

# Exploring Student Course Satisfaction in Online Learning Environments

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## Abstract

The paper entitled " Student Course Satisfaction in Learning Management System" is based on one-cycle technical action research methodology. It aimed to enhance students learning participation in LMS. The participants for this study were 26 students studying Mathematics and English education at ODEC, TU. Tools used in the study were baseline, and end-line survey on (a) students course satisfaction on LMS and (b) students perception on usefulness of four pedagogical tools in LMS: content tools, communication tools, feedback tools, and assessment tools. The reliability and validity of the tools were established by Cronbach alpha and principal component factor analysis. The data in the study were collected through an online Google form before and after AR intervention. The collected data were analyzed using inferential statistics t-test for significance test. Based on the result, this study found that students were more satisfied from LMS when it is re-designed according to AR intervention for engaged and interactive pedagogical tools: content tools, communication, and interaction tools, feedback and support tools. However, assessment tools were found to re-design in the next cycle. The study also found that math students were more satisfied from LMS than English students. Boys students were more satisfied in LMS than Girl students. However, the reasons need to the explorer in the next cycle. From the study, it is concluded that LMS itself is not a sufficient tool to enhance students learning participation, but it needs to design with pedagogical thoughtfulness while implementing an online learning environment. So, creating an engaged and interactive learning environment helps to increase student's course satisfaction in LMS. As a teacher cum researcher, it is learned that LMS should design to maintain a reciprocal relationship between teacher, student, and learning content.

**Key Words:** Student Course, Learning Management System

## Introduction

Due to the internet and technology-based educational practices during last two decades, new jargons like hybrid learning, e-learning, o-learning, M-learning, U-learning, MOOC, SOOC, etc. have been emerging to represent technology integrated educational practices. As a result, educational institutes are under increasing pressure to respond and adapt this rapidly growing online/hybrid educational practices. Central Department of Education (CDED), TU is also adopting this online/hybrid educational practices since last four years under ODEC and Quantict Collaboration.

With the implementation of the online/hybrid educational environment in CDED, faculties at CDED are aware that it is really necessary to create engaged and interactive learning environments in LMS. However, a significant gap is seen between what is expected and what is implemented. For example, this gap is seen in CDED to design engaged, and interactive LMS, it CDED case, the LMS is Moodle. For example, one evidence of gap is, there was a number of courses (34 courses; 4 from Education, 14 from Mathematics, and 14 from English) proposed to design in online delivery mode. Quantict had already started this initiative requiring CDED faculties since 2015 to design the courses for the online environment. However, a few numbers of courses are built for Moodle friendly environment. The designed courses still demand sufficient work to be done both in content and pedagogy for Moodle friendly environment.

From this gap, a question is raised. How be the online courses at CDED designed to support students learning expectations? This concern of maximizing student's learning exception and its online course satisfaction has grounded this research study. This study, in this essence, is concentrated to investigate and enhance student's course satisfaction in LMS at CDED context.

## Research Questions

The focus of the study was to investigate the following research questions.

1. What is the relationship between student perception of LMS course content tools usefulness and student LMS course satisfaction?
2. What is the relationship between student perception of LMS course assessment tools usefulness and student LMS course satisfaction?
3. What is the relationship between student perception of LMS course communication/collaboration tools usefulness and student LMS course satisfaction?
4. What is the relationship between student perception of LMS course feedback tools usefulness and student LMS course satisfaction?
5. What is the relationship between boys' and girls' perception of LMS course satisfaction?

In relation to the above research questions, action intervention on "Online Course Management: Principles and Design" was injected for course tutors to update LMS features in Moodle platform. Then Moodle LMS update was carried out by course tutors themselves. For this update, required knowledge for teachers to work in Moodle was disseminated in a joint workshop in collaboration with Quantict and ODEC. Before and after this intervention, baseline and end-line course satisfaction survey were administered. Based on the survey result, research questions were analyzed. **Review for Conceptual Framework**

Technology and its innovative use into the classroom have been a long-standing tradition in education. Some technologies like radio and television come and go, tried and tossed in the classroom. In the 1980s, computer technology entered into the classroom as another innovative educational and instructional technology. Since the 1990s, LMS has been introduced to enhance students learning.

