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CATEGORISATION OF THE INTERVENTIONS OF FACILITATING TUTORS ON PBL AND THEIR RELATIONSHIP WITH STUDENTS´ RESPONSE

Categorización de las intervenciones del tutor facilitador en abp y su relación con la respuesta del alumnado

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Abstract:

The modular structure of the Primary Education Degree in which the work has been done implies developing an Interdisciplinary Module Task (IMT) shared by the different courses in each semester. In our case, Problem Based Learning (PBL) was chosen as the methodology to develop the IMT. This work studies, on the one hand, the interventions of four teachers while tutoring groups of various sizes; on the other, the ideas stated by the students during the first tutoring session at the first stage of PBL. This was audio and video-recorded. Different categories have been established to classify the interventions of the tutors, and the number of interventions of each type for each of the tutors has been quantified. The categories for the ideas posed by students have also been identified and the participation of the different students on the categories has been analyzed. The results show that the categories established are suitable for differentiating the interventions of the tutors. Besides, when putting together the types of interventions of the tutors and the ideas posed by students, it can be seen that interventions of dynamization can generate a diversity of ideas from students, and that interventions of a learning type foster the sharing of ideas. Guidelines are proposed to intervene as a facilitating and not leading tutor on a PBL based IMT, so as to foster students' autonomous learning in an effective way.

Key Word: ***Preservice teacher, Problem Based Learning,Teacher role, Tutoring.***

Resumen:

La estructura modular del Grado de Educación Primaria en el que se ha trabajado supone la realización de una Tarea Interdisciplinar de Módulo (TIM) compartida por las asignaturas que se imparten en cada cuatrimestre. En este caso, para la realización de la TIM se adoptó la metodología Aprendizaje Basado en Problemas (ABP). En este trabajo se analizan, por un lado, las intervenciones de cuatro docentes que tutorizan a grupos de diferente tamaño y, por otro, las ideas aportadas por el alumnado, durante la sesión de tutorización de la primera fase del ABP, que fue grabada en audio y vídeo. El análisis ha permitido establecer categorías de intervención y contabilizar su frecuencia para cada tutora o tutor. Se han identificado, también, categorías de ideas del alumnado y su participación en el planteamiento de cada una de ellas. De los resultados obtenidos se puede concluir que las categorías construidas han sido adecuadas para discriminar las intervenciones de los tutores. Además al contrastar los tipos de intervenciones de cada tutora o tutor con las ideas aportadas por el alumnado, se observa que las intervenciones de dinamización generan diversidad de ideas del alumnado, y las de aprendizaje, que éstas se compartan. Se proponen pautas de actuación de tutorización facilitadora no dirigista en una TIM con metodología ABP, con el objetivo de dinamizar e impulsar de manera más eficaz el aprendizaje autónomo del alumnado.

Palabras clave: ***Aprendizaje Basado en Problemas, Formación del profesorado, Rol del profesorado, Tutorización.***

1. Introduction

The active methodological approach is customary in the teaching-learning process within the university environment since the establishment of the European Higher Education Area (EHEA) curricula.

The educational centre where the authors develop their work is no exception. For this reason, Primary Education, Infant Education and Social Education Degrees have been organised in semester modules that include complex issues related to the students' future educational tasks. The faculty who teach in each semester are organised into a teaching team who annually design and revise an Interdisciplinary

Module Task (IMT). Thus, besides their courses, students develop an IMT around a topic that they will be analysing from the different course perspectives each semester (Karrera, Zulaika, &Aldaz, 2014).

In order to undertake such a task, students form groups, and each group is tutored by a faculty member (Uskola et al, 2015). The methodology used is Problem-based Learning (PBL), as it fosters an increasingly autonomous reasoning of the questions arising from the analysis of complex problems. The tutors' task is to enable this process, taking into consideration that they are "non-experts" in the topic, except in one of the fields that the task involves.

The aim of this work is to delve into what characteristics should define interventions that seek facilitating tutoring, when tutors are "non-experts in the content", of an interdisciplinary task. This will be carried out through the analysis of recordings of the tutoring sessions during the first stage of the PBL.

