Educational Sciences: Theory & Practice - 13(2) • Spring • 1251-1261

www.edam.com.tr/estp

Learning with Peers: An Interdisciplinary Comparative Study of Learner Interaction and Satisfaction on an Instructional Design Course*

Semiral ÖNCÜ[a]
Uludağ University

Zehra ÖZDİLEK[b]
Uludağ University

Abstract

The aim of this study is to examine undergraduate students' satisfaction levels through learning with peers. Specifically, students from two departments were brought into a collective group activity to understand whether they experienced different levels of satisfaction by working with peers from a different department. Data gathered from a sample of 47 Science Education (SE) and 72 Computer Education and Instructional Technology (CEIT) students during the fall 2011 semester. Students overall were highly satisfied. Students of the two departments did not significantly differ from each other in terms of satisfaction. That means they equally enjoyed the activity. There were six themes that were identified that cause satisfaction in this interprofessional work: Performing responsibilities, socialization, cohesion, work habits, learning in general, and professional development. The most prominent theme was cohesion, and it emerged out of mostly positive but also negative student opinions. The least prominent was professional development and it was mainly expressed as a positive theme. It is argued that students do not articulate the scope of the study as much as they can. It is also argued that the nature of the assigned task let them consider the social aspects more than the other aspects.

Key Words

Satisfaction, Teamwork, Interdisciplinary, Responsibility, Socialization, Cohesion.

Benefits of teamwork on students' interpersonal development and learning have been broadly accepted in the literature (Bonanno, Jones, & English, 1998). Teamwork provides opportunities for students to learn from each other (Burdett & Hastie, 2009). Teamwork allows instructors to give more complex assignments to students, which cannot be accomplished individually otherwise. It also allows students to understand the dynamics in groups and is a chance to see diverse points of views (Mello, 1993). Bringing people from different professions together complements yet another chance for students to encounter more diverse points and perspectives. This study investigates satisfaction with teamwork in interprofessional groups.

Students are believed to succeed in groups by developing an identity or by expressing themselves in the group. For a group to be successful, being supportive of the peers and therefore building trust

* This paper was revised after being presented at 6th International Computer and Instructional Technologies Symposium, Gaziantep, Turkey, 4-6 October 2012.

a **Semiral ÖNCÜ, Ph.D.,** is currently an assistant professor at the Department of Computer Education and Instructional Technologies. His research interests involve student engagement, the design and implementation of e-learning/blended learning environments along with effective and interactive use of ICT in the educational settings. Correspondence: Assist. Prof. Semiral ÖNCÜ, Uludağ University, Faculty of Education, Department of Computer Education and Instructional Technologies, 16059, Görükle, Bursa, Turkey. E-mail: semiral@uludag.edu.tr Phone: +90 224 294 2180 Fax: +90 224 294 2199.

b Zehra ÖZDİLEK, Ph.D., is currently an assistant professor at the Department of Science Education. Contact: Assist. Prof. Zehra ÖZDİLEK, Uludağ University, Faculty of Education, Department of Science Education, 16059, Görükle, Bursa, Turkey. E-mail: zozdilek@uludag.edu.tr

within the group is an important aspect (Finegold & Cooke, 2006). Social tasks are what make groups work (Morgan, Cameron, & Willams, 2009a). Therefore, learning within the groups is usually organized around tasks completed in a process of collaboration. Satisfaction with the group work or teamwork is an indication of how well the process went inside the group.

Theoretical Framework

Derry, DuRussel, and O'Donnell (1998) connect the idea behind interdisciplinary teams to the theories of situated cognition (developed largely by Brown, Collins, & Duguid, 1989; Collins, Brown, & Newman, 1989; Lave, 1988, 1991; Lave & Wenger, 1991) and groups as information processors (Hinsz, Tinsdale, & Vollrath, 1997; O'Donnell, DuRussel, & Deny, 1997; Smith, 1994).

Situated cognition is conceptually linked to the socio-cultural learning theory, flourished in early 20th century by Vygotsky. He defines the zone of proximal development, arguing that individuals are better able to prevail over problems if a more advanced person facilitates them throughout the process (Bonk, 1998). According to situated cognition, the closer the teaching and learning activity get to the real-life conditions through interchange of ideas, the better it is for the learner. The learned reality should then be transferred to contexts that are similar in nature to the learning context (Stein, 1998). In situated cognition, teams are communities of people that accomplish practices by using tools appropriate for the respective practices. Norms, or the told and untold rules, within the groups shape the way the practices are performed. The activities of the team are influenced by the context within which the team functions. That is, different teams develop different practices depending on the environment they work. Negotiation is the key factor for people to exchange what they have in mind with the team members through mostly spoken language. People usually have different ideas, think differently and bring diverse perspectives to the meetings. These variations will have to resolve on common grounds. DuRussel and Derry (1996) claim that in the early stages of the interprofessional team meetings, negotiations are made to bargain common terminologies. Then metaphors are formed to describe the terminologies from the different professions' perspectives and to explain how similar the terminologies are. As the interdisciplinary team goes deeper into the specifics of the discussed terminologies, they are to realize the terms differ in reality by minute details. But as the members negotiate, the interdisciplinary team must redefine the ideas in the context of their own study, pertaining to the practice they are accomplishing. Therefore, negotiation plays an internal role to the teamwork.

