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E- Campus as an Environmental and Pedagogical Tool for Online Support

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***Abstract*—**The Internet and the ever growing applications enable communities to share and collaborate through common platforms. However, this growing pattern is not witnessed yet even for e-learning. This paper is based on a doctoral research which aimed at researching the ways students interact in an online campus and the supports that they look for and require. Content analysis, based on the Panchoo/Jaillet methodology, was done on four synchronous meetings between a tutor and his ten students. The UNIV-R^{ct} e-campus, analogical to a physical campus, was found to be user friendly and the students enrolled in a master's course faced no difficulties in using it. In addition to the environmental aspects, the pedagogical implementation of the course has driven the students to interact and collaborate significantly and this has contributed to overcome the problems faced by the distance learners. This completely online model was found to be fruitful in helping distant learners fight their loneliness and brave their difficulties in a socio-constructivism approach.

***Keywords*—**Content analysis, e-campus, interaction, online supports, pedagogy.

I. Introduction

INDIVIDUALS from all backgrounds around the world are evolving forcefully and passionately by integrating and interacting with social networks worldwide. We are thus witnessing ways users interact and manipulate objects. The setting up of platforms and the ways the applications are designed, compel users to interact collectively in a defined manner. This is what Sack named discourse architects; it is "the practice of designing networked environments to support conversation, discussion and exchange between people" [1]. The environment should accommodate desirable moves of users while prompting, molding and guiding them to interact naturally towards doing the learning activities. The space along with the set rules and expectations should frame or shape the conversation that take place in a given system. Thus, the way the users interact is related to the designed architects of the platforms or spaces. However, still today, the massive online interactions do not show cognitive reflections or high level thinking [2]: the sharing of photos, videos, comments, pokes or likes on social websites seldom reflect common interests but they rather show a sign of narcissism [3] on behalf of the participants. This education platform is yet to be constructed.

It is a known fact that technological tools used in education, such as radio, television, forum, chat and social networks, were not designed specifically as per the requirements of educators and learners [4], [5]. Educational environment requires "a more structured approach to then translate that technological framework into an active learning online environment" [6]. Enthusiastic online participants are not found to be natural active students. For this to happen, educators also are solicited to play more challenging roles including the one of rigorously motivating online students [4], [15] to interact, reflect, collaborate and participate in cognitive writings despite having other tempting applications running in parallel.

Virtual learning environment should be built not by integrating existing tools but it should be designed and implemented by taking into consideration the requirements of all stakeholders while bearing in mind the difficulties faced by distance learners as well as the insecure nature of the *cloud*. Online applications using analogies and metaphors proved to be successful in guiding actors in doing specific actions similar to the reality [7]. The infrastructure of the e-campus should therefore allow students to integrate the environment and behave as per the usual learning processes. It should also provide a fertile soil to continuously enable the e-campus to improve based on users' feedback. This present study takes place in an e-campus where users' interactions are logged. It is imperative not only to understand the online actors' actions and behavior but it is also very crucial to study their learning advancement to enable tutors give effective personalized feedback [8]. Logs of tutor-students interactions are studied in order to figure out supports that students seek. This will enable us design an evolving, supportive environment whereby students will progress at their own pace and as per their preferred level of achievement in their studies. This research contributes in helping distance learners interact with objects and actors for successful completion of their studies. Based on the findings, additional functionalities will be proposed to integrate the UNIV-R^{ct} e-campus.

II. Research Context

Today distance learners face many challenges despite the availability of technologies and information. The high rate of distant learners' abandoning their studies is alarming [9], [10], [11]. With regards to the role of technology in distance education, it has been found that it is mostly used as communication tool [4], thus benefiting the administrative concerns of the institutions [21], without integrating it as a pedagogical tool in the teaching and learning processes [12]. Furthermore, teachers are resistant to use technologies [13], [14] and this is to the detriment of the learning community. Thus, distance learners are not given adequate support to

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overcome difficulties, desperation, frustration and loneliness in their struggle to study [16]. Factors such as absence of human interaction and timely feedback from tutors have proved to be de-motivating and they contribute in hindering online learners to persist in their studies [4], [9], [17], [18].

