Relationship Between Various Forms of Interaction and Students' Satisfaction in Online Learning: Case of an Open University of Pakistan

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Abstract

This study aims to evaluate the relationship between the level of various forms of interaction among its key players and students' satisfaction in online setting. The level of interaction was measured following Moore's model of interaction between student and tutor, among students, and of students with content (1973). The quantitative descriptive survey was used to conduct this study using a self-tailored questionnaire. The population of the study comprised all male and female students enrolled in Bachelors' degree programs of the Department of Education in Spring 2018 and Fall 2018 at a virtual university in Pakistan (N=1049). All students enrolled in 4-years' B.Ed. Elementary, 1.5 years B.Ed. Secondary, 2.5 years B.Ed. Elementary and M. Ed. were included as sample of the study. The overall level of interaction was slightly above the midpoint on the scale. As expected, the learner-content interaction was the highest and interaction among learners was the lowest. Significant correlation was found between the level of interaction and satisfaction with the online learning mode. The findings suggest that the institutions should take necessary measures to enhance and expand the three types of interaction presented by Moore and investigated in this study.

Keywords: Interaction, online learning environment, students' satisfaction.

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Introduction

Due to technological advancements, online learning has emerged as a strong alternative to the conventional mode of learning. It is a form of distance education where learning happens when teacher and learner are separated geographically (Verduin & Clark, 1991).

Moore (1973) introduced the transactional theory of independent study which serves as a key foundation for distance learning suggesting that successful teaching can occur even when teacher and learners are geographically separated. But Kruger (2000) opined that some obstacles in teaching-learning process happen when instructors and learners are physically separated and courses are delivered using Information and Communication Technology. Sorensen and Baylen (1999), and Sutton (2001) attributed these obstacles to the absence of non-verbal signs, for example, eye contact, appearance and kinesics.

In order to overcome the shortfalls in transactional theory, Moore (1989) identified three types of interactions which usually take place in the online mode of education:

   i.   Student-instructor interaction: In the synchronous online mode this interaction is more or less similar to the conventional mode. But, in asynchronous mode such interaction remains limited to question-answers through the Learning Management System (LMS)
   ii.   Student to student interaction: This interaction takes place in the form of students' sharing information or learning experiences with each other or in groups in the form of group discussion, or group projects etc.
   iii.   Student-content interaction: It is the type of interaction in which learners get information from course materials that might be in the form of text, CD, audio/video or other software etc. (Sher. 2009)

Anderson (2003) wrote that although all these three forms of interaction are necessary and may help students learn with high level of satisfaction, meaningful learning occurs if at least one of these types of interaction is at a sufficiently high level. But Picciano (2002) believed that learner and tutor interaction is the basic to making learning successful. Learners who reported a high level of satisfaction in learning are those who experience high level of interaction with their tutors (Arbaugh, 2000; Drennan, Kennedy & Pisarski, 2005; Hollenbeck, Mason & Song, 2011;Sher, 2009; Swan, 2001; Swan, et al., 2000).

In Pakistan, there is lack of research on the processes of online instruction and students' satisfaction (Ali & Ahmed, 2011; Din & Jabeen, 2014; Farid, Ahmed, Niaz, Itmazi & Asghar, 2014; Zaheer, Jabeen & Qadri, 2015). Therefore, this study examined the relationship between the level of interaction and students' satisfaction in online setting.

Literature Review

Because of advancements in technology, online courses can serve the educational needs of the growing population as it uses a wide range of media to deliver lectures and other learning materials to the students in different locations. Online courses are generally offered through web software named as a Learning Management System (LMS). It provides a cohesive platform for management and delivery of the content (Kotzer & Elran, 2012; Mahnegar, 2012). Schar and Krueger (2000) listed the necessary elements of LMS, such as, different methods to deliver lectures and mechanize the bulky procedure of details of students; enrolments, timetable, records, reports and transcripts, assessment, evaluation and testing capacities.

LMS had been adopted widely by instructional designers and institutions. LMS is used by the tutors, students and administrators for specialized tasks. These frameworks are developed to help students with flexibility of time and space. They just need an internet connection. Students get directions, submit assignments, ask queries from their tutors and other learners of the same course. The tutors use LMS to mentor, regulate, help and assess the students. The administrators use learning management system to help and support all the users of LMS (Sher, 2009).