According to the theory of information processing, one's cognition is made up of long and short-term memories; information processing capabilities, such as filtering and storing information; and executive functions (Hinsz et al., 1997). Miller (1956) and Miller, Galanter, and Pribram (1960) provided information-processing theory as an alternative to the behaviorist learning approach. Based on information-processing approach, one processes information to store it to and retrieve it from the memory. One can only store seven plus or minus two chunks of information in short-term (or working) memory before it goes to the long-term memory. The human behavior is organized around planning, which consists of testing, operating, retesting, and exiting until a goal is accomplished. Another principle of the theory is that information is organized hierarchically. Hinsz et al. argue that the capabilities of short and long term memories can be extended by the use of tools. For example, one can use computers to speed up the processing of certain calculations to faster reach an outcome. Conceptualizing group members as tools, the idea behind the group information-processing theory becomes the collective sharing and processing of information in the group's working- and long-term memories. Hence, working in groups is an extension and enhancement to an individual's working alone.

Teamwork in the Preservice Education

Teamwork consists of two general aspects: (1) process of the teamwork and more so than that (2) building of the team. Morgan, Cameron, and Williams (2009b) address how social tasks within the groups are completed and comprehended by students in learning settings. Mutual respect and positive attitudes were found to be significant contributors in that matter. As much as the way in which the peers act to each other, the way they are engaged in the process is important. In order for the creative mindsets to take place, students should be provided with basic instructions on how to work in groups and they should then be given opportunities to engage with the peers and the work. For that matter, bringing together the right people, organizing a social atmosphere, and possessing the generic teamwork skills are essential for success (Kozlowski & Ilgen, 2007).

Middle school curriculum consists of subjects from different fields. Students enhance their understanding of life by taking classes on everything related to the world. Having students work in interdisciplinary groups helps integrate the parts of the curriculum by bringing together ideas from all disciplines, which are usually arranged around specific themes broad enough to allow for rich mixture of ideas (Goerss, 1996). There are both benefits and hardships faced when providing students with prospects that are interdisciplinary in nature (Husband & Short, 1994; Schroth, 1994). It cannot be said that most preservice teachers gain enough interdisciplinary experience and collaborative tactics of the sort, as prospective teachers of future (Goerss). One of the best ways to help preservice teachers learn this job would be to personally have them engage in interdisciplinary work (Lafer & Bancroft, 1989).

Many studies examine the process of teamwork, but there are not any studies, if not few, in the pre-service teacher education programs comparing the students from different departments who work collectively on the same issue. Most findings on teamwork come from the health care literature. For example, McNair, Stone, Sims, and Curtis (2005) report results from a study where medical, nursing, physiotherapy, and pharmacy students worked together in placement in a collaborative environment. They found that after the work they have done, the students improved their perceived teamwork skills. The study also helped students improve the knowledge about and beliefs in the importance of interprofessional work. Curran, Sharpe, Flynn, and Button (2010) conducted a longitudinal study on interprofessional work where they examined the role of interdisciplinary education on teamwork. They found that students overall had positive attitudes towards the teamwork, but students from different departments had significantly different satisfaction. However, they did not find any longitudinal effect of the interprofessional teamwork on the attitudes of the students on the interprofessional education or teamwork. Wilhelmsson, Ponzer, Dahlgren, Timpka, and Faresjö (2011) indicate that, previously participating in interprofessional work and the department of enrollment impact student attitudes only to a minimal extent. Female students and nursing students had more positive attitudes towards interprofessional work in comparison to male and medical students. Hall and Weaver (2001) did a literature review on interdisciplinary education and teamwork in health care. They concluded that much of the research in this area is about program evaluations (e.g., Carpenter, 1995) and much needs to be done to explore the process of education itself. There is a need for exploration of teamwork in general in pre-service teaching where the disciplines appear less related to each other, compared to the health care profession.

Reasons for satisfaction in a teamwork environment have been investigated to some extent in different settings. Napier and Johnson (2007) examined undergraduate students working in teams to conduct projects in information systems. They claim that information systems require solving complex problems by teams who have the ability to perform multiple functions. They grouped the reasons for satisfaction as enhancing and impeding factors. The top three factors enhancing the experience within the teams were "team spirit, work ethic, and equal team member contributions" (p. 39). The factors that impeded teamwork were "lack of participation in teams, inadequate technical skills, and poor communication among team members" (p. 39). They also found that if the team had a better collaboration, its members were statistically more satisfied.