Univ-R^{ct} is the e-campus in which both the environmental and pedagogical aspects have been implemented successfully by taking into consideration problems faced by distance learners. The main functionalities are listed in Table I:

TABLE I
MAIN TOOLS OF UNIV-R^{CT} CAMPUS

	Tools/Functionalities	Details
1	**Learning Spaces**	For formal and informal interactions
2	**Communication tools**	Synchronous and Asynchronous communication tools, such as forum, online classroom, chat, email.
3	**Organization tools**	Agenda, reminders, Short message services
4	**Sharing tools**	For collaboration among tutors and learners
5	**Creating contents**	Creation of quality materials and learning activities
6	**Presence**	Aware of the presence of others
7	**Tutor's Space**	For interaction and collaboration of tutors
8	**Administrative tools**	Managing the campus and giving access to users
9	**Individual office**	Personal space, accessible anytime from any place

Specific spaces, analogical to real physical campus, were designed with high level graphics to facilitate users focus on their assignment without being constraint by the technology. Tools for communication, sharing and organization allow for collaboration between tutor and peers. Tutors who seldom exchange in reality can do so online in synchronous and asynchronous manner in the tutor's space. The pertinent tools available under one roof deter actors from being disturbed and distracted by other applications. The *presence* functionality is of great importance as it allows the online users to not only see each other (via their name appearing on the campus) but it also enables them to communicate by sending instant informal messages. This by far has reduced the loneliness feeling among the actors. The tools in Table I have their *raison d'être* with regards to giving supports to respective online actors.

However, the success of the course does not rely solely on the user friendly environment: tools alone do not encourage any learning to take place automatically. Relevant learning strategies are devised so as to encourage the learning process to take place. One of the success factors relies on the adopted socio-constructivist approach whereby it is compulsory for tutors and students to collaborate online in order to solve complex problem-based assignments. This pedagogical strategy aims at promoting and encouraging interactions and learning to take place [4], [5].

As per the schedule, the coordinator ensures that the students are informed of the beginning of modules. Prior to this, tutors upload their course materials, learning activities and problem based assignment online. Students are thus requested to study the course materials and work out the learning activities before the compulsory synchronous meeting with their tutor. For this study, four such meetings are scrutinized in order to understand the way the actors interact so that better supports could be given to them.

III. Methodology

The e-campus comprised of different spaces and tools as shown in Table I. This gives the students freedom and flexibility to use the available tools for learning. However, the *chat* tool was mostly used as this is where the obligatory meeting took place [4]. The four *chats*, comprising of nearly a thousand lines of interactions were analyzed and coded based on the Panchoo/Jaillet grid (Table II) with the aim of revealing the way the actors interact.

TABLE II
PANCHOO/JAILLET GRID FOR CONTENT ANALYSIS

	Sub-themes	Tutor	Student
1	Socialization	t.socl	a.socl
2	Organization	t.org	a.org
3	Request for information	t.dinfo	a.eclr
4	Response	t.rep	a.rep
5	Technical Problem	PT	PT
6	Approval	t.apprb	a.apprb
7	Remark	t.remarq	a.remarq
8	Reference	t.ref	a.ref
9	pedagogical supports	t.supp	
10	Communication	t.commn	

The tutor-students interactions took place on a real-time chat sessions. Conversations recorded were similar to face to face meetings, in the sense that, for instance, actors greeted each other and this type of interaction was coded as "socialization". From logs, students were found to ask for information (a.eclr), reply to queries (a.rep), and give their opinion (a.remarq) as well as approving discussions (a.apprb). As they were requested to work in groups, they organized (a.org) their work to ensure that they were able to meet set deadlines. The tutor also behaved in a similar manner and they also asked questions (t.dinfo) in order to understand the current situation with regards to the students' progress. As support, he did not hesitate to give relevant advice and reminded students of important communiqué (t.commn) to ensure that the assignment was done smoothly. Based on the Table II, the 998 lines of interactions were coded. This coding process was validated by two independent coders [4].

