

# Team Communication via Facebook: Success or Failure?

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**Abstract.** *The implementation of advanced technological solutions in education has the potential to become a valuable resource to support students' communications and collaborations. One possible solution is the social networking site Facebook. Many college students use this site as an integral part of their daily communication activities. Many researchers, consequently, tried to investigate the potential positive use of Facebook at university level, which is focus of the literature review of the paper. As effective communication is crucial to the success of teams, we wanted to examine students' perception of Facebook as medium of communication between team members in a project-oriented course. Examination of the communication channel included assessment of communication flow, communication quality and communication satisfaction from student point of view and from teachers' point of view in terms of quality of students' output. Our results show that Facebook is perceived as good as other non-Facebook media of communication in terms of bidirectionality, formality and communication quality between team members. Our research also revealed that Facebook had better results in terms of frequency but did not have better results in terms of performance outcome and students satisfaction.*

**Keywords.** communication flow, communication quality, communication satisfaction, Facebook, team work

## 1 Introduction

Due to the fact that students spend significant shares of their time communicating and sharing different content with their friends online the implementation of new information communication technologies in education became a challenge and necessity. In the past few years positive cases of ICT use in learning in higher education were reported [2, 5-6, 10, 17].

As the social network site (SNS) Facebook became an integral part of daily communication activities for many students [15, 28], consequently, university teachers more and more introduce(d) Facebook at academic level as well [12]. But is SNS

Facebook an appropriate learning environment in different settings? "Despite its rapid growth and current popularity, it is still unclear whether or not Facebook and similar resources have a future as a mainstream communication tools in our society, let alone as supports for education" [24].

This is why the authors challenged the students. The students had to perform tasks with high demand regarding social interaction and presumably SNS Facebook should support this kind of tasks perfectly. Following research questions arise in this context: Can SNS Facebook (FB) be an adequate platform for successful team communication in project activities? How big should the team size be? It's also important to know if students liked this form of communication better, and most importantly, if their performance outcome as the key indicator of success is affected by the use of SNS FB.

This research project was performed in the course "Information system management" at Karl Franzens University Graz (KFU) in winter semester 2012. As the course program was designed to simulate the business environment working in teams to solve problems of relevance, in real business environments each student had to complete three tasks in different work settings i.e. team structure (size), preparation time and level of task difficulty. To fulfil the project tasks team members needed to communicate. As communication is frequently a major determinant for project success or failure [22], the authors wanted to examine whether Facebook environment can be successfully used for team communication in order to support students in successful completion of tasks. In our case it meant if they could produce higher quality output that is reflected by better grades. In this study we used Mohr & Sohi [20] model of communication examination and applied it to educational environment in the case of collaborative communication between team members.

The paper is organized as follows. In chapter 1 introduction to the study and research questions are presented. In chapter 2 a thorough literature review regarding communication, group work, and social networking sites is presented. Chapter 3 presents the research problem more detailed and gives the definition of hypotheses. Chapter 4 presents sample

size and methodology. Chapter 5 presents study results and the following chapter (chapter 6) concludes the study research and provides implications for further research.

## 2 Literature review

### 2.1 Communication and examination

Communication is the process of transmitting and receiving different kinds of messages (thoughts, ideas, feelings etc.). Communication is usually described “as the glue that holds together a channel of distribution” [21]. Communication can be observed from the different perspectives: mechanistic, psychological, systems-interactions, and interpretive –symbolic [25]. Communication in mechanistic perspective is viewed as a transmission process that includes message (content), channel (mode), feedback (bidirectional communication), and communication effects [21].

Mohr & Sohi [20] studied the communication channel theory where they examined the communication flows between manufacturers and dealers. Precisely, how norms of information sharing influence the frequency, bidirectionality, and formality of communication flows; how these communication flows affect dealers’ assessments of the quality of communication; the relationship between communication quality and dealers’ satisfaction with communication; and the relationship between formality of communication flows and the dealers’ distortion and withholding of information [20].

