USING WIKI TO FACILITATE PROBLEM BASED LEARNING IN PEDIATRIC DENTISTRY

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Abstract

Among all teaching methodologies focused on student learning (active methods), one of the most established in Health Sciences is Problem Based Learning (PBL), incorporated in our discipline (Pediatric Dentistry, Degree of Dentistry) under the impulse of educational innovation projects of our university (UCM). Its methodology focuses in the student´s ability to solve the common problems of their clinical practice by applying knowledge and skills, so they learn to develop as a professional. The working process is structured in four phases and ends with a summary of the information gathered, a report with new knowledge and presentation of the problem and its resolution to the whole group. The major part of the work is done in nonschool hours, which produces a discontinuous tutoring.

Some drawbacks emerged from the teachers and students perspective: work overload, superficial development of the problem, lack of tutorial control and excessive autonomy, parasitism among students, collective coverup, late tasks delivery and last minute difficulties in assessing individual work, etc.

After analyzing these problems, we consider the Wiki could facilitate this collaborative work. Its use could be a strategy that motivates the students to realize individual and group tasks, and could allow the visibility of the whole process.

Objectives:

Encouraging a more active participation of students in the tasks assigned to problem based learning;

Strengthen the relationship between students and tutorial work;

Allow better control of process development, contributing to the planned temporary compliance;

Facilitate the assessment of individual contributions and group contributions throughout the process.

Methodology:

The project has been developed in two chronological stages:

1st) Distribution of students in groups of 4 and assignment of a tutor, who poses the problem and guides its development through seven successive steps.

2nd) Creation of ten Wiki page, each one in relation to a PBL. In each one we include title, problem, objectives and distribution of the students in the group. According to a time schedule, the Wiki integrates individual work, the intragroup collaborative work and the intergroup collaborative work. At the beginning of the course, teachers show to the students the working protocol and the criteria for evaluation their participation.

Results:

In the present course, students have done the work related to the PBL by the wiki, so they have been able to make the documents collaboratively. We believe that the best way to foment this new teaching practice would be by evaluation. In order to apply uniform evaluation criteria, a known protocol was developed including: number of entries, extension and quality of them; entries within the group and entries to other groups; chronology and compliance with established deadlines and quality of the final report. In this pilot study, we found some problems related to poor management of the platform and a lack of planning in the practical use of the tool. Its main advantages are related to the control and evaluation throughout the process.

Conclusions:

This new educational tool allows collaborative training activities in a virtual environment. Wikis can facilitate the realization of collaborative projects between students but it is necessary to design a proper planning to incorporate them.

Keywords: Wiki and PBL, technology, collaborative work in Paediatric Dentistry.

1 INTRODUCTION

Collaborative work is one of the most didactic proposals entities in the European Higher Education Area (EHEA). The use of active methodologies is critical in the aim of achieving many of the competences required in university education (generic, transverse and / or specific competences). Collaborative work has become an indicator of teaching quality [1]. It represents a didactic strategy based on coordinated work of small groups of students to construct knowledge, solve problems or tasks and to develop their own learning. It represents a change towards student-centered teaching, where the teacher designs intellectual experiences for their students. Among the techniques included in collaborative work system, highlights problem-based learning (PBL) in health science. It is a method that seeks to structure thinking for use in clinical situations, develop clinical reasoning, self-directed learning and increase motivation (Barrows, 1986). Although nowadays it is widely used in dentistry teaching, probably the pioneer was the University of Malmo (Sweden), which amended its teaching program in 1990. It was followed by Adelaide in Australia (1993) and the faculties of Dentistry in Dublin, Hong Kong and Bangkok. In Canada it was the University of British Columbia that started to use this method while in the USA there Southern California and Harvard Universities were the first ones. In the Faculty of Dentistry of Complutense University of Madrid, even if it has been applied for years [2], its implementation in several disciplines during last years, has been enhanced with the arrival of Degree and through Educational Innovation Projects.

With PBL system, a small group of students work collaboratively under the guidance of a tutor who has posed the problem they have to solve. The problem has been previously selected and designed to achieve specific learning goals. During this process of interaction added goals are achieved by students, as the importance of teamwork and analysis and synthesis skills. Beyond its resolution, the problem is the trigger to identify learning issues for study so finally to cover the learning objectives of the course.

PBL features are: it is a method of active work in the acquisition of knowledge; it is oriented to solve problems in the aim of achieving certain knowledge goals; it is focused on the students; it encourages collaborative work in different disciplines and through small groups where the teacher assumes the role of facilitator or tutor learning.