LMS use is new and just a kick-off (beginning) practices in Nepal. Therefore, it requires an understanding on how to use LMS effectively, in the context of Nepal. In the literature, it is mentioned that, if LMS is used properly, there can be a number of benefits for students learning both in cognitive and meta-cognitive aspects. It is justified in a work that the impact of technology integration largely depends on how it is implemented (Conole & Dyke, 2004) & further, justified by a work that technology's benefit on student learning depends on how the technology is implemented (Li & Ma, 2010). However, it is still hard to know how technology can be best thoughtfully used for instructional purposes. How its use can be localized in the context of Nepal. Therefore, it also equally important to know how LMS improves students' learning.

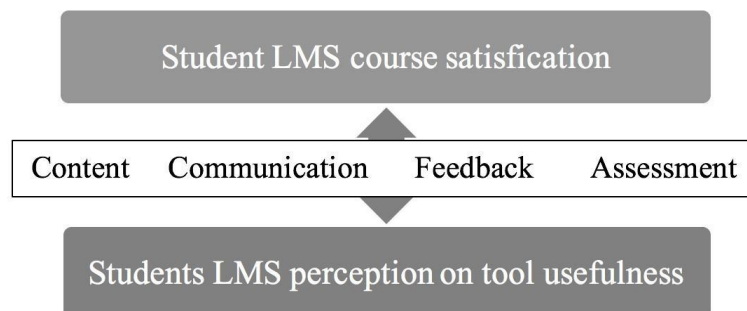
Research finding suggests that Educators who use educational technology effectively, can strengthen quality instruction and leads to increased student learning (Raines & Clark, 2011). In work, it is recommended that the instructor must use technology to facilitate student learning by using effective learning management principles (Baghdadi, 2011). It is, therefore, important to design LMS to guide student learning effectively.

Today, a number of educational technology tools are part of LMS as pedagogical tools (Yueh & Hsu, 2008). The number of such pedagogical tools that can be used in LMS are peer work, forums, lessons, quiz, assignments,

chat, and wikis. These tools can help to peruse well-designed engaged and interactive learning environments. Simply adding these tools in LMS may not work effectively, rather it may work effectively if these tools are designed thoughtfully. Online learners highly value a course when the course content is "well-organized, effectively presented, interactive, clearly written, flexible, right length and breadth" (Ozkan & Koseler, 2009). In this essence, designing LMS to address students need can be a common measure of instructional effectiveness.

While measuring the instructional effectiveness, there is a number of theories to answer how students learn. These theories are the framework to manage students learning. There are different orientations and approaches to explain this phenomenon. For example, behaviorism, cognitivism, and constructivism. The connectivism is also a growing phenomenon, even if there is a discourse to accept it as a learning theory. Among the four, constructivism is a learning theory that assumes learning as a function of activities (action). This theory is conceptualized by Piaget (Piaget, 1954) for individual level and Vygotsky (1978) at the social level. This theory argues that learning is active and generated from the interaction between and within people's actions, experiences, and subjective states of mind. The theory asserts that learning is internal and constructed, so the action is a prime source of learning.

By constructive learning theory, learning is a function if participatory, cooperative, and collaborative actions. Based on this theory, this paper understands the notion of learning as "higher the engagement higher the learning" which is here and there argued in a number of works (Vygotsky, 1986; Vygotsky, 1978; Siemens, 2005; Downes, 2005). Therefore, these students reflects student learning through their perceptions on pedagogical activities. The pedagogical activities reflected in this study are course contents, communication, and interaction within and between students and teachers, feedback and support to excel student learning, and assessment of/for/in the learning. In this essence, student's course satisfaction and its effectiveness have measured from the relationship between student LMS course satisfaction versus student's perceptions of LMS pedagogical activities (tools) usefulness. In general, the framework is conceptualized as below.