2. Theoreticalframework

2.1. Problem-Based Learning (PBL)

PBL was first developed in the Faculty of Medicine at the McMaster University in Canada during the 1960s (Branda, 2001). Its main objective was to improve the quality of medical education through the development of the necessary skills, attitudes and values for the students' personal and professional development. In order to achieve this end, the curriculum was organised on the basis of problems within the context of real life that allowed integrating different fields of knowledge. Nowadays, this method is used as a didactic strategy in other fields of knowledge in university education, adopting different perspectives (Savery, 2006). This work goes along the lines of the McMaster model.

PBL is a student-centred teaching-learning strategy that envisages giving students autonomy and responsibility in their own learning process. It consists of three basic stages: problem analysis, self-paced and collaborative learning and presentation of reports (Chng, Yew, & Schmidt, 2011). During the first stage, students examine the problem in groups and try to give explanations based on their previous knowledge; at the same time, students identify what questions need to be answered and what learning is needed in order to understand and resolve the problem. During the second stage, students seek the relevant information to learn according to the questions raised. At this stage, the students share the information in their groups, and fine-tune their initial ideas and questions. Thus, the construction of knowledge is the result of the work carried out individually and the group collaborative work. The process is completed with the issuing of the corresponding report.

There are three essential elements in PBL methodology: problems, students and tutors.

Problems are the teaching material presented to the students to initiate the learning process. Problems present situations or phenomena in real life contexts that students need to deal with through seeking, discussing and comparing information, on the basis that the problems presented do not have a single solution (Hmelo-Silver, 2004).

In PBL students are at the centre of the teaching-learning process. Through this learning strategy, students construct knowledge in a collective manner as they participate in the group discussions. Students learn through the problem-analysis reflecting and exchanging ideas with their group mates (Hmelo-Silver & Barrows, 2008).

The faculty have the role of guiding and facilitating throughout the process of knowledge construction, without being the source of information or contributing directly to solving the problem. The tutor's role is to help students relate their previous knowledge about the problem with the existing knowledge, integrate different perspectives and scientific principles, develop critical thinking, provide opportunities for constructive discourse, guarantee effective group dynamics and ultimately facilitate the process of knowledge construction for all students in general (AlHoqail&Badr, 2010; Morales & Landa, 2004).

2.2. From teacher tutor to tutor facilitator

In PBL the competences of the faculty are extended, so that organization and planning of tutoring actions are one of these competences (Mas, 2011). However, the tutor should "facilitate" the process of knowledge construction for students, and, as Branda states, this is not an easy task. *(…) I found it hard to shift from teacher who teaches to tutor who facilitates. I was justifying my interventions using words such as lead, lead back (…) all these euphemisms reflected my need for control and avoid uncertainty* (Branda, 2011, p. 152).

Defining what is meant by "facilitate" would hence be one of the first tasks that should be undertaken. Being a facilitator is not about responding to students' anxiety or to their doubts on *what are we supposed to do? What should we study?* Likewise, it is not about delivering the learning objectives at the beginning, limiting their creativity, or stopping them from making mistakes. "*The impulse of taking care, so deeply rooted in the teacher's role" does not seem the best advice if we want to be a "facilitator*" (Branda, 2011, p. 152).

Learning autonomously, that is, being able to analyse a problem and reason in an increasingly independent way from a set of questions arising from the analysis of complex problems is one of the main aims of PBL methodology. However, since this way of approaching knowledge seems to pose a certain degree of uncertainty, some tutors have created superstructures that, applied to PBL, have likely decreased its quality (Branda, 2011). Ultimately, getting students to learn in an independent way involves rethinking the process of teaching-learning and especially redefining the role of the teachers.

There are different models of tutoring, although different studies seem to support the idea that the action of the "non-expert" tutor better conveys a non-interventionist attitude, while at the same time fosters the students' autonomy (Hmelo-Silver & Barrows, 2006; Schmitdt & Moust, 2000). In any case, different styles of tutoring have been characterised according to the students' responses and output (Chi, Siler, Jeong, Yamahuchi, & Hausmann, 2001; Chng et al., 2011, Maudsley, 1999, 2003; Zhang, Lundeberg, McConnell, Koehler, & Eberhardt, 2010).

In line with Branda's observations (2011), some authors note that when students require a deeper knowledge the tutor asks open questions instead of focusing on informing and explaining (Chi et al., 2001). They also studied more in detail different aspects of intervention in a learning process, and concluded that the top influencers in the process were: content knowledge, social congruence and cognitive congruence. They also indicated that mastering the subject (content knowledge) and the capacity of giving students an understandable and friendly explanation (cognitive congruence) are relevant aspects in the educational interaction of the tutor facilitator, but social congruence (the capacity of establishing empathic communication with students) is what seems to have a greater impact in the students' learning process.

