

## ARTICLE

# Challenges and Opportunities of 2.0 Tools for the Interdisciplinary Study of Nutrition: The Case of the Mediterranean Diet Wiki

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## Abstract

This article analyses the possibility of integrating new learning practices into health-related postgraduate programmes to enable students to acquire specific competencies in their field of study while improving other cross-disciplinary competencies related to the use of elements inherent to the information and knowledge society. To that end, a decision was taken to develop a Mediterranean Diet Wiki experience; a collaborative activity on the different aspects of the Mediterranean diet, using Wikispaces. The activity had two objectives. First, to develop a holistic, transdisciplinary vision of the phenomenon of nutrition, in terms not only of its relationship to health, but also of its importance as a social, cultural and economic component. And second, to have a set of up-to-date, easy-to-access bibliographic resources available on the topic, which would prove useful throughout the students' educational process. Students and lecturers on different educational programmes took part in the experience. While focusing on a field of study related to their respective subjects, the experience offered them the opportunity to work in a shared space towards a common goal, by providing them with access to a range of multidisciplinary information and a more holistic vision of the Mediterranean diet. On completion of the experience, activity assessment and wiki participation data were analysed, as were data obtained from the anonymous questionnaire. The results showed that the Mediterranean Diet Wiki was an effective tool for approaching the phenomenon of nutrition from different angles, as well as a useful system for working on cross-disciplinary competencies such as the mastery of ICTs, searching effectively for bibliographic references, and collaborative work.

## Keywords

nutrition, e-learning, Web 2.0, transdisciplinarity, Mediterranean Diet

## *Desafíos y oportunidades de las herramientas 2.0 para el estudio interdisciplinar de la nutrición: el caso de la Wiki Dieta Mediterránea*

### *Resumen*

*En este trabajo se analiza la posibilidad de integrar en programas de formación de posgrado del Área de la Salud nuevas prácticas de aprendizaje que permitan a los estudiantes adquirir competencias específicas sobre su ámbito de estudio, al mismo tiempo que mejorar otras competencias transversales relacionadas con el uso de elementos propios de la sociedad de la información y del conocimiento. Con tal intención se desarrolló la experiencia Wiki DM, una actividad colaborativa en torno a diferentes aspectos de la dieta mediterránea (DM) usando wikispaces. Con esta actividad se pretendía, por un lado, desarrollar una visión holística y transdisciplinar del fenómeno de la alimentación, no solo en su relación con la salud, sino también resaltando la importancia de su componente social, cultural o económico; y, por otro, se buscaba generar y disponer de un conjunto de recursos bibliográficos actualizados y fácilmente accesibles sobre el tema, que fueran de utilidad a lo largo de todo su proceso formativo. En la experiencia participaron docentes y estudiantes de diferentes programas formativos, de manera que, aunque centrados en un ámbito relacionado con su asignatura pero trabajando en un espacio y con un objetivo común, pudieran acceder a una serie de información multidisciplinar y con una visión más holística de la DM. Tras la experiencia se analizaron los resultados mediante la evaluación de la actividad, la participación en la wiki y una encuesta anónima. Los resultados demostraron que la Wiki DM resulta una herramienta efectiva para abordar el fenómeno de la alimentación desde diferentes perspectivas, así como un sistema útil para trabajar en competencias transversales, tales como el dominio de las TIC, la búsqueda bibliográfica y el trabajo colaborativo.*

### *Palabras clave*

*nutrición, e-learning, web 2.0, interdiscipliniedad, dieta mediterránea*

## Introduction

Food is a complex phenomenon encompassing issues as diverse as biology, the emotions, culture and the socio-economic context. To further the study of human nutrition and its effects on health, and also to address contradictory food-related disorders occurring worldwide (e.g., malnutrition and obesity), it is therefore expedient to consider a more holistic approach such as the one recommended by the Second Programme of Community Action in the Field of Health (Commission of the European Communities, 2007; Suárez Herrera et al., 2009). Bearing such aspects in mind, postgraduate programmes in Nutrition and Health should take a multidisciplinary approach, combining subjects such as nutrition, psychology and anthropology. However, to further students' knowledge of certain subjects, the curricula of health-related programmes usually focus on scientific or experimental disciplines while ignoring the social component (De Garine, 2004; Owen et al., 2011). In this respect, the Mediterranean diet – understood in the most interdisciplinary and broadest of senses (Medina, 1996) – stands out as one of the models that, today at least, attempts to connect nutritional, health, social and cultural issues. In doing so, it not only exemplifies a dietary standard, but also tries to represent a lifestyle and a cultural model, as emphasised by UNESCO's recognition of it as Intangible Cultural Heritage of Humanity (UNESCO, 2010).