According to Verduin & Clark (1991), online education is formal learning in a situation where the tutor and student are separated geographically. Online learning is facilitated using ICT for three purpose. The first is to provide learners an access to the course materials. The second is to make them participate in online discussions and the third is to develop a positive attitude towards learning (Kear, Williams, Seaton, & Einon, 2004).

Online Learning in Pakistan

There are three distance learning universities in Pakistan (Allama Iqbal Open University, COMSATS University Islamabad and Virtual University of Pakistan) only one of which is exclusively technology based online university. Some other public sector universities are also adopting the use of ICT in their teaching learning settings. (Farid, Ahmad, Niaz, Itmazi & Asghar, 2014). Online learning is becoming more prevalent during the Corona Virus Pandemic. It is expected that the prevalence and acceptability of online instruction will remain on increase even in the post COVID period.

Student Satisfaction in Online Learning

Biner, Dean and Mellinger (1994) found that students' satisfaction plays a dynamic role in the success of distance and online education. Erdil (2007) measured level of students' satisfaction in a virtual MBA course in a university with the factors like the tutor, course facilitator and help desk designed for distance learning. A strong positive correlation was found between the quality of these supporting services and student satisfaction. In online mode, three factors increase students' level of satisfaction which are: design clarity, interaction with tutors, and active participation in course discussion among students (Swan, 2001).

Bolliger and Wasilik (2009) identified that staff satisfaction in online learning environments is affected by three factors i.e. learner, tutor and institution related factors. Bolliger (2004) concluded that students' satisfaction in on-line courses is influenced by three variables i.e. teacher traits, technical elements, and interactivity. Sampson, Leonard, Ballenger and Coleman (2010) studied the students' satisfaction with various components of a course i.e. assessment, communication, instruction, professionalism, teamwork, leadership and indicated that the lowest level of satisfaction was found in the category of instruction and the highest level of satisfaction was in the category of teamwork. Naaj, Nachouki and Ankit (2012) reported that students' satisfaction is reflected as a significant factor measuring the learning quality. It is basically a combination of multiple factors such as technology, instructor, class management, instruction and interaction.

Payne and Hamzaee (2011) found significant effects of three variables on students' satisfaction i.e., instructor's level of interest and encouragement within the course content, instructor's helpfulness and availability and general effectiveness of the course. Jackson, Jones and Rodriguez (2010) showed that students' level of satisfaction is influenced by instructors' decisions in the online courses.

Eom, Wen and Ashill (2006) investigated students' satisfaction on six variables in distance education i.e. instructor's feedback, structure of course, motivation, learning style, interaction and tutor's availability. Moreover, findings suggested that online learning can be effective if it is designed and delivered according to the preferred learning style and needs of the students with timely, effective feedback from the tutors. Thurmond and Wambach (2004) found positive correlation between learner-content interaction and students' satisfaction.

Student-Instructor Interactions in Online Learning

Thurmond and Wambach (2004) say that interaction in an online setting is different from conventional learning. The variations in interaction are because of the use of instructional media in web-based courses. Moreover, authors provide an explanation of four forms of interactions in online courses: learner-content, learner-learner, learner-interface and learner- instructor. Su, Bonk, Magjuka, et al. (2005) revealed student-tutor and learner-learner interactions are major indicators in increasing the worth of distance learning programs. Sher (2009) also indicated that learner-tutor interaction and student-student interaction are notable contributors of learning and satisfaction.

Nir-Gal (2002), and Joyner and Young (2014) argue student-instructor interaction is very important in both traditional and e-learning environments. To them online mode provides interaction opportunities even when the instructor is absent. In such a case the instructor presence may exist in online classrooms in the form of homepages, discussion boards and other such electronic elements of the courses. These additional opportunities for interaction in learning with the instructor result in enhanced students' satisfaction and improved learning outcomes (Grandzol & Grandzol, 2010). Kim and Moore (2005), and Croxton (2014) found interaction as a vital

element of satisfaction of distance learners. Furthermore, student's gender and their perceived level of difficulty of the online courses appear to be correlated with interaction. Gosmire, Morrison and Van Osdel (2009) analyzed that females take the interaction in online classrooms more favorably than their male classmates.

The investigation of Hara and Kling (2001) recommends the significance of feedback given on course activities by the instructors. In their study, despite the fact that learners were taught by an experienced and a qualified teacher, they felt disappointed because of technical issues, absence of sufficient feedback, uncertain directions on the website of course and emails from the instructor. Students expressed dissatisfaction about the feedback given on online submitted assignments (Burnett, Bonnici, Miksa, & Kim 2007).