Tseng, Wang, Ku, and Sun (2009) studied teamwork satisfaction through online collaboration. They first tried to identify factors that define online collaborative learning environment. Then, they tried to predict teamwork satisfaction from the properties associated with online collaboration. Collaboration was defined by five factors as clear and open communication; trust; acquaintance between the team members; organization of the team environment (clear rules to establish structure); and facilitation of the teamwork. The findings suggest that satisfaction with teamwork was positively and statistically affected by all factors except the facilitation. Tseng et al. were surprised to see that facilitator – that is support for the teamwork – did not have any statistical effect on the satisfaction as another study conducted by Hara and Kling (2000) to which they compare, found just the opposite.

Kruck and Teer (2009) had students from a Management Information Systems course and a Technology Assisted Decision Making course of two different departments work collaboratively in teams. They inquired students' experiences about the work done. Students mainly perceived the activity positively. The only negative point they experienced was "having someone from the other class - low connectivity." That is, the students did not have much chance to connect with each other. This was interesting to Kruck and Teer though, because they organized the two courses to meet at the same time

to prevent such a problem. The positive responses could be organized into two main categories: one being comments in general and another being comments on uniting the two courses.

Koh, Wang, Tan, Liu, and Ee (2009) collected student and teacher opinions about a group work activity. Students were quite motivated to be participating in the group project. On the other hand, not all teachers were in agreement with the students. They thought the students were not fully motivated and did not quite devote themselves to the activity. But, all in all, the activity was considered to be an enhancement to the students' performance by both parties.

In another study, Bonanno et al. (1998) placed first year undergraduate students into groups in a tutorial program at an Accounting course. About 50% of the students performed well in their groups but the other half reported having problems with the group work. The most frequent complaint was the lack of contribution of the team members. The other factors that affected the satisfaction were "the positive assessment of the group product" and "supportive social/emotional aspects of the group" (p. 373).

Goerss (1996) attempted to have preservice teachers perform cooperative learning and interdisciplinary planning activities in groups. She specifically asked her students from different departments to create interdisciplinary units as a product of the interdisciplinary meetings. The student opinions were mostly positive. The students thought they became sensible of the other fields of study in comparison to their own fields. They learned how to work with students from other majors and preferred to work with others to working alone. Lack of time and logistical difficulties were found to be impeding factors to interdisciplinary work. Goerss's study was a planning activity and required a much different approach then the activity completed in the current study. Because the planning and creating an interdisciplinary unit involves far more creativity and organization, it required a model to help students focus on the goal of preparation. The current study involved a simple teaching and learning activity where students facilitated each other's learning in groups from two departments.

This current study is an attempt to contribute to the pre-service teacher education programs by examining interdisciplinary group works to possibly enhance success and social task development. Implications for effective implementation of group work are presented.

Purpose

This study is designed to determine *Science Education* (SE) and *Computer Education and Instructional Technology* (CEIT) students' perceptions of the teamwork and effect of the group work on students' satisfaction levels in an interdisciplinary project. In addition, students' reasons for satisfaction were also examined based on their perceptions. The following research questions were investigated:

1. What are the students' satisfaction levels towards teamwork?
2. Do students of different departments equally enjoy teamwork?
3. What are students' perceptions of the teamwork in general; why do they feel satisfied or unsatisfied?

Method

As mentioned earlier, Kruck and Teer (2009) taught teams from two different departments and they reported three lessons learned from this activity. They had teams discuss an article on "factors affecting successful teamwork" as a class activity; they informed their students about the deliverables and due dates early in the semester; and they scheduled the classes at the same time to allow teams meet without difficulty.

Similar to Kruck and Teer (2009) the current study was organized around an activity. The students were also given a presentation about the specific deliverable and the due date of the teamwork activity. As Morgan et al. (2009b) indicate, providing students with basic skills in group work can be an important factor for the success of the study. Students from the CEIT department are taught of the benefits of the teamwork, and get instructions and experience with different projects done in groups throughout the program. SE students are not given as much emphasis on teamwork as the CEIT students get. It is a variation that is expected to play a role in the possible differences between the students of the two departments.

Students from the two departments were first put into groups in their respective courses. SE students were in groups of three to four. CEIT students were in groups of five to six. Each group from each course was then matched with a group from the other course. As a group project and therefore as the primary task, the students were asked to meet regularly (at least three times throughout the semester) to teach other group what they learned in their own

class on a specific topic that was determined by the instructors. Students were also asked to report at the end of the term how the group work came along.

Participants

The sample included 47 SE and 72 CEIT students of 2011-2012 fall semester. These are the average number of students the respective departments register each year. The participants were selected using purposive sampling based on the classes they attended. SE students were juniors and enrolled in college-level science and technology curriculum and planning class at the time the study was conducted. CEIT students were sophomores and enrolled in the instructional design class. The two classes offer content parallel to each other, but focus more towards their respective field of study.

