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Chat as a Tool for Social Knowledge Construction Using Asynchronous Discussion Groups in Economics Degree

María Teresa García-Álvarez
(University of A Coruña, A Coruña, Spain
mtgarcia@udc.es)

Laura Varela-Candamio
(University of A Coruña, A Coruña, Spain
laura.varela.candamio@udc.es)

Isabel Novo-Corti
(University of A Coruña, A Coruña, Spain
isabel.novo.corti@udc.es)

Abstract: The current higher education programs use information and communication technologies to conduct interactive teaching and learning activities. This paper creates an educational method based on an Interaction Analysis Model through the use of chats in higher education. Compared to the traditional functions of the chats in education, our proposal introduces discussions of current economic events and real cases. This contributes to develop the problem-based learning and leads to students not only to improve their knowledge but to develop skills such as teamwork or leadership, which should be important characteristics of a graduate in Business Degree. As a result, students transfer their knowledge to solve current case studies improving their interest in the subject greatly and, therefore, their motivation and the social knowledge construction of the whole group.

Keywords: Knowledge management, interactive learning environments, cooperative/collaborative learning, computer-mediated communication, human-computer interface, authoring tools and methods
Categories: L.2.0, L.3.6, M.0, M.9

1 Introduction

European universities are currently immersed in a new dynamic environment which highlights the importance of developing a teaching based on student-centred learning. This new approach is the result of the implementation of the Bologna Agreement to create a European Higher Education Area which has led to new ways of assessing students' performance in the current degrees1. Thus, a change in the role of teachers takes place. Traditionally, teachers have had transmission of knowledge as the main activity in the classrooms. However, nowadays, their roles have been radically modified in order to assist students in developing a new way to acquired constructive and relevant knowledge by themselves [Schire 2006]. Therefore, teacher's role acquires a new special significance in guiding students' learning process. Activities such as discussions groups to solve problems of real cases encourage active student participation and increase the communication processes through the use of both

virtual and physical resources [Huang 2010]. The introduction of these aspects will allow teachers the transition of a 'transmitter' role to another 'facilitator', which incorporates open and flexible curriculum, learning, dialogue and participation, guided participation and mutual learning [Penalva 2008].

In this context, information and communication technologies (ICTs) are taking a leading role. In the classrooms, the educational methodology was initially very simple, based on the use of video projectors (to achieve a richer transmission of the themes explained) and word processors (to speed up the editorial work) [Rigo 2009]. For students, tools were mainly based on the use of email for the transmission and delivery of information. However, at present, a wide variety of new ICTs has being developed which promote learning in the universities. Such technologies permit to have permanent digital information available (via Internet) and to develop a collaborative training using communication applications (such as email, chats or forums) that allows the transmission of knowledge.

The development of computer and emerging telecommunication technologies in recent years has led to a more efficient use of its possibilities in learning environments. Such learning environments are characterized by student-centered and, in particular, by the social knowledge construction, allowing greater interactivity as well as easy accessibility and distribution of information [Phang 2010]. However, it is convenient to consider the need to develop an adequate strategy for the integration of technology innovation in the educational model. Thus, the planning process requires a teacher to help identify the necessary technological devices to support the creation and transmission of knowledge required to obtain the powers set out in the correspondent degree.

Social software such as blogs and wikis has been finding their way into education allows students the automatic registration of discussions or messages during the learning process [Gomes 2009] [Hou 2009] [Wang 2009] [Lucas 2010]. The achievement of online synergistic interaction in social constructivist approaches to learning leads to 'deeper learning and is therefore pedagogically 'worthwhile'' [Schrire 2006]. Moreover, social negotiation is a key factor in the constructivist learning environments [Gunawardena 1997]. However, a review of recent studies referring the use of asynchronous discussions groups like blogs or chats in education highlight that these tools have had a limited development in the social knowledge construction Although this research technique is often used, standards are not yet established since the applied instruments reflect a wide variety of approaches. This analysis requires a deep theoretical and empirical base of the existing instruments in order to promote the overall quality of Computer Supported Collaborative Learning-research in terms of validity, reliability and the choice of the unit of analysis [De Weber 2006]. In order to solve these problems, the use of purely quantitative data must be complement with qualitative techniques to provide an explanatory dimension of the quality of the analysis model from a multiple perspective such as knowledge construction, critical thinking, based-problem solving, individual and socially distributed cognition or emotional expression [Hou 2008].

