HOW STUDENTS PERCEIVE E-LEARNING SITUATIONS? THE CASE OF THE SVC WBT EMBRYOLOGY COURSE

Dr. Hervé Platteaux (herve.platteaux@unifr.ch)
Centre NTE / University of Fribourg, Rue de Faucigny 2, 1700 Fribourg, Switzerland
www.unifr.ch/nte

Dr. C. Dubuis-Grieder[2] , PD Dr. S. Kasas[2], Prof . J.-P.Hornung[2], Dr. F. Schöni-Affolter[1], B. Brüsch[1], Prof. M. Celio[1], Dr. E. Strauch[3], Prof. O. Müller[3], Prof. P. Burri[3], Dr. G. Collaud[4] and Dr. M. Adé-Damilano[1]

[1]Department of Medicine, Division of Histology, University of Fribourg
[2]Institute of Cell Biology and Morphology, University of Lausanne
[3]Institute of Anatomy, University of Bern
[4]Centre NTE, University of Fribourg

KEYWORDS: **E-learning, Embryology, Formative evaluation, Students' perception**

ABSTRACT *This paper presents results about the perception students have about a Web Based Training in Embryology (SVC program). Two sessions of this course are compared to evaluate both the improvement of the pedagogical situation and the reasons motivating students to accept or refuse such an e-learning course. For the pedagogical situation, significant positive changes were obtained for important parameters such as learning objective identification, learning efficiency and students' autonomy. For the overall acceptance of the course, it appears that the parameters influencing the students' decision are not always linked to e-learning.*

PURPOSE OF THE STUDY

We present here a part of the pedagogical study of the Web Based Training (WBT) in Embryology. This Swiss Virtual Campus (SVC) project aims at building up an interactive 52 hours course for first and second year (pre-clinical) medical students. The development of this courseware is supported by a collaboration of three Swiss University institutes from Fribourg, Lausanne and Bern.

The present paper focuses on the way students act and react within the e-learning course situation proposed by this WBT project. Information is gathered to estimate how the students perceive this situation. In particular, we try to answer two main questions:

1. How are students using the interactive facilities of the e-learning course?
2. What makes the students accept, or refuse, the e-learning course situation?

The course was first proposed during January 2002 and a second time, in November 2002, to students in the University of Fribourg (first year of medicine). Students were asked to work on four thematic modules (fertilisation, pre-implantation, implantation and placenta) with an electronic book in which theory is presented by texts, drawings, interactive schemas and videos. They are associated to quizzes allowing students to test their understanding. Online communication tools (Forum, Chat and E-mail) complete these resources and allow the students to interact with the teacher and with the other students. In January, three lectures

were organised for an introduction, an intermediate and final synthesis. In contrast, a regular class was scheduled in November. There was a weekly lecture, introducing each module and making a synthesis of a case study. Forum and Chat were also organised the same way: one week dedicated to one module.

METHODS

A formative evaluation to improve the pedagogical situation

This pedagogical study is part of the WBT courseware formative evaluation process aiming at improving this e-learning course through continuous data collection. Literature reviews explain about many experimental results already obtained in this field (Dillon & Gabbard 1998; Tergan 1997). Instructional situations are always unique and are very difficult to compare (Ramage 2002). A specific study is thus needed for achieving a real understanding of a local pedagogical context (Williams 2002) such as the WBT course.

This paper considers the students' point of view and two types of results are discussed (see tables presented below). A first type of result is an average comparison of the January and November situations. It is a measure of the course quality evolution as perceived by the students. It gives feedback on the work done by the design team of our SVC project. A second type is the comparison of the November students who accept or refuse globally (designated by "yes" and "no") the proposed course. It explains the main reasons of the students' "decision" and completes the first comparison. Let us also note that the addition of results presented in the tables is not always 100%. Percentages of students who did not answer are not always indicated. For some questions, students can also give two answers.

The questionnaire

Students told how they perceived the e-learning situation by filling in a questionnaire. The very short duration of the course did not allow the use of other evaluation tools such as interviews. But, to gather both quantitative and qualitative information, the questionnaire included both close and open questions. Also a general discussion was organised during the last lecture and the questionnaire was given to the students at that time: about 120 both in January and November. 53 January students and 100 November students completed it.

Previous research was used to build up our questionnaire (Zahnd & al. 1998; Ragan 1999). It was then structured according to five main evaluation criteria: global usage of interactive facilities, communication situation, identification of learning objectives, learning efficiency and work organisation (in time and in quantity). Other criteria such as the content quality and the web site usability were tested before (Platteaux & al. 2002).

