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An approach to develop sustainability in a subject of Human Nutrition and Dietetics Degree, a pilot experience

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Abstract

The present study was aimed to develop the skill of sustainability among students of the subject “Collective Restoration” in Human Nutrition and Dietetics Degree. For that purpose activities that dealt with economic, environmental, sanitary and social sustainability were carried out. After defining the skill and learning results, different activities and evaluation criteria were proposed for their development. The skill was carried out in an active, collaborative and classroom-based way. The 75% of the students that attended classes mentioned concepts related to sustainability in the final exam. Concepts such as an adequate food distribution among people or the reduction of food wastes were considered by the students. In view of the obtained results, the skill of sustainability might be developed coordinately in more subjects of this degree in order to make students be competent in this field for their future profession

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1. Introduction

The Bologna Process (1999) has brought important changes to the pre-existing University model. University Degrees must train students in competences which include not only specific but also cross-curricular skills and they have to be improved along their education process supported by a continuous assessment (Rodríguez, 2010; Binkley

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et al., 2012; Murphy et al., 2001). It must be warranted that new graduates achieve a certain level in competences which matches with that required by the job market (Rahmat et al., 2012; Prideaux et al., 2015). They will have to face a professional environment, be able to communicate, share information, discuss problems, find solutions and at least, be able to function well in a team.

Studies in the literature show that the most developed cross-curricular skills until now in higher education are teamwork, communication skills, interpersonal abilities or critical appraisal. Several methodologies have been designed for the acquisition of these skills, among which, student-centered active learning strategies have been the most used ones (Michael and Model, 2003; Woodrow and Townley, 1993). Even though the reviews regarding the effectiveness of these active methodologies do not show significant effects in terms of academic outcomes (Colliver, 2000; Norman and Schmith, 2000), students opinion about them as suitable methodologies to develop cross-curricular skills has been very positive (Woodrow, 1993; Michael and Model, 2003).

However, there is one skill that although it is included in the list of cross-curricular skills of the university Degrees has not been developed in depth by any kind of methodology yet. That is the skill related to sustainability.

As Federico Mayor, the General Director of UNESCO said, we must assure that “the key for sustainable development is an education that reaches all the society, through new modalities and new technologies in order to provide opportunities for lifelong learning. In all countries, we must be ready to remodel education in order to promote attitudes and behaviors that lead to a culture of sustainability” (General Conference of UNESCO, 1997). Thus, to develop this skill among future professionals is actually a matter of concern and university lecturers must make an effort to include it in the academic programs.

In view of the above, the aim of the present work was to develop the skill of sustainability, among students of the subject “Collective Restoration” of Human Nutrition and Dietetics Degree. Concretely the purpose was to establish an environmental, economical, sanitary and social sustainability vision for finding solutions to face real world problems. This work is a pilot experience from a big project that aims to develop sustainability as a cross- curricular skill along the mentioned Degree. It is funded by the Students, Employment and Social Responsibility Service of the University of the Basque Country.

2. Methodology

2.1. Subject description

The selected subject is entitled “Collective Restoration”. It is a subject of the first four-month period of 4rd course of Human Nutrition and Dietetics Degree, with a duration of 6 ECTS, divided in 4 ECTS for master lectures and seminars and 2 ECTS for laboratory and food plant cooking sessions and a company visit. Two lecturers and 17 students participated in the teaching-learning of the subject.

The program of the subject with regard to developed specific skills and related themes is summarized in Table 1. The themes were carried out combining different methodologies: master lectures, practical cases, problems, etc. Cross-curricular skills such as the ability to integrate and apply knowledge, teamwork, communication related skills and critical appraisal were also developed.

Table 1. Specific skills and related themes of Collective Restoration subject

Specific skill	Themes
A. Meal production related skills	1. Collective restoration: concept.
To be able to:	2. Collective restoration types
- analyze and apply different production system	3. Meal production and distribution types
- identify specific equipments and determine their effects on nutritional value of food	4. Equipments and establishments
- analyze and apply different distribution chains	5. New technology
- construe and apply food legislation and quality assurance	6. Effects of cooking methods on nutritional value of food
	7. Food legislation and quality assurance related to collective restoration

Specific skill	Themes
B. Menu planning related skills	8. Considerations for adequate menu plannings
To be able to:	9. Menu planning for school restoration
- design menus for different collective restoration centers in good accordance with guests' characteristics	10. Menu planning for restoration with adult guests
- design nutritionally balanced menus for different collectives: children, adults, elderly people and hospital patients	11. Menu planning for restoration in residences for the elderly
	12. Menu planning for hospital restoration
	13. Psychosocial consequences of collective restoration

The evaluation of the subject consisted on two parts: a written final exam and a continuous evaluation based on the reports from laboratory and food plant cooking practices, which represented the 70% and 30% of the final mark respectively.