Dolmans et al. (2002) carried out research on what types of intervention are more typical of tutors who are "expert" and "non-expert in the content", and concluded that the latter use social congruence better. Because they are not experts in the content, they place less attention on this aspect and more in facilitating the process, thus achieving a more empathic interaction with the students. Creating a good atmosphere for educational interaction enables students to express more freely, perceiving that there is not just one right way to answer the questions posed. As a consequence, students perceive less pressure to succeed and can better appreciate the process and accept mistakes as part of the process of knowledge construction.

2.3. Discourse analysis during tutoring with tutors facilitators

During the tutoring sessions in a PBL process students pose questions and construct knowledge through discussion of ideas. Thus, the discourse taking place during these sessions is key for the process. Cazden's (1991) discourse analyses show that the predominating pattern in the classroom is teachers ask questions, students answer and then teachers evaluate the reply. However, peer cooperative interactions have been proven to enable problem solving, so the tutor facilitator's task should be to intervene to foster cooperative interactions and for these to be productive. Thus, Branda and Lee (2000) classified the tutor's interventions into six categories (Steers, Informs, Confronts, Challenges, Educates and Shares) placing them on a continuum from what they came to call *hierarchic tutoring* to *facilitating tutoring*. Although they acknowledged that different situations require different interventions, they concluded that the last three are the most desirable to facilitate autonomous learning in students.

Few studies have analysed in detail the tutor's interventions during tutoring sessions in a PBL process (Zhang et al., 2010), although some studies have been carried out in different contexts. For example, Chi et al. (2001) carried out an extensive study on individual tutoring sessions of one and half hours on the human circulatory system. In a first stage of the research they analysed the tutors' and students' interventions and found that more interactive interventions favoured learning further, but the tutors' actions (including explanations) generated shallow responses and shallow learning. This led them to carry out a second stage of the research, with the aim of modifying the tutors' actions to generate more in-depth responses and learning. Thus, tutors were instructed not to give explanations or feedback, or information, and to prompt dialogue and constructive responses. During the second stage students gave more in-depth responses, as they were given more opportunities to be constructive.

The relevance of open metacognitive questions was also found in the context of a PBL process with Medical students by Hmelo-Silver and Barrows (2008). In their case, tutoring took place with groups of 5 students who were used to the PBL methodology. They analysed the first two tutoring sessions and categorised the tutor's questions and students' interventions on the basis of individual tutoring analysis framework. The tutor's questions were categorised into three groups, two of which (long and short responses) were about contents (Chi et al., 2001); the third category (meta) was the predominant (75% of tutor's interventions) and it contained the questions referring to the group dynamics and to clarifying issues. They considered that this strategy created the right climate to foster collaborative learning and that further studies in different contexts were necessary. Zhang et al. (2010) contributed to develop a model of analysis of group tutoring in PBL, and they did so in a context of teacher training different from Medicine, where PBL processes are the norm. Participants were 35 teachers who had a group of highly experienced facilitators. Researchers analysed the type of interventions (questions) posed by facilitators, during the first two sessions of tutoring of three problems. They found that the most recurring were oriented to reframing ideas and reformulating questions, and concluded that there is not just one successful model of facilitating, but this should adapt to the type of students and their previous knowledge of the PBL process.

There seems to be more than one successful facilitating model. Among other reasons, the different experiences of students with this type of work create different needs for facilitating tutorship. Moreover, when defining the characteristics of a successful tutor facilitator model, both in students' interpersonal skills and in the knowledge content, the variable of previous experience should be taken into account (Kassab et al., 2006).

In this work, we aim to delve deeper into the characteristics of group tutoring by teachers who are "no experts in the contents" who work in a modular interdisciplinary in a teacher-training centre, to make it more facilitating. More specifically, we focus on the first stage of the PBL process, in which students examine the problem in groups and try to give explanations based on their previous knowledge,

while they identify the questions they need to answer and the learning needed to understand or resolve the problem posed.

