From The Cooperative Approach To The Collaborative Approach: The Choice Of Technological Tools For A Learning Task.

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Abstract. Collaborative learning and cooperative learning promote support and mutual aid between learners by creating small groups to accomplish a defined task and whether learning is collaborative or cooperative, it is about learning by achieving a goal. This always leads to confusion between the two, when they are indeed two distinct types of learning. In this article we will summarize what cooperation is and identify the similarities between cooperation and collaboration while highlighting that the collaborative approach is more suitable for autonomous learners, having acquired a certain maturity and feeling responsible for their learning, as well as than analyzing the collaborative and cooperative tasks which will help to better understand the different ways of envisaging the objective in cooperation and collaboration. In addition, we will cite the range of technological tools that can be used to serve these two types of learning in terms of e-learning depending on the target audience, the context and the situation for each training.

Keywords: engineering, pedagogy, modeling, scenarisation, skill, e-learning.

1 Introduction

The theoretical elements we present in this section form the backdrop for collaborative learning without, however, offering a formal definition. Some authors, such as Lebow, have attempted to define the phenomenon of collaborative learning by establishing its axiological system and by describing the main characteristics of the collaborative process.

According to Lebow in 1991, collaborative learning is a concept based on seven values drawn from constructivist philosophy: collaboration, autonomy, reflexivity, generativity, active engagement, personal relevance and pluralism. Drawing on cognitivist theories, it proposes that the learner engage in a dynamic and reflective process of knowledge construction that is characterized by offering the learner to (Lebow, 1991):

- Explore the knowledge of a domain to identify its structure rather than assimilating content whose components and structure are imposed;
- Carry out their learning in real, authentic situations;
- Participate actively and in a sustained manner in group interactions;
- Progressively develop autonomy and the ability to interact effectively;
- Develop high-level skills: analysis, synthesis, problem solving and evaluation.

In addition, it requires him/her to:

- Implement effective cognitive and metacognitive strategies to exploit the cognitive resources available in the learning environment;
- Commit to the group and pursue the common goal;

- Agree to operate in a mutually supportive setting among learners;
- Participate in group synergy to develop complex knowledge through discussion and negotiation of meaning.

In addition, we propose for what follows to better understand collaborative learning by comparing it to cooperative learning. This process allows us to synthesize what cooperation is and to identify the similarities between cooperation and collaboration while highlighting that the collaborative approach is more appropriate for autonomous learners who have acquired a certain maturity and feel responsible for their learning. Similarly, the analysis of collaborative and cooperative tasks helps to better understand the different ways of looking at the goal in cooperation and collaboration.

2   The Collaborative Task And The Cooperative Task

The collaborative task consists of a set of activities or subtasks recorded in a learning scenario that leads to the exploration of content, the development of representations, the communication of ideas and the construction of knowledge. But unlike the cooperative task, it is not broken down for distribution among the participants. The learner carries out the whole task for himself and by himself, drawing on the resources of the environment and relying on the group, which also becomes a resource. With some variations, the group takes over the task using the contributions of each person. This collective approach allows the group to reach the objective while supporting the individual approach of each learner. Collaboration is therefore based on two approaches: that of the learner and that of the group. The latter provides each learner with some of the resources and assistance he or she needs to complete the task alone in order to achieve the objective. The following figure illustrates the collaborative task which is the same for all and carried out by all.
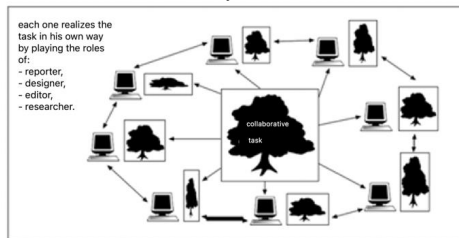

Fig. 1. The collaborative task

This is not the case with the cooperative approach to task completion. The task is accomplished through a process of specialization and adopts a pyramid shape. Most often, the group is divided into teams of two to five learners who are given subtasks that may vary from one team to another. Within the teams, each individual member has a specific responsibility. The task is complete when all team members have done what they were assigned and all teams have pooled their accomplishments. The following figure illustrates the cooperative task, which is a set of different subtasks performed as a team.
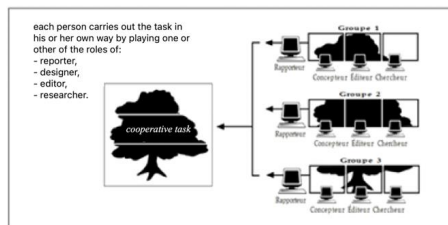

