# Virtual learning community and dynamics of groups in the test of brakes

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**Abstract.** This paper presents our research work on tracking how activities in distance learning situations organized themselves in spite of brakes and barriers they encounter. A part of this research work is related to the tracking data exploitation during asynchronous communication, it focuses on shapes data analysis, in a quantitative way at the level of group.

## 1 Introduction

The virtual campus of the University of Limoges CVTiC is a distance training platform which organization relies upon on the concept of virtual community of learning. Presentation of contents, modalities of exchanges and validation, relationships with the teacher are completely established according to this collaborative training framework between students. For every credit, the students are asked to constitute a workgroup then to determine the strategies of piloting

and driving of the activities that the working order suggests. We are interested in demonstrating the existence of stimuli that forced the Virtual Learning Community (CLV) to work in a collaborative mode. Using primary traces on the forums for two teaching units and converting them in M-Trace (Djouad 2008), we could classify the different stimuli. From the many posts on these forums, we were able to determine the types of operation of CLV. Using the classification of the regulatory action proposed by Mac Grath, we could then see that the CLV naturally tended toward a collaborative work mode face stimuli.

## 2 Rules of collaboration

From a learning unit to another one, from an activity to another one, according to the skills and the motivations of each participant, the leadership within a workgroup can change. The group is going to recognize, in such or such moment, the capacity of one of its members to take things in hand, each agreeing on the objectives to continue. In some cases, according to the weaknesses of some of its members (linguistic, technical), some forms of tutelage can appear, the success of the group in the collective realization being a priority.

Our works are carrier of some testimonies of this type. The public interest of the community dominates on the investment which each is brought to supply. From that point of view, when, within a workgroup, this co-support is refused by some of the members, the group disintegrates and does not manage to reach the objectives of expected work, at least in a disrupted way, thus except order.

Generally speaking, this behavior shapes the group and gives substance to itself to develop in a real community of interest: the success in fine to the diploma. The community thinks of obtaining a gain in terms of productivity and fluidity in the training evolution. It is not dependent any more in its progress of the arbitrary and the behavior of a managerial employee but obtains internally all the necessary knowledge and know-how for the realization of its objective.

The virtual campus of Limoges was equipped with a charter to define the group work. This charter insists on the importance of rules and modalities structuring the community. For the main part, let us quote:
- Participating in the exchanges and in the group work according to the advice given in the guide of the collaborative work,
- Contributing to establish a reliable climate, to let never without news (short stories) the rest of one's group, to hold its commitments not to put the group in trouble, respect and make respect the calendar and the terms, fill in with honesty the board of follow-up when someone is asked to report one's activities;
- Publishing a photo allowing other students and teachers to identify a student on the platform of training of which the access is secured;

- Following working rules indicated by the teaching staff. These can be modified at any time according to the educational or organizational imperatives.

The training guide of this virtual campus insists on four locatable levels of community:

(1) the working community within a credit;

(2) the community that groups together around a credit;

(3) the community of promotion which groups together around a program of training;

(4) the community of the students of CVTIC (students on a longer term).

# 3  Brakes for optimal operation of the community

From an ecological point of view, the virtual communities of learning that we observe on the Virtual Campus CVTIC of Limoges accentuate several conditions necessary for their smooth running: the exchanges between peers are useful exchanges; the freedom and the flexibility of tone does not compromise the end of the exchanges: Inquiring mutually, progressing collectively; asynchronous exchanges are reagent; every member of a group declares its procedures, choices, and difficulties; the members of a group co-support themselves; every time it is necessary and possible, there is exchange of expertise the leadership turns inside the group. In such a way, we can regard virtual communities as being dissipative system.

However, the functioning of the VLC can be disrupted by the problems of internationalization of the virtual campus and the constraints bound to the training opened remotely. If it is acquired that the emergence of the virtual communities of learning is a long and complex process, several brakes in their birth quickly appear in the practice during the implementation of university trainings via an international virtual campus. It is advisable, at first, to list in a most exhaustive possible way these brakes and barriers before studying more forward their impacts on the life and the survival of the VLC

We are interested in two learning units of four weeks. The first unit (UE303, Nstudents= 40, ngroups = 8) is a unit of three years university degree "Servicetique" which belongs to the core of the diploma. The second unit (UE150, Nstudents = 15, ngroups = 3) is a unit of International iFOAD degree. Both units are based on the same educational approach: each week a series of activities have to be achieved by each group before the end of the week. . The number of post per day for example is a synthetic indicator that reveals nothing of the kind of messages exchanged. Over time, however, the evolution of this indicator provides a number of lessons that can detect volumetric stimuli by the volume of response associated.