Table 1 summarizes the participants in terms of gender. Of the participants, 43.7% were male and 56.3% were female. As seen in the table, majority of the SE department were females whereas the CEIT department had a more balanced distribution over gender. Also seen from the table is the fact that the study had more participants from the CEIT department.

Table 1.
Participants of the Study by Gender

	Male		*Female*		*All*	
	N	*N %*	*N*	*N %*	*N*	*N %*
CEIT	40	55.6	32	44.4	72	100.0
SE	12	25.5	35	74.5	47	100.0
Total	52	43.7	67	56.3	119	100.0

Data Sources

The data for this study were gathered using the Teamwork Satisfaction Scale. It is a 10-item, 5-choice Likert-type scale developed by Tseng (2008) and was applied to determine pre-service science teachers' satisfaction levels towards teamwork projects. The options ranged from 1 = "Strongly Disagree" to 5 = "Strongly Agree". An alpha reliability coefficient of the original scale was found to be .95 by Tseng. Cronbach's alpha reliability coefficient of the Turkish version of the scale was found to be .948, indicating a high degree of reliability and a very close match to the original study.

Qualitative data were collected by having participants respond in writing to an open-ended question. The question inquired whether the participants liked or disliked the teamwork they performed with the students from another department. It also asked to justify their opinion.

Data Analysis

For the first research question, descriptive statistics involving frequencies, means and standard deviations were used to determine all participants' satisfaction levels regarding the teamwork project.

For the second research question, a mean score of the teamwork satisfaction scale was calculated. Then, a one-way ANOVA was used to determine whether there was a difference between the mean scores of the SE students and CEIT students regarding the teamwork.

The third research question determined the participants' perceptions about the teamwork through the qualitative analysis of the related open-ended question. The responses were first divided into idea units by two raters. These idea units (statements) were to split the student opinions into the simplest meaningful units. Within the 119 survey responses, overall, 161 idea units were identified. Each student's answers were read several times until all opinion statements had been assigned to a category. Because the open-ended questions were in the short answer form, most opinions were already in their simplest form. This resulted in only a slight increase in the number of idea units vs. opinions to be coded later on.

During the analysis, first, one of the raters analyzed and coded the idea units into themes. Six themes emerged out of this coding process: (a) performing responsibilities, (b) socialization, (c) cohesion (d) work habits, (e) learning in general, and (f) professional development. Another rater, using the themes identified and defined by the first rater, then independently coded the data for the second time. The percentage of one-to-one agreement between the two raters' codes was 76.40% (123 out of 161). As a better indicator of inter-rater reliability, Cohen's Kappa was calculated. The Cohen Kappa inter-rater agreement coefficient was found to be 0.71, which is accepted as "good agreement" as being above the threshold of .70. The 38 quotes on which the researchers disagreed were read and discussed several times to be finally resolved in the ultimate codes. Descriptive statistics were also used to describe themes in the results section.

Results

The results show that students took the inter-disciplinary task seriously. Overall, 40.3% of the learners participated in the group meetings at least three times, 37.8% participated four times, and the re-

maining students stated that they participated various times. Table 2 shows this information based on mean number of scores students marked on their survey forms. On average, the students met about four times during the study and on average students participated in the meetings 3.74 times. The overall ideal group size for the students was about four. That is, for students to work effectively in groups, they thought the ideal group size would be about four. One interesting point in table 2 is that female students almost always reported slightly less numbers in comparison to the male students.

In the rest of this section, the findings are organized according to the research questions.

Student Satisfaction with Teamwork

The results of the descriptive statistics showed that the item scores for satisfaction levels towards teamwork had values ranging from 1 to 5, with an overall mean score of 3.81 (see the last row in Table 3). This means that students' overall satisfaction levels were near the value of "agree", with minimal deviation from the mean score (SD = .93). CEIT students had a slightly higher mean score than did the SE students.

A one-way ANOVA was used to determine whether the SE and CEIT students differed in terms of satisfaction. The results show that no statistically significant difference between the departments exists with respect to satisfaction levels ($F(1, 118) = 3341$, $p > .05$).

Also, the students were asked to write down their opinions about whether they liked or disliked the teamwork they completed. They were asked to provide reasons, as well. Two raters independently categorized the qualitative data as 0 = "did not like participating in the teamwork", 1 = "neither liked nor disliked the teamwork", and 2 = "liked participating in the teamwork." This coding was separate than the coding described in the Data Analysis section, but used the same responses to the open-ended question. As mentioned earlier, students expressed their feelings in very simple terms and the sentences were short (because of space on the instrument paper) so the inter-rater reliability was .991. Table 4 summarizes the results of the qualitative data. Complying with the previous findings, overall, the majority (71.43%) stated that they were satisfied with what they have done within their large groups. The resulting codes of the comments were balanced across the groups meaning that the departments did not much differ in their choice percentagewise.