Online instructors must always be active in the conduct of classes and communicate with the learners regularly. They should know about the needs and progress of students, and act immediately when required (Pallof & Pratt, 2007).

Student to Student Interaction in Online Learning

The preceding section explains that learning is a complex and multi-dimensional process. Students learn not only from their instructors, they also learn from their course-fellows and the course materials. Sher (2009) and Su, Bonk, Magjuka et.al. (2005) indicated that in addition to the learner-tutor interactions, student-student interactions are notable contributors of learning and satisfaction.

Hollenbeck, Mason, and Song (2011) agree that students mostly rely upon learner to learner interaction because it minimize the threat of poor performance in an online course. If a student has no interaction with other fellows, he/she may feel dissatisfied with the online learning environment. Students may interact with each other in order to discuss about their studies, course assignments and projects etc. Grandzol and Grandzol (2010), and Arbaugh and Rau (2007) investigated that learner-to-learner interaction was significantly correlated with completion of the course.

Gunawardena (2010), is the only study to find that student-student interaction was negatively correlated with their satisfaction. Dissatisfaction with student-student interaction on course discussion boards might be due to limited guidance on how to interact with other learners in this context. Moreover, they suggested that satisfaction with inter-student interaction in a course differs according to the level and type of student. It is a significant feature of providing flexible environment of learning to students (Hrastinski 2008). Bolliger and Wasilik (2009) indicated that students benefit from on-line discussions by knowing and comparing their understanding of a specific subject matter with others. Students accept criticism on their work as an element of their learning process.

Student to Course Interaction in Online Learning

Interaction of the student with the course content is dependent upon the format and modes of content presentation. According to Moore (1991, p. 3), the structure of course "expresses the rigidity or flexibility of the program's educational objectives, teaching strategies, and evaluation methods" and it describes "the extent to which an education program can accommodate or be responsive to each learner's individual needs."

Learners may have issues in understanding the course information (Baker, 1986). Likewise, expectations from the course are sometimes not clear, and in distance education those aggravate due to physical distance between the learner and the instructor. Payne and Hamzaee (2011) provided evidence that students' satisfaction of course effectiveness can be influenced greatly by quality of assignments and readings, discussions and effectiveness of instructors in online courses. Rothman (2011) investigated six factors of students' satisfaction in online learning: technological tools, appropriateness of assignments, feedback from instructor and communication, organization of the course, clarity of outcomes and format of the content. He found a greater level of learner's satisfaction with the content of online courses, and somewhat lower satisfaction related to technology and instructor's feedback. Students rated format and organization of the content more favorably than its other aspects.

Perhaps it is not surprising that a course which fails to meet learner's desires and needs, can result in low level of learner participation (Hall, 2001). Student to content interaction was found as a strong predictor of students' satisfaction in e-learning (Kuo 2013; Chejlyk, 2006).

Objectives of the study

The objectives of the study were to:

1. Investigate the levels of various forms of students' interaction in asynchronous online setting i.e., learner-tutor, inter students and learner-content.
2. Explore the students' level of satisfaction with various forms of interaction in online learning.
3. Find out the level of correlation between the overall and by form level of interaction and students' satisfaction in online setting.

Research Questions

The research study answered the research questions stated below:
1. What is the level of interaction of learners with the tutors?
2. What is the level of interaction among the learners?
3. What is the level of learners' interaction with the course content?
4. What is the overall level of learners' satisfaction in online setting?
5. What is the relationship between the overall score of learners' satisfaction and interaction in online learning?
6. What is the relationship between interaction by form of interaction and satisfaction of learners?

Research Methodology

The study was quantitative conducted using a survey method. The population of the study comprised all male and female learners (N=1049) enrolled in Bachelors' degree programs of the Department of Education during Spring 2018 and Fall 2018 semesters at the selected open university of Pakistan. Using census sampling, all the students enrolled in the 4years' B.Ed. Elementary, 2.5years' B.Ed. Elementary,1.5years B.Ed. Secondary and M. Ed were selected as a sample of the study.

A questionnaire was developed to collect the data. The questionnaire had two parts; the first part consisted on items relating to the level of interaction with the tutor, among students and with the content. The second part had questions seeking an understanding of the student's level of satisfaction within the same areas. A five-point Likert scale of the responses for students' level of interaction and satisfaction ranged from "Strongly Disagree = 1" to "Strongly Agree = 5".

