

# ASSESSING QUALITY OF STUDENT LEARNING IN DESIGN

**Gudur Raghavendra Reddy**

## **ABSTRACT**

This paper is about ongoing action research on developing pedagogy to teach a basic design module in multidisciplinary university setting. Over the past few years changes were made to teaching approaches, curriculum and learning environment for this module to improve quality of student learning. Most of these changes were made based on quality of student learning outcome. Initially, assessment of student learning was mostly based on teacher's perception. It soon became evident that this method of student learning assessment is very subjective and may lead to teacher-centered learning. Research evidence points out that teacher-centered learning environment encourage students to take surface learning approach [1]. Which is not desirable because, approach that a student takes to learning has an impact on the quality of that learning [2]. In short, a deep approach is characterized by student's attempt to make sense of the subject. A surface approach is characterized by student learning by rote.

In this paper results of recent study on relationship between method of assessment and students approaches to learning approaches are shared.

*Keywords: Studio-based teaching, design pedagogy, learning approaches, assessment, teacher-centered learning, student-centered learning, reflection*

## 1 CONTEXT

Communications and New Media (CNM) programme is an inter-disciplinary programme offered by Faculty of Arts and Social Sciences, National University of Singapore. Modules offered under this programme broadly fall under two categories, "New media studies" and "Interactive media". Crucial component of Interactive media segment is a basic design module "Principles of Visual Communication" which is used for this case study.

## 2 BACKGROUND

This action research project is now almost four years old. So far the project has gone through 3 cycles of study. (A typical cycle involves four steps, Planning, Acting, Observing and Reflecting) [3]. Each of these study cycles have resolved some problems and at times created newer ones. Listed below are some of these problems controlled satisfactorily during this course of study.

### **2.1 Cycle 1: Background / motivation of student and Teaching environment**

Problem: Listed below are few important problems identified during this study phase [4].

1. Students were treating each lecture and assignment as an isolated package. There was no effort on their part to understand interrelationships between different concepts introduced over semester.
2. University teaching environment: module format (lecture-tutorial) and learning environment not conducive to situated learning.

Study outcome: Following changes were made to encourage students to reflect on what they were doing, interact with fellow students and most importantly engage in design activity after contact hours.

1. Learning report: A reflective design journal maintained by students. To encourage deep approach to learning.
2. Classroom exercises: To encourage student-student and student-instructor interaction.
3. Assignment revision: To help connect different concepts introduced over the semester.

## **2.2 Cycle 2: Workload**

Problem: Research indicates that there is a strong relationship between students' perceived workload and learning approach. A heavy perceived workload and inappropriate assessment influences students towards surface learning approach [5].

Study outcome: There was slight indication of excessive workload which was rectified by decreasing academic workload by almost 30% [6].

## **2.3 Cycle 3: Design critique**

Problem: Traditional Design critique session is teacher-centered method of assessment and feedback. [1].

Study outcome: Even though design critique sessions were not entirely teacher-centered 30% of students felt that they tend to please instructor when they present their design solution to the class and when they give feedback to other students' presentation. This problem was controlled to a large extent by instructor taking facilitator's role rather than directly participating in the critique session.

## **3 INTRODUCTION**

Last study cycle has highlighted some problems with assessment process. There is an indication that present method of assessment is encouraging students to take surface approach to learning.

### **3.1. Present Assessment process**

Module requirement: students are required to tackle six weekly assignments and one 3 week term project.

#### **3.1.1 Method of Assessment:**

There are two components to assessment

1. Formative assessment: Weekly design critique session and classroom exercises
2. Summative assessment: Learning report, assignments and term project which are graded at the end of the semester (All assignments are graded through learning report.)

Basic difference between these two modes of assessment is that Formative assessment is usually done at the beginning or during a programme and Summative assessment is done at the end of the programme. Objective of formative assessment is to give instant feedback on student learning. This mode of assessment does not involve grading a student. Objective of summative assessment is to check level of learning at the end of the programme.

**3.1.2 Evaluation criteria:**

20% classroom participation, 35% assignments, 25% term project, 20% Exam

**4 PROBLEM**

Summative assessment: Presently this component of assessment is not transparent. Meaning, students do not directly participate in the evaluation process of their work (apart from learning report where they document their thought process, approach to solving problem, justification and knowledge gained).

This study is designed to find out if present method of assessment (especially the summative component) is encouraging students towards teacher-centered learning.

**4.1 Teacher vs. Student-centered learning**

*Table 1. Teacher vs. student-centered learning*

<b>Teacher-centered learning</b>	<b>Student-centered learning</b>
In teacher-centered approaches, judgments about appropriate areas and methods of inquiry, legitimacy of information, and what constitutes knowledge rest with the teacher.	Student-centered approaches derive from constructivist views of education, in which the construction of knowledge is shared and learning is achieved through students' engagement with activities in which they are invested.
Encourages surface approach to learning	Encourages deep approach to learning

[7]

In teacher-centered learning an achieving student will mould his work behavior and work output into teacher's perception of what is right and wrong [2]. In present situation summative assessment (in spite of learning report) is opaque to students and subjected to teacher's perception of right and wrong. In a situation like this there is a possibility that students (especially achieving type) work to please the teacher rather than trying to make sense of a complex world and risk getting a bad grade.