The main question we try to answer is: is teacher behaviour different in a facilitating tutoring from what we know from previous studies in other contexts? (Branda, 2011; Chi et al., 2001; Hmelo-Silver & Barrows, 2008). The necessity that the tutor's interventions are open questions and mostly referred to the group dynamics and question clarification, rather than informative and explanatory seems proven (Branda, 2011; Chi et al., 2001), as is the need for questions to focus idea reframing and question reformulation (Zhang et al., 2010). In the same way, we seek to corroborate if "non-expert" tutors pay more attention to the process than to the contents (Dolmans et al., 2002).

So the research questions are:

- how are the interventions of the tutors studied?
- what are the ideas posed by students in these groups?
- which is the relation between tutor´s intervention and the production of ideas by students?

With the aim of characterising a successful facilitating tutoring, we have considered student participation, the number of ideas expressed and their proximity to the expected learning outcomes in the proposed interdisciplinary task.

3. Methodology

The study corresponds with the tutoring of Module 2 of the Degree in Primary Education Teaching, called "School and Curriculum", offered in the first year, second semester. The chosen topic by the faculty team of this Module is "The role of the Primary Education Teacher in situations of consumption". In order to carry out this task, each course in the Module gives away one ECTS credit, so that the IMT has an overall workload of 5 ECTS credits.

The task is divided up into two parts. In the first one, students undertake the analysis of a scenario/problem following the PBL methodology. The scenario showed a situation in a fourth grade classroom where a student arrived carrying a brand new and fancy knapsack and a discussion among students started. Analysis of the problem is undertaken from the perspective of the five courses in the module (Natural Sciences in the Primary Education classroom I, Teaching Social Sciences, Mathematics and their Teaching I, Psychology of Education and General Teaching). In the second part, students design a proposal of educational intervention on the basis of the analysis carried out.

The expected learning outcomes in this stage of the IMT are as follows (see Table 1):

Table 1
IMT learningoutcomes.

	LearningOutcomes
1	Develop a responsible consumer culture
2	Identify market mechanisms
3	Understand our responsibility as consumers in the final results of our economy
4	Value the importance of advertising in consumption and the economy
5	Approach the situation put forward from different real-life experiences
6	Acknowledge and understand that certain consumption habits influence resource exhaustion, residue production and contamination
7	Be aware of the influence of certain habits on the health and gender inequality

3.1. Participants

The teachers carrying out this research belong to the Departments of "Teaching of Mathematics and Experimental Sciences" and "Developmental and Educational Psychology". The teachers participated in several training courses and consultations on PBL methodology, cooperative learning and facilitating tutoring. During academic year 2013/14, they tutored 5 groups; due to technical problems, the results presented correspond to 4 of the groups, with a total 39 students. The four tutors analysed have been named T1, T2, T3 and T4, and the students have been called S, preceded by the corresponding tutor. T1 tutored 4 students (T1S1 to T1S4), T2 tutored 5 students (from T2S1 to T2S5), T3 tutored 16 students (T3S1 to T3S16) and T4 tutored 14 students (T4S1 to T4S14).

3.2. Procedure

Data have been collected from audio and video recordings during the brainstorming stages after reading the problem/scenario in the first tutoring session.

The categories of tutors' interventions have been established, on the one hand, according to previous studies (Branda& Lee, 2000; Hmelo-Silver & Barrows, 2008; Zhang et al., 2010), and on the other, by contrasting these with the data obtained. With this aim, all five team members proceeded to visualise and analyse the recording of two tutors, T1 and T3. Later, the recordings of T2 and T4 were analysed separately by two team members, reaching consensus in the cases of divergent interpretations.

All interventions for each category have been identified and recorded. On occasions, there are interventions of different types during the same speaking turn. Moreover, when interventions are answers to questions or demands made by students, we added "i".

All ideas, questions and comments contributed by students, which were related with the problem/scenario have been identified, and categories have been established

to group those that were related. In order to know to what extent the groups share ideas and questions, we counted how many different students participate in posing each one of them.

In order to establish the categories mentioned we took into account the expected learning outcomes on the one hand (see Table 1), and the data obtained on the other. For this purpose, all five team members visualised and analysed together the recordings of one of the tutors, and then the rest of recordings were analysed independently by each of the group members, reaching consensus in the cases of divergent interpretations.

4. Results

The different categories are shown below with examples for each of them.

- A: Contextualisation. It contains interventions about the tutor's presentation, clarifications on the recording and on belonging to the research group.