On the other hand, adapting the higher education system to the Bologna Process means that master's degree courses have to ensure that students acquire a series of basic competencies that enable them to work in teams, to interact with students of other disciplines, to think critically and to participate.<sup>1</sup> Such basic competencies are combined with series of cross-disciplinary competencies that, for the courses on which this work was carried out,<sup>2</sup> are related to the use of elements inherent to the information and knowledge society, such as the ability to search for quality scientific information, to disseminate and transfer expert knowledge, or to interpret socio-cultural diversity and the role it plays in nutrition (Goble, 2004; Hammick et al., 2007).

The advent of 2.0 tools has provided higher education with a particularly interesting opportunity, since they are easy-to-access, cheap and very versatile applications that are commonly used (Karasavvidis, 2010). In addition, they also mean that the walls of the classroom are no longer a barrier to education. And, among many other things, they enable group work by area of interest, the design of cooperative study dynamics, access to materials that are not related to the curricular content of a particular educational programme, and interdisciplinary work (Mann et al., 2009; Sargeant, 2009). The integration of 2.0 tools as an element that overarches different higher education programmes could turn out to be a good option in terms of helping not only to overcome the difficulties of communication and joint working between students and/or professionals of different disciplines, but also to keep knowledge up to date (Gardner et al., 2002; Levis, 2011). A number of recent experiences implemented in the higher education setting (Aguilar et al., 2011; Molina et al., 2011;

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1. Spanish Royal Decree 1393/2007, of 29 October, establishing the structure of official university teaching. Chapter IV, Articles 15-17.

2. Curricula for Nutrition programmes at the Open University of Catalonia (UOC). Accessed 21 July 2011. Available at: <<http://www.uoc.edu/estudios/masters-universitarios/nutricion/plan-de-estudios/index.html>>

Saigí, 2011) bear witness to the effective use of 2.0 tools for interdisciplinary collaborative work in the field of health.

Of the many kinds of 2.0 tools available, wikis are considered to be the most 'scholarly' (Barberà, 2009). Alongside blogs, they are also the most popular and commonly used. The reason for this is that they combine versatility and simplicity, allowing work to take place in groups and between groups (Schwartz et al., 2004; Standing & Kiniti, 2011; Tolosa & García, 2011). The use of wikis also provides a space into which the principles of social constructivism can be incorporated (Su & Beaumont, 2010), since it facilitates active participation, discussion, an exchange of ideas and opinions, collaboration in knowledge construction, etc., all of which are key aspects of continuing, independent learning (Boud & Falchikov, 2007).

That is why a decision was taken to develop a Mediterranean Diet Wiki experience; a collaborative activity on the different aspects of the Mediterranean diet, using *Wikispaces*. The aim of the Mediterranean Diet Wiki experience was to assess the potential that this tool offers: 1) To improve learning by developing a holistic vision of the phenomenon of nutrition, in terms not only of its relationship to health, but also of its importance as a social, cultural and economic component; 2) To work on the course's cross-disciplinary competencies, such as the mastery of information and communication technologies (ICTs) applied to the course's field of work, interdisciplinary collaborative work, and searching effectively for bibliographic references to have a set of up-to-date, easy-to-access bibliographic resources available on the topic, which would prove useful throughout the students' educational process.

## Method

To implement this experience, *Wikispaces* was used to create a wiki on the different aspects of the Mediterranean diet. It included pages on the Mediterranean diet's historical and social components, as well as lists of typical food items and a summary of effects on health.

Access was restricted to the course participants (students and lecturers). The reason for giving lecturers access to it was to enable them to monitor and analyse the students' contributions more closely.

The experience was implemented in the first two weeks of July 2011, and it involved three lecturers and 35 students of two subjects on the Nutrition and the Food Systems, Culture and Society postgraduate programmes.