Student Perceptions of Teamwork

The following section introduces and describes the themes that emerged during the analysis. As mentioned earlier, student opinions were investigated from two perspectives: (1) the themes, (2) positive, negative and undecided opinions. Table 5 shows how the themes fall into the positive, negative, and undecided categories. As seen from the table, the most frequently occurring positive theme was *learning in general*. The most frequently mentioned negative and undecided opinions were formulated around *cohesion*. Just over half of the comments complaining about the interdisciplinary work concentrated on *cohesion* while about 30% of undecided comments were on the same manner.

Table 2.
Mean Number of Group Sizes and Meetings per Semester

	CEIT			*SE*			*All*		
	M	*F*	*All*	*M*	*F*	*All*	*M*	*F*	*All*
Mean number of perceived ideal group size	4.33	3.91	4.14	4.08	4.11	4.11	4.27	4.01	4.13
Mean number of times group met during semester	5.00	3.56	4.35	3.64	3.46	3.50	4.70	3.51	4.02
Mean number of times participated in group meetings	4.50	3.44	4.01	3.55	3.26	3.33	4.29	3.34	3.74

M = Male, F = Female

Table 3.
Student Scores on Mean Satisfaction with Teamwork

		Satisfaction with Teamwork			
Department	*N*	*Mean*	*SD*	*Min*	*Max*
CEIT	72	3.94	0.91	1	5
SE	47	3.62	0.94	1.1	5
All	119	3.81	0.93	1	5

Table 4.
Numbers and Percentages of Students with Opinions on Teamwork

Department	*Did not like*	*Liked*	*Neither liked, nor disliked*
CEIT	12	51	9
	(16.67%)	(70.83%)	(12.50%)
SE	7	34	6
	(14.89%)	(72.34%)	(12.77%)
All	19	85	15
	(15.97%)	(71.43%)	(12.61%)

Table 5.
The Frequencies and Percentages of the Themes

	Positive		*Negative*		*Undecided*		*Total*	
Category	*N*	%	*N*	%	*N*	%	*N*	%
Performing responsibilities	9	7.76	6	19.35	3	21.43	18	11.18
Socialization	20	17.24	1	3.23	0	0	21	13.04
Cohesion	18	15.52	16	51.61	5	35.71	39	24.22
Work habits	22	18.96	6	19.35	4	28.57	32	19.88
Learning in general	33	28.45	1	3.23	2	14.29	36	22.36
Professional development	14	12.07	1	3.23	0	0	15	9.32
Total	116	100	31	100	14	100	161	100

When the codes are contemplated from the perspective of the themes, a more balanced figure appears. That is, codes were distributed across the themes with nearly equal percentages. The most frequently debated theme was again *cohesion* (24.22%) whereas the least debated was professional development (9.32%). Although cohesion emerges as a problematic area, the number of students who talked about cohesion positively is more than the number of students who did so negatively, nor undecidedly. It is also important to note that *socialization* and *professional development* were almost always presented with positive feelings. After examining the themes in this perspective, below is a description of each theme given along with example illustrative opinions. Students' pseudo names were also given to help recognize the department.

Performing Responsibilities: One of the faintest themes that emerged from the qualitative analysis of the open-ended questions was performing responsibilities. Students who talked about this theme mentioned accomplishing the group related works, regularly participating in meetings, regularly completing tasks, and devoting effort to the work done by the group. Out of a total of 18 statements on performing responsibilities, 9 were positive, 6 were negative, and 3 were undecided. This figure demonstrates the diversity of student considerations. The following comments are typical of the responses coded as performing responsibilities.

Positive example:

> I liked the work because everyone had responsibilities and each accomplished their responsibility successfully (SE student 115).

Negative example:

> I did not like it, because, except a few people, the teammates did not come to the meetings on time. They left us in hardship. This caused some problems (CEIT student 53).

Undecided example:

> I can say that I moderately liked it, because the other group came to the meetings with missing members, I took a dislike to it (CEIT student 51).

Socialization: Responses such as meeting with new friends and getting to know friends more closely were incorporated into the socialization category. Although it was not a frequent theme, as mentioned earlier, this theme almost always emerged with positive feelings. The interprofessional nature of the work would compel one to speculate that the social considerations would come up more frequently than the actual observations. The only one negative opinion was given as example below. None of the idea units were coded as undecided for this theme.

Positive example:

> We met with new friends. It was nice to establish friendships. I liked it for that reason (SE student 125).

Negative example:

> We could not blend with the group members much. It appeared different, because we worked with diverse people (SE student 157).

