

Effects of Mastery Learning Pedagogy on Secondary School Students' Achievement in English Language Composition Writing, In Nyandarua County, Kenya

Thuku Stephen Ndichu*

Laikipia University, P.O. Box 1100-20300 Nyahururu, Kenya

*Corresponding author: Thuku Stephen Ndichu

| Received: 15.05.2019 | Accepted: 25.05.2019 | Published: 30.05.2019

DOI: [10.21276/jaep.2019.3.5.5](https://doi.org/10.21276/jaep.2019.3.5.5)

Abstract

Overall performance in written English in Kenya Certificate of Secondary Education (KCSE) examination has been fluctuating below 50% between 1998 to 2012. Empirical evidence shows that mastery learning (ML) pedagogy is more effective than traditional pedagogy (TP) in instruction. Thus the effect of ML pedagogy on achievement in writing in English, in Nyandarua County was examined. This was achieved by comparing the effects of ML pedagogy on achievement to those of TP. The target population was all the Form One students in the location. Form ones were chosen to exercise control on the TP of their secondary schools to which they were not habituated, being new in the secondary level of education. The target population was a total of 5,779 students consisting of 2,702 girls and 3,077 boys. The stratified sampling technique was used, to ensure that all subgroups of the population were represented. In this way, a sample of 989 subjects was drawn, including 430 girls and 559 boys. This study used quasi – experimental research employing Solomon Three – Group Design. A Composition Achievement Test (COMPAT) and a ML pedagogy module for teachers were used for data collection. These instruments were developed by the researcher. Pilot testing with respect to the COMPAT was done for reliability of the instrument. Pilot testing yielded .9 Cronbach's alpha with respect to reliability. Content and construct validity were ensured through systematic construction of the research instruments. Validity of the instruments was further established by five Egerton University test experts. Data was analysed using the Statistical Package for Social Sciences (SPSS) version 17.0 for Windows. One way ANOVA, Scheffe post hoc test and the t-test were the inferential statistics that were used. All levels of significance were fixed at $\alpha = .05$ level. The bases on which comparison was made included undifferentiated wholesale grouping. The null hypothesis was not accepted. The students taught English composition through ML pedagogy had a COMPAT achievement that was statistically significantly higher than that of the students taught through TP throughout the investigation. This study has findings that indicate possible benefits for secondary school teachers of English and their students, the research community, curriculum development institutes and university departments of English language education. The main recommendation put forth was that ML pedagogy should be used in the teaching of English language composition writing in Kenya.

Keywords: Mastery Learning Pedagogy; traditional pedagogy; achievement in composition writing.

Copyright © 2019: This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use (NonCommercial, or CC-BY-NC) provided the original author and sources are credited.

INTRODUCTION

Post-independence Kenyan national orientation of learning English in the secondary school is English as a second language (ESL). Although this has been embraced by all the former British colonies, it is a very challenging course to take. The ESL learner is expected to attain high standards in both spoken and written English, comparable to those of the educated learner of English as a first language (L1) in Britain or the United States of America [1].

All the same, the demanding labour of learning to compose in writing as a learner of ESL is a most rewarding one, both to the individual writer and to

humanity in general. English is, variety – wise, a very versatile language, and every individual learner of writing in it is assured of finding an appropriate variety to write in. The range of variety classes of English that is useful to ESL writers includes Standard English, academic English, medium and attitude. Moreover, English is the language of education, diplomacy and government, law and science, commerce and technology. Thus to write in it is to catalyze the development of these vital human activities [2]. Moreover, writing in the English language confers on the writer an unequalled vantage point to discharge the eternal functions of writing: to conduct inquiry in order to fulfil the intrinsic human need for creativity and to

preserve knowledge and ideas and by so doing, to transmit them to future generations [3].

That English is learned as a second language in Kenya makes at least an above average mastery of writing skills in it, a major determinant of success in the Kenyan secondary education. Written English was made the medium of expression for all Kenyan secondary school subjects that are not other languages. According to The Kenya National Examinations Council (KNEC) learners should exhibit their ability in these and in the English language subject areas by means of written English according to the Kenya National Examinations Council [4].

That written English was made the medium of expression for all non-language Kenyan secondary school's subjects, leads to the reality that in the long term, the students who are high achievers in written English are more likely to do better in almost all English medium subjects in the Kenya Certificate of

Secondary Education (KCSE) examination than those who are not.

Success in the KCSE examination should attract opportunities for further education; the latter almost always turns out to be lucrative. Specifically, further education gives an individual a superior competitive edge for success socially, economically and politically. Actually, to become a viable individual in Kenya, one must first of all acquire a substantive mastery of written English. This follows from the reality that in Kenya, English is the medium of instruction, the official language, the language of administration, of the law, the mass media, commerce and political unity [5].

Regrettably, in the ESL context and considering performance at the KCSE examination, whatever achievement most Kenyan secondary school students attain turns out to be modest, as it is clear from Table-1.

Table-1: Candidates' Achievement in writing in English in the years 1998 to 2006

Year	Mean Score %	Standard Deviation
1998	39.5	3.00
1999	41.6	3.50
2000	37.3	3.83
2001	41.9	3.37
2002	36.2	4.07
2003	37.5	3.53
2004	40.9	3.00
2005	40.9	3.24
2006	31.5	7.83

Note: The mean scores have been converted into percentage form for easier interpretation)

Source: KNEC (2006) [4] Examination Report

As it is seen in Table-1, KNEC reports for the years 1998 to 2006 shows that the performance in writing is dogged by a fluctuating, below 50% average achievement. In other words, in the ESL context, every year, more and more secondary school students fail to attain the threshold of viable written English [4].