Fig. 2. The cooperative task

3   From The Cooperative Approach To The Collaborative Approach

Based on the work of Abrami and his colleagues in 1995 and Lewis in 1996, we note that the expressions collaborative approach and cooperative approach are most often used interchangeably to designate the process underway within teams or groups. The approaches are confused as much when we talk about learning as when we report on work approaches in institutions. In what follows, we will attempt to remove the blurring between cooperation and collaboration by presenting the characteristics of these two approaches (Abrami et al, 1995; Lewis, 1996a and 1996b)

For a given group, the choice between a cooperative or a collaborative approach depends on the maturity of the learners, their autonomy and their ability to control their learning.

In fact, the cooperative approach is better suited to the profile of young learners who are less autonomous, who have not acquired much cognitive maturity and who do not yet have an extensive repertoire of learning strategies. The cooperative approach must be structured and supervising, and the teacher must have control over the learning process. However, this control is exercised in an informed manner with the objective of helping the learner gradually develop collaborative skills and acquire greater autonomy. The cooperative approach thus has a dual purpose: on the one hand, to learn the content, and on the other, to learn to work effectively in a group and to become autonomous.

While the collaborative approach has essentially the same objectives, the difference is that it is more flexible and offers learners more freedom and is more suitable for adults. But for those who are not yet mature enough to engage in real collaboration, we can adapt the collaborative approach by proposing a balance between teacher control and learner autonomy.

To determine whether a collaborative approach is more appropriate, the teacher diagnoses the learners' abilities, assesses their level of maturity and their ability to work in groups. The teacher makes consequent decisions about the freedom they will have to make choices about certain aspects of the learning content and the strategies they will use to learn.

Adams and Hamm (1990) and Cavalier and colleagues (1995) conceive of the cooperative approach as a method of initiation or preparation for collaboration. Inspired by the same philosophy, cooperation and collaboration are situated on a continuum. The learner is led to move from one to the other as he or she takes on more and more decisions and responsibilities regarding his or her learning. What distinguishes the two approaches is the degree of learner autonomy and control over their learning (Adams & Hamm, 1990; Cavalier et al, 1995). The following figure illustrates the shift from cooperation to collaboration by moving from growth to autonomy.
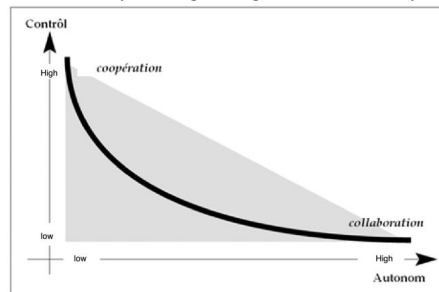

Fig. 3. From cooperation to collaboration: an exercise in growth towards autonomy

Generally, we agree that cooperative and collaborative groups act and work to achieve a common or shared goal. Cole, however, would like to qualify this proposition to remind us of the two meanings we can give to the word sharing (Cole, 1993). On the one hand, sharing refers to the division of a whole into several parts. On the other hand, sharing also means taking part or participating in something. Cole observes that

cooperation perceives sharing in the sense of division, whereas in collaboration, he perceives sharing in the sense of participation. We find this nuance very useful in helping us distinguish between the two modes of operation.

Indeed, cooperation is based on the division of tasks and responsibilities within a group. Each member is responsible for carrying out an action or subtask. All of these actions and activities lead the group to the desired goal. It is the group as a whole that achieves the goal by completing the task from which a collective output emerges. Each learner participates in the achievement of the objective by making a specific contribution to the collective work (Abrami et al, 1995). The following figure illustrates the cooperative task modality.
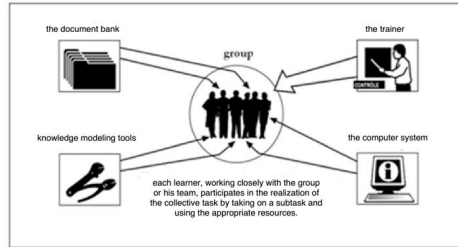