In this sense, it is very difficult to find asynchronous discussions groups in learning environments that reaches high quality interactions in the complex thinking stages. We found an only exception [Lucas 2010]. These authors develop an online learning regime through blogs in a postgraduate course of Multimedia in Education

with 56 students participating in the study. Discussions emerged from the interaction that resulted from the first message launched by the teachers and then students created another blog moderated by them. From the 752 messages coded, it has found a high participation not only in the first stages of the activity but even in the more complex thinking process of the latter stages. Authors conclude that these better results in the student participation in the complex thinking stages of knowledge construction process are consequence of the autonomous behaviour, contextualization of each case study, transfer of responsibility to students, the use of problem-based learning and inter-group collaborative work. From our perspective, the condition of imposing the participation in the blogs as a percentage of the course assessment becomes a key factor to explain the higher participation in the activity. However, despite of these improvements, they are also lacking automatic analysis tools towards the development of the right answer in the collaborative knowledge construction combining both qualitative and quantitative analysis.

This paper utilizes the Interaction Analysis Model (IAM) developed by [Gunawardena 1997] with the introduction of solving based-problem techniques to study the use of chats in the social knowledge construction in learning environments. This study was realized with a total of 85 undergraduates attending Microeconomics in the second course of the Degree of Economics at the University of Coruna (UDC). We conclude that the use of both techniques overcomes the problems of assessment of the social construction knowledge discussed above and provide good results in both qualitative and quantitative aspects in terms of increasing participating, critical thinking, student's responsibility, problem-based learning and collaborative work. Moreover, in our activity, students always reached the right answer to the problems showing in the blogs for each case study. This reveals that social knowledge is superior to the individual one and reinforces the motivation and formation of each particular student.

The paper is organized as follows. In Section 2, we provide an overview of the social construction knowledge within the virtual learning environments detailing those that refer the use of blogs. Then, we describe the asynchronous discussion group method using the IAM provided by [Gunawardena 1997]. In order to validate our educational methodology, in Section 3 we present our teaching experience using IAM jointly with the use of chats as a means of learning and assessment in the Microeconomics second course at UDC (Spain). After monitoring the social construction knowledge process, we analyze the assessment of the method and the main results. Finally, we summarize the conclusions of our work and the future research avenues.

2 Social Knowledge Construction in Virtual Learning Environment: Characteristics and Implementation Using IAM

Virtual learning environments refer to software systems designed to support teaching and learning [Martín Blas 2009a]. They are formed by a set of tools related to the rise of content, communication, management of groups of students, evaluation of content, the implementation of questionnaires, use of chats, blogs or wikis, etc. with the support of Internet. It is straightforward to see that the basis of virtual learning

environments is the ICTs whose development has allowed the establishment of three types of roles in teaching [Rigo 2009]:
a) The traditional function as a tool for students and professors to acquire a certain level of computer knowledge. These needs force them to take digital literacy.
b) The role of support and complement of the educational content. Thus, students need to develop new skills in the use of technologies that allow the collection and transmission of knowledge
c) The role of interaction between the various actors involved in education (teachers and students) in order to promote student learning. Thus, virtual learning environments promote staff skills to access, manipulate and share information.

However, ICTs themselves do not constitute the creation of knowledge. To do this, it is required a planning process that allows teachers to determine the technologies to be used in order to develop the learning process. Thus, it is necessary the teacher's role as mediator of knowledge. Moreover, virtual learning environments promote student self-activity and also mean greater responsibility for them. Thus, the student must determine which media to use and which learning strategies they will use to achieve the objectives of the subject in question.

These systems for learning management consist of different components, sections and technological means, such as: a) the display module to students, b) program components (which exposes the syllabus), c) the means of communication (such as email, chat, forums, wikis,…) d) learning resources (power-point presentations, links to interesting news on the net) and e) instructional units (through the development of material specifically carried out for students to achieve learning).

The main features that should include these virtual learning environments to promote student-based learning are the following [Boenu 2007]:
a) Interactivity. The students should be aware of the important role it plays in the learning process through the use of information technology and communication.
b) Flexibility. It requires the development of an adaptation of the curriculum as well as the content and teaching styles used in universities to e-learning platforms. Its implementation is not possible to traditional teaching, teacher-oriented, where the same is the main source of transmission of knowledge
c) Scalability. They information technology and communication, used in teaching, runs independently of the number of users (a small number or a large number of users)
d) Standardization. They tend to use the same platform for learning in different subjects allowing general track students' behaviour within the course.