In the framework, students LMS course satisfaction is function of four pedagogical activities, i.e., students LMS course satisfaction is a real-valued multivariate function  $f(\text{Content, Communication, Feedback, Assessment})$ . The score of the function  $f$  is accumulated from students' score on Content, Communication, Feedback, and Assessment usefulness. Then, the interaction between students LMS course satisfaction and their perception of pedagogical tool usefulness (Content, Communication, Feedback, and Assessment) are analyzed.

## Methodology

This study is based on one cycle action research (AR) methodology to observe, reflect, re-observe, and confirm the reality among the community of learner. AR is used because of the researched need opportunity for reflection, improvement, and transformation on educational practice. McNiff & Whitehead (2006) mentioned that social situations are created by people, so it can be reconstructed for better practice. In this essence, AR is used to enhance students learning opportunity on LMS.

In general, there are three forms of AR (McNiff & Whitehead, 2006). The researcher has deployed an empirical/technical form of T-AR because it tries to maintain the objectivity of the research field to see cause and effect relationship, like 'if x, then y,' where results are generated by statistical analysis and can be applied and generalized, and replicable in similar conditions. The researcher has avoided the interpretive AR, which tries to

observe events in natural settings to describe and explain on "what is being/doing there" and to understand about "what is happening" and negotiate meanings about objectivity. Beyond both AR, the researcher has avoided participatory AR, because it envisages a collaborative approach of investigation to engage "subjects: researcher" and "objects: participants" with interest in common problems. Therefore, T-AR is used to improve educational practices incorporating the core elements plan, act, observe/ reflect, modify, and move in feasible directions based on if "x" then "y" relationships.

In this study, T-AR was utilized in the context of students course satisfaction in LMS at CDED context. First of all, students baseline on course satisfaction in LMS was collected.

Then an action intervention was taken with working faculties to update and to make LMS more engaged and interactive. Then course updated on Moodle was carried out. This single cycle action research (plan, act, observe, and reflect) was carried out by the following activities. (a) Baseline information on students course satisfaction in LMS was collected. Based on collected information and reflection over it, (b) action goals were determined (plan). The action intervention was to update LMS as with pedagogical tools as developed in the conceptual framework (Plan/Act). Based on the plan, (c) an intervention workshop and hands-on support were carried out to update LMS (Acting). Finally, after two months interval of re-designed LMS implementation, (d) end-line information on students course satisfaction in LMS was collected through the survey (Observing). Based on the baseline and end-line survey responses, (e) effectiveness on action intervention was analyzed (Reflecting). The details of the methodology adopted in this study are as follows.

### **Participants of the Study**

The participants in this study were master's students of mathematics and English education at ODEC, University Campus, Kirtipur. These participants were first semester students during the academic year 2018. The study used ODEC students because they were online students and studying their courses through Moodle LMS. The total enrolled students in ODEC were 36, of which 26 (70%) participated in both baseline and end-line survey. Therefore, 26 students were considered as study participants. Among 26 students, 13 were boys (73%), and the remaining 7 were girls (27%). Among 26 students, 13 were from mathematics education (50%), and the remaining 15 were from English education (50%).

### **The independent and dependent variable**

The dependent variable in the study was a student's LMS course satisfaction. This variable was computed from survey responses on four pedagogical constructs: content tools; communication and interaction tools; feedback and support tools; and assessment tools. The independent variables in the study were the usefulness of content tools, assessment tools, communication/collaboration tools, and feedback tools. All these independent variable were measure from survey opinionnaire based on a five-point Likert scale.