Cohesion: Responses that talked about team spirit, communication skills, acting in harmony, and motivation as a result of group dynamics were considered within the cohesion theme. A total of 39 comments were about cohesion, of which 18 were positive, 16 were negative, and 5 were undecided. This was a center theme, covering about 24% of all codes. And as mentioned earlier, it is the most important point of complaint in terms of the interdisciplinary group work. Illustrative statements follow:

Positive example:

> We established a nice communication with the friends in the group. This enhanced our efficiency in the work. In short, I liked the friends in the group (CEIT Student 75).

Negative example:

I cannot say that I liked this study. In such studies, in order to be productive, one needs to be in harmony with the other members of the group (CEIT Student 60).

Undecided example:

Because we have not had acquaintance with the other group members, the two groups were a little recessive (CEIT student 52).

Work Habits: Students' comments with regard to enjoying cooperation, preferring to study in groups vs. alone, relishing to study alone vs. in groups were coded as work habits. It was the second favorite topic within the positive opinions with 22 occurrences. That means majority of the students prefer studying in groups rather than working alone as a work habit, regardless of the study in question. The comments below illustrate how the ideas fall into the categories.

Positive example:

I liked the study, because there was knowledge-sharing. Learning becomes more permanent and enjoyable if negotiated and discussed with friends rather than when a topic is studied through reading a book alone (SE student 146).

Negative example:

I did not like the work with the team. I rather like to study individually. I believe that I will be more successful and I will better express myself when I study alone (SE student 116).

Undecided example:

I cannot say anything certain on whether I like the study or not. I usually like to study alone, but I also think that there are means in studying in groups that are fun (SE student 158).

Learning in General: Sometimes students referred to learning in very general terms. In such cases, the ideas were coded as learning in general. Such terms included gaining knowledge, learning, brainstorming, sharing information, and exchanging ideas as a result of the interdisciplinary group study. It is seen that the positive comments that are about learning in general are the most occurring ideas if the cells across Table 5 are examined. It can easily be said that although the students are not able to specifically name their takeaways, they learned something from the interdisciplinary work, which so made them satisfied about the study. The following are example codes.

Positive example:

I liked the study, because I think I learned a different instructional design (CEIT student 49).

Negative example:

I did not like much, because I could not quite understand the model from the students of the other department, for which they were responsible (CEIT Student 57).

Undecided example:

Actually, I like group works, but I think that I could not get enough information. To me, this study may not have been productive enough (SE Student 119).

Professional Development: The responses such as overcoming one's deficiencies, self-improvement, and development of teamwork habits/skills were considered within the professional development theme. It is clear that professional development was relatively low priority for these students, since only about nine percent of the idea units were related to this theme. But, just like the socialization theme, nearly all of the comments on professional development were positive feelings. No undecided opinions were identified. The only negative statement was presented below.

Positive example:

I liked the study, because we have acquired the study skills for working in groups together with people, whom we didn't know before (SE student 124).

Negative example:

I did not like the study, as I have not gained anything (CEIT student 54).

Conclusion and Discussion

The quantitative data indicate that students in both groups were similar regarding the satisfaction levels (see Table 4). The statistical analyses showed that the students from the two different departments enjoyed the activity equally well since their scores were not statistically different from each other. The results concur with McNair et al. (2005) in that the majority of the students were satisfied with the activity and the students indicated that they gained positive attitudes and motivation as a result of the study. The study is an exemplary indication of how different departments, and therefore different professions, within the schools of education can collaborate to provide their students with diverse experiences.

Several themes emerged from the analysis of the responses on teamwork satisfaction. The themes can be investigated for both departments in the same manner for the purposes of this study, because the two departments were not significantly different on satisfaction. As Kruck and Teer (2009) found, these themes can be seen from the lenses of (1) *comments in general*, and (2) *comments on uniting the two courses*. The themes of work habits, learning in general, and professional development fit into the first category in which students talked about general comments as a benefit or as a disadvantage of the teamwork they have completed. Students made generalizations about their experience and inferred to ideas in their everyday life. The themes of performing responsibilities, socialization, and cohesion can possibly fit into the second category in which the students referred more to the aspects of the teamwork resulted from bringing together the groups of two different fields.

The themes indicate that some factors were paid more attention than the others, since not all of the categories were discussed with equal emphasis. However, the more prominent point was that the emergent themes of *socialization*, *work habits*, and *learning in general* have not been pronounced in the literature as much as the current study. There are at least two possible reasons. One of the reasons is that students are not able to articulate their thoughts as much as one would want. This could be an indication of lack of experience. So, they keep their thoughts short, distinct, mostly concrete, and simple. The space would not allow for in depth discussion but there was not much sign of synthesis as one could expect in such situations. *Professional development* can be discussed from the same standpoint. Students did not have the experience to find the connections with advanced skills so there was little and shallow discussion on professional development. Articulation can be a problem in any similar research context so this is the less likely reason. The more likely reason is the question that was asked to the students. The question was not leaded, meaning that it did not purposefully influence, nor diverge the students towards any direction. The idea was to capture the student opinions in as much free form as possible so as to bring about what they really think. Expressing the question with broad, or open, expression unavoidably brought diversion from the context and brought discussion of general ideas. Therefore, students basically said, "I made friends," "I learned things," and "I like group work as a habit."