As a pilot experience, an activity was designed to simulate a hypothetical situation that is typical in a professional working environment, since it would require students of different programmes and subjects to work collaboratively.

To make it easier to work with the tool and to carry out the proposed activity, the wiki home page included information about how to use *Wikispaces* and how to improve information competencies and ways of searching for scientific information on nutrition (Bonich et al., 2010, Sanz-Valero & Castiel, 2010).

The activity consisted in deciding on the expediency – or otherwise – of incorporating certain food items (e.g., red meat, milk, potatoes and wine) into the graphic representation of the 2010 Mediterranean diet food pyramid, and the possible links between such items and cancer, immunity or the glycaemic index. The students randomly divided themselves into groups of four or five.

By way of this exercise, it was possible not only to observe those aspects relating to nutrition, but also to the various socio-cultural representations associated with the food items and their presence in the Mediterranean diet.

Over the two-week duration of the experience, each group had a page on the wiki, and their task consisted in deciding whether or not to include the assigned food item. If the decision was affirmative, they also had to decide how often to include it. The respective group members had to reach a final decision by consensus, and base that decision on quality bibliographic references while taking account of social, culinary, economic and health criteria. The bibliographic resources and the final decision were included in the wiki home page. The 'Discussion' tab was there to facilitate the task of group discussion among the group members.

On the wiki, any member could directly access all the bibliographic references used to support the decisions that had been taken. Any references that could not be accessed were excluded, as were posts to blogs, discussion boards and other opinion spaces.

The assessment of the experience was based on the students' perceptions and opinions (obtained via an online questionnaire sent to every participant), and on the lecturers' analysis of the students' contributions to and participation in the wiki, and of the students' learning.

From the range of e-learning analysis models available (Mayes & Freitas, 2004), Salmon's five-stage model was selected (Salmon, 2006): access and motivation, online socialisation, information exchange, knowledge construction and development. This model particularly allowed us to consider the students' experiences in the light of new learning models and the gradual development of learning, which are centred on the design and effective application of e-learning tools (Su & Beaumont, 2010).

The questionnaire was anonymous and optional, and included a combination of open and closed questions. In order to design the questions, the five stages referred to above were taken into account to assess both the e-learning and other matters relating to interdisciplinary collaboration and cross-disciplinary competency work.

A five-point Likert-type scale was used for the students to answer each question, and a blank space was included so that they could add comments. A generic qualitative analysis (Denzin, 2003) was performed on the data generated by the open questions. The students were able to complete the questionnaire in the last two weeks of July 2011, and 18 valid responses were received.

## Results

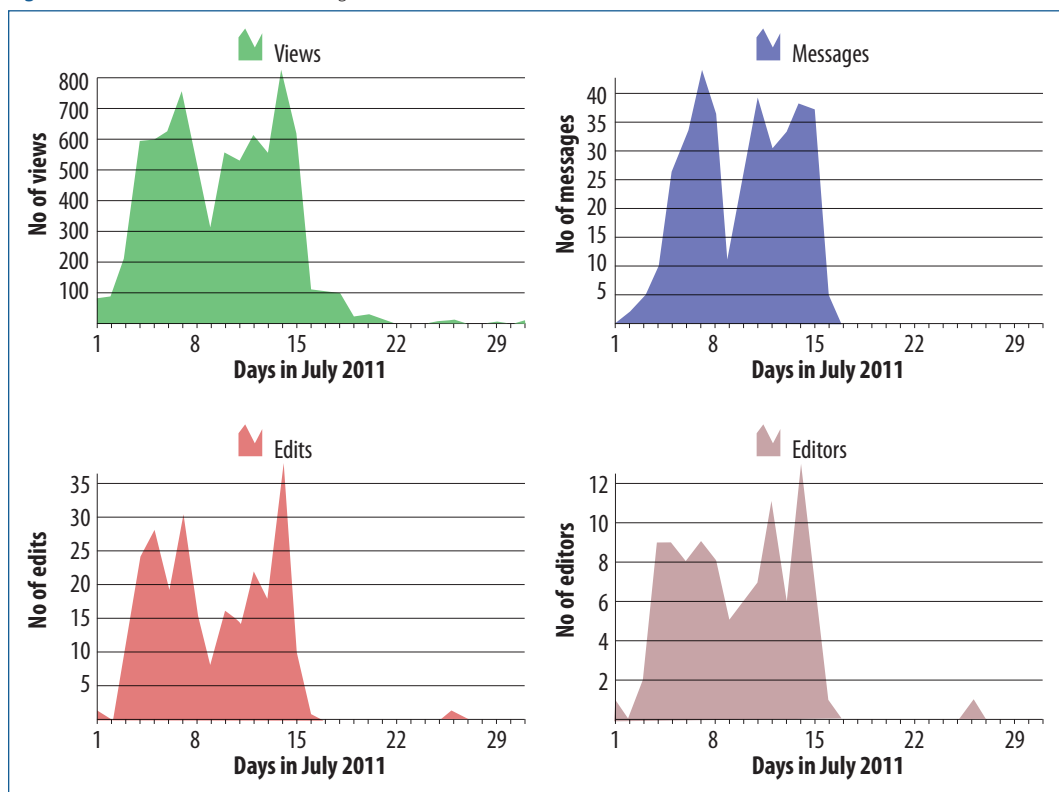
The analysis of the data collected from the questionnaire and the wiki activity assessment gave the following results for the objectives pursued:

### 1. To improve learning by developing a holistic vision of the phenomenon of nutrition.

Applying Salmon's five-stage model, shown below are the results obtained for learning progress at each stage: access and motivation, online socialisation, information exchange, knowledge construction and development.

Over the two-week duration of the experience, all students assigned to the different classes accessed the wiki and, to illustrate their activity, the results are broken down by number of wiki views, messages, edits and editors (see Figure 1).

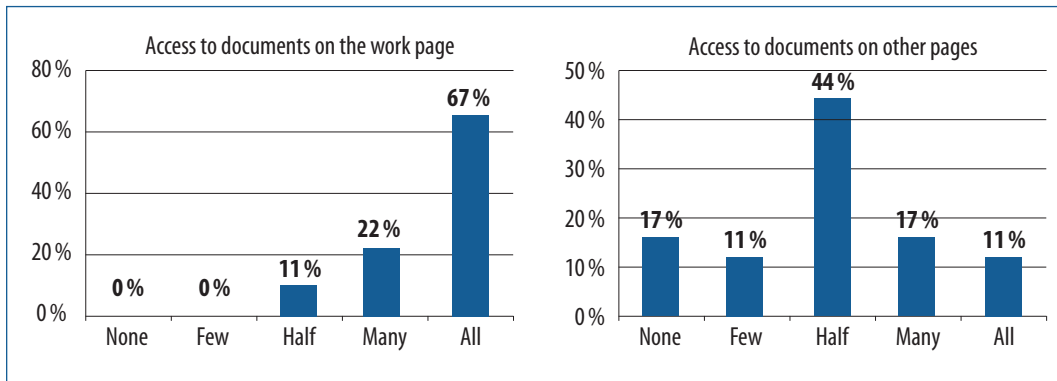
**Figure 1.** Number of wiki views, messages, edits and editors



In line with the results of other studies on the use of wikis in education (Montenegro & Pujol, 2010), working with wikis turned out to be simple and intuitive, as confirmed by 89% of the questionnaire respondents. In addition, it should be noted that 72% of the respondents had not previously participated in experiences of online collaborative work, and that 83% had not heard of *Wikispaces*. And while tutorials and detailed instructions about how to work in *Wikispaces* were available, 30% of the respondents stated that they had not accessed any of them.

Some 66% of the students stated that they had accessed all or nearly all of the existing pages, but the ones with highest number of views and edits were those relating to food items and health, specifically *milk* and *diabetes* (1,202 and 1,106 views, respectively). Just 6% of the students stated that they had only accessed the page that they had to work on (see Figure 2).

Interaction between students was not limited to page editing. Indeed, all of the students stated that they had accessed the discussion boards, and 77% of them had actively participated in the

**Figure 2.** Access to documents on the various pages of the Mediterranean Diet Wiki

various discussions. Besides taking part in discussions on other pages, 39% of the students helped to edit them, even though they were not the ones that had been directly assigned by the lecturers. The students collaborated on knowledge construction and on decisions about the information and the relevance of the bibliographic references to include. Given below are some excerpts of the students' posts to the discussion boards:

... I've tried to summarise our conclusions and comments in a single, final conclusion. I've attached the draft. Please change it, add to it, comment on it and improve it as you see fit...