Moodle is a learning platform characterized by comprising the combination of a number of tools that offer various functions, among which are learning, productivity, student involvement, support of the platform or the publication of courses and contents [Odzamu 2013] [Boenu 2007]. Thus, there are three different types of tools only needing a username and a password. The first ones refer to the support tools such as the authentication of users, the allocation of activities and the use of actions by each type of users (professor or student) by means of tutorials, user manuals or help system. The second ones are student-centred tools related to the involvement of students, indicating the course materials and the subject contents. The third ones are based on productivity-oriented tools where students find forum pages and timing-

schedules to update notices and messages and plan several activities during the course.

Experience has shown that the use of Moodle as a learning platform has various advantages and disadvantages. The main advantages are the removal of spatial and temporal barriers, resulting in flexibility in higher education, learning and continuous recycling of ICTs and ability to perform continuous assessment of learning acquired by students. However, we also have observed a number of disadvantages that may discourage learning through the use of ICTs such as that students must have a computer to use this learning system and the lack of motivation of the student as a result of making learning more isolated than traditional teaching. The first one does not constitute a disadvantage anymore since, in recent years, the majority of households have, at least, a computer at home. The second one can be solved introducing some collaborative work in the different tasks. Therefore, this type of e-learning platform is becoming a necessary element in the current development of teaching based on learning. Thus, it shows its widespread use with 330,000 registered courses in 160 countries in 75 different languages [Rice 2005].

In our case study, we have used the platform Moodle for students in University of Coruna (UDC), Spain. This is one of the platforms of e-learning web-based more widespread in education from the universities. It based on a course management system that allows teachers to create online learning communities and students access to the digital courses. UDC provides all students access to the platform Moodle which allows lectures to upload files with course notes, exercises and other activities and assess students using online tasks in a suitable framework.

In our methodological proposal we have combined the three aforementioned tools (support tools, student-centred tools and productivity-oriented tools) in a qualitative and quantitative scheme using IAM. In this sense, it is possible to provide some interesting options to generate asynchronous discussions groups to construct social knowledge. In particular, in section 3 we show with our educational proposal that online chats can contribute to assess in a more complete way the exchange of messages from users during the course for asynchronous communications rather than simply by providing a list of exercises and a file repository where students can upload their answers. The results of this methodology allow new activities and comments proposed by students generating a continuous feedback between professors and students and increasing the interaction and motivation in the whole group.

The interaction analysis model (IAM) involves social construction knowledge. Social construction knowledge can be defined as a foster learning through exploration, connection and artefact creation within a limitless learning environment. Knowledge is achieved as a product of communal relationships beyond the sum of individual minds. This way of learning involves a variety of alternatives where students are likely to select differentially and to move toward “approved” sequences, narrowing the range of alternatives through feedback and evaluation. Teachers can help as assistants recommending books and lectures but students will assume the control along the whole process. The incorporation of this model in our educational proposal allows assessing students while we provide a real case study at the same based on our teaching experience and taking advantage of the Moodle platform, as we will show in the next section.

Phases	Activities
Phase I	**Sharing and comparing of information** A. A statement of observation and opinion B. A statement of agreement from one or more participants C. Corroborating examples provided by one or more participants D. Asking and answering questions to clarify details of statements E. Definition, description or identification of a problem
Phase II	**The discovery and exploration of dissonance or inconsistency among ideas, concept or statements** (cognitive dissonance) A. Identifying and stating areas of disagreement B. Asking and answering questions to clarify the source and extent of disagreement C. Restating the participant's position and possible advancing arguments or considerations in its support by references to the participant's experience, literature, formal data collected or proposal of relevant metaphor or analogy to illustrate point of view
Phase III	**Negotiation of meaning/co-construction of knowledge** A. Negotiation or clarification of the meaning of terms B. Negotiation of the relative weight to be assigned to types of argument C. Identification of areas of agreement or overlap among conflicting concepts D. Proposal and negotiation of new statements embodying compromise, co-construction E. Proposal of integrating or accommodating metaphors or analogies
Phase IV	**Testing and modification of proposed synthesis or co-construction** A. Testing the proposed synthesis against "received fact" as share by the participants and/or their culture B. Testing against existing cognitive schema C. Testing against personal experience D. Testing against formal data collected E. Testing against contradictory testimony in the literature
Phase V	**Agreement statement(s)/applications of newly constructed meaning** A. Summarization of agreement(s) B. Applications of new knowledge C. Metacognitive statements by the participants illustrating their understanding that their knowledge or ways of thinking cognitive scheme) have changed as a result of the conference interaction