### 2.1 Background on group work and computer-mediated communication

Work in groups is common way of working in a variety of professions. Educators implemented group work at all levels of education as well. Implementation of this practice is an important preparation for professional careers, providing real-world authenticity [26]. Group assignments ground in the social constructivist approach to learning where learners learn as they reflect on their own experiences with other individuals [16]. In group assignments learners discuss and share their experiences and findings. They contribute to different understandings that lead to new, shared knowledge and attitudes [16].

Computer supported collaborative learning can be time- and place- independent and allows “many-to-many” interactive communication and may facilitate group work [4]. Some researchers suggest that computer-mediated communication can be as effective as or even more effective than face-to-face (f2f) collaboration and communication [27].

A study performed by Smith et al. [26] compared student group work experiences in online versus face-

to-face and they found: 1) face-to-face (f2f) settings generally have positive results in terms of student achievement when working in groups; 2) students in online sections were more negative about group work than were students in f2f sections; 3) online students were less satisfied with group work; and 4) because of fewer channels of communication online students were less able to resolve logistical difficulties associated with group work. Some reasons for positive results in case of f2f are basically because f2f groups simply communicate more frequently than computer mediated groups [17].

Ocker & Yaverbaum [23] compared student face-to-face and asynchronous computer conferencing collaboration. The elements of comparison taken into consideration were learning outcomes, quality of solution, solution content, and satisfaction with the solution quality. The results showed that the asynchronous way of collaborating has the same results as face-to-face collaboration and that students were significantly less satisfied with the asynchronous learning experience “both in terms of the group interaction process and the quality of group discussions” [23]. In spite of being less satisfied with asynchronous collaboration process students generally felt that this way of collaboration was beneficial [23].

Another study performed by Goold et al. [11] examined the comparison between f2f and online conversion of a project management course. The results showed that students liked the flexibility of an online environment, but many indicated that the biggest challenge was communication and the tendency for group members to submit work at the last minute [11].

### 2.3 Social networking sites and education

According to Bartlett-Bragg [1] social networking sites are “applications that augments group interactions and shared spaces for collaboration, social connections, and aggregates information exchanges in a web-based environment.” Another definition is from Boyd and Ellison [3] who define social networks as web-based services which allow users to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and to view and traverse their list of connections and those made by others within the system.

One of the most famous social networking sites today is Facebook. Facebook is defined as “a social utility that helps people share information and communicate more efficiently with their friends, family and co-workers” [8]. SNS Facebook originally was developed as a social web space for college students in the United States in 2004 [12]. Later Facebook expanded its use to individuals outside the college and university system. From the beginning Facebook gained popularity and the number of users increased rapidly during last 8 years. At the end of

December 2011 FB reported more than 845 million monthly active users, and approximately 80% of monthly active users were outside the U.S. and Canada (according to Facebook.com statistics retrieved in March 2012 [8]). Having these numbers in mind, we can freely say that FB is currently one of the world most popular communication tools.

Facebook has a “diverse community of users at all levels of education and areas of society, including companies and universities” [24]. Mazman & Usluel [19] state that the idea of using social networks in educational and instructional contexts could be beneficial simply because students spend a lot of time on these online networking activities. Some studies report that between 85 and 99% of college students use Facebook [14].

Roblyer et al. [24] reported that university students were very open to Facebook use or the use of similar technologies to support classroom work. Haverback [13] applied FB for educational purposes on a reading education methods course. Students were asked in an online learning community on Facebook to discuss assignments, ask and answer questions, to post information, and to support each other. Students showed higher engagement and participation and produced more valuable ideas in groups than compared to when they read individually (Haverback, 2009).

A research conducted at Michigan State University (MSU) about the educational uses of Facebook by university students revealed that 10% of the MSU respondents said they used Facebook as part of an assigned class exercise, about half had used Facebook to arrange a study group or meeting, more than half had used it to discuss classes or schoolwork, and about one-third reported using Facebook to “collaborate on an assignment in a way that your instructor would like”. Most of the respondents (69%) had used Facebook to contact another student with a question related to class or school-work [7].