**5 METHODOLOGY**

In this research study outcome of summative assessment component is compared with well tested Biggs Revised two-factor study process questionnaire (R-SPQ-2F) [9]. The objective is to see if present method of assessment is encouraging teacher-centered learning. This will be achieved by comparing student's performance in summative assessment component with approach that student has taken to learning (using Biggs R-SPQ-2F).

## 5.1 Literature Review

### 5.1.1 Approaches to learning

Table 2. Motive and strategy in approaches to learning and studying

Approach	Motive	Strategy
Surface	Is instrumental: main purpose is to meet requirements minimally: a balance between working too hard and failing	Reproductive: limit target to bare essentials and reproduce through rote learning.
Deep	Is intrinsic: study to actualize interest and competence in particular academic subjects.	Is meaningful: read widely, interrelate with previous relevant knowledge.
Achieving	Is based on competition and ego-enhancement: obtain highest grades, whether or not material is interesting.	Is based on organizing one's time and working space: behave as 'model student'.

[2]

### 5.1.2 Learning approaches and assessment

Below are few relevant research findings on assessment, student-centered and teacher-centered learning approaches.

- Research indicates that teacher-centered learning encourages students to take surface approach to learning [2].
- Traditional design critique session (teacher-centered) encourages students to take surface approach to learning [2].
- End of the course assessment (again a normal practice in design education) in the absence of very clearly defined evaluation methods will encourage students to take surface approach to learning [8].

## 5.2 Data collection

Primarily two instruments were used in this study to evaluate assessment method.

1. Summative assessment: Assignments graded through Learning report (a reflective design journal maintained by students) [8].
2. Revised two-factor study process questionnaire [9]: A reliable generic instrument to evaluate students learning approaches.

To validate above data two more questionnaires were developed.

1. To check if formative assessment component encouraging students to take surface approach to learning [4]. This questionnaire primarily checks students' reaction to critique sessions, classroom activities, discussion and learning environment.
2. To rule out excessive workload which was in the past forced some students to take surface approach to learning [6]. This questionnaire checks for academic work stress levels, time spent on preparing assignments and students' perception of learning environment.

## 5.3 Participants

Questionnaire was distributed to all 68 students in the class on the last day of the semester. 56 students responded and 43 responses were used for the study. Other responses were discarded as they were incomplete.

## 6 RESULTS AND DISCUSSION

Data from the questionnaire is presented below as a scatter plot (Figure 1). The plot compares results from Biggs Revised two-factor study process questionnaire (Y axis) with summative assessment results (X axis). It is quite evident from the plot that the majority of students who did well (score 8 on scale of 10) in summative assessment component are taking surface approach to learning.

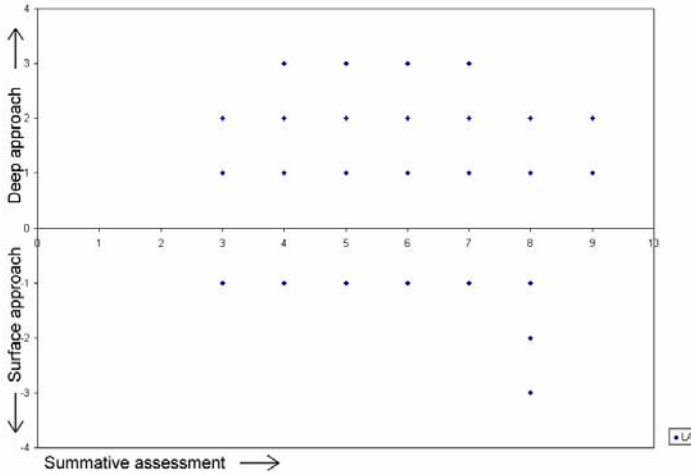


Figure 1. Relationship between learning approach and assessment

Table 3. Summary of results

Summative assessment grade (scale of 1 to 10)	Students taking deep approach to Learning	Students taking surface approach to learning
(Group A) 10 percent of the students scored 9 and above (very high performers)	10 percent	0 percent
(Group B) 15 percent of the students scored above 7 below 9 (high performers)	25 percent	75 percent
(Group C) 35 percent of the students scored above 5 below 7 (average performers)	75 percent	25 percent
(Group D) 40 percent of the students scored 5 and below	70 percent	30 percent

When the results from formative assessment component are taken into consideration it became clear that Group B students were in fact taking achieving approach to learning. Achieving or strategic approach is a very well organised form of surface approach to learning in which primary motivation is to get good grade. Group B students have successfully gauged instructor’s way of looking at (assessing) artifacts and managed to

adjust their behavior accordingly. In short, perfect case for teacher-centered learning approach [2].

### 6.1 Future directions

During the course of this study few issues surfaced which could have affected the results.

1. Biggs Revised two-factor study process questionnaire: Data was not available on use of this study process questionnaire in the context of art and design.
2. Students were requested to provide (voluntarily) their matriculation number. This was essential to compare results from R-SPQ-2F with their summative assessment results. There is a possibility that this could have influenced their responses.

What is the solution for this problem?

One possibility is to bring in some amount of transparency in summative assessment component and repeat this study. Presently a pilot project is underway to create online peer and instructor open assessment environment. Outcome of this project and subsequent study will be reported in near future.

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### Contact info

Gudur Raghavendra Reddy  
Communications and New Media Programme  
Faculty of Arts & Social Sciences  
National University of Singapore  
Singapore 117570  
Email: [cnmgr@nus.edu.sg](mailto:cnmgr@nus.edu.sg)