Fig. 4 : Modality of the cooperative task

In collaboration, the members of the group also have a common goal. But it is not only the group that, through its activities, will work to achieve the objective: each member, individually, will try to achieve by himself this objective that is agreed upon within the group. The result will be several productions, a collective production and the individual productions of the learners. The following figure illustrates the modality of the collaborative task.
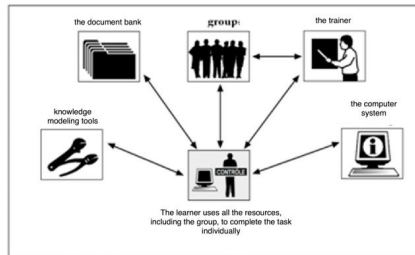

Fig. 5. Modality of the collaborative task

4   Towards A Definition Of Collaborative Learning

Based on the work of Henri and Lundgren-Cayrol and Lundgren-Cayrol, collaborative learning is not a theory of learning, it is an approach to the progressive construction of knowledge. Based on the constructivist paradigm, on learning theories from the cognitivist current, on andragogical principles and on the comparison between cooperative and collaborative approaches. On the other hand, the use of this definition will allow us to explore the social and cognitive processes at stake in collaboration and to study their functioning, to propose a model for the design of collaborative virtual environments and to describe possible uses of information and communication technologies (Henri and Lundgren-Cayrol, 2001).

Thus, collaborative learning is an active process by which the learner works on the construction of his or her knowledge. The teacher plays the role of learning facilitator, while the group participates as a source of information, as a motivator, as a means of mutual help and support, and as a privileged place of interaction for the collective construction of knowledge. The collaborative approach recognizes the individual and reflective nature of learning as well as its social anchoring by connecting it to group

interactions. In fact, the collaborative approach couples two approaches: that of the learner and that of the group.

The learner commits to working with group members toward a common goal while balancing personal interests and goals. He/she collaborates in group interactions by sharing his/her findings. Exchanges with the group and the completion of a collective task allow them to share their discoveries, negotiate the meaning of their work and validate their newly acquired knowledge. In the process, they demonstrate autonomy and take responsibility for their learning while feeling accountable for achieving the goal they share with all members of the group.

As far as the group is concerned, it is considered a catalyst for learning. By giving itself an objective, by committing itself to the collective achievement of a task, the group, as a group, learns and builds knowledge. In doing so, it allows each learner to confront the others and it nourishes the learning of each one. In the collaborative approach, the learners collaborate in the learning of the group and, in return, the group collaborates in the learners' learning.

5   Technological Tools For Collaborative Learning

Discussing, sharing knowledge and working together on a common project are collaborative activities. Social software, such as chat rooms, discussion forums and blogs, are used to enable online collaboration among learners. Thus, the recent great diversification of ICTE allows today to target pedagogical interventions according to teaching needs. Whether in synchronous or asynchronous mode, teachers can use many activities very effectively, depending on the needs (Lemay & Mottet, 2009). Barrette in 2009 identifies three areas of activity where the integration of ICT in teaching is appropriate (Barrette, 2009).

5.1   Adaptive And Differentiated Devices For Repeated Exercises, Such As Educational Games (Serious Games).

Although the serious game is a widespread pedagogical approach in traditional classroom teaching, it is only more recently that it has appeared in distance education. It is defined as a computer resource that integrates both playful and educational aspects (St-Pierre, 2010).

Video games in an educational context have opened another door by adding real-time feedback based on the participant's choices. This scripting of learning in a game sometimes makes people smile. However, it should be remembered that the game is a means to an end, not an end in itself. It accompanies the teaching strategy. This implies, beforehand, the planning of a pedagogical scenario that must end with a plenary session with the player-learners.

The term serious games covers different types of games. According to Alvarez and Rampnoux and Djaouti, we can distinguish five types of serious games (Alvarez et al., 2017): advergaming (advertising games), they are mainly intended for advertising. Edutainment (educational vocation), they have an educational vocation. Edumarketing games (corporate communication), they are part of the tools dedicated to communication strategy by relying on video games, but also by integrating an educational aspect. Committed (hijacked) games often aim to denounce political or geopolitical problems in a direct way and finally training and simulation games.

Similarly, there are 5 ways to incorporate games into education (Romero, 2016):
-     Through the use of serious games;
-     Through the creation of serious games in the classroom;
-     Through educational gamification;
-     By creating digital games as a learning activity;
-     Through the use of commercial educational games.