Tutor/Situation	*Intervention*
T1, at the beginning of the stage analysed.	Excuse me, I understand that you have read the cases. During this short time you have been reading them, you've even thought about choosing another one.
T4, when a student asks why they cannot choose the scenario.	Yes, in this case you will all work with this scenario.

- B: Task presentation: Group interventions related to the particularities of the PBL methodology, the task to be undertaken during the session (reading about the scenario, giving ideas...) and what is sought.

Tutor/Situation	*Intervention*
T2, close to the end of the stage, when students have put forward different ideas, tutor intervenes so that they organise them.	At this point I think you have already got a few issues, and now the question would be what are you going to do with all this…? How are you going to manage the amount of things you have got, with a view to getting started with the work ahead?
T4, when a student asks if they have to formulate a hypothesis like they did in last semester's IMT.	The methodology has some nuances; you don't have to follow set steps. At this moment you have read (the scenario), each one of you will have their own thoughts on what to research, what this suggests to you, what experiences… You will now comment on it all together to have a larger number of ideas.

- C: Group dynamisation: When interventions envisage student participation, either with direct prompting or asking for ideas.

Tutor/Situation	*Intervention*
T2, asking a student directly.	What do you think, T2S1?
T3, demanding students' participation and ideas.	What else?
T4, encouraging people who haven't intervened to do it.	But a lot of people are quiet, and I'm sure they have ideas.

- D: Learning process: Interventions in which the tutor points at an idea, brings back an idea, asks about one of the ideas given in order to clarify it or elaborate on it.

Tutor/Situation	*Intervention*
T3, repeating the ideas that students have mentioned. T3, to ask about the degree of agreement with the ideas mentioned.	What do you need to add? She mentioned the parents, you mention television… Do you agree?

- E: Social congruence: Gathers interventions related to creating a close and empathic environment with students.

Tutor/Situation	*Intervention*
T1, when students comment on the task completed during the previous semester, when they visited a school, and the tutor shows interest to know who had been there.	The three of you were there... You two and Miguel, who's not here this year.

- F: Valuation: These are interventions expressing value judgements.

Tutor/Situation	*Intervention*
T3, valuing ideas as interesting.	That's a lot of ideas!; Interesting ideas keep appearing!

- G: Guiding or directive intervention: Interventions where the tutor puts forward their own ideas or tries to guide the group in a certain direction, with the aim of influencing the group with their opinions.

Tutor/Situation	*Intervention*
T3, introducing a topic the groups had not even thought about.	What if I say to you: Have you seen that "copies of brands" are being sold in the street. They sell lots. What do we make of this?

- H: Others: Interventions that don't appear in the categories mentioned.

The number of interventions in each of the categories made by each of the tutor teachers is shown in Table 2. The time devoted to the brainstorming in the first stage of the PBL tutoring is also indicated.

Differences in the quantity and the type of intervention of each tutor can be observed, although the time employed at this stage of tutoring is very similar.

Table 2
Number of tutors' interventions by type.

	T1	T2	T3	T4
TIME	27'	27´	29´	21'
Categories				
A	2			
Ai				4
B		1	1	4
Bi		2		11
C		4	25	6
D			25	
E	1		2	
F			5	2
G			9	
H	1		1	
TOTAL	4	7 (2 i)	68	27 (15 i)

T3, who carried out a broader contextualisation of the task, has only one intervention of type A or B, while the rest (T1, T2 and T4) have half or more of their interventions of type A and B.

Not taking into account interventions prompted by students, T1 and T2 intervene only on a few occasions, four and five respectively. T3 and T4, who tutor larger groups of students, intervene more often. It is significant that the number of interventions by T3 is five times higher than that of T4. It is also remarkable that most of T3's interventions are type C and type D.

4.3. Ideas contributed by students

Ten categories have been established (see Table 3) to classify the ideas offered by students. Examples of students' contributions are shown in Table 3, with ideas for each of the categories.

In the category "Education" we include all the references to school, education and the teachers' interventions. Expressions around how students feel about their group, their self-esteem, etc. have been grouped. Students ask themselves about the role and the values acquired from the family ("Family influence"). All the ideas about the importance of messages from the media have been grouped along with advertising messages in "Advertising and media". Ideas referring to gender differentiation have been grouped under "Gender". Explicit references about the "Importance of brands" have been differentiated in a category with this name. On various occasions students have noticed the ages of the students in the problem and have taken this into account as a variable to consider ("Age"), and have wondered whether the problem changes in any way according to age. Comments about product quality have been differentiated ("Quality") and so has the possible relationship between price and quality; that is,

shopping criteria not based on a brand. On the contrary, ideas related to offering a certain image, and the prestige that certain products give, as a shopping criteria, have been included within the category "Appearances/ Image/ Prestige". Finally, ideas focusing on the consumerist society, the capitalist system, the importance of money within the system, are gathered in the category "Capitalist system".