### **Action Intervention**

In this study, AR action intervention was a workshop on "Online course management: Principles and Design." This three-day-long intervention was carried out to working faculties who were tutoring courses under ODEC. The faculties were tutoring ODEC students through Moodle LMS. Therefore, faculty support workshop was carried out to make Moodle LMS more engaged and more interactive. This workshop was based on discussion cum hands-on support. Basically, the action workshop was based on LMS update features on four pedagogical tools. These pedagogical tools were Contents tools, Communication/collaboration tools, Feedback and support tools, and Assessment tools.

The content tools discussed in the workshop were Reading Materials, Lecture Slides, E-book, Audio video resources, Teacher's Recorded Video, Discussion Forum, Glossary, Lesson, and Wiki. The communication/collaboration tools discussed in the workshop were Chat-room, Discussion board, Email, Sms, use of Facebook as Social media, Blog, and live Virtual classroom. The feedback and support tools discussed in the workshop were News and Forum for Announcements, Moodle Page with Course Information, Calendar with Due

Dates, Choice (Poll), Question Board, Use of email, sms for notification, telephone and message for instant need, and Use of feedback files. The assessment tools discussed in the workshop were Quiz, Assignment, Games, Peer review assignment, Project work / Case study. Finally, based on the workshop and hand on support, the courses were upgraded in Moodle LMS with four level pedagogical constructs by the course teacher themselves. The course tutors were supported wherever and whenever they need help to design the activities in Moodle LMS.

### **Data collection and analysis procedure**

In this study, the data were collected from survey opinnioire. The opinnioire was based on the usefulness of four pedagogical constructs: content tools, communication and interaction tools, feedback and support tools, and assessment tools. In these tools usefulness, the survey opinnioire, there were five options to respond: 5 -very useful, 4 - somewhat useful, 3-don't know, 2 - not useful, 1 - N/A- didn't use. In student LMS course satisfaction, there were four constructs. The survey opinnioire for these constructs were leveled in four options: 4=very satisfied, 3=somewhat satisfied, 2=not satisfied, 1=it is bad.

The reliability and validity of survey were established by statistical analysis. Reliability is concerned with the precision and accuracy of tools. It is essentially a synonym for consistency and possibility to replicate in a similar situation over time, instruments, and groups of respondents (Creswell, 2014). In this study, the reliability of survey items was calculated with Cronbach alpha coefficient in SPSS 18, and it was 0.81. This Cronbach alpha coefficient indicated 64% reliability factor, therefore, the survey tool is accepted to use in this study. For research to be valid, it must demonstrate content coherent (Denzin & Lincoln, 2005). In this study, the validity of the tools was established by principle component factor analysis.

In this study, the data were collected through an online Google form. This Google form link was attached to the LMS course home page. In addition, Google form was sent to students through students email. After, two months interval of AR action intervention, the Google form was re-sent to those students. Google form link as URL was re-activated to LMS course home page. There were, 36 students enrolled in the ODEC courses, however, 26 students replied in both baseline and end-line survey. Therefore, these 26 responses were considered for further analysis. These 26 responses were analyzed using inferential statistics t-test for significance test at 5% level into four pedagogical constructs.

The student LMS course satisfaction was collected from learning resources, communication and interaction, activities and assignments, feedback and support, and assessment and evaluation. Similarly, student perception on pedagogical tool usefulness was measured from content tools usefulness, assessment tools usefulness, communication/collaboration tools usefulness and feedback tools usefulness.

The student perception of LMS course content tools usefulness was collected from Reading Materials, Lecture Slides, E-book, Audio video resources, Teacher's Recorded Video, Discussion Forum, Glossary, Lesson, and Wiki.

The student perception of LMS course feedback and support tools usefulness was collected from News and Forum for Announcements, Moodle Page with Course Information, Calendar with Due Dates, Choice, Question Board, Use of email, SMS, telephone and message, Use of feedback files.

The student perception of LMS course assessment tools usefulness was collected from Quiz, Assignment, Games, Peer review assignment, Project work / Case study.

### **Ethical Considerations**

The ethical issue in the study was ensured. The participants in the study were informed that their participation is voluntary and that they could at any time decide to discontinue their participation or decline to answer any question or stop the participation for any reason without penalty. In addition, they were informed that confidentially and anonymity will be maintained for their responses.

