGITHEAT - TFT
Group II (Not Irrigated Soil)	11 students	Group C	5 students 2 from Group I, 2 from Group II y 1 from Group III	
		Group D	6 students 2 from Group I, 2 from Group II y 2 from Group III	
Group III	11 atudanta	Group E	6 students 2 from Group I, 2 from Group II y 2 from Group III	
Soil)	i i students	Group F	6 students 2 from Group I, 2 from Group II y 2 from Group III	

PRACTICAL WORK. Green Campus Project Cooperative Learning

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Group I	11 atudanta	Group A	5 students 1 from Group I, 2 from Group II y 2 from Group III	SR JAB Val
(Suelo regado)	TTStudents	Group B	5 students 2 from Group I, 1 from Group II y 2 from Group III	SNM =
Group II (Not	11 atudanta	Group C	5 students 2 from Group I, 2 from Group II y 1 from Group III	SNR
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d Soil)	11 students	Group F	6 students 2 from Group I, 2 from Group II y 2 from Group III	





PRACTICAL WORK. Green Campus Project **Evaluation.** Final Report





PRACTICAL WORK. Green Campus Project **Evaluation.** Presentation of results

800

1000

y = 0,0971ln(x) + 1,2167

 $R^2 = 0.8084$

1200

N.º de Muestra	Densidad ap.seca (g/cm ³)	Densidad ap.húmeda (g/cm ³)	Agua (%)	
SR1	1,22	1,40	14,03	
SR2	0,88	1,04	17,75	
SNR1	1,41	1,67	18,73	
SNR2	1,40	1,54	10,39	
SNM1	1,52	1,69	10,73	
SNM2	1,55	1,71	10,44	

N.º de Muestra	Conductividad campo (mS/cm)	Conductividad hidráulica (µS/cm)	pH hidráulico	
SR1	0,15	75	7,72	
SR2	0,17	75	7,72	
SNR1	2,44	137	7,06	
SNR2	2,64	137	7,06	
SNM1	0,34	149	8,24	
SNM2	0,34	149	8,24	









1.8



PRACTICAL WORK. Green Campus Project **Evaluation.** Campus Sustainability



3. RESULTS

Student feedback

Evaluation of the Group Dynamics						
1. Which group do you belong to?	A, B, C, D, E, F					
2. Has there been any incident? Do you consider that any member from the group has not participated sufficiently?	0 answers					
3. If you answered yes to the previous question, indicate the percentage of collaboration for each person.	0 answers					
Evaluation of the Activity						
4. Rate your level of satisfaction with the activity from 1 to 5.	4.6/5					
5. ¿Would you repeat the activity next year?	Yes in all answers					
6. Do you have any other suggestions?						
Improve the organization in laboratory analytics.						
Interest in including more activities of this type.						



Comparison with previous year scores



Descriptive statistics for the practical work

Academic year	Mean	Median	Standard Deviation	Interquaratile Range (IQR)	Q1 (25%)	Q2 (50%)	Q3 (75%)	Q4 (100%)	Number of data
2022/23	7,25	6,7	2,3	2,4	5,75	7,25	8,12	10	24
2023/24	9,5	9,3	0,45	0,75	9	9,5	9,75	9,75	33



4. CONCLUSIONS

- Active methodologies such as Case-Based Learning and Cooperative Learning has enhanced student autonomy and participation, gradually replacing traditional expository methods with inquiry-based approaches.
- This learning experience has encouraged the application of theoretical knowledge to real-world sustainability challenges within the students' own environment, helping to better understand the applicability of what was learned.
- The methodology has successfully integrated sustainability into university teaching, aligning with the LOSU and the 2030 Agenda, and offers a model that could be applied to other courses for similar integration.



Future initiatives

- Implementation into an URJC teaching innovation project (granted in the 2024/25 call), to extend the activity to other degrees and give it a more multidisciplinary approach
 - Soil Science (3rd year Biology Degree)
 - Hydrogeology (4th year Experimental Sciences Degree), Hydrogeology (2nd year Water Resources Degree)
 - Soil and Water Resource Management (3rd year Environmental Sciences Degree)
 - Biodiversity and Ecosystems (3rd year Environmental Engineering)
- Frame the results within other initiatives of the Green Office
 - Maximize the contribution of students to achieving the SDGs in their campus.
 - Assess the potential of proposing the activity as a Service-Learning Project.

