

Influence of communication means in project oriented education

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Abstract—This article describes the results of previous research in electronic communication area. It deals with the organization and implementation of research, which goal was to find out the electronic communication impact at project oriented education effectiveness within the computer science courses at the Faculty of Education at Trnava University in Trnava.

I. INTRODUCTION

With the arrival of new technologies the possibilities of communication in education will also be possibly changed. Communication is essential for teamwork within projects and can significantly affect learning processes and learning outcomes as well. New technologies open up additional possibilities for the learning communities' creation. But that requires acquisition of new communication skills for the teachers and students.

Communication has significant place in education. Intensive research has been carried out in the field of communication in education mainly in connection with new technology opportunities. Ohlund, Yu, Jannssch-Pennell a Digangi [1] presented the results of research in which respondents were divided into four groups according to the use of communication medium: (1) email, (2) chat, (3) email and chat, and (4) other communication tool. Respondents who use synchronous and asynchronous forms of online discussions were largely able to fulfil the required course activities. Research has shown that the combined synchronous and asynchronous online discussing maximize personal engagement in learning. Yout and Shapiro [2] reported a case study in which student's ranked higher asynchronous communication than synchronous communication. Johnoson G. M., J. Johnoson A. [3] [4] have done research which compared two WebCT communication tools, synchronous chat and asynchronous discussion. The research found that about 40% of respondents indicate that they prefer synchronous chat and 60% of respondents preferred asynchronous discussion. Experienced users decided more often to use chat instead of asynchronous discussion forum. Research also showed that about 43% of respondents identified that they learned best when used synchronous chat and about 57% of respondents identified the asynchronous discussion. Although these studies confirm that digital communication has become one of the basic skills needed for career advancement, but it involves more than just achieving computer literacy. Success in school and at work depends on knowing how to choose the right

medium for the message, and then design and create various forms of communication.

II. THE RESEARCH REALIZATION AND ORGANIZATION

Within the complex research supported by VEGA grant we researched also how students use individual electronic communication mediums in the education process realized in the form of project oriented education. The research has been realized in fall term 2009-2010 at the Faculty of Education at Trnava University in Trnava. Students were split into two groups face-to-face, and blended learning group. The model, recommended by Turek, was used for planning and realization of the project oriented education [5].

The research goal was set as follow: to find out how form and means of communication impact the project oriented education effectiveness within the computer science courses. Following hypotheses were tested:

H1: Students prefer electronic communication medium with no regard of the education form.

H2: There is statistically significant difference between project assessments of students working with following mediums: 1. group – chat; 2. group – e-mail; 3. group – discussion forum; 4. group – face-to-face discussion.

H3: Duration of the communication medium usage has influence on the project assessments.

The research sample consisted of 171 students in the third year of undergraduate study full time in the fields of Teaching. Students were classified into four working groups according to the preferred communication medium. The first group used as the preferred medium synchronous chat, the second group used the asynchronous e-mail, third group asynchronous discussion forum, and the last group preferably used synchronous communication – face-to-face.

III. INTERPRETATION OF RESEARCH RESULTS

In Hypothesis H1, we assumed that students prefer electronic communication medium with no regard of the education form (Table 1, Table 2).

We found that electronic communications significantly outweigh a face-to-face communication and even students who were enrolled for face-to-face form of education have a higher percentage of use of electronic communication means (61,73%) compared with a face-to-face communication (38,27%). Based on these results we proved the validity of the hypothesis H1. The electronic

communication means, which are largely based on impersonal and yet interactive communications are becoming increasingly popular among students and provide them with new opportunities in education. Whether the independence of electronic communication, where teachers and learners are not necessarily in the same place and at the same time during communication or gain greater opportunities to obtain information necessary for the development tasks within the project.

TABLE I.
THE CORRELATION BETWEEN THE USAGES OF COMMUNICATION MEDIUM

	Face-to-face	Electronic means
Percentage ratio	29,5	70,5

TABLE II.
THE CORRELATION BETWEEN THE USAGES OF COMMUNICATION MEDIUM DEPENDING ON THE FORM OF EDUCATION

Education form	Group	Face-to-face	Electronic means
Distance learning	1.group	29,04	70,96
	2.group	26,69	73,31
	3.group	27,46	72,54
Face-to-face	4.group	38,27	61,73

Facts, that electronic communication is currently developing, are confirmed by further results (Table 3).

TABLE III.
PERCENTAGE SHARE OF COMMUNICATION MEANS BY GROUPS

Groups	Face-to-face	Chat	Phone	E-mail	Discuss forum
% ratio of all means	29,5	27,8	1,6	31,1	10

The e-mail, asynchronous communication mean, was most often used by students in projects (31,1% of all communication means). The second most common used communication mean was a face-to-face discussion represented with 29,5% portion followed by synchronous chat with 27,8%. One of possible explanation is that students have more time to write messages with asynchronous means because the sender does not wait for an immediate response. This increases the ability to process information and may have a positive impact on the quality of the information.