IV. Results and Discussions

For a particular module which lasted for three weeks, the ten students enrolled in a masters' course interacted freely during the chats in order to understand their tutor's expectations with regards to the assignment they needed to submit. Contrary to what literature revealed [9], the students

did not hesitate to interact with their tutor and the latter gave prompt feedback and advice. In the first meeting, the tutor exchanged 84 lines in the chat while the ten students together exchanged 184 lines (Table III).

TABLE III
NUMBER OF LINES OF INTERACTIONS EXCHANGED BY TUTOR AND STUDENTS

	Online Meetings			
Chat lines	Chat 1	Chat 2	Chat 3	Chat 4
Tutor	84		115	28
Students	184	154	218	215
	268	**154**	**333**	**243**

Those meetings helped the students to voice out their difficulties and support each other. In chat 2, the tutor was not present and similar to the face to face interactions; the online students interacted among themselves while waiting for the tutor. The result is found in the Table IV below.

TABLE IV
TYPES OF INTERACTIONS IN THE FOUR MEETINGS

Chat lines	Chat (1 %)	Chat 2 (%)	Chat 3 (%)	Chat 4 (%)	**Total (%)**
a.apprb	14	8	6	10	**10**
a.eclr	18	17	11	18	**15**
a.org	3	3	4	5	**4**
a.remarq	2	5	4	5	**4**
a.rep	21	45	27	36	**30**
a.socl	12	21	14	15	**15**
commn	4	0	1	0	**2**
supp	2	0	7	1	**3**
t.apprb	0	0	2	0	**1**
t.dinfo	6	0	6	2	**4**
t.org	1	0	1	0	**1**
t.ref	0	0	0	1	**0**
t.remarq	1	0	2	2	**1**
t.rep	16	0	13	5	**10**
t.socl	1	0	2	0	**1**
PT	0	0	0	0	**0**

The interactions were composed of the usual conversation cycles (question, reply and feedback). Fifteen percent of interactions were questions or queries asked by students. The tutor also queried around four percent which is a considerable amount (as he is alone faced to 10 students). Interestingly, the replies of students were thirty percent. This can be explained by the fact that once a question was asked on the chat, the logs showed that, even if the questions were directed to the tutor, the other students did not hesitate to reply back. Viewed on a social network diagram, the actors are found to be related to each other through the interactions.

Based on the content analysis, result shows that neither the tutors nor the students faced problems in using the e-campus even though this module was their first. The success of this course relies on the good use of technology and this is an important requirement. It is worth noting though, that, prior to the online course, face-to-face sessions were conducted to teach the students of how to use the e-campus.

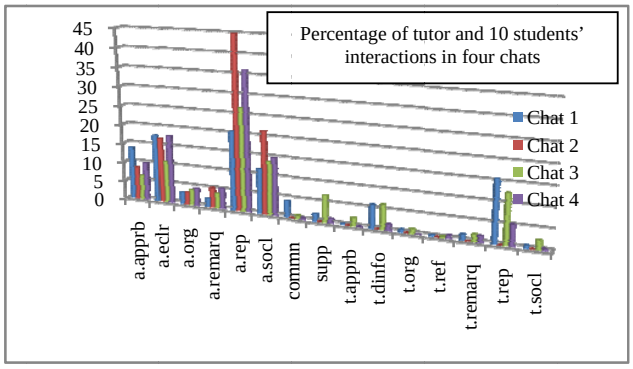

Fig. 1 Interactions, in percentage, of a tutor and his ten students in four chats

Students asked lots of questions. However, an earlier research [8] showed that those interactions did not relate to cognitive issues. This finding is interesting in the sense that students did not expect to be spoon fed; rather they needed points of reference to construct their knowledge. With few clarifications, they were able to understand and complete their work successfully. They were more concerned to fully understand the tutor's expectations and their role *vis-à-vis* their peers. Because of the insecurity feeling, online students asked pertinent questions to verify their understanding and knowledge because of their need to progress confidently.

As regards to the tutor's interactions, he communicated, asked questions, replied questions and approved writings of the students. It is worth noting that tutors normally start the chat sessions by communicating important information or by reminding them of the objectives of the sessions.