Table 3
Categories of ideas put forward by students.

CATEGORY	EXAMPLE
1 Education	T3S4: We cannot changes classes, but as teachers, we can change perception and the critical capacity.
2 Self-esteem and belonging to the group	T1S2: He feels inhibited.
3 Family influence	T4S14: What are parents going to do?
4 Advertising and media	T4S13: He says, because it's on television, it's better.
5 Gender	T1S1: Roxy is for girls.
6 Importance of brands	T2S3: (…) in the end the brand is what attracts you, because he could have bought another one.
7 Age	T2S1: Also what happened in fourth year; maybe this doesn't happen in first year.
8 Quality	T2S2: My criteria when consuming is usefulness and price, and immediately after, it's aesthetics; but you pay for everything, you pay for aesthetics too.
9 Capitalist system	T3S9: In my opinion it's the capitalist system's fault. That is, consumerism is at the basis of this system, they take benefit from this consumerism. Society will do everything possible to encourage consumerism (…)
10 Appearances / Image / Prestige	T3S8: To have an image.

The results of the groups of the four tutors analysed can be seen in Table 4. The first row contains the total number of students in each group; the second row has the total number of students actively participating in posing questions and putting forward ideas related to the problem. The following rows contain the number of students and groups that participate with ideas and questions for each category.

Table 4
Number of groups and students participating in posing questions and putting forward ideas for the different categories.

	T1	T2	T3	T4	Number of groups	Number of students
Students	4	5	16	14		
Participants	4	5	16	6		
1 Education	4	4	14	5	4	27
2 Self-esteem and belonging to the group	4	3	7	2	4	16
3 Family influence	1	4	8	2	4	15
4 Advertising and media	3	2	3	3	4	11
5 Gender	3	2	1	2	4	9
6 Importance of brands		2	7	1	3	10
7 Age		3	5	1	3	9
8 Quality	3	3	2		3	8
9 Capitalist system		3	6		2	9
10 Appearances/ Image/ Prestige		1	5		2	6

As can be observed, there are topics that appear in all groups: “Education”, “Gender”, “Advertising and communication media”, “Self-esteem and belonging to the group” and “Family influence”. “Education” stands out, as virtually all students in every group put forward ideas in every group discussion. The other categories of ideas have only been obtained in two or three of the groups.

If we compare the categories of ideas of students with the expected learning outcomes, it emerges that in this brainstorming stage all the expected ideas are put forward, except those related with acknowledging and understanding that certain habits of consumption have an influence on resource exhaustion and the generation of residues and contamination, the sixth expected learning outcome.

The category “Education” is related with references to the responsibility that students will have as future educators faced with situations such as teaching responsible consumption. As we have mentioned before, this category stands out in all groups, which means that the scenario designed, which is a classroom situation, is appropriate for students to place themselves into this role.

Categories “Capitalist system”, “Importance of brands”, “Quality” and “Appearances/ Image/ Prestige” are examples that students focus on obtaining the expected learning outcomes related to developing a culture of responsible consumers; identifying the market mechanisms and understanding the personal responsibility as consumers in the final outcomes of the economy. These are related to the first, second and third learning outcomes.

Assessing the importance of advertising and the media, the fourth expected learning outcome, is related with the category called “Advertising and communication media”.

The category “Gender” is explicitly linked with being aware of the influence that certain consumption habits have on gender inequality, part of the seventh expected learning outcome.

The fifth expected learning outcome appears indirectly within the categories “Self-esteem and belonging to the group” and “Family influence”, as it cannot easily appear in an elaborated way in the initial brainstorming session to identify the scope of the work.

Regarding the degree of idea sharing within groups, and taking into account the number of students participating in each category, we observe that in T1’s group, five out of six categories of ideas are shared by half or more of the students; in T2’s, six out of ten categories are shared; in T3’s, with 16 students participating, four out of ten categories are shared. Finally, T4’s group, with 14 students but where only 6 participated, in only two categories do at least half of the 6 participating students share ideas.