The questionnaire was sent online to all the sampled students and a survey link was circulated to them. A reminder was sent twice to them to fill the questionnaire online. The response rate was 59% with 622 respondents.

Data Analysis and Results

Data were analyzed using SPSS version 21. The respondents indicated their level of agreement on each question by selecting one of the five options ranging from "Strongly Disagree = 1" to "Strongly Agree =5". The responses of the respondents were tabulated and appropriate statistical techniques such as frequencies; mean scores, percentage, and standard deviation were used to analyze the data. Pearson Product Moment correlation was used to determine level of relationship between the two variables.

The following criteria were developed by the researchers to interpret the data:

$\leq 1.49 = SD$
$1.50 - 2.49 = D$ — Low Level

$2.50 - 3.49 = N$ — Moderate Level

$3.50 - 4.49 = A$
$\geq 4.50 = SA$ — High Level

The questionnaire comprised of three factors; interaction between learners, interaction among learners and tutors, and the interaction of learners with the content. The first objective of the study was: to investigate students' levels of interaction in online settings.

Research Objective 1: Investigate learners' level of interaction in e-learning environment.

Students' level of interaction was the highest with the course content and was the lowest with the inter-student interaction. The overall mean score of 3.65 shows a slightly above average interaction.

Table 1
Mean level of overall and by-factor interaction for learners (N=622)

Factor	N	Mean	SD
learner-tutor interaction	622	3.74	0.72
learner-learner interaction	622	3.42	0.64
learner-content interaction	622	3.79	0.61
Mean of Means	622	3.65	0.57

Student-Tutor Interaction: Research Question 1: What is the level of interaction of learners with the tutors on various teaching learning tasks?

Items 3 has the highest mean value i.e., 4.18 followed by item 6 with mean= 4.03 that indicate that instructor treat students with respect and encourage questions and comments from them. Items 4, 5 and 7 were related to the instructors' availability and feedback. The mean values of 3.79 and 3.89 show that instructor is accessible most of the times and provides timely feedback. Items 2 and 7 show moderate interaction level. The students' level of interaction with the tutor and creating chances for students to interact with each other were found to be at moderate level with mean values of 3.34 and 3.27, respectively.

Table 2
Learners' level of interaction with the tutor on various tasks in online learning (N = 622)

Item	SD N	SD %	D N	D %	N N	N %	A N	A %	SA N	SA %	Mean	SD
1. Instructor encouraged me to participate in discussions of the course.	10	1.6	80	12.9	132	21.2	270	43.4	130	20.9	3.69	0.91
2. Instructor provided platforms to learn from each other.	43	6.9	118	19.0	183	29.4	185	29.7	93	15.0	3.27	1.13
3. Instructor treated students with respect.	8	1.3	16	2.6	69	11.1	292	46.9	237	38.1	4.18	0.82
4. Instructor provided timely feedback.	16	2.6	54	8.7	121	19.5	284	45.7	147	23.6	3.79	0.98

Item	N	%	N	%	N	%	N	%	N	%	Mean	SD
5. Instructor was available and helpful throughout the semester.	6	1.0	42	6.8	118	19.0	303	48.7	153	24.6	3.89	0.88
6. Instructor welcomes and encourages questions and comments.	6	1.0	28	4.5	111	17.8	275	44.2	202	32.5	4.03	0.87
7. I frequently interact with the instructor.	17	2.7	127	20.4	181	29.1	221	35.5	76	12.2	3.34	1.02

Inter student Interaction. Research Question 2: What is the level of interaction among learners?

Table 3 shows that interaction among learners was slightly above the midpoint on all elements except for the frequency of interaction. They did not find interacting with other students of high value to them.

Table 3
Inter-*student level of interaction and its perceived value (N = 622)*

Item	SD		D		N		A		SA		Mean	SD
	N	%	N	%	N	%	N	%	N	%		
1. I was able to share learning experiences/ information with others.	31	5.0	127	20.4	122	19.6	272	43.7	70	11.3	3.36	1.07
2. Frequent contact helped me to understand course.	20	3.2	126	20.3	155	24.9	239	38.4	82	13.2	3.38	1.04
3. Encouraged me to work in teams or small groups.	24	3.9	138	22.2	154	24.8	243	39.1	63	10.1	3.29	1.04
4. I frequently interacted with other students.	55	8.8	195	31.4	160	25.7	169	27.2	43	6.9	2.92	1.10

Learner-Content Interaction. Research Question 3: What is the learners' level of interaction with the course content?