Table 1: IAM model by phases [Gunawardena 1997]

The IAM was first presented by [Gunawardena 1997] to discuss a topic of mutual interest through the social construction knowledge. The methodology is based on the exchange of messages by means of networked computers through five phases (Table 1) comprising from the simplest interaction group to the most complex thinking. Each phase includes a set of activities to check to what extent the knowledge achieved by means of the interaction among participants generates changes in the individual understanding and new social knowledge construction.

Further developments of this model have not demonstrated the expected results since the levels of complex thinking in the last stages (phases) were rarely achieved [Hou 2009] [Wang 2009]. Behind this failure is the highly structured format of the debate where some participants reach compromise on new point of views but the debate did not allow participants to evolve into more advanced phases of thought solving the participation with only a "yes" or a "no". Therefore, the analysis must be complemented with other procedures that can better illustrate the development of collaborative knowledge construction. Aspects such as the nature of topics [Hull

2009] [Wang 2009] or the assignment of specific roles to students participating in asynchronous discussions [De Wever 2009] [Schellens 2007] can influence the depth of online discussions and levels of knowledge construction leading to complex thinking.

One of the great advantages of virtual environments has been the student's role as an actor in the learning process and responsible of it. The theoretical justification using network-based software designed to facilitate group activities such as discussions or debates comes from the active learning paradigm know as constructivism, that is, environments in which students construct their own understanding of the source materials [Karahoca 2013] [Grenlaw 1999]. Therefore, the problem is to find the necessary environment to achieve this autonomous learning. Following [Bigss 2005] the necessary conditions to be carried out to get a good learning process are four: 1) a knowledge base with a clear structure 2) a suitable environment to enable the motivation, 3) students´active activity and 4) interaction between students. Quality teaching requires the application of knowledge to realistic cases and problems, which place students in real situations that can be applied to their future working life. This requires an active and critical learning of them [De Miguel Díaz 2006].

In this environment, the use of forums or chats can be used effectively as a natural framework for teaching critical thinking [Greenlaw 2003] and thus becomes an essential tool that has not always been given the attention it deserves. In our case, we used the chat for the group of students in Economic Theory (Microeconomics) of Business Degree. The big problem with these subjects in economic theory is, as its name indicates, its excessive theoretical foundation making them extremely abstract subjects for students. This degree of abstraction can be reduced by applying these theoretical concepts to the socioeconomic reality of the moment. In this sense, students of Economics identified as elements that should be added to the core in Economics degree: more training in building microeconomic models, a discussion of the methodological foundations of model-building, more emphasis on institutions to motivate and contextualize macroeconomic models and greater econometric practice rather than theory [Abito 2011].

The use of forums allows them to discuss real issues. This tool is especially important in distance education where the development of e-learning is essential, given the profile of students. The Open University is the further advantage of the development of new technologies and now has a virtual environment that includes interactive videos, explanations, guides, tutorials, etc. that includes the so-called interactive whiteboard, with a degree of development a lot higher than the college classroom. Within this environment, the use of chat rooms to interact with the teacher and other students is very common in the so-called 'interactive whiteboard'.

Chats and forums are traditionally conceived as an online space for discussion and a real-time source of information and news. Indeed, students have to up-to-date information about the different activities they have to carry out in order to follow the course [Martín Blas 2009b]. However, as we shall see, our proposal to encourage the use of chat in higher education is not limited to the typical function of solving class issues doubts but we have given it a higher value since it contributes to motivation and learning promotes student`s self-learning, increasing their interest in the subject and also their responsibility. Unlike what happens with other instruments, such as

tutoring, in which, in our experience, its use by students is not very common (even in the Open University) chats with student-interaction strength the interaction student-teacher and, as we will explain in the next section, the profile of the teacher as evaluator passes into the background, creating an ex ante self-evaluation by the student and an ex post one by the teacher.

3 The Use of Chat as a Means of Learning and Assessment through the IAM: Analysis of a Case Study

3.1 The interactive learning environment

In this section, we show our educational method by using chats in Moodle platform. Our proposal tries to build a virtual environment where students cannot only share their doubts or any issues about organization/schedule of the subject (as it has been used traditionally) but share knowledge and opinions to generate a real debate based on management and leadership models. It is a knowledge-based learning through computer and telecommunications technologies.

