STUDENTS’ AND TEACHERS’ EXPECTATIONS
IN RADIO-COMMUNICATIONS REMOTE LABORATORY 1

Mariela Pavalache-Ilie
Transilvania University
Brasov, Romania

Gheorghe Scutaru
Transilvania University
Brasov, Romania

Marian Alexandru
Transilvania University
Brasov, Romania

Sorin Cocorada
Transilvania University
Brasov, Romania

ABSTRACT

The paper presents the empirical and quantitative research that aims to compare the students’ and teachers’ expectations in remote laboratory. Two mixed symmetrical questionnaires have administrated for a sample comprises teachers and students in electrical engineering, computer science and telecommunications, from more European countries. We have obtained differences between students’ awareness needs in e-Learning and their habits in traditional learning, between males’ and females’ expectations and referable needs by teachers. The results show several common elements, too. The conclusions do not have a high degree of generality and, accordingly, we do not extrapolate them to other samples, the purpose of our research being an applicative one. But the conclusions can be useful as sources of suggestions to an effective teaching, to a personalized learning in radio communications remote laboratory and to improved performances and gratifications for all actors. They are the leading point for intercultural studies and for European networks, too.

I. INTRODUCTION

Web has become an alternative to traditional learning and a standard for universities, institutions and companies [1, 2] because it represents an attractive and efficient learning environment. By web it’s possible to gain rich informational sources, to distribute them between members of the work group, to interact with each other and also to interact with the machine [3, 4, 5].

The evolution of digital technologies has allowed the creation of remote laboratories, by which a new element is introduced in the learning environment – the equipments for developing experiments accessible from far away. Now, by remote laboratory it’s possible to learn some practical algorithms, the manual coordination is ameliorated and also the understanding of some complex situations. By approaching the real problems of a work place and by understanding some difficult situations, the student’s motivation for learning is accentuated [6, 5]. The physical absence of the teacher from the learning field doesn’t equal with a total absence, this absence is substituted by a more accentuated predetermination of the learning situation, realised on the basis of understanding student personalities [7, 3]. To gain the focus of teaching on the student, on his expectations, studies upon the electronic learning environment have grown bigger in the last three decades by developing specific instruments: Distance and Open Learning Environment Scale (DOLES) for university [ap.1], Connecting Communities Learning – CCL [8], the Web-Based Learning Environment Inventory – WEBLEI [2].

II. RESEARCH METHODOLOGY

A. Objectives and hypothesis

The objective of this study is to identify the degree of overlapping between the points of view of students and teachers on the situations of learning in an electronic environment. Besides realizing an analysis of needs focused on the beneficiary, analysis which responds to some pragmatic needs in the field of radio-communications, we have considered opportune to identify the attitudes and representations of teachers upon learning in a virtual environment, knowing that no platform, no learning environment forms competences if the actors do not play their roles adequately [3]. For this paper, the need analysis has defined as the analyze that provides a fine grained determination of where a need is coming from, and provides clues to how the need may be reduced or eliminated [8, 9]. The general hypothesis is: the expectations of students towards the learning situations that involve the electronic environment overlap only partially with the representations of teachers upon the same object.

Specified hypothesis:

H1. The expectations of students towards the situations of learning in the electronic environment are different from the usual formats of traditional learning.

H2. The expectations of students vary according to gender, age and the year of study.

H3. The representations of teachers upon the electronic environment of learning vary according to gender, age and experience at the work place.

H4. The representations of students and teachers upon the learning situations in the electronic environment are partially different.

B. Sample

The sample, unrandom, comprises teachers and students in electrical engineering, computer science and telecommunications. The lot is comprised of 119 student subjects, the big majority being included between the age interval of 19 – 24, and 48 teachers (Table 1). The table shows that the number of females from the sample (students and teachers) is low as in the target population. It is confirmed that the pressure of the first socialization, the discouragement from behalf of the teachers, the ambivalence

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upon the cultural abilities and values discourages women in choosing a nontraditional career.

