Student Interaction on Moodle for a Foundation Course at a Tertiary Institute in Fiji

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Abstract. In this paper, we examine which interaction(s) students engage in the most on Moodle in a Pre-degree (English Foundation) course in a tertiary institute in Fiji. A mixed method research approach was used to collect data. Quantitative data was collected and analysed for students' interaction on Moodle with the content, teacher, other learners, learning environment, assessment, and feedback on assessment. Qualitative data was examined to explore students' interaction with the institution. It was found that students interacted mostly with the learning environment than the other forms of interaction, as this included the total number of times students logged into the course (LLFXX) Moodle page. Their interaction with the assessment and feedback on assessment was also higher than the content, teacher, and other learners. Therefore, it can be concluded that students' interaction was high for assessment related interactions (assessment and feedback on assessment).

Keywords: e-learning, interaction, LMS, Moodle.

1   Introduction

E-learning has become a major component of the teaching learning process. Classes are being facilitated using technology-enhanced learning tools. Due to technology enhanced teaching, Blended mode of teaching is emerging. Learning Management System (LMS) has emerged and have made great impact in ensuring that technology enhanced learning is implemented easily. A globally adopted LMS is adopted globally is MOODLE (Modular Object-Oriented Dynamic Learning Environment). It is used to facilitate the teaching learning process virtually.

For teaching learning process to be successful and productive, it is crucial for interaction to take place. The need to interact in a classroom is still crucial for the instructors and students despite the shift from a traditional classroom to a virtual classroom. The mode of teaching, whether it is Blended or Online, has not changed the expectation and/or the perception of the instructor and the students. The shift to virtual classroom strongly emphasizes on the importance of interaction in the teaching learning process. [13]. Researchers have usually looked at students' interaction on Moodle in total or have studied students' interaction with content, teacher and other learners [8], [9].

It has been emphasized in recent studies that all forms of interactions are equally important for students. Initially student to content, student to instructor and student to student communication were focused on [1], [4], [5], [6], [7], [9], [11]. Now it has been realised that in order to have a holistic approach to learning, it is essential for a learner to collaborate with his or her learning and teaching setting. Every student needs to interact with his or her assessments, response to assessments or performance and the university altogether [5], [6], [7], [8], [12]. A very interactive learning process is developed if students interact in all the seven forms.

With such a holistic approach, this paper will explore learner interaction with content, teacher, other learners, learning environment, assessment, feedback on assessment and the institution [5], [6], [7].

The study was done on one of the mandatory English Language courses at Foundation level (Pre degree) at a tertiary institute in Fiji. The institute offers courses to students from Fiji and other countries. Moodle assists in facilitating teaching and learning. This LMS has been used in the institute since 2008. When it started, it was used for certain courses only. However, over the years it has become mandatory for every course to use Moodle.

The courses are offered through either Print, Blended or Online mode. The presence of Moodle in the courses totally depends on the mode of teaching. For example, for an Online course, Moodle facilitates teaching and thus is the virtual classroom. Since there is no set guideline for Blended mode of study [10], the use of Moodle differs from course to course. However, for LLFXX, Moodle is used for uploading resources, submitting assessments, providing feedback on assessments, communicating with students and teaching staff, and for sharing information.

The purpose of the research is to see which interaction students engage in the most.

2 Methodology

Qualitative or quantitative data is not able to deliver a complete comprehension of the research problem alone. As a result, a mixed method approach provides enhanced strategies to collect or analyse data [2], [3].

A total of 109 students (80 Blended and 29 Print mode) participated in the research. These were Foundation students from main campus enrolled in LLFXX in the institute. The students' interaction on the Moodle page with the content, teacher, other learners, learning environment, assessment, feedback on assessment and the institution was investigated.

From the seven types of interaction, six had quantitative data, whilst one form interaction had qualitative data to be analysed. The quantitative data was derived from the Moodle page. The number of times students clicked onto the LLFXX Moodle page and accessed its various sections were recorded and used in the research. These were categorized under six different forms of interaction. For the seventh form of interaction, data was collected from a questionnaire that was prepared in Moodle and the students were asked to complete the questionnaire online. This collected data on students'

interaction with the institution. Therefore, mixed method was the most appropriate approach for this study.

