Relevance of Mastery Learning (ML) in Teaching of English (Case Study of the University of Guilan, Iran)

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The main purpose of the study was to gather, analyze and interpret the perceptions of the students about mastery learning (ML) held by 240 students randomly selected from each of the populations of different faculties in Guilan University. Guilan University was chosen because the researchers have some valuable experiences about English learning and are familiar with students' weakness in English learning. The students of high ability were allocated to "A" and "B" classes, average to "C" and "D" classes and low to "E" and "F" classes respectively. Two Academic Staff Members were assigned to teach the six classes of English. Students could take 3 classes with each academic. Results showed that based on research results on deep and surface, biased learners increasingly which became surface learners did worse compare with deep learners. On the other hand, surface students of low ability seem to be motivated to study as they are given more chances to secure a pass. Thus, although the findings of this paper indicate that mastery learning promotes better quantitative results in English for surface learners, there are dangers. One of the main aims of learning to increase higher level cognitive processes seems actually to be discouraged in this mode.

Keywords: Learning; Mastery Learning; Surface Learning; Deep Learning

Introduction

Iranian universities are spending much time and effort to provide their students with the best learning experience possible. This effort becomes particularly important when framed within the idea that students usually have more than one choice for their class career, leading to competition between universities. In order to make their programs more attractive to current students, the University of Guilan have begun a fundamental shift in how their classes are conducted by implementing internal and external assessments. Often, these universities have moved away from the traditional teacher-based instruction in favor of more active, learner-centered activities. It is believed that more learner-centered and collaborative activities will enhance a ML experience. Though, a positive learning experience could be defined by a number of factors the use of deep learning strategies are believed to be integral to a ML experience. Corno and Mandinach (1983) were the first researchers to define and examine student participation. They proposed that student participation was evident when students demonstrated prolonged attention to a mentally challenging task, resulting in authentic learning and increased levels of higher order thinking. Indeed, Conrad and Donaldson (2004) stated that critical thinking is a result of high levels of participation as a signal of ML.

Deep learners can transfer the learned concepts to a variety of situations thereby creating a denser matrix of connections within their understanding. Therefore, the students' motives are integral to whether they engage in deep or surface learning strategies. Though, there are a number of factors related to ML and perception of learning strategies are among the most important. While cognitive engagement and perception of course value sug-

gest motives for learning, learning strategies are what the students do relative to those motives (Biggs, 1987). Deep and surface learning strategies are motivated by different factors and would be expected to move in a coherent pattern in relationship to each other: Students who use deep learning strategies would tend not to use surface strategies, and students who use surface learning strategies would tend not to use deep strategies (Cano, 2007). Thus, learning strategies are affected by learning approach. Research has shown that shifting from traditional teacher centered to a more learner-centered approach leads to deeper levels of learning (Tagg, 2003).

In their study of undergraduate students, Robinson and Hullinger (2008) found that successful students, defined as those who averaged an A grade, and students who were satisfied with their university experience reported higher levels of participation. Researchers have often paired the factors of course value as a symbol of ML and learning in their study of student evaluations of teaching (Marsh & Roche, 2000).

According to "Davis & Sorrel" (1995) the ML concept have increased in American schools in 1920's with the work of Washburn and others in the format of Winnetka plan. ML is based on the assumption that learning is a function of time, the learning history of a student and the quality of instruction (Bloom, 1976) and also, is anchored in the work of Bloom (1981) often associated with the emphasis on standards-based curriculum. It was developed as a way for teachers to provide more appropriate instructional strategies for their students. Guskey (1985, 2007) believed under these more favorable learning conditions; the theory was that nearly all students would be able to teach a subject to the point of "mastery" and combine teacher expertise and resources to enhance the classroom environment and collaboration.

The term "ML" refers to a divers category of instructional methods but the principal defining characteristics are: the establishment of a criterion level of performance to represent "mastery" of a given skill or concept frequent assessment of student progress and provision of corrective instruction. In order to ensure that most students are able to master instructional objectives time and resources are reorganized; those failing to reach the objectives initially are given more time in which to do so in subsequent attempts. Bloom (1976) also includes an emphasis on appropriate use of such instructional variables as cues participation feedback and reinforcement as elements of ML.

There are three primary forms of ML. The Personalized System of Instruction (PSI) or the Keller Plan and Continuous Progress (Cohen, 1977) where students work on individualized units entirely at their own speed. The third form of ML is called group based ML or Learning For Mastery (Block & Anderson, 1975), commonly used in elementary and secondary schools and it is adapted for the present study.