... in general, the conclusions you've put seem fine to me. Though I think there's one thing that's not quite right about the "high energy value of potatoes" because, as I said in my first intervention, that's not the case when comparing it to other food items in the same group. I'd talk about its high glycaemic index, which is what diabetes-related studies refer to. What do you think? I'd put the final conclusion as follows...

... here's my suggestion for the definitive list of items. I'd like to see your suggestions...

Regarding improvements in nutrition- and food-related knowledge, 72% of the students mostly or completely agreed that the experience had been useful for learning in their field of study, 78% considered it useful for overall learning and 88% stated that it had been useful for improving their knowledge of the different aspects of the Mediterranean diet, understood in the most interdisciplinary and broadest of senses.

The truth is that working on one topic from a number of different angles actually widens your point of view. (*Participant 8*)

Most of the participants that had assessed the experience agreed that the use of the Mediterranean Diet Wiki was a very interesting system, not only for interaction between students on different programmes, but also for the dissemination of the work that had been done. Table 1 shows a summary of experience assessment results.

**Table 1.** Summary of respondents perceptions and opinions (n = 18) of the Mediterranean Diet Wiki experience

	Scoring option "Agree"	Scoring option "Completely agree"
Interesting as a system for interaction between students on different programmes	7	8
Interesting as a system for the dissemination of work done by students	8	8
Useful for my learning in my field of study	5	8
Useful for my overall learning	7	7
Useful for my future professional activity	5	4
It has allowed me to interact with students on other programmes and to share knowledge	5	3
Improve my ability to search for scientific information	8	7
Have a set of interesting bibliographical resources available for my field of study	5	6
Improve my knowledge of the different aspects of the Mediterranean diet	8	8
Find out about a new work tool and improve my ICT competency	6	10
Enhance the visibility of my networking	6	6
I think that such collaboration is necessary and that implementing experiences of this type should be fostered	6	8
I would like to see experiences of this type incorporated into my educational programme as a matter of course	9	3

In addition, 77% of the participants were convinced of the need to foster collaboration and to implement experiences of this type, and 67% wanted to see them incorporated into their educational programmes as a matter of course.

Experiences like these have a lot to offer... (Participant 2)

Team working and interacting with my fellow course students are things I find very interesting. (Participant 7)

I found the experience very interesting and enriching. (Participant 8)

Besides the group work and seeing how other participants work, it's interesting because it forces you to interact, concur and reach agreements with other people. (Participant 9)

Overall, I think it's a very useful tool. (Participant 12)

I think an activity of this type should be included in every subject. (Participant 13)

However, some problems stemming from working in a group in a virtual environment were highlighted.



... I find it very complicated to work virtually in a group... (Participant 2)

... For me, it wasn't easy to work in a group (or in my group, at least) because of the lack of communication and my need to lead. (Participant 6)