To understand how a chat evolves, Fig. 2 shows the types of interactions that took place from beginning to end, in ten time frames. Similar to conversations, there are no defined sequences of interactions. Actors collaborated freely without constraints. At the very start, the students socialized (a.socl) and replied to queries. The tutor socialized and led the chat by communicating (t.commn) pertinent information.

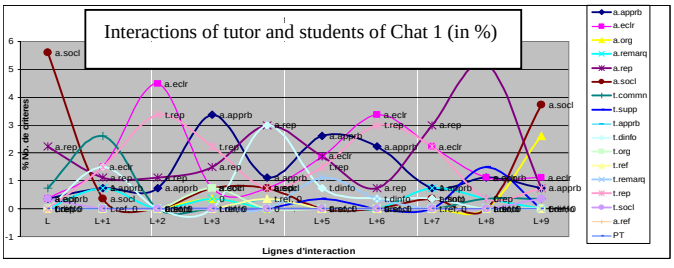

Fig. 2 First chat viewed in ten segments across time

The leadership of the tutor is an important factor which students needed and expected to have as support. Technical, pedagogical and psychological supports were sought. Online students respected the authority and knowledge of their tutor; they read attentively the instructions and the active ones replied back promptly. An interesting and valuable result worth mentioning is that the tutor has the ability to lead and direct the chats, that is, if he talks on cognitive matters, the students will interact on the same topics. This result should be exploited further.

V. Improved Functionalities of the UNIV-R^{CT}

Technology can be used as a means to attain objectives. For sure the environmental aspect is very important and it contributes greatly in molding the behavior or the learning actions of the users. However, it is clear that tools on its own do not motivate students in behaving in a particular manner. The pedagogical aspect is of paramount importance: it acts as an engine and it programs the way the students should behave. Having set up such environments and strategies to enable online learners to succeed in their distance course, it is highly recommended to make sure that the students' predicted behavior and interactions match with the actual ones. Corrective actions should then be taken to re-orient the students in discussing on specific topics. The tutor has this ability to shift the discussions from low cognitive to high cognitive matters. However, although the interactions are logged, it is too tedious for tutors to scrutinize past interactions manually. Indeed the logs should be automatically computed and visualized to enable tutors understand the students' progress (individually and in group) in terms of number and types of interactions exchanged.

Exceptional reports should be sent to the respective tutor to report the lurkers and passive students. This *caring* nature and monitoring of the tutor will be felt by the students and they will then be motivated to work regularly. Such follow up will contribute in helping students perform better and be successful in their studies [9].

Students also ask questions relating to instructions already given to them in the course content or in the written assignment. In many cases, students do not read the learning materials as expected before attending the online meetings. This, to some extent, does not contribute in the learning process. It may even be seen as a waste of time for those who have actually studied as required. It is therefore important for the learning activities found in the course materials to be interactive and automatically assessed so that students' efforts and results are sent to the tutors.

VI. Conclusion

This paper has the aim of understanding the way students interact online in a closed virtual environment. All different stakeholders need to play their role fully: coordinators should communicate and solve technical problems as promptly as possible. Course designers have an important contribution in this process: the student-content interactions do contribute in the learning progress [4]. Tutor is seen to be the leader in orienting discussions as required. Individual feedback is possible if relevant tools are given to the tutors to enable them track the students' participation and progress. To a very large extent they have the capabilities of not only helping the students persist in their studies but they can also motivate them individually so that they can improve their learning process in a more effective manner. Students are hereby given the proper environment and experts as support. They have the opportunity to seek for help and feedback from international students and tutors. Integrating different communities in the same environment will be made possible only if the actors have common interests.

Just like learning is a never ending process, the virtual environments should also evolve continuously as per the users' needs. Students nowadays adopt new ways of interacting and the e-campus should keep pace with those changes. For instance, decision support system, drill down reports, intelligent agents and game programming should be implemented in order to make teaching and learning more challenging and personalized. With the help of proper technology, pedagogy and involvement of tutors and peers, online students will no longer feel to be the 'second chance' [19], [20] learners. This strategic *one time* investment of the e-campus should be given due consideration as its users, the distance learners, will circulate and give life to it, similar to the soul of human beings.

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