Deep learning can be reached when attention and motivation are present. The process of participation is as an important a factor in informing our students as the quality and usefulness of the task at hand. Initial interest in learning can be triggered by personal relevance (Hidi & Renninger, 2006). However individual interest may diminish if not supported and true participation may not result. Well-developed individual interest tends to be psychologically based and affective but is still facilitated by instructional conditions, such as opportunities for interaction and ML Hulleman (2007) found that a relevance intervention, where students were encouraged to apply the course material to their own lives, increased perception of value, leading to increased interest and classroom performance, particularly among students with lower levels of belief in their abilities.

The academic staffs instruct the entire class at one pace. At the end of each unit of instruction a "formative" test is given with a mastery criterion usually in the range of 80% - 90% correct. Any students who do not achieve the mastery criterion receive corrective instruction which may take the form of tutoring by the teacher or by students who did achieve the criterion level. Corrective activities are different from the kinds of actives used in the initial instruction as suggested by Block and Anderson. Following the corrective instruction students take a parallel test. The class, then moves on even if several students still have not got a passing score. All students who achieve the mastery criterion at any point are generally given an "a" on the unit regardless of how many attempts it took for them to reach the criterion score.

The Importance of Mastery Learning

According to "Zimmerman & Dibendetto" (2008) ML uses differentiated and individualized instruction, progress monitoring formative assessment, feedback, corrective procedures and instructional alignment to memorize achievement gaps.

There have been many studies of the effectiveness of ML and teaching strategy recently reviewed and evaluated in a Meta analysis by Kulik, Kulik and Bangert-Drowns (1990). With regard to final examination or test performance it was found in 67 out of 96 studies that the performance of students in mastery programs was significantly higher than in control classes the remaining differences being no significant. In no case were mastery groups significantly worse off than controls. Gains in mastery groups were greatest for low ability students. Best results were found when using locally designed tests rather than standardized test. Less research seems to have been conducted relating students approaches to learning or even the cognitive level of learning outcomes to ML programs. Given the apparent success of ML this is a serious gap as it could be that success is bought at the price of leaning quality.

This possibility is raised because the design of ML programs would seem to encourage surface learning as success is defined in terms of passing test items usually quite specific to the content taught. Although each test attempt is contingent on success in a previous test students are not encouraged to integrate material or even to remember material previously tested but not in the upcoming unit. Further test items tend to be of a low cognitive level because of the requirements of precise and frequent testing (Cole 1990).

Main Objectives

This study focuses on the teaching of English for students in Guilan University, using ML. The objectives of the study are:

1) To look at the effects of ML on the learning outcomes in students with different learning approaches in learning English and;

2) To look at the effects of ML on the cognitive level of the outcomes elicited.

Methodology

Participants

The participants of this study consisted of 240 students in different faculties in Guilan University. The students of high ability were allocated to "A" and "B" classes, average to "C" and "D" classes and low to "E" and "F" classes respectively. Two academic staff members were assigned to teach the six classes of English students, with each academic taking 3 classes. The assignment of teaching duties to the various classes is stated in **Table 1** with students' respective mean English scores in Humanities and English attainment test scores from the previous year.

Data Collection

Learning Process Questionnaire (LPQ)

At the beginning of the term, the LPQ was given to all students. The raw scores were then coded as deciles scale scores. Afterwards, the students were classified into surface learners and deep learners' categories accordingly. The basis of classifycation was as follows:

1) Surface learners. Surface deciles scale score is greater than deep deciles Scale score by two.

2) Deep learners. Deep deciles scale score is greater than surface deciles scale score by two.

Table 1.
Mean scores of English scores in Humanities (HU) and English scores in none Humanities (NHU) and assignment of teaching duties (n = 240).

Class	A	B	C	D	E	F
HU	84.9	56.8	46.5	55.7	44.9	44.4
NHU	67.7	43.2	41.5	38.2	36.3	31.4
Treatment	C	E	C	E	C	E
Academic Staff	A	B	B	B	A	A

Research Design

Table 2.
Non-equivalent control group design.

Pre-entry Characteristic	Treatment	Outcomes
HU English scores	Mastery learning	English scores
NHU English scores	Conventional	Classification
LPQ deciles scores	Learning approach	Attitude

Treatment

In order to the implementation of ML procedures, the learning materials were divided into smaller teaching units to be covered within five days of the teaching and learning time. Students learned the subject matter in a class with about 35 students per academic staff in three different classes. The instruction on each teaching unit was administered in a 4-phases including initial instruction, formative test A, corrective instruction and formative test B. The initial instruction was similar to those in the conventional non-mastery classes. After the teaching, assignments were given to students of all classes.