Looking at the forums, at the level group, we could found and classified stimuli such as shown on table I.

| Type of stimulus | Nature of stimulus | Example |
|---|---|---|
| Exogenous | Technical | Unable to read a text because of format |
| | Societal/cultural/linguistic | Conflict with a teacher |
| | Organizational | Delay in on-line publishing |
| Endogenous n/1 | Technical | Internet locally collapses |
| | Societal/cultural/linguistic | Integration of a new member |
| | Organizational | Jet lag |
| Endogenous 1/1 | Societal/cultural/linguistic | Local war |
| | Organizational | Simultaneous leadership |
| Endogenous n/n | Technical | Incompatible OS |
| | Societal/cultural/linguistic | Religious membership, ethnicity |
| | Organizational | non agreement on work orientation |

Table I. Typologies of brakes/Stimuli

Using the presentation of McGrath task circumplex we can see the arrangements (regulatory function) that have developed between the actors reach the final results. This classification allows to see the way the VLC has taken to meet the guidelines or to stimuli. We thus follow the approach used for the study of forums (Caviale 2008). We have then found that:

- the production and selection dominate the distribution of activities. They are present almost throughout the duration of the project (production activities are negligible at startup).
- trading activities are more limited over time (which does not mean they are less important). The detailed analysis of the trading activity shows that the VLC seeks itself to identify experts it fails to find. Everyone will then be formed individually before they offer new services to VLC (second bounce).
- we can notice the absence of messages related to enforcement activities (which reflect the hierarchical relationships or competition). This absence can be explained by the circumstances: it is the beginning of training, the promotion was not structured and the position of dominant / dominated is still regarded as harmful to the group's assessment, what we show analyzing the evolution of group behavior in the EU. This is precisely the absence of strong leaders (dominant) in the group that explains the length of the negotiation before work.

# 4  Typologies of work

To determine which type of profile is a volumetric mode of operation and if this pairing is structurally feasible, we have identified profiles of outstanding and we have analyzed the types of trade and distribution (Desjardins 2002). We may well have set three basic types of earthworks (Table II).
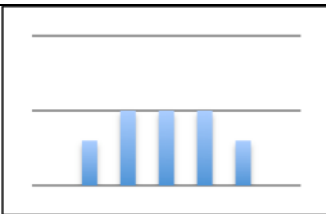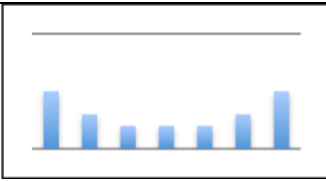
| Type of volumetric Profile | Volumetriuc Profile (number of post per day) | Notice | Work typoligy |
|---|---|---|---|
| In « U » | | Students exchange at the beginning, the distribution of tasks, act independently of each other and then make a summary of their work. | Cooperative |
| In « bridge » | | Students exchange throughout the week, with peak activity in mid-week for the transfer of knowledge between experts and the group. | Collaborative |
| In « M » | | Students exchange at the beginning of the week to search for experts. Everyone will gather information outside of the community. | Interested collaborative |

Table II. Typologies of work.

# 5  Conclusion, extension of the work

Looking at the patterns of the forum before the brake and after the brake and with the use of Mac Grath circumplex, we have seen that even with a break, a VLC stay in a collaborative work. Moreover, if it was in a CSCW (Computer Supported Cooperative Work) before the break, it will be after in a more collaborative work. This demonstrates that a virtual community needs, to set up a collaborative work, some stimuli, while they are endogenous or exogenous. It is the succession of these stimuli, due to the indexed answers, which supplies the community. They drive this last one to a collaborative work and\or maintain it in this working modality. We avoid a tunnel effect, which leads towards a purely

cooperative work, or towards a destruction of the group. We tried successfully to detect stimuli or answers (or their absences) to define the state of the community. Hence, we will soon proposed some skills and rules introduced in the LMS Moodle that will help teachers and tutors to manage the working way of the VLC by using breaks.

Using the theory of fuzzy logic, we will develop a module in Moodle that use the rules above. We will integrate into a phase fuzification, the rules allow the inference when comparing the behavior of the community with a robust operating said optimum collaboration. This is for the model to predict whether the VLC work effectively in collaborative mode. The expert system issue, when implemented, alerts on degraded operation of VLC in real time during training sessions on the virtual campus and advises, through the proposal of stimuli, the tutor in his approach to animation. The flexibility of a model associated with a fuzzy logic approach can provide a scalable model and open with each additional indicator, regardless of its origin is a layer over the inference.

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