5. Discussion of results

Regarding the number of interventions by the tutor, the fact that T1 and T2 intervene only in few occasions may be due to the fact that fewer students prompt more participation. In fact, all students participate in these groups (see Table 4) and tutors don't need to intervene too much to keep the group dynamics going.

However, in big groups (T3 and T4) the situation is quite different as both tutors intervene more than in small groups. At the same time, T3 intervenes nearly three times more, which means that although the pattern has been followed, the intervention has been different.

Regarding the ideas put forward by students, the fact that these were related with nearly all expected learning outcomes seems to indicate that the scenario has been adequately designed.

In the case of small groups (T1's and T2's), although all students participate, we need to take into consideration that T1's group put forward ideas for six out of ten categories, and T2's do for all ten. Although we acknowledge that the group characteristics and dynamics are different, it should be noted that half of T2's interventions are for boosting group dynamics, while T1 does not make interventions of this type (see Table 2). Although interventions are very low in number, the types might have an influence on the diversity of the ideas put forward.

Differences are also observed in big groups. All students in T3's group participate, and they bring ideas for all categories, unlike T4's, in which nearly half of the students participate, and ideas are brought for seven out of ten categories. This can be related to the types of interventions made by each tutor. We need to take into account that T3, unlike T4, has had many interventions (25) encouraging students to participate. This could generate a diversity of ideas and not only participation, as has already been observed in small groups.

T3 also encourages the putting forward of clearer and more in-depth ideas, having made 25 interventions in category D. This could explain the fact that knowledge has been shared more broadly; in that 5 or more students participate building ideas form seven out of ten categories (see Table 4).

6. Conclusions

First, it can be concluded that the categories built have shown to be adequate to discriminate tutors' interventions. Contrasting these with students' ideas has also enabled to characterise facilitating tutoring.

Regarding the performance of the tutors analysed, and in spite of having had the same indications regarding group steering in the PBL methodology (Branda, 2011), interpretations made by each tutor of their own facilitating tutoring seems to be different. Thus, there are differences in the number of interventions of all four tutors analysed, one standing out noticeably. This difference could be due to how each tutor

interprets their facilitating tutoring, regarding that non-intervention gives students more freedom to participate. However, this circumstance should be further researched.

Regarding the types of tutors' interventions, the high number of interventions in types A and B by three of the tutors, who had contextualised the task to a lesser extent, underlines the need to extend contextualisation. Also, results show that type C interventions have generated diversity of ideas both in small and big groups, and that interventions of type D stimulate sharing ideas. These results are related with the conclusions obtained by Chi et al. (2001) and Zhang et al. (2010), in the sense that these types of interventions facilitate debate, search and autonomous construction of knowledge. However, these results differ from those obtained by Chi et al. (2001) and Dolmans et al. (2002) related to the significant importance of interventions related to social coherence, since this work obtained satisfactory results with hardly any intervention of this type.

Group size also seems to be a factor to consider, as it can explain that albeit for the few tutor interventions in small groups, all students participated. This is a result to be expected, as the influence of social control makes it difficult for more introverted students to intervene freely in bigger groups (Durkheim, 1976).

Another remarkable conclusion of this experience is that the expected learning outcomes can be obtained through facilitating tutoring (based on interventions on group dynamics and deepening of ideas), carried out by "non-expert" tutors when the task is interdisciplinary. It has also been observed that one of the learning results does not appear in any of the groups, which suggests the need to rethink the drafting of the scenario. However, results can be considered good, taking into account that students are not familiar with PBL methodology and they are used to more teacher-led tutoring.

The results confirm studies done around the characteristics of the tutor facilitator in other educational contexts (Branda& Lee, 2000). Although this study has peculiarities that make it different and innovative, and would not allow direct comparison with results from previous studies, it does add nuances and richness to the studies carried out to present. Few studies refer to the application of the tutor facilitator model in interdisciplinary activities and to comparing big and small groups in the literature reviewed. For all these reasons, we believe that the results and conclusions obtained in this work provide and advance the specific knowledge of "facilitating tutoring".

In the light of all the above mentioned we conclude that the influence of the actions of the "tutor facilitator non-expert in the content" in an interdisciplinary task seems rather important. Data let us also assert that actions that allow a facilitating non-directing tutoring, point at the tutor making a clear initial contextualization of the task and to intervene by dynamising and fostering group learning.

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