RESULTS AND DISCUSSION

Global usage of interactive facilities

Table 1 shows that the students' use of the main interactive facilities is very different. The overall course organisation required the use of theory modules and we see that 100 percents of the students use them. But learning efficiency results introduce nuances about this "obligation" (see Table 6). Table 1 also shows that students use the quizzes less and that they use communication tools even less. These observations are valid for January and November situations.

But there are significant differences between the two course situations. First of all, November students use quizzes much more and the learning efficiency results show why. In November, students know through the quizzes whether or not they have achieved learning goals. This is important because it makes the students more independent. The increase in the use of communication tools is also important. The role of the Forum becomes clear to the students after it was assigned a precise work (case studies). This is also true for Email but not for the Chat that remains used by only half of the students.

Table 1. *Students use of main facilities?*

	January (% of students)	**November (all)** (% of students)	**November (yes)** (% of students)	**November (no)** (% of students)
Modules (theory)	100	100	100	100
Modules (quiz)	53	81.5	80	83
Forum	53	74	77	71
Email	41	53	57	49
Chat	50	51	53	49

This global overview of the facility usage is completed by a look at the material support that students use to work on the modules' contents. Many January students said they wished an easy way to print modules and pdf files were proposed for the November session. 90% of the November students used them for the four modules and only 12% of them were reading all the modules from the computer screen (see Table 2). Students are attached to paper for many reasons that should not be forgotten with the development of e-learning. With paper, "students can transfer the benefits of strategies which they had learned as successful: progressing linearly, underlining, keeping track of what they have already seen"; this is a space for internalising externally presented information (Collaud & al. 1996).

Table 2. *Read from printed materials or from computer screen?*

	November (all) (% of students)	**November (yes)** (% of students)	**November (no)** (% of students)
Read from printed pdf files for about 100% of modules	90	83	97
Read from computer screen for about 100% of modules	12	20	4

One can see however a difference in this practice (see Table 2). Students who refuse the November situation are totally attached to paper material. Students who accept the e-learning situation are attached to paper but also use the computer for reading.

Communication situation

As shown in Table 3, no significant difference is seen, from a student's point of view, between January and November for the quantity of contact with the teacher. About 60% of the students are satisfied with the number of times they can get in touch with the teacher (face to face sessions or at a distance). About 40% of the students want more contact with the teacher. They say they want face to face lectures at the beginning, middle and end of the course.

This preference for a face to face type of communication explains the differences that appear in the November figures. The two right columns of Table 3 show that the type of contact students can have with the teacher (face to face or at a distance) influences them a lot for

accepting or refusing the course situation. This observation is also valid for the contact that the course situation allows between the students.

Table 3. *Do you want more contacts with teacher and students?*

	January (% of students)	**November (all)** (% of students)	**November (yes)** (% of students)	**November (no)** (% of students)
More contacts with teacher?				
Yes	38	42	27	57
No	62	56.5	70	43
More contacts with students?				
Yes	25	32	27	37
No	62	67	73	61

On one hand, this confirms that students feel the educational power of hybrid situations (blended learning). One should encourage situations that are mixing face to face and distant sessions. But time is needed before students know how to act in them. For example, the November situation gives the students more opportunities for real meetings with their colleagues and the teacher. However, as noted before, there is no significant change with their feeling of their contact with the teacher. And the same remark is true for their contact with their colleagues.

Identification of learning objectives

The results of Table 4 show a real positive transformation of the situation. In January, only a very small fraction of the students could identify the learning objectives and more than 40% of them could not! In November, it is the contrary. But the course situation has not yet become perfect regarding this aspect. There is not a big decrease of the students who can partly identify the objectives. This point needs further attention in the future.

Table 4. *Can you clearly identify learning objectives?*

	January (% of students)	**November (all)** (% of students)	**November (yes)** (% of students)	**November (no)** (% of students)
Yes	4	45	57	33
Partly	54	50	43	57
No	42	5	0	10

A radical change appears in the means used to identify the learning objectives (see Table 5). January students seem to not be able to make this identification using one single means. In contrast, modules are used by two thirds of November students. This positive result is reinforced by the figures concerning the teacher's role for this purpose. Students become much more independent of the teacher and are thus much more autonomous within the November situation. This is an important improvement of the course.

Table 5. *What means are used to identify the learning objectives?*

	January (% of students)	**November (all)** (% of students)	**November (yes)** (% of students)	**November (no)** (% of students)
Modules	31	65.5	65	66
Teacher	29	14.5	14	15
Other means	26	13.5	12	15
No answer	14	6.5	9	4

Table 5 shows no significant difference among the November answers for students accepting or refusing the situation. The means used to identify the learning objectives thus appear not to be crucial for the acceptance of the e-learning situation. But Table 4 makes obvious that the possibility, or impossibility, for the students to clearly identify such objectives is an important factor for the success of a higher education course.