Table 4 shows that students' interaction level with the content is quite high. Item no. 1 has the highest mean value (4.09) closely followed by the item 3 (4.04) indicating that content of the courses support learning and all material and resources relevant to the courses are easily accessible to the students. The Mean score at Item no. 2 shows that the content of the course helps the students to incorporate facts and make generalizations from the course material. Item no. 4 relating to the use of Skype and Adobe for interaction was slightly below the midpoint. However, they were using

Moderated Discussion Boards and Emails more frequently to ask content related queries. Item no. 5 and 6 show that most of the students read handouts and additional reading material before watching videos.

Table 4
Students' level of interaction with the content in online learning (N = 622)

Items	SD		D		N		A		SA		Mean	SD
	N	%	N	%	N	%	N	%	N	%		
1. Overall content of the course	12	1.9	15	2.4	57	9.2	356	57.2	182	29.3	4.09	0.80
2. Incorporate facts and make generalizations from material of the course.	6	1.0	28	4.5	103	16.6	356	57.2	129	20.7	3.92	0.79
3. All materials/resources of the course were readily accessible.	10	1.6	21	3.4	84	13.5	327	52.6	180	28.9	4.04	0.83
4. Use of Skype/Adobe.	45	7.2	187	30.1	188	30.2	143	23.0	59	9.5	2.97	1.09
5. Reading handouts/ textbook before watching the video lecture.	19	3.1	61	9.8	87	14.0	308	49.5	147	23.6	3.81	1.04
6. Additional reading material.	8	1.3	61	9.8	91	14.6	321	51.6	141	22.7	3.85	0.92
7. Questions MDBs and Email.	15	2.4	48	7.7	110	17.7	274	44.1	175	28.1	3.88	0.98

Students' Satisfaction Level: Research Objective 2: Explore students' level of satisfaction in online environment of learning.

Table 5 shows that students' level of satisfaction studying in online environment is at reasonably high level with mean= 3.96.

Table 5
Level of students' satisfaction in online environment of learning

Factor	N	Mean	SD
Students' Satisfaction	622	3.96	0.74

Elements of Student's Satisfaction with online learning mode

Table 6 shows that satisfaction of students with online learning is attributed to its flexibility of time and space. They can study along with job and family responsibilities and can adjust their study time to their convenience. Students are satisfied with the learning experience and would like to study in this mode in future as well.

Research Question 4: What is the level of students' satisfaction with online setting?

Table 6
Level of students' satisfaction with various elements in online learning environment (N=622).

Element	SD		D		N		A		SA		Mean	SD
	N	%	N	%	N	%	N	%	N	%		
1. participation in academic activities.	11	1.8	51	8.2	137	22.0	289	46.5	134	21.5	3.78	0.93
2. interest in the subject matter of the courses.	10	1.6	30	4.8	116	18.6	326	52.4	140	22.5	3.89	0.86
3. Allows me to complete my education with my job responsibilities.	0	0	54	8.7	67	10.8	266	42.8	235	37.8	4.10	0.90
4. Study the lectures when it is feasible for me during the week.	6	1.0	22	3.5	75	12.1	297	47.7	222	35.7	4.14	0.830
5. I am satisfied with my learning experiences.	11	1.8	53	8.5	88	14.1	264	42.4	206	33.1	3.97	0.98
6. Another opportunity to study via this mode I would do so gladly.	29	4.7	53	8.5	89	14.3	217	34.9	234	37.6	3.92	1.13

Correlation between Interaction and Satisfaction: Research Objective 3: Find out the relationship between students' level of interaction and students' satisfaction in online setting.

To interpret the correlation coefficient, the guidelines given by Evans (1996) were adopted in the study. Evans's guidelines were as follows:

- .00 – 0.19 = Very weak
- 0.20 – 0.39 = Weak
- 0.40 – 0.59 = Moderate
- 0.60 – 0.79 = Strong

- 0.80 – 1.0 = Very Strong

α = 0.05

Table 7 shows a strong significant positive correlation (r=0.63, N= 622, p = 0.00), between students' level of interaction and their satisfaction with online learning. The students were most satisfied with their interaction with the course content followed by their interaction with the tutor. They were least satisfied with the inter-student interaction.