## Result of the study

The study was carried out to analyze students LMS course satisfaction through faculty support workshop. For this, action intervention was implemented. The effect action intervention was analyzed with reference to five research questions. These research questions were related to analyzing the relationship between student perception of LMS course pedagogical tools usefulness and student LMS course satisfaction. The results on these research question were presented herein accordingly.

### Content tool usefulness and Course satisfaction

The first research question was to analyze the relationship between student perception of LMS course content tools usefulness and student LMS course satisfaction. For this, the data were gathered from the survey. The data were analyzed statistically for the significance of correlation among the variables: Content usefulness and Course satisfaction. In the baseline, the results of the Spearman correlation indicated that there was a significant positive association between Content usefulness and Course satisfaction, ( $r(26) = 0.311$ ,  $p < .05$ ). In the end-line, the results of the correlation was positive strong and significant ( $r(26) = 0.558$ ,  $p < .05$ ).

### Communication/collaboration usefulness and Course satisfaction

In this study, the third research question was to analyze the relationship between student perception of LMS communication/collaboration tools usefulness and student LMS course satisfaction. For this, the data were gathered from the survey. The data were analyzed statistically for the significance of correlation among the variables: communication/collaboration tool usefulness and Course satisfaction. In the baseline, the results of the Spearman correlation indicated that there was a significant positive association between Content usefulness and Course satisfaction, ( $r(26) = 0.241$ ,  $p < .05$ ). In the end-line, the results of the correlation was positive and significant ( $r(26) = 0.586$ ,  $p < .05$ ).

### Feedback and support usefulness and Course satisfaction

In this study, the fourth research question was to analyze the relationship between student perception of LMS feedback and support tools usefulness and student LMS course satisfaction. For this, the data were gathered from the survey. The data were analyzed statistically for the significance of correlation among the variables: feedback and support tool usefulness and Course satisfaction. In the baseline, the results of the Spearman correlation indicated that there was a significant positive association between Content usefulness and Course satisfaction, ( $r(26) = 0.161$ ,  $p < .05$ ). In the end-line, the results of the correlation was positive and significant ( $r(26) = 0.492$ ,  $p < 0.05$ ).

### Assessment tool usefulness and Course satisfaction

In this study, the second research question was to analyze the relationship between student perception of LMS assessment tools usefulness and student LMS course satisfaction. For this, the data were gathered from the survey. The data were analyzed statistically for the significance of correlation among the variables: Assessment tool usefulness and Course satisfaction. In the baseline, the results showed that Spearman correlation was not significant between Content usefulness and Course satisfaction, ( $r(26) = 0.08$ ,  $p > 0.05$ ). In the end-line, the results of the correlation was also not significant ( $r(26) = 0.335$ ,  $p > .05$ ).

### Subject and Course satisfaction

In this study, the fifth research question was to analyze the relationship between student's perceptions of student LMS course satisfaction within-subject level. For this, the data were gathered from the survey. The data were analyzed statistically for the significance of correlation among the subjects for student's perceptions of student LMS course satisfaction. In the baseline, an independent-samples t-test indicated that scores were statistically equal for Mathematics education students ( $M = 12.12$ ,  $SD = 4.71$ ) and English education students ( $M = 11.69$ ,  $SD = 5.01$ ),  $t(24) = 0.21$ ,  $p > 0.05$ . In the end line, the scores were significantly higher for Mathematics education

students ( $M = 16.92$ ,  $SD = 3.56$ ) than for English education students ( $M = 15.69$ ,  $SD = 1.84$ ),  $t(24) = 1.15$ ,  $p < 0.05$ .