3 Dimensions of Flexibility

Student interaction has been divided into seven categories. These are known as the "Dimensions of Flexibility'. These seven categories are learner interactions with the content, teacher/instructor, other learners, learning environment, assessment activities, feedback and with the institution. These will be discussed below.

3.1 Learner - Content Interaction

LLFXX Moodle page has a range of resources, like recordings, notes, course outline, course book, tutorial questions, assignment guidelines and additional resources. Data was collected on the number of times these were accessed.

Table 1. LLFXX students' and content interaction on the Moodle page.

Content	Number of Clicks		Mean, μ (Standard Deviation, σ)		Range	
	Blended	Print	Blended	Print	Blended	Print
Recordings of Lecture	198	8	2.2 (4.9)	0.28 (0.78)	(39-0) 39	(4-0) 4
Tutorial Recordings	19	3	0.21 (0.59)	0.1 (0.3)	(3-0) 3	(1-0) 1
Notes on Lecture	67	7	0.74 (2.1)	0.24 (0.81)	(17-0) 17	(4-0) 4
Additional Resources	69	45	0.76 (1.65)	1.55 (1.63)	(11-0) 11	(6-0) 6
Course Book	133	35	1.48 (2.04)	1.2 (1.6)	(10-0) 10	(6-0) 6
Outline of Course	43	16	0.48 (0.81)	0.55 (1.07)	(4-0) 4	(4-0) 4
Questions on Tutorial	25	3	0.28 (1.35)	0.1 (0.3)	(10-0) 10	(1-0) 1
Assignment two Guidelines	107	24	1.19 (1.67)	0.83 (1.31)	(7-0) 7	(6-0) 6
OVERALL	**661**	**141**	**7.34 (10.66)**	**4.86 (4.2)**	**(86-0) 86**	**(14-0) 14**

Table 1 shows that the most accessed content on the Moodle page was Lecture Recordings for students studying via Blended mode and Tutorial Recordings was the least

accessed. The range was also the highest for Lecture Recordings for Blended mode students. Students studying via Print mode mostly accessed Additional Resources and Tutorial Recordings and Tutorial Question were the least accessed. The range for these three components was the highest for Print mode students. In total content was accessed by Blended mode students 661 times with a mean of 7.34 and by Print mode students 141 times with a mean of 4.86.

3.2   Learner – Teacher Interaction

Four means were available for learners to interact with their facilitator and coordinator. These were through BBB, Class News & Announcement, Discussion Forum and Messaging.

Table 2. LLFXX students' interaction with the teacher on the Moodle page.

Means of interacting with teacher	Number of Clicks		Mean, μ (Standard Deviation, σ)		Range	
	Blended	Print	Blended	Print	Blended	Print
BBB	47	5	0.52 (1.38)	0.17 (0.53)	(7-0) 7	(2-0) 2
Class News & Announcement	1194	148	13.27 (24.14)	5.1 (8.05)	(153-0) 153	(28-0) 28
Discussion Forum	1235	715	13.72 (24.41)	24.66 (76.43)	(150-0) 150	(420-0) 420
Messaging	19	2	0.21 (0.59)	0.07 (0.25)	(3-0) 3	(1-0) 1
OVERALL	**2495**	**870**	**27.72 (41.73)**	**30 (81.57)**	**(232-0) 232**	**(448-0) 448**

As shown in Table 2, both, Blended and Print mode students interacted mostly by communicating on Discussion Forum. This is an average of 13.72 for Blended mode students and 24.66 for Print mode students. Messaging was the least used means of communication with Blended mode students accessing it 19 times and Print mode students accessing it only twice. For Blended mode students the highest range was for Class News & Announcements but for Print mode students the highest range was for Discussion Forums.

3.3 Learner – Learner Interaction

Table 3 shows that BBB, Class News & Announcement, Discussion Forum and Messaging were the means of interaction between learners.

Table 3. LLFXX students' interaction with the other students on the Moodle page.