Table 7
Correlation between the forms of interaction and students' satisfaction

Variables	1	2	3	4	5
1. Students' Satisfaction	-				
2. Student-Teacher Interaction	.595**	-			
3. Learner-Learner Interaction	.384**	.597**	-		
4. Learner-content Interaction	.668**	.689**	.558**	-	
5. Overall Interaction	0.636*				-

P= 0.05

Conclusion, Discussion and Recommendations

This study was conducted to find out the level of interaction of the learners and their level of satisfaction in the online teaching-learning setting in an open university. The level of interaction was measured according to the Moore's model of Interaction. Moore (1973, 1989, 1993) noted all three types of interactions are necessary for effective online education. The study shows that learners experience highest level of interaction with the content of the courses followed by that with the tutor but shows moderate level of inter-student interaction. A high level of satisfaction was found among students with online learning settings, particularly related to the flexibility in time and space of study. Moreover, there is a strong positive relationship, between students' level of interaction and their satisfaction with the online learning.

Results of the study have been discussed according to the research objectives and questions. The first objective of the study was to find out the level of learners' interaction in online learning. The results revealed that overall learners' level of interaction was above the median. As online learning is self-directed and learner-centered, therefore, it needs higher level of interaction with content of the courses and tutor to perform well. The first research objective was followed by three research questions. The first research question was: what is the level of interaction of learners with the instructors? Various studies have been conducted on measuring the level of student-instructor interaction. Joyner, Fuller, Holzweiss, Henderson and Young (2014) argue student-instructor interaction is very important in both conventional and e-learning settings. Nir-Gal (2002)

says online education involves a high level of interaction between tutor and a learner. Grandzol and Grandzol (2010) suggested need for additional interaction in e-learning for raising students' satisfaction and improving learning outcomes. This study found a reasonably high level of learner-tutor interaction. The investigation of Hara and Kling (2001) recommends the importance of timely feedback on course activities by the instructors. A few students showed dissatisfaction about the feedback given on assignments which are submitted online (Burnett, 2007). The current study shows students' satisfaction about the feedback from instructors. The items related to timely feedback through comments and frequent interaction with the instructor were at a quite high level with mean values of 4.03 and 3.79, respectively.

The second research question was 'what is the level of interaction between learners?'. The present study showed a moderate level of interaction amongst learners. Swan et al. (2000) found that within a class, interaction among students is very important for increased level of learner satisfaction. Hollenbeck, Mason, and Song (2011) investigated student's reliance on inter-learner interaction because it reduces the threat of poor performance in an online course. Participants of the current study expressed moderate level of interaction with each other. It suggests that this online university should explore more technology-based avenues and methods to enhance inter-student interaction and communication.

The third research question was: what is the level of learners' interaction with the content? The level of such interaction in the current study was the highest of the three types of interaction. Several studies on this type of interaction have been conducted. For example, Payne and Hamzaee (2011) witnessed that students' satisfaction with the course effectiveness can be influenced greatly by the quality of assignments and readings, discussions and effectiveness of instructors in online courses. In the current study, the majority of the participants agreed that they participate in course discussions and do not hesitate to ask questions on watched video lectures.

The fourth research question was: what is the level of students' satisfaction with online learning environment? Participants expressed a reasonably high level of satisfaction. Bolliger (2004) indicated that students' satisfaction in on-line courses is influenced by three variables i.e. teacher variables, technical problems, and interactivity. The findings of this current study are in line with these results that interaction plays a vital role in students' level of satisfaction.

The fifth research question was: what is the relationship between students' level of interaction and satisfaction in online learning? The current study found a significant positive relationship, between students' level of interaction and their satisfaction with online learning. These results are in consonance with the earlier research studies such as Bolliger 2004; Eom, Wen and Ashill (2006); Grandzol and Grandzol (2010); Hollenbeck, Mason, and Song (2011).

Although various forms of interactions were reasonably at high level, still there is need to improve it further by using new ICTs and innovative pedagogies. This study also exhibited inter-student interaction at the lowest level in the three types of interaction. Therefore, more focus is

needed to promote inter-student interaction for the enrichment of learning, promoting collaborative and cooperative learning. Only one department of the selected university was selected in this research. Future research may be conducted on learners of other departments and in other distance learning contexts in Pakistan

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