In our teaching experience, we have applied the IAM using chats in second course of Microeconomics of Business Degree in the Faculty of Economics and Business, at the University of A Coruña (Spain), during the course 2011-2012. A total of 85 undergraduates took part in the study. The asynchronous tool used was the chat and we consider messages as the unit of analysis, registering the percentage of coded messages in each phase proposed by the analysis model.

A virtual chat environment was created in Moodle where the teacher posted a various questions related with the subject that must be answered by students. The analysis model pursues students to apply the knowledge acquired in class to real scenarios that require collaborative skills. The novelty of our proposal is that there will not be individual answer to the questionnaire but the answer will be unique for the whole group. This requires the appointment of a reply to the questions from the group's overall response. Thus, it is encouraging a process of teamwork to force a single response based on the cooperation of everyone and avoiding a simple "yes" or "no" answer. Moreover, we do not follow a highly structured format. Topics are launched by the teachers and then a flexible interaction begins among students without previous schedules or rounds of targeted interventions. There is no a fixed number of contributions required in the chats but participation represented 20% of the course assessment. However, students have a deadline for the questionnaire. They will appoint a responsible partner to answer questions before the deadline but the final response to the questionnaire should be based on group consensus. This approach is in line with the requirements of the real companies, which are staffed by graduates of Business Degree (for instance, Deloitte, KPMG, etc). As pointed out [Biggs 2005], employers expect their employees not only be 'learned' in their field but also, increasingly, they expect to be able to work together, lead a group, communicate, think creatively, be socially committed, self-motivated, among others skills.

Figure 1 shows the functional diagram of the experiment. Teachers suggest a problem in the forum and students answer individually their responses to the same forum. If they achieve an agreed solution, the coordinator picks the agreement up and informs the forum they have got a joint solution to this particular issue. If there is not

any agreement, students still keep on discussing in the forum and continue to provide individual solutions. When it has reached agreement on all issues the coordinator makes a final report with the joint agreement.

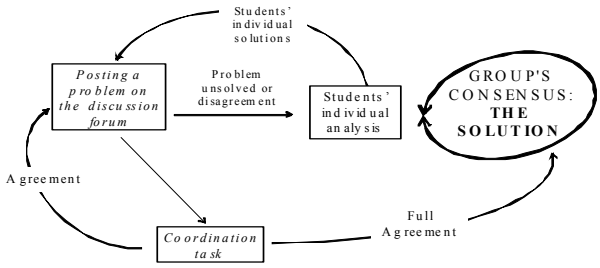

Figure 1: Diagram of the experiment

3.2 Analysis of the experience

Firstly, we posted in Moodle a hypothetical situation, where students must analyze some differential situations about market equilibrium solutions. In our particular teaching experience, we described an imaginary situation, related to a market where we supposed to be policy makers or business leaders, as the case study presented at the time. They must evaluate all possible solutions, the best situation in welfare terms, taking into account that their target is to achieve a Pareto's optimal situation. Anyway, they must also be aware about some inequalities that could arise. Then, students must evaluate and analyze the situation, in the light of the knowledge acquired in microeconomic theory.

In this context, each one must assume their individual personal work focused on telling their own opinion to their colleagues. That is to say, each student must study the situation carefully, to give their own evaluation the appropriateness of each of the scenarios. Then, they must offer a solution, writing it on Moodle platform, because the only way of communication with other students must be through the chat.

At this point, the interaction on-line begins: each student reported to her colleagues, via the chat, his own opinions, expressing their thoughts and possible doubts (if it is the case). In Fig. 2 we show a picture of the chat process, where it is possible to appreciate some students participation, showing their own opinions about the best way of solving a market equilibrium situation Throughout this process, teachers´ role is reduced to be a mere observer in the shadow. So, they only will actuate in the chat if students were not able to rise an agreement. In our case, teachers didn't make any interventions, due to the existence of a final agreement.

Students proceeded to an exchange of views and, finally, they achieved a shared solution. This solution would be the public policy to apply, in our imaginary scenario. At the end of the process, a student, chosen among all participants, is the spokesman for the group, and his role was to collect and put in a common position all opinions written on chat. With these common answers, such student filled a questionnaire, established by the teacher, which expresses the views of the group once they have reached an agreement.