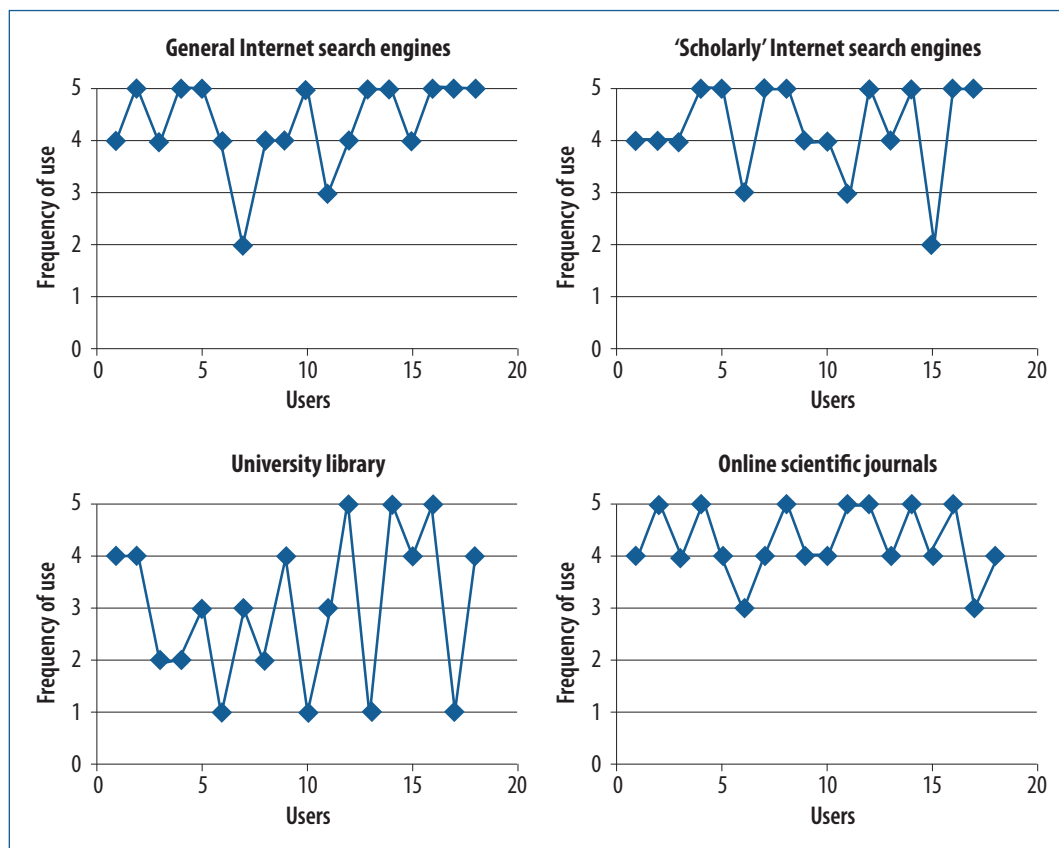
## 2. To work on the course's cross-disciplinary competencies and to have a set of up-to-date, easy-to-access bibliographic resources available on the topic, which would prove useful throughout the students' educational process.

Regarding improvements in competencies relating to the effective use of elements inherent to the information and knowledge society, 89% of the respondents mostly or completely agreed that the experience had been useful for improving their ICT competencies. Similarly, 83% of the respondents considered that it had improved their ability to search for scientific information, and 61% stated that it was good system for having a set of interesting bibliographic resources available for their field of study.

It allowed me improve my skills with regard to ICTs, communicating with my fellow students and searching for scientific information. (Participant 12)

... apart from being based on individual bibliographic reference searches (a key aspect of all subjects), it fosters interaction and collaboration between students. What's more, ICTs are the present and the future, so it's only right to know about them and apply them to our fields of study. (Participant 13)

**Figure 3.** Frequency of use and dispersion of resource sources used. 5: Very often 1: Not at all



However, the analysis of the type of resources used and their sources revealed that general Internet search engines and online scientific journals were the most popular, whereas the digital library was used much less (22% of the respondents did not use it at all), despite the fact that it offers higher quality and greater reliability, as required by the activity (see Figure 3).

In this respect, some of the participants posted comments like:

Sometimes it's really hard to access the library. (*Participant 2*)

I'd like to know how to use the digital library; I think it would further my knowledge because loads of bibliographic sources can be accessed, but I'm not at all familiar with it and therefore can't find what I'm looking for. (*Participant 7*)

## Discussion and conclusions

The results of this experience show that the Mediterranean Diet Wiki can be considered an effective tool for approaching the phenomenon of nutrition from different angles while working on cross-disciplinary competencies such as the mastery of ICTs, searching effectively for bibliographic references, and collaborative work.

Having a wiki available to enable work to be done on different aspects of a specific topic – the Mediterranean diet in this case – allowed the limitations of an activity confined to a specific field to be overcome. It also fostered interaction between students who would not otherwise have mixed with each other, or would have done so in a relatively tenuous manner in the context of the virtual classrooms. Bringing information from very diverse disciplines together in a common space has an impact on the complex reality of the sphere of food and nutrition, and on the obvious need to take an interdisciplinary approach. Collaborative work between and among students can help to pinpoint common issues on which work needs to be done, to create synergies and to ensure that this practice spills over into their future professional activities.