But PBL method present also difficulties. In collaborative work, evaluation is one of the elements that create more difficulties. The teacher assessment can be done individually, or to the whole group or even both ways. It is difficult to determine individual qualifications because it is not always possible to identify the contribution and individual performance in a group work. Group ratings ensure that it is held accountable assuming individual responsibility that is not always present (parasitism among students). In addition [3] put the ratings of group individuals is unfair and unwise, among others, because reward / penalize some students for the actions of others, students are assessed according to factors beyond their control (work of their peers). Grades (score, qualification) should show a combination of individual and group performance. It can facilitate achieving the task structure to require both individual and group work and ensure that way the distinction between individual work and group and reflected in a product that can be evaluated.

The wiki spaces, through the Virtual Campus can contribute to better development of these teaching techniques. In this web application, users can write, modify or delete contents while they share them. Teachers can evaluate more objectively the contribution of each member. The wiki spaces can offer different possibilities following the teacher design: they can be completely private (strictly group work) or in a more open option, allowing content to be seen by other colleagues. With this tool we can achieve several goals: group work (private area), cooperation (division of labor), teacher and student communication (continuous review of the material and the possibility of virtual tutorials), motivation in students and continuous assessment not only by the teacher but also self-assessment among students.

Using the wiki tool improves the teaching experience in the following dimensions [4]:

- Visualization and monitoring of the process: in addition to the product, the wiki allows to monitor the production process work. The page history is especially interesting, and identifies how people from different groups collaborate in the work of others. The collaboration between groups is an important consideration, since it represents a "peer-to-peer" learning element recognized as a teaching tool because of the diversity present in the skills of participants.
- Specificity of feedback: the tool offers the possibility of incorporate specific information and comments about the work.
- Reduction linearity teacher - student: wiki tool facilitates cooperation group as a whole, reducing the directionality of the relationship between teacher and student and promoting more active participation

Resources offered by Internet promotes flexible teaching methods and the wikis facilitate joint projects and promotes the creation of “constructivist learning environments” (Wilson 1996) [5].

1.1 Academic context (Pediatric Dentistry: Pediatric Dentistry I and II subjects)

Pediatric Dentistry matter provides the Degree in Dentistry student skills that allow him to carry out "the planning and Implementation of pediatric dental treatment of limited complexity in pediatric patients". Those skills are developed progressively in 2 academic years. In third grade, through Pediatric Dentistry I (6 ECTS) subject, and based on simulated practice, students acquire the basic pre-clinical skills prior to join clinical activity in pediatric patients, which is developed along 4th year (Pediatric Dentistry II, 12 ECTS).

The design of both subjects distributes the training time student in 3 activities:

1 Educational activities, which follow a more traditional structure based on the transmission of knowledge to the student.

2 Practical activities, which aim to progressively develop the skills required by the student for dental care for children.

3 Student activities, seeking to develop a more autonomous work him to lay the foundations of learning that will continue throughout his life (Lifelong Learning).

1.1.1 Student Activities

Since the introduction of the Degree in Dentistry we considered very important the active work of the student under the guidance of a tutor in the training process. It is the basis to assume a more responsible role in this process, and that it extends throughout its entire life.

This active participation in the course of Pediatric Dentistry I is embodied in the performance of work for bibliographical updates, the student performs and in small groups. It represents an important individual work and started a collaborative work. In 4th year (subject Pediatric Dentistry II) through the PBL we require the student a greater effort to learn to cope as a capable professional to identify and solve problems, understand the impact of their own performance, interpret data and design strategies to apply them in clinical reality.

2 OBJECTIVES

Encourage the active participation of students in the subject through an open space to publish their work and contributions.

Contribute to improve other learning (Problem Based Learning).

Develop and implement the resources the Moodle platform provides through the Virtual Campus of the UCM.

Update and disseminate knowledge to other interested students.

3 METHODOLOGY

At the beginning of the course he was assigned to each group of 4 students:

- A tutor teacher;

- A problem for study and resolution (presenting their peers with a final document);
- A wiki space that will help them throughout their development by facilitating individual and collective contributions;

After the experience, students have been able to carry out the resolution of the problem, an audiovisual presentation of it to their peers and produce a final document of the group who collected their individual contributions, and was discussed / evaluated / edited by other groups.

Work was carried out in 2 phases, imbricated in time:

1st Application of the methodology of Problem-Based Learning (PBL), which follows the steps:

1 Description of the problem (by the teacher).

2 Formulation of relevant issues (teacher) to achieve the expected goals of knowledge.

3 Set goals to achieve knowledge (related questions).

4 Distribution among students group the objectives and tasks to achieve them.

5 Development of individual tasks related to the objectives of knowledge.

6 Coordination (teacher) of individual tasks for final resolution.

7 Preparation of a document of conclusions with the problem solved (delivered to peers).

8 Presentation audiovisual group for discussion.

2nd Creation and integration of the PBL SPACES wiki activity at the beginning of the course.