The different ways of integrating games in education lead us to say that the positive impacts related to the use of games, whether they are designed for learning or entertainment, mainly concern the acquisition of knowledge, the development of cognitive and perceptive skills, as well as the affective and motivational aspects of

users. Furthermore, the literature shows that certain conditions can influence these positive impacts in educational settings, such as the number of sessions allocated to the use of the game or the intentional addition of other teaching approaches to the game used (Marin & Astrid, 2018).

5.2   Devices Promoting Metacognition, Such As Tutorials.

Indeed, two concepts need to be defined: metacognition and tutorials. Thus, according to Noël in 1997, "metacognition is a mental process whose object is either a cognitive activity, or a set of cognitive activities that the subject has just performed or is in the process of performing, or a mental product of these cognitive activities. Metacognition can lead to a judgment (usually unexpressed) about the quality of the mental activities in question or their product and eventually to a decision to modify the cognitive activity, its product or even the situation that gave rise to it" (Noël, 1997). Metacognition occurs when the environment imposes itself on the subject as a problem to be solved. It is linked to intentionality, and gives meaning to the environment; it is a factor of redescription and not simply an action on cognition. It concerns abstract tasks as well as "manual" tasks. Thus, one speaks of metacognition in the school environment and in the training environment in general, as well as in the sports environment. The difference between metacognition and cognition is the conscious or controlled aspect of the processes, but also the semantically penetrable aspect of the domain in question. Metacognition is related to the problems of attention, verbalization, learning, and other paradoxes of reflexivity.

However, the use of the word "tutorial" has become widespread and has extended to all sorts of activities, such as DIY, automotive, photography, video, gardening, hobbies and even areas such as personal development. The tutorial is an educational tool that can be presented in the form of another software, a video, an electronic text/image document such as a computer graphics or paper, consisting of detailed step-by-step instructions, most often in stages. Unlike a user manual, which lists and describes the functionalities in detail, a tutorial shows how to achieve one of the possible objectives, clearly defined. In the case of software, it can be a first method of approach, consisting of practical examples. For all activities, users who are not considered to be very competent in the field concerned are taught how to perform a task.

5.3   Collaborative Learning Devices, Such As Virtual Learning Environments Like The Wiki.

Indeed, the wiki can be defined as an ICT tool that allows for the creation and editing of content, while allowing for the organization of information by topic among the members of a group. Moreover, in distance learning, exchanges between learners and teacher comments encourage regulation. (Duchesneau et al., 2012). Thus, wikis are tools for collective knowledge construction where collaboration and interaction are required. They have advantages related to their particular functionality:

- They allow for diagnosis to differentiate learning, which is more difficult to achieve with online social applications (Duchesneau et al., 2012).
- They can be used as a tool to aid persistence through collaboration and interactivity (Lai & Ng, 2011).
- They allow working on complex tasks promoting a good online learning environment. (Duchesneau et al., 2012).

Although teachers are more familiar with wikis as reference tools on the Internet, research is increasingly recognizing the pedagogical value of building a wiki. There are more and more online tools for building a wiki and integrating it as a learning activity in a course.

5.4   Learning Devices Using Mobile Technologies.

According to Corbeil and Valdes-Corbeil in 2007, the emergence of mobile technologies (laptops, phones, tablets, etc.) has transformed the approach to information in society. Some researchers have even predicted that mobile technology will in the future enable truly time- and location-independent learning, facilitated by laptops that

provide interactivity, connectivity and processing power. Thus, the adoption of mobile technologies is related to whether the services and features offered are effective and necessary (Corbeil & Valdes-Corbeil, 2007).

According to Caron et al. in 2007, certain conditions are important for the relevance of mobile content in a course: "Educational content must be short. Their designers must exploit the possibilities of multimedia to create dynamic and interactive content. Above all, the content must be highly relevant to the course and in no way substitute for the teacher's role as primary source." Although teachers are no strangers to the use of mobile technologies, their use in a school context is far from widespread. In the pedagogical realm, mobile content is most effective when it is brief and in support of content with a more traditional delivery method. Instead, teachers should approach it as a complement to their teaching (Caron et al., 2007).

6   Conclusion

To conclude this work, we can say that there is a big difference between the collaborative task and the cooperative task, even though it has a huge resemblance. Also, there is a wide range of technological tools that can be combined to serve different e-learning approaches depending on the target audience, the context and the situation for each training in each type of task.

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