Learning efficiency

Learning efficiency results are very positive when comparing January and November situations. The number of students saying they learn by using Modules (both for theory and quizzes) and communication tools increased a lot. The number of students saying they are not very satisfied with these resources for learning is decreasing. The same trend is seen for Forum and Email. Only the Chat does not show this very big positive progression and we will further investigate to determine why. The two right columns of Table 6 show that the learning efficiency perception has a big weight when students accept or refuse an e-learning course.

Table 6. *What learning efficiency of resources?*

	January (% of students)	**November (all)** (% of students)	**November (yes)** (% of students)	**November (no)** (% of students)
Modules (theory and quiz)				
Very good and good	51	70	80	60
Sufficient and insufficient	49	22.5	7	38
Modules (quiz alone)				
Very good and good	9	51.5	60	43
Sufficient and insufficient	44	38	30	46
Forum				
Very good and good	23	29.5	33	26
Sufficient and insufficient	32	26.5	10	43
Email				
Very good and good	13	30.5	37	24
Sufficient and insufficient	21	15.5	10	21
Chat				
Very good and good	17	20.5	27	14
Sufficient and insufficient	34	27	23	31

Work organisation

Two thirds of the January students said that the instructions they received to organise their working time were clear. This positive result indicated that the course design team could focus its efforts on other developments. The only organisational change was to reinforce the parallelism between the weeks and the modules. Each week of the November course was dedicated to one thematic module, thus making the time organisation even easier. And, again, two thirds of the students said they could easily organise their working time.

Table 7. *How much work amount per week?*

	November (yes) (% of students)	**November (no)** (% of students)
1 hour	7	14
2 hours	47	31
3 hours	43	40
4 hours and more	3	13
average value	2.88 hours	3.06 hours

The November questionnaire explores such questions further by estimating both the quantity of work furnished by the students and the feeling they have about it. Tables 7 and 8 show that this last parameter has an amazingly large impact on the students' global perception of the course. The average work hours per week are very similar, but they are perceived as radically different. Students seem to globally refuse the course if they feel the amount of necessary work is high. Many students said they did not participate in the Forum and Chat sessions because of lack of time. Furthermore, prefering to work on a paper version of the modules, many students complained about the time needed to print it.

Table 8. *What perception of work amount per week?*

	November (yes) (% of students)	**November (no)** (% of students)
little and very little	10	10
normal	53	30
big and very big	33	59

CONCLUSIONS

Through the students' perception of the first WBT course, the design team identified where work efforts should be focused. And a similar study during the second course session shows that the quality of the pedagogical situation significantly increased. Important pedagogical parameters such as learning objective identification, learning efficiency, etc. are now very well perceived by the students. Furthermore the students become more and more autonomous in their work with the proposed e-learning facilities.

Our study also reveals that the global acceptance, positive or negative, of the students for a e-learning course does not depend only on factors that are specific to e-learning. One should insist, for example, on the importance of work quantity and on the feeling students have about it. The success of e-learning depends also largely on such factors that have to be taken into account.

REFERENCES

COLLAUD, G. & al. (2000). Design and use of a hypermedia system at the University level. Journal of Computer Assisted Learning 16: 137-147.
DILLON, A. & GABBARD, R. (1998). Hypermedia as an educational technology : a review of quantitative research literature on learner comprehension, control and style. Review of Educational Research 68(3): 322-349.
PLATTEAUX, H. & al. (2002). Pedagogical evaluation of a web based training in embryology: a study of image-text combinations. In: FLÜCKIGER, F. & al. (eds.). Proceedings of the 4th International Conference on New Educational Environment: 2.1/43-46.
RAGAN, L. C. (1999). Good teaching is good teaching: an emerging set of guiding principles and practises for the design and development of distance education. Cause/Effect Journal 22(1).
RAMAGE, T. R. (2002). The "no significant difference" phenomenon: a literature review. E-Journal of Instructional Science and Technology 5(1).
TERGAN, S.-O. (1997). Misleading theoretical assumptions in hypertext / hypermedia research. Journal of Educational Multimedia and Hypermedia 6(3/4): 257-283.

WILLIAMS, D. D. (2002). Improving use of learning technologies in higher education through participant oriented evaluations. Educational Technology & Society 5(3): 11-17.
ZAHND, J. & al. (1998). Pedagogical aspects of education in a virtual classroom. In: FLÜCKIGER, F. & NINCK,A. (eds.). Proceedings of the first International Conference on New Learning Technologies.