2.2. Activities dealed with sustainability

The present work is focused on the development of sustainability skill. Therefore, the rest of specific and key skills are not assessed.

The skill was formulated as follows: to be able to apply sustainability criteria in meal production and menu planning in collective restoration. The learning-results related to the competence had to be feasible, observable and evaluable. Thus, we proposed the next ones: 1) to describe sustainability criteria in different collective restoration activities, 2) to resolve problems related to sustainability in different collective restoration activities.

Lecturers included the sustainability criteria in a continuous manner along the course in the themes related to both, meal production and menu planning, and using different teaching modalities. Table 2 shows a summary of the development of the mentioned competence.

Table 2. Summary of the development of sustainability skill

Skill, learning results and themes involved	Activities, tasks and evaluation criteria
A. Meal production related...	
a) Skill	a) Activities
to be able to apply sustainability criteria in meal production in collective restoration	Master lectures: definition of concepts
b) Learning results	Practical cooking session in the food plant: different collective menu design, preparation in groups and discussion about generated residues, its management (recycling and posible reuses) and ways to reduce them
1) to describe sustainability criteria in different collective restoration activities	b) Task
2) to resolve problems related to sustainability in different collective restoration activities	Report of the activity
c) Themes:	c) Evaluation criteria
3. Meal production and distribution types	1. Student defines generated residues and their management
4. Equipments and establishments	2. Student proposes different ways to reuse the residues
5. New technology	3. Student proposes alternatives to reduce generated residues
6. Effects of cooking methods on nutritional value of food	

Skill, learning results and themes involved	Activities, tasks and evaluation criteria
B. Menu planning related...	
a) Skill	a) Activities
to be able to apply sustainability criteria in menu planning in collective restoration	Master lectures: definition of concepts Seminars: critical reading of articles and discussion
b) Learning-results	Seminars: practical cases of menu planning
1) to describe sustainability criteria in different collective restoration activities	b) Task
2) to resolve problems related to sustainability in different collective restoration activities.	Written exam
c) Themes:	c) Evaluation criteria
8. Considerations for adequate menu planning	1. Student defines the sustainability criteria that must be consider in a case of menu planning
9. Menu planning for school restoration	2.Student proposes alternatives to improve the quality of the designed menu from sustainability points of view
10. Menu planning for restoration with adult guests	
11. Menu planning for restoration in residences for the elderly	
12. Menu planning for hospital restoration	

Master lectures were used to define concepts related to environmental, economic, sanitary and social sustainability, such as, energy consumption, food security and safety, nutritional education, seasonal food and recipes, specific diets (vegetarianism, religion, allergy, intolerances) and novel foods. Those concepts were alternated with the rest of the subject in well defined themes and moments, presented above in table 2.

On the one hand, with regard to meal production, a practical cooking activity in the food plant was carried out, consisting of three session in which student had to 1) design meals for different collectives, calculating food quantities, 2) prepare them in the food plant and 3) do a critical appraisal of their or peers work, based not only in the product (meal) but also in the process. This activity encompassed a lot of competences of the subject. With regard to environmental sustainability, the attention was focused on residues: which ones were generated, why (error in food quantity calculation, error in meal portion definition, bad look/taste of meals, hygiene, meal not adapted to specific collectives, etc), its management (reusing and recycling) and alternatives to reduce them.

This activity was carried out in groups of 3-4 students, in a cooperative manner. In overall, it last 1.5 ECTS. The evaluation of the activity was continuous; two lecturers took part in the session to assure the feed-back to and from student. Student prepared a report of the activity which was used to evaluate them, according to the following criteria: 1) student defines generated residues, 2) student optimizes their management -ways to reuse or recycle them- and 3) student proposes alternatives to reduce generated residues. Although the activity was taken into account in the final calcification, no aspects concerning sustainability were considered.

On the other hand, in relation to menu planning related sustainability, different seminars were conducted. In some of them a critical reading and discussion of articles was carried out in the big group. Articles dealt with menu planning rules, recommendations to reduce residues in school and hospital collective restoration and ways to save money and reduce environmental impact examining garbage. This seminar allowed student to go on a deep reflection about sustainability in collective restoration. Other seminars consisted on individual practical cases of menu planning, in which besides nutritional, dietetic and technological criteria, sustainability ones were developed: nutritional education, seasonal food and recipes, specific diets (vegetarianism, religion, allergy and intolerances), novel foods and prevention of food waste. Thus, for example, after assessing the nutritional quality of a menu for school children, it was improved including seasonal foods as specific fruits, detecting recipes that might be bad look or taste for children, proposing alternatives to reduce possible residues or to reuse some of them, etc.

The lecturers worked close to students during these seminars, in a continuous and active manner. Economic, environmental, sanitary and social sustainability visions were evaluated and evaluated through a written exam. The evaluation criteria were: 1. student defines the sustainability criteria that must be consider in a case of menu planning and 2. student proposes alternatives to improve the quality of the designed menu from sustainability points of view.