Means of interacting with other learners	Number of Clicks		Mean, μ (Standard Deviation, σ)		Range	
	Blended	Print	Blended	Print	Blended	Print
BBB	49	5	0.54 (1.42)	0.17 (0.53)	(7-0) 7	(2-0) 2
Class News & Announcement	0	0	0 (0)	0 (0)	0	0
Forum for Discussion	15	0	0.17 (0.52)	0 (0)	(3-0) 3	0
Message	0	0	0 (0)	0 (0)	0	0
OVERALL	**64**	**5**	**0.71 (1.53)**	**0.17 (0.53)**	**(7-0) 7**	**(2-0) 2**

Unlike, learner – teacher interaction, the interaction between the learners (learner – learner) was very low. Learner – learner interaction mostly took place in BBB sessions for both Blended and Print mode students. There was no interaction amongst learners through message or Class News & Announcement.

3.4 Learner Interaction with the Learning Environment

On the Moodle platform, learner interaction with the learning environment was analysed by examining the number of times students logged in into the LLFXX Moodle page. The other Moodle page component that enabled them to interact with the learning environment was by signing up for tutorials (Table 4).

Table 4. LLFXX students' interaction with the learning environment on the Moodle page.

Means of interacting with the learning environment	Number of Clicks		Mean, μ (Standard Deviation, σ)		Range	
	Blended	Print	Blended	Print	Blended	Print
Logged in into Moodle	99763	29722	1108.48 (886.6)	1024.9 (610.64)	(7326-207) 7119	(2592-77) 2515

| Tutorial sig-nup | 231 | 0 | 2.57 (2.56) | 0 (0) | (14-0) 14 | 0 |
| **OVERALL** | **99994** | **29722** | **1111 (887.1)** | **1024.9 (610.64)** | **(7331-207) 7124** | **(2592-77) 2515** |

The mean of this interaction is very high for both, Blended and Print mode students. This is due to their frequency of logins. Students had logged in into the LLFXX Moodle page quite frequently (Blended- μ=1111 and Print- μ=1024.9) for various reasons, basically for interacting with content, teacher, other students, assessment activities, feedback and the institution.

3.5 Learner Interaction with Assessment Activities

LLFXX Moodle page has nine assessment activities. These are the tests, assignments, sample tests, starting test and quizzes.

Table 5. LLFXX students' interaction with the assessment on the Moodle page.

Assessments	Number of Clicks		Mean, μ (Standard Deviation, σ)		Range	
	Blended	**Print**	**Blended**	**Print**	**Blended**	**Print**
Assign. 1	1567	580	17.41 (13.55)	20 (12.52)	(96-0) 96	(50-0) 50
Assign. 2	1825	619	20.28 (22.45)	21.34 (14.02)	(189-0) 189	(60-0) 60
Test 1	473	275	5.26 (3.21)	9.48 (6.7)	(17-0) 17	(37-0) 37
Test 2	337	166	3.74 (2.8)	5.72 (4.61)	(19-0) 19	(25-0) 25
Sample Test 1	319	207	3.54 (3.25)	7.14 (6.1)	(14-0) 14	(30-0) 30
Sample Test 2	221	176	2.46 (2.99)	6.07 (4.77)	(16-0) 16	(19-0) 19
Grammar Starting Quiz	347	184	3.85 (3)	6.34 (4.91)	(14-0) 14	(19-0) 19
Verb Tense Activity	212	138	2.36 (3.46)	4.76 (3.27)	(23-0) 23	(11-0) 11
Essay Writing Activity	173	0	1.92 (2.35)	0 (0)	(13-0) 13	0
OVERALL	**5474**	**2345**	**60.82 (40.36)**	**80.86 (43.73)**	**(332-5) 327**	**(233-17) 216**

As per Table 5, the students mostly accessed the assignments (Assign.) (1 and 2). Blended mode students accessed assignment (Assign.) 2 1825 times and assignment

(Assign.) 1 1567 times. Print mode students accessed assignment (Assign.) 2 619 times and assignment (Assign.) 1 580 times. The least accessed assessment activity was the Essay Writing Quiz (173 for Blended mode and 0 for Print mode). The highest range for both, the Blended mode (189) and Print mode (60) was for Assignment 2.

3.6 Learner interaction with Feedback

Feedback was given to learners for Assignment 1, Assignment 2, Test and Final exam answer.

Table 6. LLFXX students' interaction with the feedback on the Moodle page.

