



## ENGAGEMENT TOOL FOR EVALUATING LEARNING IN AN OPEN AND DISTANCE LEARNING ENVIRONMENT

**Dr. (Ms). Sameena Falleiro**

Associate Professor, Department of Computer Science, Parvatibai Chowgule College of Arts and Science (AUTONOMOUS) Margao, Goa

### ABSTRACT

The paper evaluates Engagement scale that has been designed by the researcher, as a tool to examine the effectiveness of learning in Learning Management System-(LMS) through a two sample 'post-test only' experimental research design. It discusses the development, validity, reliability and the scoring method of the Engagement scale. The Engagement Scale developed used a four-point rating scale with 21 items, with an objective to study the cognitive, affective and behavioral aspects of engagement. Scores obtained from the Engagement scales helped determine the extent of engagement. The findings are useful to conclude that if these tools can be used to measure effectiveness of learning in LMS, they can be used to examine learning for any other Open Distance Learning-(ODL) environment.

**KEYWORDS** : ODL, LMS, MOODLE, Engagement

### INTRODUCTION

Learning Management Systems (LMS) is changing the way students are getting educated nowadays. This new paradigm has become a critical component in the mission of academic institutions extending the learning process beyond the classroom (Coates, 2005). Different systems have different emphasis but common LMS features include content authoring tools, calendars, syllabi, discussion boards and assessment mechanisms (Hall, 2003; Chapman, 2003). Student engagement results provide educators across a variety of campus programs and departments, information to consider in their efforts to understand the student experience and to collaborate in the design of educationally productive activities and programs (NSSE, 2011). Measuring engagement and its link to learning is challenging and this is especially true when the term engagement is often used in broad terms to describe a range of behaviours that learners exhibit (Bulger, Mayer, Almeroth, & Blau, 2008).

The present research study discusses the development, validity, reliability and the scoring methods of tools prepared by the researcher to evaluate the engagement levels in students studying via an LMS. It also discusses the development and implementation of the Evaluation Rubric (ER) to capture all the learning that is taking place via the various features that the LMS offers.

### REVIEW OF LITERATURE

Educators must actively collaborate about the experience of their students, talk about what students know and can do, and design new approaches to engaging students at high levels (NSSE, 2011). Independent studies done by Chen, Lambert, and Guidry, (2010) and Kuh, et al (2007) to investigate student engagement in face-to-face and web-based learning environments show a general positive relationship between the use the learning technology and student engagement and learning outcomes. Engagement is mental effort focused on learning and it is a precondition to learning progress (Kuh, 2007; Helme & Clarke, 2001). Measures of student engagement inform many aspects of university education. In higher education, engagement has become a catch-all term most commonly used to describe a compendium of behaviors characterizing students (Krause & Coates, 2008). It has even been suggested that student engagement could be used as an indicator of institutional teaching quality (Kuh, 2007). Measuring engagement and its link to learning is challenging and this is especially true when the term engagement is often used in broad terms to describe a range of behaviours that learners exhibit (Bulger, Mayer, Almeroth, & Blau, 2008). Additionally, engagement is the degree to which learners are engaged with their educational activities and that engagement is positively linked to a host of desired outcomes, including high grades, student satisfaction, and perseverance. This definition implies the use of three interrelated criteria to assess student engagement levels namely:

- Cognitive: The extent to which students are attending to and expending mental effort in the learning tasks encountered.
- Affective: The extent to which students are making active responses to the learning tasks presented and their emotional reactions.
- Behavioral: The level of students' investment in and their collaborative actions to the learning tasks and also implies their group work (Chapman, 2003).

### OBJECTIVES OF THE STUDY

- To develop a Tool for evaluating Engagement to study the effectiveness of LMS for student Engagement.