Table 1: The composition of the sample

<table>
<thead>
<tr>
<th>Gender</th>
<th>Students</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Girls</td>
<td>Boys</td>
</tr>
<tr>
<td>Number</td>
<td>24</td>
<td>95</td>
</tr>
<tr>
<td>Total</td>
<td>119</td>
<td>48</td>
</tr>
</tbody>
</table>

C. Used tools

We have administered two mixed symmetrical questionnaires for students and teachers. The questionnaire for students has the following dimensions: habits in face to face learning, awareness needs in web based learning, advantages and disadvantages in computer-based communication, preferred methods for teaching-learning.

The questionnaires for teachers have the following dimensions: preferred methods for teaching-learning, advantages and disadvantages in computer-based communication, basic concepts in high frequency and radio communication related courses (the later will not be the subject of this analysis). The identification data of the subjects were solicited by items that looked at age, gender, the level of education, respectively the number of teaching years for teachers. The analysis of data has been realized with the SPSS program. Showing the results of the entire sample represents the reference point towards which the significant differences were mentioned after the previously mentioned variables, where they appear.

III. FINDINGS

The results have been organized and analyzed into three categories: group learning, preferred learning methods, and the perception of advantages and disadvantages of the CMC.

A. Group learning

The proportion of girls and boys that prefer to study alone a new subject is sensibly equal (20.20 respectively 20.50). Those who want the help of a competent person (studying with someone who knows the subject well) represent 59% of the sample but the proportion of girls from this category is lower then that of boys. Girls (20.8 %) prefer more then boys (15.8%) to study in a group (Fig. 1). Those who say that they do not need to be guided in learning, come from students that like independent individual learning or in group (r=290, p=002), the group being regarded as a horizontal environment of learning, “guidance” being a lop-sided relation, on the vertical.

B. The organization of the material that has to be assimilated and the preferred learning methods

As a reminiscence of traditional learning besides the electronic environment, girls prefer in a higher measure to learn by going though the chapters in a given order, one by one, step by step (65%) while as boys (27%) prefer to learn “by means of questions and answers between the system and you.”

Figure 1: Web site learning modalities

Q7_1 Go through the chapters in a given order one by one
Q7_2 Reach the information by means of keywords and read only the chapter you need
Q7_3 By means of questions and answers between the system and you.

In what concerns the learning methods preferred by students to realize experiments by means of the computer, the hierarchy made led to the following results (Fig. 2).

- Girls prefer to use <Figures on the subjects> (unexpected result because boys have higher visual/spatial ability [10]. Girls prefer <Sound-based instructions> too.
- Boys prefer <games related with the subject>, <means of games> and <story based>.

Figure 2: Learning methods and computer experiments (preferred by student)
Q8_1 Interactive
Q8_2 Batch jobs
Q8_3 Story based
Q8_4 By means of games
Q8_5 Figures on the subjects
Q8_6 Several problems and exercises
Q8_7 Games related with the subject,
Q8_8 Animations on the subject
Q8_9 Text-based instructions
Q8_10 Sound-based instructions

Probably girls want a higher degree of information, and computer games, even subordinated to learning, are rejected. We find here an old finding: «Women and men view video games as male activities» [10] and «at college men were even more skilled in using computers», was said two decades [11]. All teachers, regardless of the gender, use in class especially «power-point projector». Women-teachers use in a higher proportion then men announcements on the web-site and course materials on the web-site. On the other hand, men make more often then women simulations for the laboratory experiments. Neither category of teachers declares that they would use the chat-forum platforms that solicit more time. This way the opportunity of concentrating on the student is lost because the electronic forum can provide a context and features that support reflective dialogues and collaborative processes, which in turn can help the students construct their own knowledge [12, 13].

Relative to the methods used, both women and men consider that the most adequate for learning by experiments on computer are the interactive methods, several problems and exercises, and text-based instructions that are not specified in the virtual environment (Fig. 3). By tradition, these methods have deep roots. Paradoxically, all teachers find little use for the «By means of games method», although this is highly appreciated by most of the beneficiaries and especially, boys. So, teacher and student preferences are different, this way confirming the hypothesis 4.