### Gender and Course satisfaction

In this study, fifth research question was to analyze the relationship between student's perceptions of student LMS course satisfaction within gender level. For this, the data were gathered from survey. In the baseline, an independent-samples t-test indicated that scores were statistically equal for Boys students ( $M = 10.21$ ,  $SD = 4.32$ ) and Girl students ( $M = 10.85$ ,  $SD = 4.44$ ),  $t(24) = 0.21$ ,  $p > 0.05$ . In the end line, the scores were significantly higher for Boys students ( $M = 16.78$ ,  $SD = 0.7$ ) than for Girl students ( $M = 15$ ,  $SD = 1.73$ ),  $t(24) = 1.44$ ,  $p < 0.05$ .

### Discussions and Conclusion

LMS use in education has been a dominant means for educational governance. However, thoughtfully designed pedagogical activities in LMS can only help students learning. Though LMS is useful for education delivery, it is found that the success of LMS largely depends on proper instructional design. This was justified by a version that says technology integration largely depends on how it is implemented (Conole & Dyke, 2004) & further, justified by a work that technology's benefit on student learning depends on how the technology is implemented (Li & Ma, 2010). Therefore, in this study, it is noticed that if pedagogical tools are less interactive within LMS, students would less engaged and less motivated. Therefore, sound pedagogical tools like content tools, assessment tools, communication tools, feedback tools are important to design thoughtfully to enhance students learning.

Based on the result, this study found that students were more satisfied from LMS learning environment when it is designed according to engaged and interactive pedagogical tools: content tools, communication and interaction tools, feedback and support tools. This finding is similar to the version of Educators who suggested that educational technology can strengthen quality instruction and leads to increased student learning (Raines & Clark, 2011). The finding is aligned with the recommendation that says the instructor must use technology to facilitate student learning by using effective learning management principles (Baghdadi, 2011). However, it is agreed with the version that online learners highly value a course when the course content is "well-organized, effectively presented, interactive, clearly written, flexible, right length and breadth" (Ozkan & Koseler, 2009). Therefore a number of educational technology tools need to be part of LMS as suggested by Yueh & Hsu (Yueh & Hsu, 2008).

In this study, it is also found that students were less satisfied from LMS assessment tools. So, assessment tools need to re-design. Constructivism assumes that learning as a function of activities (action). But assessment tool was not based on this principles, so more collaborative type of assessment tools need to design in LMS. The Finding is aligned to Vygotsky's (1978) argument that suggested for social interaction level. The finding supported that learning is active and generated from the interaction between and within people's actions, experiences, and subjective states of mind. It is therefore concluded that "higher the engagement higher the learning" which is also argued in a number of works (Vygotsky, 1986; Vygotsky, 1978; Siemens, 2005; Downes, 2005).

This study found that math students were more satisfied from LMS courseware than English students. Boys students were more satisfied from LMS courseware than Girl students. From the study, it is concluded that LMS need to design with good pedagogical elements like learning resource tools, learning activity tools, assessment tools, communication tools, and feedback tools. Also, gender friendly learning tools are necessary to consider while implementing an online learning environment.

### Reflective Lessons Learnt

As a teacher cum researcher, this research study has some noticeable points as lessons to learn. These days, online learning activities are increasing. The digital features are making physical things ease of access. However, during this research study, I learned that LMS alone could not enhance quality learning. Although students use LMS for learning, and they often show very high belief, LMS must be designed with a number of opportunities to build it more engaged and more interactive. LMS should maintain a reciprocal relationship between teacherstudent and

learning content, therefore creating engaged and interactive learning environment in LMS to accelerate students learning and their course satisfaction.

This study only touched students' perceptions on the use of LMS in their learning. Future studies regarding the use of LMS in learning may be directed at evaluating the various courses in the M. Ed programme. A future study may also necessary to establish the effectiveness and relevance of LMS to visualize higher order learning skills. There is a clear need to explore this topic in greater depth for two reasons. Firstly, the effectiveness of LMS in the context of TU and in the context of Nepal, where ICT is being an inherent part of education. Secondly, the use of LMS helps to support students learning to make it accessible anywhere anytime.

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