Hypothesis H2 stated that there is statistically significant difference between project assessments of students working in groups using different communication means as preferred selection: 1. group – chat; 2. group – e-mail; 3. group – discussion forum; 4. group – face-to-face discussion. Research was oriented onto the influence of preferred means of communication, type of communication medium and length of communication on the results. The goal was to find out whether the results of each group are comparable and which one of communication means leads to improved results for project results. The method of analysis of variance ANOVA $F(3,64) = 5,263, p = 0,0026$ confirmed that

between the project results are a statistically significant difference, so hypothesis H2 is valid (Figure 1).

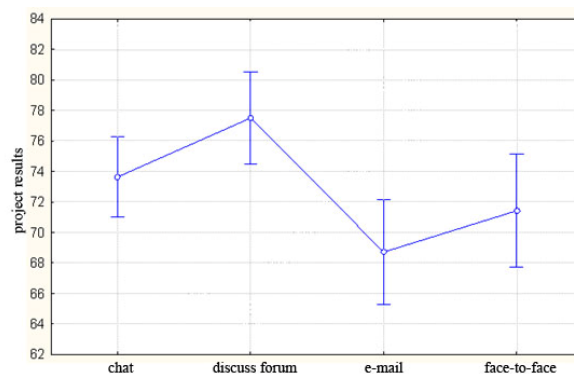


Figure 1. Influence of communication means on the results

Students achieved the best results with usage of discussion forum as preferred communication mean. Students preferably used e-mail achieved the worst results. Comparing results of different groups among themselves, statistically significant difference exists only between the second (e-mail) and the third group (discussion forum) ($p = 0,0017$) (Table 4).

TABLE IV.
TUKEY POST-HOC TEST - COMPARISON OF PEER GROUPS

Groups	Chat (p)	E-mail (p)	Discuss forum (p)	Face-to-face
Chat	–	0,115797	0,230079	0,766985
E-mail	0,115797	–	0,001782	0,709253
Discuss forum	0,230079	0,001782	–	0,065365
Face-to-face	0,766985	0,709253	0,065365	–

Results of described research showed, that inclusion of a discussion forum as a means of communication in the project oriented education can improve it taking into account the limits bordered the research.

Hypothesis H3 stated that the length of interpersonal communication using communication means among the members of project team has an impact on the results of the project. Multiple linear regression ($R^2 = 0,15; F(4,64) = 2,734; p = 0,036$) showed that only the length of a face-to-face communication had statistically significant ($p = 0,017$) effect on the results of the project (Table 5).

It is possible to conclude that the longer lasted face-to-face communication in solving students' project, the better were results of the projects (Figure 2). However, the validity of hypothesis H3 is not confirmed because other variables (time spent on the discussion forum and chat), no significant affected the evaluation of the project.

TABLE V.
RESULTS OF MULTIPLE LINEAR REGRESSIONS WITH THE RESULTS OF THE EVALUATION PROJECT AS A DEPENDENT VARIABLE

	Beta	SE Beta	B	SE B	t(63)	p
Group	-0,294	0,133	-1,859	0,837	-2,221	0,030
Face-to-face in minutes	0,316	0,129	0,011	0,005	2,457	0,017
Discuss in minutes	0,135	0,117	0,166	0,144	1,152	0,254
Chat in minutes	0,131	0,127	0,003	0,003	1,032	0,306

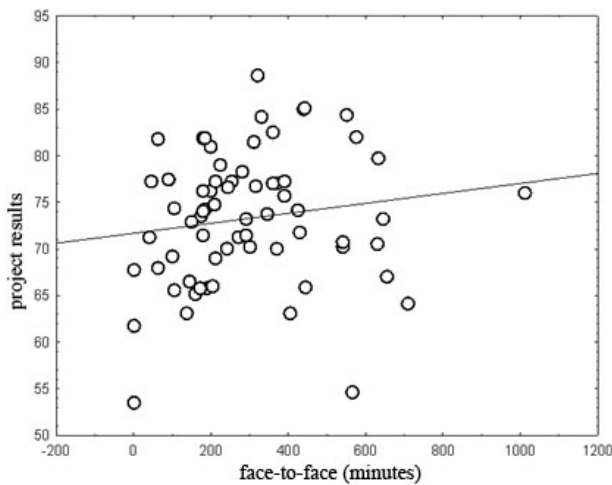


Figure 2. Multiple linear regression

IV. CONCLUSIONS

The research results showed that preferred communication medium and communication duration have an impact on the project results. It also showed that the discussion forum is a suitable communication medium for the project teamwork. Based on these findings, it is suitable to include this communication medium in the project oriented education.

Electronic communication expands everyday in the whole society, mainly in industry and business. Education cannot ignore this trend and moreover, needs to prepare students for life. The success of graduates in the job market is dependent on their knowledge and skills. Research described in this article has ambition to develop educational process by improved understanding of the electronic communication use in project oriented education.

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