C. Perception of advantages and disadvantages of the CMC

Boys consider that the strongest advantages of the CMC are the geographic independence and temporal independence this way confirming the characteristic of the electronic environment that assures the “flexible learning” (Where, when and how’ they want it.). Student boys add that in virtual environment they are not embarrassed by the teacher’s presence. Girls consider that the strongest advantages of the CMC are Silent (<nobody disturb you>) and <You can find quickly elements of all past communications>. (Fig. 4). The last argument differentiates significantly the subgroup women-teacher from the subgroup of men-teachers. The fact that girls are not disturbed by the presence of the teacher but in a small measure 4.2% can be the result of the perception of the teacher as a source of information and support element that is in concordance with the previously formulated conclusion.

Boys consider that the strongest disadvantages of the CMC are <Reading online especially if the amount of information to be read online is significant> and <You may not be certain whether other participants have received your message>. In opposition, girls consider that the strongest disadvantage of CMC is their insufficient knowledge of how to use the...
internet (Not yet sufficient experience with the web and the Internet). For teachers the most important disadvantage of the CMC is <You are not embarrassing for teacher’s presence>. According to this, we can say that also on this dimension, the existence of some differences is noticeable between gender, and also the difference between student-teacher, this way confirming the hypothesis.

IV CONCLUSIONS

The analysis of data confirms the general hypothesis, indicating the existence of some differences between the representations of students and that of the teachers regarding the learning situations in the electronic environment, which vary, in different degrees, after all the proposed variables. The guided learning is valorized by most of the half of the investigated group, its preference being diminished in the case of girls. These prefer to learn in group, according to studies that confirm that girls are more sociable. Regarding the ways in which one can assimilate the information, we can notice the differences between learning face to face and by learning in the electronic environment: traditionally the simple approach, chapter by chapter, in all the partner countries, is more powerful in the case of girls and in the electronic environment the interactivity between student and machine is valorized (it is stronger at boys), followed by reading of all the chapters (preferred by girls). The last has imposed probably by the specific of the technical disciplines and by the tendency of girls to be more conscientious then boys.

The techniques preferred by students in doing a laboratory work are: games related to the subject games related with the subject, story based, figures on the subjects, and problems and exercises solving which corresponds, in a high degree, to the specific of the virtual environment, but it is different from the teaching offer, introducing a possible frustration. The written instructions are preferred to the audio ones, by all subjects, students and teachers.

Regarding the guidance offered by the teacher, two distinguishing subgroups are formed which should be treated differently: students with a declared need of guidance and those who do not need it. It can be seen that when growing in age the independence toward the teachers grows too but the need of help from behalf of the teacher is maintained in some situations of failure. This is stronger in the case of girls. The termination of the mandarinate phenomenon is confirmed by the development of relations between the students, this being done in the detriment of the classical teacher-student relation. In this context, the fundamental role of the teacher or tutor has not changed but the mode of operation has changed.

The revealing of the possibility of retaking some operations until they are understood and the insufficient time of work in the traditional laboratory reconfirms the opportunity of the remote laboratory.

The perception of the advantages and disadvantages in the CMC corresponds to the existent tendencies in literature this way showing the possibility of research by means of links and spatial and temporal independence. Although other studies upon the virtual space underline the importance of learning in an own rhythm, two thirds of the questioned subjects are not conscious of it.

Although the subgroups belong to some universities from countries with different cultural characteristics, there are many similarities between the expectations and preferences of students, which plead for using some common learning scenarios and instruments.

Yet again the phenomenon of the globalization of education is confirmed, the diminishment of some cultural differences being intensified by the virtual environment. In the same time, we can also notice significant differences between groups, differences which can’t be generalized to the entire population, but which must be respected as to raise the efficiency of learning and the satisfaction of the actors, students and teachers. Ours conclusions can be useful as sources of suggestions to an effective teaching, to a personalized learning in radio-communications remote laboratory and to improved performances for all actors. They are the leading point for intercultural studies and for European networks, too.

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