3. Results and discussion

As Constanza (2000) wrote: “The most critical task facing humanity today is the creation of a shared vision of a sustainable and desirable society, one that can provide permanent prosperity within the biophysical constraints of the real world in a way that is fair and equitable to all of humanity, to other species, and to future generations.” In that sense different policies have been set up by several Governments in the 2030 Agenda (United Nations, 2015). This universal agreement must be underpinned by a Global Partnership, mobilizing governments and stakeholders (citizens, civil society, private sector, academia, etc.) at all levels. In the academia field some countries such as Australia has already established goals in order to integrate in educational program skills related to sustainability (Australian Education Ministry, 2008). In the particular case of Human Nutrition and Dietetics Degree in the University of Basque Country there is a paradox. “Recognizing the essential elements of the profession of Dietitian-Nutritionist, including ethical principles, legal responsibilities and exercise of the profession, applying the principle of social justice to professional practice and developing it with respect for people, their habits, beliefs and cultures” is defined as one of the Degree learning outcomes, but activities to develop skills concerning social, economic and environmental sustainability are scarce in the Degree.

In this context, the present study was carried out in order to develop sustainability vision (social, environmental, sanitary and economic) among students from the last course of Human Nutrition and Dietetics Degree. As this skill is not carried out in a regular manner in the mentioned Degree, it would be interesting to coordinate it with the rest of skills of the career, to design tools to help students to achieve this skill and to create evaluation strategies in order to measure their improvements. In fact, there is a lack of these learning-evaluation tools and lecturers show little experience in this field.

Last year courses not only offer the opportunity to evaluate the level of skill acquisition, but also represent a good opportunity to make improvements with those students who, for any reason, have not achieved the expected learning targets. For this reason the present pilot study has been established in a last year subject: “Collective Restoration”. Through the integration of concepts related to sustainability among students, this pilot experience seeks as final goal that students aware of sustainability and internalize principles such as, ethics, respect, or social justice for their future profession.

The attitude of the students who attended classes was active, they demonstrated interest in all the activities proposed. The communication between students and lecturers was fluent and easy.

From 17 students in the group, 12 attended classes, 8 of them every day and 4 attended the half. Thus, 5 of the students, did not work on the competence developed in this study, because it was developed in a active, collaborative and classroom-based way.

In the written exam, different practical cases were proposed in which student had the chance to apply nutritional, dietetic, and technologic and sustainability criteria. For example, they were given a defined menu for a collective and they were asked to detect errors and propose alternatives to correct them. In order to evaluate the sustainability internalization by the students, in the exam questions sustainability term was not mentioned.

From 17 students 8 forgot sustainability related comments. Taking into account that from the 17 students only 12 used to go to class, and considering that from this 8 students 5 are probably those that did not develop our skill in a classroom-based manner, it can be considered that from 12 students attend class, 3 forgot sustainability. The rest, 9 students, mentioned this issue: two of them just mentioned it and 7 described concepts related to sustainability and applied them to resolve the proposed practical cases (Fig. 1.). Among their proposals the next concepts were included: proper food distribution for people, reduction of food wastes, the importance of sustainability in nutritional education or modifications that could be performed in a menu in order to make foods more palatable and thus, more consumed.

This study reveals some strengths and limitations. Presented activities were designed for developing a skill that is not considered in depth in Degrees. Moreover, its development was inserted with different skills of the subject, specific and cross-curricular ones, in a balanced proportion. Nevertheless, there are that can be improved such as the small number of students or the fact that only one subject from one Degree was included in the study.

This work is a pilot experience from a big project that aims to develop sustainability as a cross-curricular skill along the Degree of Human Nutrition and Dietetics. The final outcome is to define methodologies and tools that

allow the development and evaluation of sustainability along the whole curriculum. In that way, different levels of acquisition of the competence will be reached in each course, from lower to higher levels, and finally students will achieve a global view of the skill when reaching the graduation. Therefore, the following step should be to design proper methodologies to develop sustainability in more subjects of different courses of this degree.

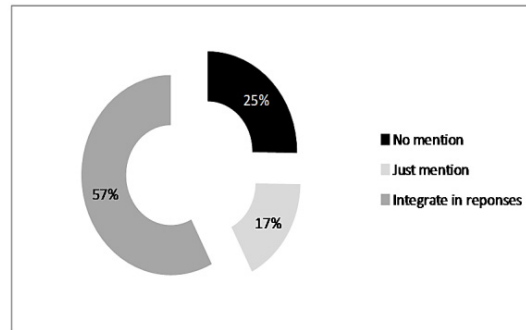


Fig. 1. Percentage of students who attend class and internalized or not sustainability in exam questions.

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