### 3 Hypotheses development Research questions

In order to investigate possible positive effects of Facebook as educational platform under different circumstances and based on literature review the authors formulated following hypothesis:

- **H1a:** *There is no difference in communication frequency between group members in Facebook and non-Facebook group.*
- **H1b:** *There is no difference in distribution of communication frequency in different group size settings.*
- **H2a:** *There is no difference in communication bidirectionality between group members in Facebook and non-Facebook group.*
- **H3a:** *There is no difference in communication formality between group members in Facebook and non-Facebook group.*

- **H3b:** *There is no difference in distribution of communication formality in different group size settings.*
- **H4a:** *There is no difference in perceived communication quality between group members in Facebook and non-Facebook group*
- **H4b:** *There is no difference in distribution of communication bidirectionality in different group size settings.*
- **H5a:** *There is no difference in perceived communication satisfaction between group members in Facebook and non-Facebook group*
- **H5b:** *There is no difference in distribution of communication satisfaction in different group size settings.*
- **H6a:** *There is no difference in project quality outputs between group members in Facebook and non-Facebook group.*
- **H6b:** *There is no difference in distribution of project quality output in different group size settings.*

The basic idea is to check in which elements of communication examination and project settings Facebook communication deviate from other communicational settings i.e. face-to-face, mobile phone, e-mail, Skype etc. (non-Facebook communication).

## 4 Method

### 4.1 Sample overview

The research study was performed in the course “Information system management” at Karl Franzens University Graz in winter semester 2012. The sample therefore consisted of 27 students respectively 23 who successfully completed the course. Four students abandoned the course before and are not included in the data analysis as their data sets are not complete and as their negative grades do not necessarily represent their performance in single tasks. Gender distribution was unremarkable among the sample (14 female and 9 male students) whereas the number of exchange students was higher than usual (30 %) due to the fact that the course language was English.

The organization as an interactive course was chosen in order to foster achievement of course learning outcomes. A combination of conveying knowledge by means of lecture, group work, discussion and presentation diversified the learning process. Main course learning objectives were:

- *a profound knowledge concerning main tasks of IS management,*
- *basic knowledge concerning specific tasks of IS management,*
- *basic knowledge of IS vocabulary,*
- *the ability to develop and communicate IS strategies,*
- *the ability to understand IS architectures,*

- the ability to plan IS projects,
- the ability to manage IS development processes, and
- the ability to manage IS implementation and operation.

Each student had to complete three tasks in different group work settings regarding group size, preparation time and level of difficulty (Table 1). Students met regularly during scheduled classes. Computer mediated communication or f2f communication was used to continue collaboration outside class.

Table 1. Description of tasks and group work settings

Task order	Group size	Time for the preparation	Level of difficulty
First (1.)	2	Five (5) weeks	Normal
	First task was the presentation of the strategic decision: <b>What kind of software should be used for a new information system at KFU?</b> <ul style="list-style-type: none"> <li>• standard software versus individual software?</li> <li>• open source?</li> <li>• in house development versus outsourcing?</li> </ul> It was expected that the teams of two will give a 10 to 15 minutes presentation including well-reasoned implications of their decision that was based on balanced reasons while referring to the existing information system at Karl-Franzens University (UniGraz Online - UGO).		
Second (2.)	4	Eight (8) weeks	Medium
	Second task was more difficult. The groups of four had to prepare 20 to 30 minutes presentations and decisions regarding the question: <b>What are important tasks concerning implementation and operation of a new information system at Karl-Franzens University?</b> <ul style="list-style-type: none"> <li>• data security?</li> <li>• maintenance?</li> <li>• capacity issues?</li> <li>• staff training?</li> <li>• privacy issues?</li> </ul> They were asked to refer to the structure at KFU and to provide well-reasoned decisions.		
Third (3.)	6	Ten (10) weeks	High
	The third task was most difficult and groups of six had to prepare 30 to 40 minutes presentations and answers to the question: <b>What are important steps in the development process of a new information system for KFU?</b> <ul style="list-style-type: none"> <li>• requirements?</li> <li>• architecture?</li> <li>• projects?</li> <li>• project portfolio?</li> <li>• tests?</li> <li>• change management?</li> </ul> They were again asked to refer to the existing structure at KFU and to focus on management issues involved in this task.		