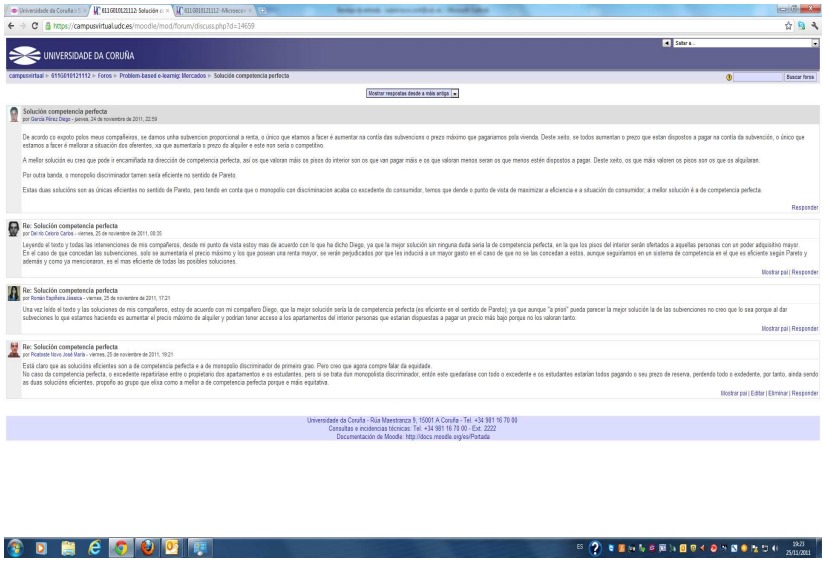

Figure 2: Chat participation of students, showing their own opinions about the best way of solving a market equilibrium situation

The questionnaire explains the situation in this way "*In the text that you have read, you found a special market situation, where you have some different equilibrium solutions: Competition, Monopoly, Discriminator Monopoly, equilibrium based on institutional grants. Your colleagues and you were asked to give the best solution for society, taking account that you must achieve the Pareto's Equilibrium, trying to obtain the best situation for social welfare. Once that all of you have heard each one's opinions, please summarize it, answering this questionnaire telling the consensus solution that all of you have achieved after chat's interactions*".

Teachers asked three questions. The first one was about efficiency (a. What is the most efficient of the proposed solutions?), the second one is about equality (b. What is the most equitable of the proposed solutions?), and the third one was about the best solution for consumers (c. from the point of the consumer, what is the most advantageous?).

Finally, we asked for a whole response, as a conclusion (d. Summarizing, the chosen solution is_____ because_____).

Finally, we provide students with a chat in which to share the possible answers. Thus, we can implement a triple strategy tool: reading notes, quiz and forums. In some cases, even their own chat responses lead to further discussion and open a new discussion forum, feeding back the interest of students in the subject. Once students have sent their tasks, teachers can make them some suggestions or comments via personal message utility that Moodle has or simply via email [Martín-Blas 2009a].

The educational advantages of this method are basically: a) the application of theoretical knowledge to real cases, b) skill development and active participation, teamwork, leadership roles, representation, etc., c) individual effort is very small (for

just participating in the chat once or twice) while learning is very fast, d) knowledge acquired in class individually is added to the group and, therefore, student learning is greater, e) the familiarity of the instrument used (nowadays, chat rooms and forums are part of the social life of students.

3.3 Monitoring the Social Knowledge Construction

For the evaluation of the experience, we follow the IAM model by phases. According to the Phase I, the different alternatives for the equilibrium solution in the market was presented: Competition, Monopoly, Discriminator Monopoly and Equilibrium based on institutional grants. Therefore, activities A, B and C were completed since each student showed and/or corroborated their opinion among the possible options (Table 2). Before giving an answer about the option chosen, some of them asked and answering questions to help the others in some details of statements (activity D). In relation to the activity E (definition, description or identification of a problem), the spokesman, as a summary, was asked to make the sharing of the point of views of students.

	Phase I	**Phase II**	**Phase III**	**Phase IV**	**Phase V**
Competition	21	21	38	57	85
Monopoly	9	9	5	0	0
Discriminator Monopoly	14	14	10	0	0
Institutional grants	40	40	32	28	0
TOTAL STUDENTS [a]	**85**	**85**	**85**	**85**	**85**
Total messages	**96**	**61**	**50**	**37**	**28**

[a]These results show the agreement/disagreement of each student but the number of messages posted in the chat was highly superior, as it can be seen in the last row in Table 2, since each student could interview more than once in each phase.