The ease of direct access to information and resources relating to the social field of nutrition also allowed the students' interest in such aspects to be raised. This was illustrated by the fact that the page on socio-cultural aspects, for example, had 51 views, even though none of the participants in this pilot test held Anthropology or Social Sciences degrees. Some 6% of the students also considered it to be the most interesting page of all.

In addition, the Mediterranean Diet Wiki made it possible to improve learning in different subjects by having complementary, up-to-date bibliographic resources available. These resources were not only related to the specific fields of study, but also to other disciplines and subjects, keeping up to date with which requires considerable effort in terms of searching for and updating information, mainly because of the rapid advances in scientific production.

This aspect is particularly interesting for e-learning; students have greater autonomy when it comes to managing and organising their time and learning. In this case, while 67% of the students accessed all the resources on their work page, 17% did not consult any resources at all from other

disciplines. Therefore, we should bear in mind that having more documentation and information available on a topic does not necessarily mean that they will be accessed. Hence, it is crucial to design activities that encourage students to access bibliographic sources or spark their interest in learning more about specific topics.

In this respect, proposing an activity that required group discussion and decision-making not only on a text, but also on the resources to be incorporated, fostered analytical and synthetic abilities and improved written expression (Montenegro & Pujol, 2010). The need to compare various sources of information and to accept or reject contributions made by the other students helped to develop critical competencies. This skill is particularly useful for analysing scientific information, since this is precisely one of the main problem areas, as other studies have also found (Engstrom & Jewet, 2005). The students' justification for making hardly any use of the university library was that they did not know how it worked, despite the availability of a specific training section on it.

The majority of the participants' positive assessment of the Mediterranean Diet Wiki and of its interaction and collaboration potential, and the expressed interest in seeing it included in their educational programmes as a matter of course, together mean that we remain convinced about the need to carry on advocating the inclusion of different 2.0 tools in postgraduate students' learning processes. However, certain aspects that foster student participation and motivation need to be considered.

We believe that some of the keys to the success of the Mediterranean Diet Wiki reside in the fact that it is easy to use and edit. This fosters both student and lecturer motivation and involvement, thus helping to overcome any initial reticence that might possibly be attributed to a lack of knowledge about the tool. Moreover, this can lead to an improvement in ICT-use competencies, not only because of the experience in its own right, but also because the use of a simple tool may actually make people more willing to try out other, more complex tools and to use them regularly. In any event, it would be advisable to incorporate an element of training in Web 2.0 tools in Food and Nutrition educational programmes because of their dimension and impact and also their growth potential.

Moreover, the opportunity to assess an activity not only on the outcome, but also throughout the process, enables continuous assessment and motivates students to get involved and take responsibility, since it bears witness to the work they have done and the influence that their activities have had on others in the group (Beaumont et al., 2008).

Finally, the design of specific learning activities associated with the use of the tool, which students perceive either as part of their discipline or as being useful for their field of study, constitutes another success factor, because students only adopt a tool if they feel it is useful and valuable for the task being performed (Norman & Schmidt, 2000). In this respect, involving students in the development of a project, the outcome of which they will benefit from, helps to increase involvement and motivation (Sharpe, 2004).

On the other hand, the teaching staff's active participation in the organisation and monitoring of, and feedback on, the work carried out can help to foster collaboration and minimise the problems posed by working in asynchronous online groups, where people with different activities, availabilities, roles, etc. have to work together (Gibbs & Simpson, 2004). Having more

time to implement experiences of this type could facilitate understanding and group work. With regard to the latter, however, the added difficulty of coordinating the schedules of lecturers on different programmes was a significant obstacle. It would be interesting to consider including interdisciplinary collaborative activities in the design of programmes to achieve the right level of organisation, coordination, timing, etc.

While further tests need to be carried out before arriving at any definitive conclusions, the Mediterranean Diet Wiki can, in our opinion, be considered an effective tool for approaching the phenomenon of nutrition from different angles, and for improving not only the knowledge of that phenomenon, but also the competencies inherent to the information and knowledge society. Our intention is to carry on working on it by incorporating students of different subjects on Food Systems, Culture and Society, and Biostatistics programmes<sup>3</sup> in order to continue investigating and exploring its potential.

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