## 4.2 Instrument and measures

This study used the 5 item scale from Mohr & Sohi [20] model to examine the relationships between communication flows and communication quality and satisfaction. Communication flow is examined through frequency of the interaction, bidirectionality of communication and the formality of communication flow.

Construct item “*frequency*” is the amount of contact between channel members. The applied scale was coded using a five-point Likert scale: 1 - very frequent to 5 - very infrequent. Construct item “*bidirectionality*” is the extent to which each party

gives feedback an input to other. The applied scale was coded using a five-point Likert scale: 1 - a lot to 5 - none. Construct item “*formality*” is the extent to which communication flow are structured, planned and routinized. The applied scale was coded using a five-point Likert scale: 1 - strongly agree to 5 strongly disagree. Construct item “*assessment of communication quality*” is usually defined as the extent to which the parties perceive communication flows as *timely, accurate, complete* and *credible*. The applied scale was coded using a five-point Likert scale: 1 - strongly agree to 5 strongly disagree. Construct item “*satisfaction with communication*” represents how positively or negatively a team

member feels about communication during the project execution. The applied scale was coded using a five-point Likert scale: 1 - strongly agree to 5 strongly disagree.

To determine project success we used an assessment rubric with the following criteria:

- 1) *Originality of work* – Is there a unique contribution?
- 2) *Outline* – Is there a visible structure within presentation?
- 3) *Presenting style* – Is the presentation appropriate to attract the attention of the audience?
- 4) *Effort* – Did the presenters put enough effort in their work?
- 5) *Argumentation* – Is the presentation convincing?
- 6) *Completeness* – Are all questions answered?
- 7) *Coherence* – Do the part of the presentation complete each other?
- 8) *Overall impression* – How would you grade the presentation?

Each criterion was graded on five-point scale where 1 means excellent and 5 means poor criteria match. In the process of assessment participated all students and the teachers. This assessment rubric was used for every team in all three tasks.

Survey also included demographic items (sex, study degree), foreign language order, language of communication among team members, medium of communication Facebook or non-Facebook, size of team and team letter (A, B, C...).

All gathered data was analysed using statistical software SPSS (ver. 20). Descriptive statistics such as means, standard deviations, and variance were computed (Table 2).

## 5 Results and discussion

We tested the normality of distribution of depended variables. Not all variables were normally distributed and due the small sample based on independent variable, Facebook (FB) or non-Facebook (NFB) group, we applied non-parametric tests to test our data. The critical probability ( $p$ ) for all tests was set at 0,05.

*Can SNS FB be adequate platform for team communication and successful project completion?* From descriptive statistics in Table 2 we can see that there is a difference in results for dependent variables between FB and NFB groups. *Communication frequency* in FB group was  $M=2,747\pm 0,646$  and NFB  $M=4,316\pm 0,899$ ; *communication bidirectionality* in FB group was  $M=3,0556\pm 0,92334$  and NFB  $M=2,9737\pm 0,74590$ ; *communication formality* FB:  $M=3,5988\pm 1,02871$  and NFB:  $M=3,1250\pm 1,15707$ ; *communication quality* FB:  $M=2,7556\pm 0,89824$  and NFB:  $M=2,4000\pm 1,14371$ ; *communication satisfaction* FB:  $M=2,6481\pm 1,006$  and NFB:  $M=1,975\pm 1,150$ ; and project quality output in FB:  $M=1,44\pm 0,506$ ; and NFB:  $M=1,15\pm 0,366$ .