A wiki space was create for each working group. At the beginning spaces have been "closed" to the work of each group. All wikis for group work present the same structure. In the home page of each wiki was seen the problem posed and the distribution of the objectives of knowledge among students PBL group.

Integrating wiki:

1 Individual work: at first, each student includes progressively its individual contribution on separate pages (in relation to step number 5 of PBL).

2 Collaborative work intragroup: Teacher studies individual contributions and arranges coordination meetings to coordinate tasks. A wiki is open to work together in order to produce a final document (in relation to step number 7 of PBL).

3 Collaborative work intergroup: wikis are finally opened to collaborative work and evaluation of other groups. This last phase has been done after the audiovisual presentation of PBL (step 8) so that discussion between students can allow a final enrichment elaborate work, allowing participation of any student.

4 RESULTS

Problem based learning (PBL) is a teaching and learning strategy where knowledge and development of skills and attitudes are important. Its application in the field of pediatric dentistry enables students to identify, analyze and solve problems of oral health in pediatric patients effectively and efficiently.

The main advantages of the implementation of the PBL in the course of the 4th year of the Degree of Dentistry, Pediatric Dentistry II, have been varied:

- Promoting teamwork, which serve students in their incorporation into clinical activities, as these are not individual.
- Developing the student's ability to solve problems. The tutor provides data exploration or treatment of child patients to be solved by the students through proper diagnosis and appropriate treatment given.
- Developing student clinical skills will enable to better perform their future professional work.
- Stimulating student motivation.
- Helps develop research skills; since it requires citations to justify the resolution of the problem is provided.

However, in applying the educational system PBL Pediatric Dentistry II, we have also arisen certain problems, we will specify, as affecting students or tutors:

Students:

- Receive the description of the problem globally. That is, they are faced with a situation and must be answering questions about it in different phases. When the first responses are not adequate, the rest will be also wrong, which poses a serious problem for student learning.
- Choosing team members: If students do not participate in the organization of groups, generally, the final work is affected negatively.
- Difficulty in the availability of physical space for the sharing and development work as well as temporal coordination team.
- Complexity in the distribution of tasks within the team and ensure that there is an equitable and qualitative participation of each member, to avoid an opportunistic attitude of some students.
- A group member must assume leadership of the team, regardless of the willingness or voluntariness of it.
- The integration of some students in the assigned team is not always appropriate, since the level of interest and training can vary.
- Need to support with sufficient theoretical knowledge and updated scientific level to justify the resolution of the problem.
- Poor use of the final results.
- Obtaining an overall rating based only on the final presentation.
- Lack of discipline in handing the tasks in the stipulated time frame.
- Being autonomous in their learning, students tend to acquire knowledge easily accessible sources on the internet and with little scientific bases.

Teachers:

- the system requires increased monitoring and dedication by the teacher, as the results obtained in solving problems should be part of the educational training not only the group, but the rest of his teammates of the subject.
- Problems regarding fluid communication tutor-group as the face tutorials in college limited to a few hours a week.
- Unequal communication with group members.
- Difficulty in correcting if there is no compliance deadlines for submission of work by students.
- Difficulty to individualize assessment of each member of the group, since no tools available for it.
- At present globally, it is not possible to carry out an assessment of each of the phases of problem solving.

5 CONCLUSIONS

Educational changes that are leading to the passage of a teaching based on the transmission of knowledge, around the figure of the teacher towards a student-centered system and the development of competences that enable it to better perform their future work professional, they have been favored with the addition of Internet teaching. Educational platforms integrated into the Virtual Campus of Universities provide a set of web tools that make our teaching and student interaction. They contribute to the development of teaching learning processes complementing or presenting alternatives to traditional education. They are considered key in this process of transition and innovation.

When the wiki is used as a tool to support collaborative work, monitoring and individualized assessment of student work is achieved. Wiki system facilitates teacher-student interaction and requires the participation and collaboration of all components of the working group, since it is not necessary to appoint a responsible. The tool also promotes student engagement with learning, developing their critical capacity.

It contributes to the construction of knowledge and problem solving gradually and sequentially. That is, students are solving phases or issues proposed by the tutor and only to be overcome, are allowed to move forward and achieve full resolution of the problem. It also develop critical capacity of the student to be able to comment freely on the content provided by each member of the group.

Therefore, the wiki can be a tool to facilitate and complement the use of PBL in the course Pediatric Dentistry II of the degree of Dentistry.

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