### RESEARCH DESIGN AND METHODOLOGY

The Research Design used for this study was the 'Experimental method' with 'post-test only' design. The number of students in the experimental and control group were 13 each respectively. The students in the two groups were enrolled in a compulsory course titled Software Engineering (SE) during the last (sixth) semester (B.Sc. Computer Science degree programme offered by Goa University, India) for the academic year 2014–2015. Both groups were taught the course in the conventional environment, with the only difference being that only students from the experimental group had access to MOODLE-LMS. Engagement implies the use of three interrelated criteria namely, Cognitive, Affective and Behavioral to assess student engagement levels (Chapman, 2003). The researcher developed an Engagement Scale using a four-point rating scale with 21 items, with an objective to study the cognitive, affective and behavioral aspects of engagement.

An Evaluation Rubric (ER) was also constructed to help determine the extent to which MOODLE-LMS features namely Chat, Discussion Forum, Glossary, Assignment and Quiz actively promote student engagement and participation. The scores obtained from the rubric helped determine whether such activities appeal to the learners, thereby increasing their engagement and interaction.

### DEVELOPMENT OF THE ENGAGEMENT TOOL

The basic construct involved in framing questions as discussed in the Review of literature were with regards to: The affective component of student engagement involved discovering different ways to respond to learning tasks and covers feedback received from teachers as well as confidence to do well in class. The behavioral component concerns students' behavioral or psychomotor actions to the task. Each of these statements were to be rated on a scale of 0 to 3. The engagement scale that was prepared had a four point Likert-type scale and the objects labeled as: Always: 3; Frequently: 2; Sometimes: 1 and Never: 0.

### ESTABLISHING CONTENT VALIDITY AND RELIABILITY OF THE ENGAGEMENT TOOL

The engagement scale was subjected to content validity by experts who were holding PhD degree and were professionals in the fields for more than a decade. The experts feedback and suggestions were then incorporated and there were finally 21 questions in the engagement scale. Each category was presented in the form of statements evenly distributed and indicated in Table 1.1 that shows the category type, the statement numbers and the number of statements in each category.

**TABLE 1.1: CATEGORY OF STATEMENTS IN THE ENGAGEMENT SCALE**

Category	Statement Numbers	Number of statements
Cognitive	1,3,4,6,7,8 and 18	7
Affective	2,5,9,12,13,15 and 21	7
Behavioral	10,11,14,16,17,19 and 20	7
<b>Total number of statements</b>	<b>21</b>	

To test the reliability of the engagement scale, the Cronbach Alpha was computed. According to George and Mallery (2003) when using Likert-type scales it is imperative to calculate and report Cronbach's alpha coefficient for internal consistency reliability for any scales or subscales one may be using. Based on this the Cronbach alpha value calculated for the entire Engagement scale w.r.t this study is 0.939, which is Excellent. The category wise Cronbach alpha values too fall in the Acceptable to Good range. The Table 1.2 gives the Cronbach Alpha values in each category of the Engagement Scale, followed by the total scale value.

**TABLE 1.2: CRONBACH ALPHA RELIABILITY VALUES FOR EACH CATEGORY IN THE ENGAGEMENT SCALE**

ENGAGEMENT	
Category	Cronbach Alpha value
Cognitive	0.843
Affective	0.762
Behavioral	0.878
<b>Total Scale</b>	<b>0.939</b>

**Scoring of the Engagement Tool**

The final scale that was administered to the sample contained 21 statements distributed evenly across all the three categories. Each category had seven statements each. The engagement scale that was prepared had a four point Likert-type scale. The students were asked to rate each of these statements on a scale of 0 to 3.

The following are the terms with their intended meanings in the present study:

- Always (3): You experience this all the time
- Frequently (2): You experience this more than 75% of the time
- Sometimes (1): You experience this more than 50% of the time
- Never (0): You do not experience this at all

**TABLE 1.3: WEIGHTAGES FOR THE ENGAGEMENT SCALE**

Scale Range	Always	Frequently	Sometimes	Never
<b>Score</b>	3	2	1	0

An increased score indicated higher degree of engagement whereas a decreased score indicates a lower degree of engagement. The researcher calculated the scores for all the items for each respondent to obtain a total score. This was the total engagement score for that student. The total engagement score obtained by the student after the engagement scale was administered as a post-test and made available in Master Copy.