Table 2. Basic descriptive statistics for Facebook (FB) and non-Facebook group (NFB)

FacebookGroup = Yes						
Variable	Number of respondents	Minimum	Maximum	Sum	Mean	Std. Deviation
TaskResult	27	1	2	39	<b>1,44</b>	,506
Average_Frequency	27	1,67	4,33	74,17	<b>2,7469</b>	,64611
Average_Bidirectionality	27	1,50	5,00	82,50	<b>3,0556</b>	,92334
Average_Formality	27	1,17	5,00	97,17	<b>3,5988</b>	1,02871
TP_Average_Quality	27	1,40	4,80	74,40	<b>2,7556</b>	,89824
Average_Satisfaction	27	1,00	5,00	71,50	<b>2,6481</b>	1,00568
FacebookGroup = No						
Variable	Number of respondents	Minimum	Maximum	Sum	Mean	Std. Deviation
TaskResult	20	1	2	23	<b>1,15</b>	,366
Average_Frequency	19	2,00	5,00	82,00	<b>4,3158</b>	,89906
Average_Bidirectionality	19	1,33	4,00	56,50	<b>2,9737</b>	,74590
Average_Formality	20	1,00	4,83	62,50	<b>3,1250</b>	1,15707
TP_Average_Quality	20	1,00	4,07	48,00	<b>2,4000</b>	1,14371
Average_Satisfaction	20	1,00	4,33	39,50	<b>1,9750</b>	1,14997

In order to compare statistically significant difference in the dependent variables between the FB and NFB group, we used Mann Whitney U test. The results are shown in table 3. In terms of communication frequency, communication satisfaction and project quality output there is a difference between Facebook and Non-Facebook

group. The distribution of communication bidirectionality ( $U=256,500$ ;  $Z=,000$ ;  $\text{sig}=1,000$ ), communication formality ( $U=213,000$ ;  $Z=-1,230$ ;  $\text{sig}=,219$ ), and communication quality ( $U=192,500$ ;  $Z=-1,315$ ;  $\text{sig}=,189$ ), is the same across the Facebook and Non-Facebook group.

Table 3. Mann Whitney U test results between the FB and NFB group

Variable Results	Average_ Frequency	Average_ Bidirectionality	Average_ Formality	Average_ Quality	Average_ Satisfaction	Task Result
Mann-Whitney U	49,500	256,500	213,000	192,500	165,500	190,500
Wilcoxon W	427,500	446,500	423,000	402,500	375,500	400,500
Z	-4,666	,000	-1,230	-1,315	-2,259	-2,118
Asymp. Sig. (2-tailed)	,000	1,000	,219	,189	,024	,034
	<i>Reject</i>	<i>Accept</i>	<i>Accept</i>	<i>Accept</i>	<i>Reject</i>	<i>Reject</i>

a. Grouping Variable: FacebookGroup

From the results shown in Table 3 we can accept hypothesis **H2a**; **H3a**; **H4a**; but we can't accept following hypothesis: **H1a**; **H5a**; **H6a**. We therefore conclude that Facebook is adequate in teams of

communication flow: bidirectionality, formality and quality, but inadequate in terms of communication frequency, communication satisfaction and project quality output.

Table 4. Kruskal Wallis Test results (grouping variable: team size)

Test Statistics <sup>a,b,c</sup>						
Variable Results	Task Mark	Average_ Frequency	Average_ Bidirectionality	Average_ Formality	TP_Average_ Quality	Average_ Satisfaction
Chi-Square	,062	6,448	6,259	4,419	7,429	3,335
df	2	2	2	2	2	2
Asymp. Sig.	,970	,040	,044	,110	,024	,189
	<i>Accept</i>	<i>Reject</i>	<i>Reject</i>	<i>Accept</i>	<i>Reject</i>	<i>Accept</i>

a. FacebookGroup = Yes

b. Kruskal Wallis Test

c. Grouping Variable: SizeOfTeam

Further we wanted to check under which circumstances i.e. project settings, Facebook is better for communication in teams. We applied Kruskal Wallis Test for comparing multiple groups concerning their mean value. The results are presented in Table 4. Analysing the results, we can accept following hypothesis: **H3b**; **H5b**; **H6b**; (i.e. team size doesn't influence on communication formality, satisfaction and project quality output) but we can't accept the following hypothesis: **H1b**; **H2b**; **H4b** (i.e. team size influence on communication frequency, bidirectionality, and communication quality). Students perceived communication in NFB groups as most satisfying in general but communication in team of four (4) as most satisfying in FB environment.