During the next double period a short formative test that carefully assessed ML objectives was given. It was usually in the form of a short quiz covering the materials learned in a particular teaching unit. The test was criterion referenced and was not counted in the final grade. The test was given approximately once per cycle for the purpose of feedback typically taking about 15 minutes to complete and was marked by the subject teacher concerned and returned to students in the next class session. These tests were mainly used to diagnose the learning a weakness of students so that both the academic staffs and students can get immediate feedback to improve their learning activates.

The students who did not attain 70% ML standard were given corrective exercises to be done outside class time. Those who had demonstrated ML were given times which included instructing their classmates who needed corrective activities. After the corrective exercise a parallel formative test was given to the non masters to check their progress The parallel formative test was given two or three days after the first one. Also, the test scores of the control and experimental groups of learners with different learning approaches were calculated. A repeated measure two ways ANOVA with approaches x test time was performed on these means.

Results

In the first time, the results on the summative test were examined. The ANCOVA indicated that both approaches and treatment had significant main effects on the scores (F = 3.33, $P <$ 0.05, F = 5.06, $P < 0.05$), as did their interaction (F = 3.22, $P <$ 0.05). The treatment main effect appears to support previous research findings that ML and teaching process does have a positive effect on learning (Davis and Sorrell 1995) but the interaction shows that this is mainly limited to surface students (**Table 3**).

Table 3 shows that those who had a preferred surface learning, appeared to do considerably better in the ML.

However, these data do not show how students with different preferred approaches to learning might react from test time to

Table 3.
Mean scores of groups of students on tests.

	Control	experimental	difference
Surface Learner (SL)	37.42 (26)	53.41 (37)	+15.99
No bias	63.22 (12)	54.33 (29)	−8.89
Deep Learners (DL)	62.35 (42)	68.69 (53)	+6.34
Total	65.38 (71)	60.80 (85)	+4.58

time within the mastery treatment. Accordingly it was decided to use a repeated measure ANOVA with tests 1 to 4 as the dependent variables and preferred approach as the independent variable. There were no significant main effects for approach or test occasions but a significant approach x test occasions interaction (F = 7.17, $P < 0.01$).

Students from the control group were told about the nature of ML and asked how they thought they would like it. Deep learners from the control group thought that mastery retesting would require students to attend to the tests in a different way and this would be a positive challenge while the surface learners expressed dislike for the viewpoints of continual resetting.

Therefore, it can be concluding that the ML does have a positive effect on surface learners which is cognate with the findings by Kulik et al. (1990) that mastery learner especially benefits those of average or low ability. However, the present results show that ML is preferred by surface learners and indeed it is likely that it promotes surface learning and has little or no benefit in terms of improving the cognitive skills and analytical power of students.

Conclusion and Discussion

Previous studies had confirmed positive effects of the ML and teaching on student achievement: general achievement, specific achievement by grade level and subject area knowledge retention time on task and learning rate (Davis & Sorrell, 1995; Guskey, 2007; Zimmerman & Dibenedetto, 2008)). However, these studies have not investigated the effects of the ML on cognitive and analytic skills and on students study approaches.

This paper looks at the effects of ML and teaching on students study approaches and cognitive skills. Results showed that over repeated trials deep and surface learners, increasingly diverge surface learners doing better each trial and deep worse. On the other hand, surface students of low ability seem to be motivated to study as they are given more chances to secure a pass.

The results of this study suggest that students who perceive they think and act to ML are more likely to report greater use of deep learning strategies. Also, students who have a negative view of the value of learning will report less use of surface learning strategies.

While there is much research to suggest that engagement is a way to help students learn, the findings of this study show that course value has a stronger correlation with a deep learning strategy than engagement does. Our measure of ML is consistent with Hulleman (2007), where the course is perceived as useful or important to other tasks or aspects of an individual's life.

The important role of ML in this study suggests that it would be fruitful for future research to examine how to enhance the ML to the student. Activities that are seen as useful have been

described as relevant to the student's life or future. Use of participation, interaction, deep learning may help in showing relevance, but further research is needed to show these connections between classroom tasks and ML.Finally, surface learning strategies will delay ML while deep learning strategies help to ML In fact in Surface learning, the student is simply trying to pass the course with minimal effort.

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