Table 2: Monitoring the whole learning process

Phase II refers to the cognitive dissonance. The activity A was done identifying as the main areas of disagreement the relative weight given to the consumers, companies, government. Relating to the activity B, the source and extent of disagreement was focused on considerations of efficiency, equity or both aspects. Then, students began to justify their views using the notes took in the classroom and quoting some literature related to the problem related in this case study (activity C). In Phase III, the exchange of opinions showed clear leadership profiles in the group and because of that some students were changing their opinions along the different alternatives. Thus, compared to the initial result, the competitive solution became for the first time, the majority choice. In terms of activities, the negotiation between them brought some clarification about what Pareto's Equilibrium means and gave more relative weight to the social welfare opinions (activity A and B). The identification of agreement areas was achieved rejecting social values views and focusing on market efficiency solutions (activity C). Moreover, there were new statements and analogies (such as the Edgeworth's box reference) to apply to the case of study (activity D and E).

In Phase IV, students were organized by themselves around working groups and each one numerically calculated the results in terms of welfare for each option. Note that these working groups matched with the ones they assigned to perform other tasks, such as oral presentations in the classrooms. After the completion of practical exercises (activity D), personal experience consulting to other professionals or relatives (activity C) and contradictory testimony in the literature (activity E), some positions were abandoned leaving only two options as a possible final solution: Competitive market and Institutional Grants (activity A). Monopoly was rejected due to the market price is too high and the quantity exchanged in the market is less than the amount that would satisfy all consumers, generating the so-called social cost. Discriminator Monopoly was rejected because, although it generates a maximum level of social welfare (efficient in the sense of Pareto), the solution competitive is also equally efficient and also maintains the consumer surplus (activity B).

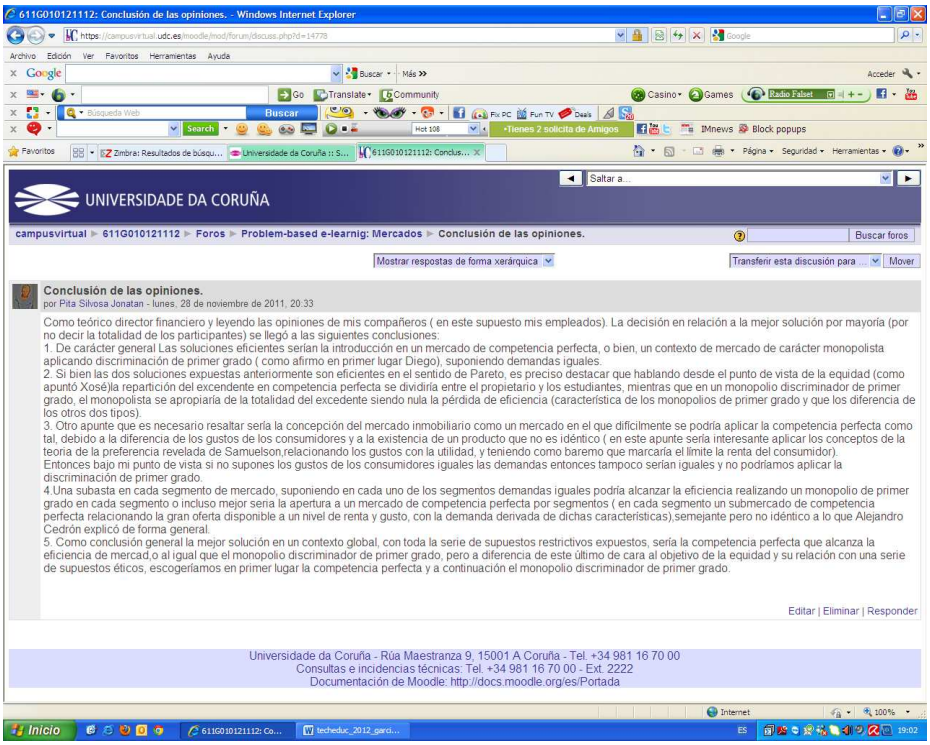

Figure 3: Summary of the solution provided by the group

As a result, in Phase V the class delegate (spokesman) took stock of the comments made in the case of studio (activity A), justifying why they declined other options and why they finally decided to choose the solution of the competitive market as the definitive response (activity B). They declined the option based on institutional grants since subsidies increase the maximum price to pay for housing. If all the price increases in the amount of the subsidy, only suppliers situation improves, since it

would increase the rental price and this price would not be a competitive price (Figure 2). Finally, once the working group reached a common agreement on the final answer, the student representative appointed by them gave their verdict on behalf of the group (activity C). In particular, he stated that 'both the solution of monopoly with discrimination and the solution of perfect competition are efficient in sense of Pareto". However, considering that the monopoly with discrimination will end consumer surplus, the best solution is the competitive solution, both in terms of efficiency and from the point of view of the consumer' (see Figure 3).