Socialization had an average score but mostly in positive trend. It is easy to see why socialization came up as a theme, in light of the purpose of the study. It is a first time experience for the students of school of education and it is probably the only example of it in Turkey, if not one of the few. A possible take away for the students was to enjoy the moment, enjoy the environment, meet with new people, get acquainted with them, be proud of being part of a rare activity, rather than to worry about the requirements. It would not be a surprise if socialization came up as a more frequent theme, though. In regular classes, there are not many opportunities for students to meet with new people. In general, spending a dedicated time span with a group of people is not possible as much as the current study, either. So, it is comfortable to think that the study would allow for socialization more than it does for anything else.

The students touched little to the theme of *performing responsibilities* when they commented on the group work. Since the students were mainly satisfied by the experience, responsibility may not have meant much to students. Responsibility was a theme that stood strongly in the work of Napier and Johnson (2007). It was one of the top-three factors identified by their students. They talk about responsibility as "equal team member contribution" when they refer to it in terms of factors enhancing the teamwork. They call it "lack of participation" when they refer to it as an impeding factor. Bonanno et al. (1998) also point to the issue. The difference might originate from the nature of the tasks students were given to complete. In Napier and Johnson's study, students were asked to prepare and submit a database design project, which is concrete in nature, as a deliverable on the students' part. In the current study, however, students were in a context that is more social in nature. They were asked to teach a topic and facilitate each other's learning where deliverables are not any concern or where deadlines are not much relevant. In the current study, the most problematic aspect was *cohesion* and this may be linked to performing responsibilities. It is possible to speculate that the negative notion, observed about the *responsibility* could have been overcome if the students worked in cohesion. Cohesion also highlights the social nature of the study as speculated above. In this perspective, where social interaction is more appreciated, cohesion was more of a concern as the students' were expected to be socially present in the meetings. So, it would be apt to speculate that *cohesion* is a vital factor for the success of the interdisciplinary teamwork in this case, because

of the social nature of the task. And, it would feed right into the theory of groups as information processors with respect to negotiation as discussed by DuRussel and Derry (1996) and Derry et al. (1998). Negotiation is necessary for the group to function and it can ideally happen if the group has cohesion. Future studies might specifically elaborate the relationship between negotiation, cohesion and socialization with and without the presence of tasks that are social in nature.

Two instantaneous directions can be seen to possibly enhance cohesion. One is to have students pick their peers and/or groups at will. Such enhanced cohesion may also improve professional development, by focusing them on advanced skills, rather than dealing with conflicts. But such an option may prevent them from having new friends and socialization because they would be already pairing with whom they are acquainted. The other is to have instructor arrange regular meeting days and times for the students to meet. This way, the instructor can control the setting. The students would not have to worry about finding common times and, again, therefore could divert their energy to other useful tasks.

References

Bonanno, H., Jones, J., & English, L. (1998). Improving group satisfaction: Making groups work in a first- year undergraduate course. *Teaching in Higher Education*, *3* (3), 365-382.

Bonk, C. J. (1998). Searching for learner-centered, constructivist, and sociocultural components of collaborative educational learning tools. In C. J. Bonk & K. S. King (Eds.), *Electronic collaborators learner-centered technologies for literacty, apprenticeship, and discourse* (pp. 25-50). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18* (1), 32-42.

Burdett, J., & Hastie, B. (2009). Predicting satisfaction with group work assignments. *Journal of University Teaching & Learning Practice, 6* (1), 61-71.

Carpenter, J. (1995). Interprofessional education for medical and nursing students: Evaluation of a programme. *Medical Education, 29* (4), 265-272 (doi: 10.1111/j.1365-2923.1995.tb02847.x).

Collins, A., Brown, J. S., & Newman, S. E. (1989). Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics. In L. B. Resnick (Ed.), *Knowing, learning, and instruction: Essays in honor of Robert Glaser* (pp. 453-494). Hillsdale, NJ: Lawrence Erlbaum Associates.

Curran, V. R., Sharpe, D., Flynn, K., & Button, P. (2010). A longitudinal study of the effect of an interprofessional education curriculum on student satisfaction and attitudes towards interprofessional teamwork and education. *Journal of Interprofessional Care, 24* (1), 41-52.

Derry, S. J., DuRussel, L. A., & O'Donnell, A. M. (1998). Individual and distributed cognitions in interdisciplinary teamwork: A developing case study and emerging theory. *Educational Psychology Review, 10* (1), 25-56.