## 6 Conclusion

The purpose of this paper was to examine potentially good characteristics of Facebook as communication medium between team members in project based learning environment. The results of our small scaled research project showed that Facebook is perceived as good as other non-Facebook media of communication in terms of bidirectionality (extent to which each party gives feedback and input to other), formality

(extent to which communication flow is structured, planned and routinized) and communication quality (extent to which the parties perceive communication flows as timely, accurate, complete and credible) between team members in Facebook groups and non-Facebook groups. Our research also revealed that Facebook had better results in terms of frequency (amount of contact between channel members). Regarding the possible influence of team size on successful project completion we found equal results in Facebook groups and in Non-Facebook groups in terms of formality, satisfaction and project quality output. Students were more satisfied with communication in Non-Facebook environment than in Facebook environment but Facebook environment received better scores in team of four (4) and worst in teams of six (6) in terms of frequency, bidirectionality and quality.

In the course of a feedback and reflection lesson that was held at the end of the course the students discussed their experiences during the course and the corresponding tasks. Their reports in the discussion corroborate the findings of our statistical analysis. The students experienced the advantages of FB as an asynchronous medium of communication and also the benefits of less physical meetings but they also

reported a lack of personal communication. An interesting fact is that they perceived problems in actually finding their team partners in the first place. We can conclude that Facebook as a medium of communication between team members is an adequate but not optimal solution. And it is more appropriate for team communication in teams of four (4) members.

Due to the fact that technology is improving every day, we believe that Facebook will have more new useful functionalities in future. That is also the first limitation of this research because change of functionalities influences the efficiency of communication channel as well. The second limitation is caused by the small sample size and consequently the use of nonparametric tests, which have less statistical power than parametric tests. In future research we will try to reveal the connection between task difficulty and preparation time as project settings circumstance and examine their effects on communication channel and project output.

## 7 Acknowledgments

The authors would like to express their deep gratitude to o. Univ. - Prof. Mag. Dr. Wolf Rauch for supporting this project, and also want to thank the students of “Information system management” course at Karl Franzens University Graz in winter semester 2012, who agreed to participate in this research and gave valuable feedback.

## References

- [1] Bartlett-Bragg, A., Reflections on pedagogy: Reframing practice to foster informal learning with social software, <http://matchsz.inf.elte.hu/tt/docs/Anne20Bartlett-Bragg.pdf>, retrieved: February 21<sup>th</sup> 2012
- [2] Bennett, S; Bishop, A; Dalgarno, B; Waycott, J; Kennedy, G. Implementing Web 2.0 technologies in higher education: A collective case study. *Computers & Education*, 59: 524–534, 2012.
- [3] Boyd, D.M; Ellison, N.B. Social Network Sites: Definition, History, and Scholarship, *Journal of Computer-Mediated Communication*, 13(1):210–230, 2008.
- [4] Brewer, S; Klein, J. D. Type of Positive Interdependence and Affiliation Motive in an Asynchronous, Collaborative Learning Environment. *ETR&D*, 54:331–354, 2006.
- [5] Bubaš, G; Ćorić, A; Orehovački, T. The Evaluation of the Use of Online Community Tool Ning for Support of Student Interaction and Learning. *Proceedings of the 21st Central European Conference on Information and Intelligent Systems*, pages 171-178, Varaždin, Croatia, 2010.
- [6] Ebner, M; Lienhardt, C; Rohs, M; Meyer, I. Microblogs in Higher Education – A chance to facilitate informal and process-oriented learning? *Computers & Education*, 55:92–100, 2010.
- [7] Ellison, N.B; Steinfield, C; Lampe, C. The Benefits of Facebook “Friends:” Social Capital and College Students’ Use of Online Social Network Sites, *Journal of Computer-Mediated Communication*, 12, 1143–1168. 2007.
- [8] Facebook, <http://newsroom.fb.com/content/default.aspx?NewsAreaId=22>, retrieved: March 02<sup>th</sup> 2012
- [9] Garrison, D. R.; Kanuka, H. Blended learning: Uncovering its transformative potential in higher education. *Internet and Higher Education*, 7: 95–105, 2004.
- [10] Gokcearslan, S; Ozcan, S. Place of Wikis in Learning and Teaching Process. *Procedia - Social and Behavioral Sciences*, 28:481–485, 2011
- [11] Goold A; Augar, N; Farmer, J. Learning in virtual teams: Exploring the student experience, *Journal of Information Technology Education*, 5:477–490, 2006.
- [12] Grosbeck, G; Bran, R; Tiru, L. Dear teacher, what should I write on my wall? A case study on academic uses of Facebook. *Procedia Social and Behavioral Sciences*, 15:1425–1430, 2011.
- [13] Haverback H. Facebook: Uncharted territory in a reading education classroom, *Reading Today*, 1 2009.
- [14] Junco, R. The relationship between frequency of Facebook use, participation in Facebook. *Computers & Education*, 58:162–171, 2012.
- [15] Kabilan, M.K; Ahmad, N; Abidin, M.J. Facebook: An online environment for learning of English in institutions of higher education? *Internet and Higher Education*, 13:179–187, 2010.