4 Results and Discussion

During the whole academic year, some students contributed with post based in new views while the remaining ones participated reinforcing these views in the form of confirming or rejecting the mentioned posts. From the IAM perspective, the experience results in 272 messages coded in Moodle where 34% were coded in Phase I, 22% in Phase II, 18% in Phase III, 14% in Phase IV and 11% in Phase V. Keep in mind that the reduction of the number of messages coded in the latter stages of the process is due in part to the students' union by working groups. This reinforced the only participation of the spokesman students in each group versus the whole group in the initial phases. However, collaboration between all members of the working groups should necessarily be high to reach consensus within the different working groups. Therefore, although the majority of operations coded remained in Phase I, there are existing levels of complex thinking. In particular, there is some evidence of operations in Phase II and III and, contrary to the previous studies related to the IAM, they are still present in Phase IV and V.

In this type of educational method is not looking for qualifying the student individually (because the response to the questionnaire has to be achieved together with the agreement of the whole group). Evaluation is based, therefore, on generating a system of incentives, i.e., it is necessary to engage in chats by other means. This is achieved by increasing the final grades based on the degree of participation in the chats. In any case, the host of this method has been very well received by students because they increasingly demand the need to link the theoretical content of the course with the economic reality around them. Thus, students pursued the discussion by proposing alternative views, compromising with them and building on each other's ideas.

Chats facilitate learning and student assessment. Assessing the skills development involves an integrated assessment of all its components, which is opposed to an analytical and additive view where each would be evaluated separately. We do not talk of evaluation as a means of evaluating student's grade, but as a learning group that allows developing the skills that the future graduates will need in the labour market. It is also interesting to note that the solutions reached corresponded to the right ones, according to economic theory. Therefore, students can infer the proper understanding of the concepts explained in the lectures.

5 Conclusions

The ICTs are taking a leading role in the field of teaching, especially in higher education. Faced with the traditional techniques of transmission of knowledge in the classroom (face-to-face), there are nowadays new techniques whose purpose is to advise students to develop appropriate competencies and skills to their training. Thus, the focus shifts from teacher to student learning. As a result of this change, the assessment systems prove to be an essential key to guide and motivate the student's learning where knowledge social construction is got by means of ICTs

Based on the above, our proposal is to develop a chat in which the students reach a joint agreement from the interaction between them through the business models of solving problems. In addition, these tools are intended to improve student assessment. It is necessary to abandon the idea that the only element of the review is the final exam and be aware of the need for continuous and formative assessment. The test only allows students to get subsequent evaluations. However, the aim of our proposal using chats is to facilitate orientation on the course objectives to the students and the necessary concepts and skills to overcome them.

The group feeling arose in a natural way. Student acting as a coordinator (spokesman) has offered the right answer to the problem in all case studies. The experience was very successful mainly for two reasons. The first one is the great implication on the assumption of the role of leader or manager as a task very effective and convincing, following the scheme of business models. The second one is that coordination work was exercised with great interest in order to achieve a single answer. In fact, in all cases, all students have reached a common solution, achieving a common response to conflicts of opinion.

The challenge for teachers is to design learning experiences from their ways of seeing and understanding reality in which students can construct a new meaningful learning and develop and implement solutions to properly contextualized problems. The overall success depends on the outcome of the group. The responsibility or shame for wrong answers disappears. As a result, the participation of the whole group in the last phases of the social construction knowledge was highly achieved, modifying the individual thinking and providing the right answer in the final solution.

Finally, this approach developed is still incipient but hopefully in the future. It will provide results on motivation, especially about the impact on the final student grade. The goal is to satisfy the aforementioned conditions of being able to work together, leading a group, communicating, thinking creatively, being socially committed and self-motivated. In any case, at this stage, the students' response to this teaching experience has been successful and the degree of activity in the forums is growing. Future avenues about how these techniques are relating to the higher marks in the academic results of the students are expected.

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