**IMPLEMENTATION AND FEEDBACK OF THE EVALUATION TOOLS**

Over the treatment period, various resources and activities were made available to the experimental group through the LMS. The students from this group were expected to access and participate in

all these activities from time-to-time. Based on their interaction with the particular LMS feature during the entire treatment period, these interactions were evaluated against each and every criteria mentioned in the ER under the respective LMS feature, and scores were given accordingly. This score was then entered in the ER for each student. The total ER scores and a detailed criteria wise score obtained by the student w.r.t. the LMS features of Chat, Discussion Forum, Glossary, Assignment and Quiz during the treatment period is available in Master Copy.

The post-test on engagement was administered to students of both groups as post-test and data was stored in Master Copy. The researcher calculated the scores obtained in the post-test for all the items in the engagement scale and motivation scale respectively for each and every respondent (in both the experimental group and the control group) to obtain a total score. These total engagement data/scores for each student were stored and analyzed.

**CONCLUSIONS**

The findings are useful to conclude that if these tools can be used to measure effectiveness of learning in LMS, they can be used to examine learning for any other open and distance learning environment. The findings of the study can be applied to a technology enhanced global classroom environment like Massive Open Online Courses (MOOCS) which are being widely explored as alternatives and supplements to traditional university courses wherein students are expected to use quality time both for their individual and collaborative activities without any face-to-face contact with faculty. Taken together, these findings hold practical implications for stakeholders in Higher Education who are seeking to enhance key facets of students' engagement, as well as implications for researchers seeking to assess the impact of technology on academic outcomes.

**References:**

1. Bulger, M.E., Mayer, R. E., Almeroth, K.C., & Blau, S.D. (2008). Measuring learner engagement in computer-equipped college classrooms. *Journal of Educational Multimedia and Hypermedia*, 17(2), 129-143.
2. Chapman, E. (2003). Alternative approaches to assessing student engagement rates. *Practical assessment, research and evaluation*, 13(8). Retrieved January 25, 2018, from <http://PAREonline.net/getvn.asp?v=8&n=13>.
3. Chen, P. S. D., Lambert, A. D., & Guidry, K. R. (2010). Engaging online learners: The impact of Web-based learning technology on college student engagement. *Computers & Education*, 54(4), 1222-1232.
4. Coates, H. (2005). Leveraging LMSs to enhance campus-based student engagement. *EDUCAUSE Quarterly*, vol. 28, no. 1, pp 66-68. Retrieved January 20, 2016 from <http://www.educause.edu/ero/article/leveraging-lms-enhance-campus-based-student-engagement>
5. George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference*. 11.0 update (4th ed.). Boston: Allyn & Bacon.
6. Hall John. (2003). *Assessing Learning Management*. Retrieved on January 30, 2018 from [http://www.clomedia.com/content/templates/clo\\_feature.asp?articleid=91](http://www.clomedia.com/content/templates/clo_feature.asp?articleid=91)
7. Helme, S., & Clarke, D. (2001). "Identifying cognitive engagement in the mathematics classroom". *Mathematics Education Research Journal*, 13(2), pp 133-153. Retrieved January 16, 2018, from <http://link.springer.com/article/10.1007/BF03217103#page-1>
8. Kuh, G. D. (2001). Assessing what really matters to student learning inside the national survey of student engagement. *Change: The Magazine of Higher Learning*, 33(3), 10-17. Retrieved January 15, 2018, from <http://www.tandfonline.com/doi/pdf/10.1080/00091380109601795>
9. Kuh G. D. (2007). "What Student Engagement Data Tells Us about College Readiness". Retrieved February 4, 2018 from: [www.indiana.edu/~ceep/hsse](http://www.indiana.edu/~ceep/hsse)
10. National Survey of Student Engagement (NSSE). (2011). *Fostering student engagement campus wide—annual results 2011*. Bloomington, IN: Indiana University Center for Postsecondary Research. Retrieved January 28, 2018, from [http://nsse.iub.edu/NSSE\\_2011\\_Results/pdf/NSSE\\_2011\\_AnnualResults.pdf](http://nsse.iub.edu/NSSE_2011_Results/pdf/NSSE_2011_AnnualResults.pdf)