DuRussel, L. A., & Derry, S. J. (1996). Sociocultural approaches to analyzing cognitive development in interdisciplinary teams. In *Proceedings of the Eighteenth Annual Meeting of the Cognitive Science Society* (pp. 529-533). Mahwah, NJ: Erlbaum.

Finegold, A. R. D., & Cooke, L. (2006). Exploring the attitudes, experiences and dynamics of interaction in online groups. *Internet and Higher Education, 9*, 201-215.

Goerss, B. (1996). Interdisciplinary planning within cooperative groups. *Journal of Adolescent & Adult Literacy, 40* (2), 110-116.

Hall, P., & Weaver, L. (2001). Interdisciplinary education and teamwork: A long and winding road. *Medical Education, 35* (9), 867-875 (doi: 10.1046/j.1365-2923.2001.00919.x).

Hara, N., & Kling, R. (2000). Students' distress with a web-based distance education course: An ethnographic study of participants' experiences. *Information, Communication and Society, 3* (4), 557-579.

Hinsz, V. B., Tindale, R. S., & Vollrath, D. A. (1997). The emerging conceptualization of groups as information processors. *Psychological Bulletin, 121*, 43-64.

Husband, R. E., & Short, P. M. (1994). Interdisciplinary teams lead to greater teacher empowerment. *Middle School Journal, 26*, 58-61.

Koh, C., Wang, C. K. J., Tan, O. S., Liu, W. C., & Ee, J. (2009). Bridging the gaps between students' perceptions of group project work and their teachers' expectations. *The Journal of Educational Research, 102* (5), 333-347.

Kozlowski, S. W. J., & Ilgen, D. R. (2007). The science of team success. *Scientific American Mind, 18* (3), 54-61.

Kruck, S. E., & Teer, F. P. (2009). Interdisciplinary student teams projects: A case study. *Journal of Information Systems Education, 20* (3), 325-330.

Lafer, S., & Bancroft, M. J. (1989). The college of education as an instructional development resource. *Capstone Journal of Education, 9* (4), 76-83.

Lave, J. (1988). *Cognition in practice: Mind, mathematics, and culture in everyday life*. Cambridge, UK: Cambridge University Press.

Lave, J. (1991). Situating learning in communities of practice. In L. Resnick, J. Levin, & S. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 63-84). Washington, DC: American Psychological Association.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* New York: Cambridge University Press.

McNair, R., Stone, N., Sims, J., & Curtis, C. (2005). Australian evidence for interprofessional education contributing to effective teamwork preparation and interest in rural practice. *Journal of Interprofessional Care, 19* (6), 579-594 (doi:10.1080/13561820500412452).

Mello, J. (1993). Improving individual member accountability in small work group settings. *Journal of Management Education, 17*, 253-259.

Miller, G. A., Galanter, E., & Pribram, K. H. (1960). *Plans and the structure of behavior*. New York: Holt, Rinehart & Winston.

Miller, G.A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review, 63*, 81-97.

Morgan, K., Cameron, B. A., & Williams, K. C. (2009a). Student perceptions of social task development in online group project work. *The Quarterly Review of Distance Education, 10* (3), 285-294.

Morgan, K., Cameron, B. A., & Williams, K. C. (2009b). Group projects: Student perceptions of the relationship between social tasks and a sense of community in online group work. *The American Journal of Distance Education, 23*, 20-33.

Napier, N. P., & Johnson, R. D. (2007). Technical projects: Understanding teamwork satisfaction in an introductory is course. *Journal of Information Systems Education, 18* (1), 39-48

O'Donnell, A. M., DuRussel, L. A., & Derry, S. J. (1997). *Cognitive processes in interdisciplinary groups: Problems and possibilities* (Research Monograph No. 5). University of Wisconsin-Madison: National Institute for Science Education, Madison.

Schroth, G. (1994). Do you really know what you're getting into with interdisciplinary instruction? *Middle School Journal, 25*, 32-34.

Smith, J. B. (1994). *Collective intelligence in computer-based collaboration.* Hillsdale, NJ: Erlbaum.

Stein, D. (1998). *Situated learning in adult education* (ERIC Digest No. 195).

Tseng, H. (2008). *The relationships between trust and satisfaction and performance among the virtual teams with different developmental processes* (Ph.D. 3348800). University of Northern Colorado, Colorado, US. Retrieved from http://search.proquest.com/docview/304546806?accountid=17219 ProQuest Dissertations & Theses (PQDT) database.

Tseng, H., Wang, C.-H., Ku, H.-Y., & Sun, L. (2009). Key factors in online collaboration and their relationship to teamwork satisfaction. *The Quarterly Review of Distance Education, 10* (2), 195-206.

Wilhelmsson, M., Ponzer, S., Dahlgren, L-O., Timpka, T., & Faresjö, T. (2011). Are female students in general and nursing students more ready for teamwork and interprofessional collaboration in healthcare? *BMC Medical Education, 11* (15) (doi:10.1186/1472-6920-11-15).