Feedback	Number of Clicks		Mean, μ (Standard Deviation, σ)		Range	
	Blended	Print	Blended	Print	Blended	Print
Assign. 1	234	87	2.6 (2.55)	3 (2.36)	(11-0) 11	(9-0) 9
Assign. 2	148	29	1.64 (2.83)	1 (2.02)	(20-0) 20	(9-0) 9
Quiz	104	62	1.16 (2.45)	2.14 (2.6)	(13-0) 13	(11-0) 11
Past Semester Final examination answer	74	48	0.82 (1.36)	1.66 (1.56)	(9-0) 9	(5-0) 5
OVERALL	**560**	**226**	**6.22 (6.58)**	**7.79 (5.73)**	**(38-0) 38**	**(24-0) 24**

Table 6 shows that both, Blended and Print mode students mostly accessed the feedback for Assignment (Assign.) 1 (Blended – 234 and Print – 87). The least accessed feedback for Blended mode students was Final examination answer (74) and for Print mode students was Assignment (Assign.) 2 (29).

3.7 Learner Interaction with Institution

This interaction was measured through qualitative approach, whereby, students' response on how practical the use of Moodle was for studies for different learning modes, how helpful the development of ICT at the institute was for Pre-Degree students and how relatable the Moodle services were for LLFXX students.

Majority of the students found Moodle to be very viable and its services very relatable. Most of the LLFXX students agree that the ICT development for Pre-Degree student is quite helpful.

3.8   Summary of Findings

The quantitative data shows the number of times students interacted with the components on the LLFXX Moodle page. These have been summarized below for six out of seven types of interaction.
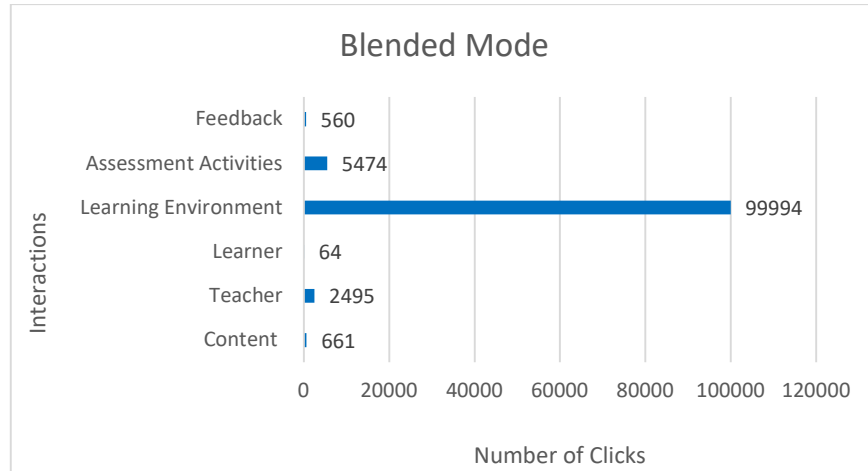
Blended Mode

Interaction	Value
Feedback	560
Assessment Activities	5474
Learning Environment	99994
Learner	64
Teacher	2495
Content	661

(Number of Clicks; axis: 0, 20000, 40000, 60000, 80000, 100000, 120000)

Fig. 1. Interaction on Moodle by Blended mode students

Fig. 1 shows that Blended mode students mostly interacted with the learning environment. This includes them accessing the Moodle page. Therefore, the value is very high. Their least interaction by Blended mode students was with other learners.
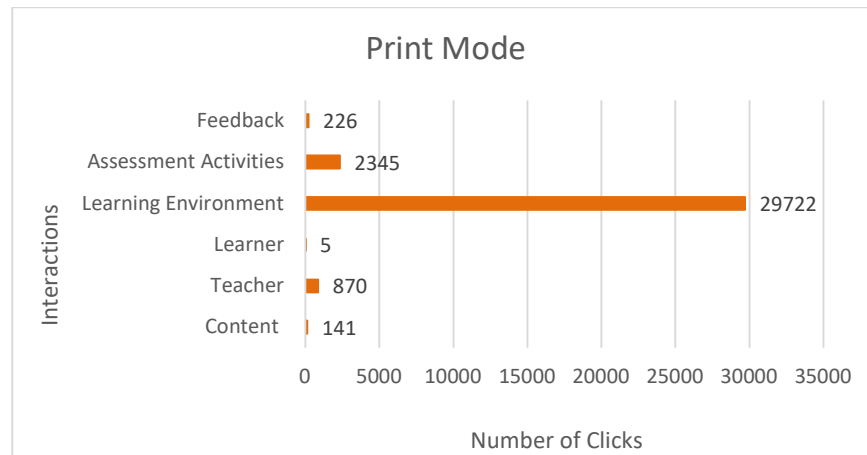
Print Mode

Interaction	Value
Feedback	226
Assessment Activities	2345
Learning Environment	29722
Learner	5
Teacher	870
Content	141

(Number of Clicks; axis: 0, 5000, 10000, 15000, 20000, 25000, 30000, 35000)

Fig. 2. Interaction on Moodle by Print mode students

Fig. 2 depicts that Print mode students also had a similar trend of interaction; most interaction was with the learning environment and the least interaction was with other learners.