- [16] Koh, E; Lim, J. Using online collaboration applications for group assignments: The interplay between design and human characteristics. *Computers & Education*, 59:481–496, 2012.
- [17] Lebie, L; Rhoades, J.A; Mcgrath, J.E. Interaction process in computer-mediated and face-to-face groups. *Computer Supported Cooperative Work (CSCW)*, 4(2-3):127-152, 1995.
- [18] Liu, M.; Kalk, D; Kinney, L; Orr, G; Reid, M. Web 2.0 and Its Use in Higher Education: A Review of Literature, *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education*, pages 2871-2880. AACE, Chesapeake, VA, 2009.
- [19] Mazman, S.G; Usluel, Y.K. Modeling educational usage of Facebook. *Computers & Education*, 55:444-453, 2010.
- [20] Mohr, J.J; Sohi, R.S. Communication Flows in Distribution Channels: Impact on Assessment of Communication Quality and Satisfaction. *Journal of Retailing*, 71(4):393-416, 1995.
- [21] Mohr, J., Nevin, J. R. Communication Strategies in Marketing Channels: A Theoretical Perspective. *The Journal of Marketing*, 54(4):36-51, 1990.
- [22] Moller, R. Communication of Information Technology Project Sponsors and Managers in Buyer-Seller Relationships. London: Universal-Publishers, 2003.
- [23] Ocker, R.J; Yaverbaum, G.J. Asynchronous Computer-mediated Communication versus Face-to-face Collaboration: Results on Student Learning, Quality and Satisfaction. *Group Decision and Negotiation*, 8: 427–440, 1999.
- [24] Roblyer, M; McDaniel, M; Webb, M; Herman, J; Witty, J.V. Findings on Facebook in higher education: A comparison of college faculty and student uses and perceptions of social networking sites. *Internet and Higher Education*, 13:134–140, 2010.
- [25] Sindhav, B; Adidam, P.T. Marketing Communication as Organizational Communication: Exploration and Synthesis of the Underlying Theoretical Perspectives. *Innovative Marketing*, 1(2):77-88, 2005.
- [26] Smith, G. G; Sorensen, C; Gump, A; Heindel, A.J; Caris, M; Martinez, C.D. Overcoming student resistance to group work: Online versus face-to-face. *Internet and Higher Education*, 14:121–128, 2011.
- [27] Uribe D; Klein, J.D; Sullivan H. The Effect of Computer-Mediated Collaborative Learning on Solving Ill-Defined Problems. *Educational Technology Research and Development*, 51(1):5-19, 2003.
- [28] Vrocharidou, A.; Efthymiou, I. Computer mediated communication for social and academic purposes: Profiles of use and University students' gratifications. *Computers & Education*, 58(1):609–616, 2012.