4   Discussion

The goal of this study was to empirically examine student interaction on the Moodle page for a Pre-degree (Foundation) course in a tertiary institute in Fiji. The study was done by examining student interaction on Moodle page with the content, teacher, other learners, learning environment, assessment, feedback on assessments and the institution.

Table 1 shows that Blended mode students interacted the most with the Lecture Recordings (198). This may be due to low attendance during lecture times. During the beginning of the semester, students' attendance in lecture is very high, but after few weeks it decreases. The possibility of students accessing lecture recordings on Moodle rather than attending the face-to-face lecture is very high.

In addition to this, table 2 shows that students interact with the teacher the most through discussion forums. The interaction is 1235 for Blended mode students and 715 for Print mode students. This is the component of Moodle where students raise and clarify any confusion that they may have. They also respond to any necessary postings done by the teacher.

On the contrary, learner – learner interaction on Moodle as shown in table 3 is very low. Discussion forum interaction amongst learners is only 15 for Blended mode students and 0 for Print mode students. This shows that students do not prefer to interact amongst themselves on discussion forum.

For total interaction, it was found that both, Blended (Fig. 1) and Print (Fig. 2) mode students interacted with the learning environment. Interaction is very high for the learning environment when compared to other interactions as this interaction takes into account every time the students logged into the Moodle page for the course (LLFXX). This is regardless of how genuine or in-genuine the reasons for logging in would had been.

Fig. 1 shows that Blended mode students interacted with the assessment (5474) many times also and then with the Feedback for the assessments (560). Print mode students (Fig. 2), similarly, interacted more with the Assessments (2345) than the Feedback on assessments (226). This clearly shows that students are interacting only for marks or better final grades. They interaction is result centered and not merely for interaction or for communication purpose.

The least interaction for both, Blended mode (64) as shown in Fig. 1 and Print mode (5) as shown in Fig. 2 were with other learners. These students also as shown in Fig. 1 and Fig. 2 interacted with the teacher (Blended mode - 2495 and Print mode - 870) more than with the content (Blended mode – 661 and Print mode – 14).

The qualitative data showed that majority of the students found Moodle to be very viable and its services very relatable; 'the services are relevant to my student needs'.

Most of the LLFXX students agree that the ICT development at the institute for Pre-Degree student is quite helpful; 'the development has made me have access to things that I need for my studies and had never imagined about'.

Based on this research it could be easily seen which components of the Moodle page students interact more on rather than analyzing just a few of them or looking at the total number of student interaction only. Such specific data can assist instructors of the Moodle page to upgrade to the complete competency of the Moodle page. This may increase student interaction with the Moodle page and assist them with their e-learning process.

5   Conclusion

It was the first time through this study that Foundation students were researched on (at the institution). Their interaction on Moodle was the main component of the research. The data collected through this research can assist to make some changes to enhance interaction by the learners and the instructors. Such research can guide instructors to ensure that they are designing the Moodle page and adding resources to the Moodle page that are student friendly and learner need oriented.

The research examined Foundation students interaction on the Moodle page in the main campus for Blended and Print mode students. This is a Pre-degree course, hence, the possibility of it being the first exposure to Moodle or to any LMS. As a result, it can be said that there are variations in student interaction with the content, teacher, other learners, learning environment, assessment, feedback on assessment and the institution.

The tertiary institute has made it mandatory for all courses to have Moodle presence despite their mode of teaching (Face to face, Blended, Online or Print). More courses are taught in Blended mode. Therefore, it is crucial to explore learner interaction or the Moodle page. It was established in the study that of all the interactions on Moodle, student interaction was soaring for interactions associated with assessment (assessment and feedback on assessments).

6   References

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