Similarly, it is evident from Table-2 that overall achievement in English from the year 2009 to 2012 does not show any significant improvement of the situation.

Table-2: Candidates' Overall Achievement in English in the Years 2009 to 2012

Year	Paper	Maximum Score	Mean Score %	Standard Deviation
2009	1	60	51.30	8.05
	2	80	36.66	12.21
	3	60	34.75	7.97
	Overall	200	38.68	26.82
2010	1	60	46.86	9.17
	2	80	38.83	11.61
	3	60	31.06	8.42
	Overall	200	38.68	26.82
2011	1	60	42.88	8.41
	2	80	35.66	12.46
	3	60	31.00	7.04
	Overall	200	36.42	25.14
2012	1	60	48.13	9.20
	2	80	35.96	12.91
	3	60	30.10	7.61
	Overall	200	37.88	27.34

Note: Paper 1 is composition, paper 2 is grammar and reading while paper 3 is literature in English.

Source: KNEC (2013) [6]

That candidates are required to show their ability in all types of competence in English by means of written composition does make the latter critical in the overall achievement in English language. For example, English paper 3 is about ability in literature in English. However, observing that it continued to be poorly done, KNEC [6] proceeded to counsel that every effort needed to be made to improve performance in this paper by teaching composition writing.

Failure to be viably proficient in written English for a majority of KCSE graduates makes them suffer great loss of opportunity. First, it lowers their academic achievement across the board, and so may effectively block further academic advancement. Second, being the language of vital matters in many Anglophonic countries, English makes those who fail to master it effectively to be marginalized economically, socially and politically [7]. Finally, and perhaps to be decried most of all, poor achievement in written English at KCSE means waste of scarce national financial, personnel and temporal resources, because having been spent on an unproductive enterprise, they are irrecoverable.

The top three reasons commonly cited for poor performance in written English can be subsumed under ineffective pedagogy. Specifically they include: a) tardiness in embracing newer and more realistic teaching/learning methods; b) excessive dependence on traditional methods that demand correctly executed texts right from the beginning before mastery of the process of writing, and c) Unenhanced motivation for writing [8]. In other words, in a situation replete with either poor or below average achievement, the strategies that teachers employ to teach writing do not effectively help learners solve problems specific to writing.

It has been shown that Kenyan society does its best to ensure that secondary school students master written English. However, achievement in this area is modest and has failed to improve over the years (see Table-1). Evidently, then, the teaching of writing in English in Nyandarua County is in the same boat and is clearly in search of pedagogy.

The realization that the quality of instruction plays a crucial role in learning outcomes has become an impetus for educationists to study interventions that may improve student learning or some other valued outcome. For example, many research studies are carried out to identify interventions to improve students' academic achievement [9]. This trend has not escaped the concern of Kenyan educationists, a few of whom are mentioned here as an example. Kembu [10] did a survey of the factors influencing achievement in written composition in primary schools. The study found that all are related to ineffective pedagogy. Omwadhoo [11] identified the factors which influence the teaching and learning of written English in upper

primary classes. Njoroge [12] examined the factors affecting availability, acquisition and utilization of resources in the teaching of English and both studies related the problem to pedagogy.

In keeping with the spirit described above, much research has been done on ML. This is as teaching/learning (T/L) method that is activity-oriented and that ensures the individual learners' mastery of pre-requisite skills and knowledge. Thus it is keen on feedback and does not allow the learner to proceed to the next expected learning outcome before mastering the current one [13, 14].

In the school subjects it has been experimented on, ML has invariably proved effective. The key to this effectiveness lies within the provision of feedback/corrective mechanism [15]. In the employment of Mastery Learning (ML), an instructional method, it is presumed that, provided with the appropriate learning conditions, all learners can learn excellently. In order to ensure thorough learning, ML pedagogy students are not advanced to a subsequent expected learning outcome until they demonstrate a set degree of proficiency with the current one [13, 16, 17, 15].

Mastery Learning approach obliges the instructor to organize the course content into a hierarchy of learning unit and to specify a mastery criterion for each unit. Expected learning outcomes are set for each unit and a formative test is given for each unit after instruction and practice. Early masters are allowed to engage in enrichment. Meanwhile, non-masters are given additional instruction until they succeed. In an ML environment, the instructor conducts a variety of group-based (GB) instructional techniques, with frequent and specific feedback by using formative tests, as well as regularly correcting mistakes students make along their learning path. Teachers evaluate students with criterion-referenced rather than norm-referenced tests [18].

Concerned with merely the process of mastering any content, ML is based on Benjamin Bloom's model of learning for mastery with refinements made by Block [19]. It may be conducted as teacher-paced Group Based (GB) mode, which is the one that was adopted in this study, involved direct teacher instruction and cooperation between classmates. In addition, it requires well-defined expected learning outcomes organized into smaller, sequentially organized units. Therefore, the basic jobs facing developers of ML which have been identified consist of definition of mastery, planning for mastery, teaching for mastery and grading for mastery [18, 13]. This study was based on the teacher – paced GB mode because its subjects were secondary school students who cannot be divided further. The components of quality instruction, such as ML pedagogy provides, are summarized in Figure-1.

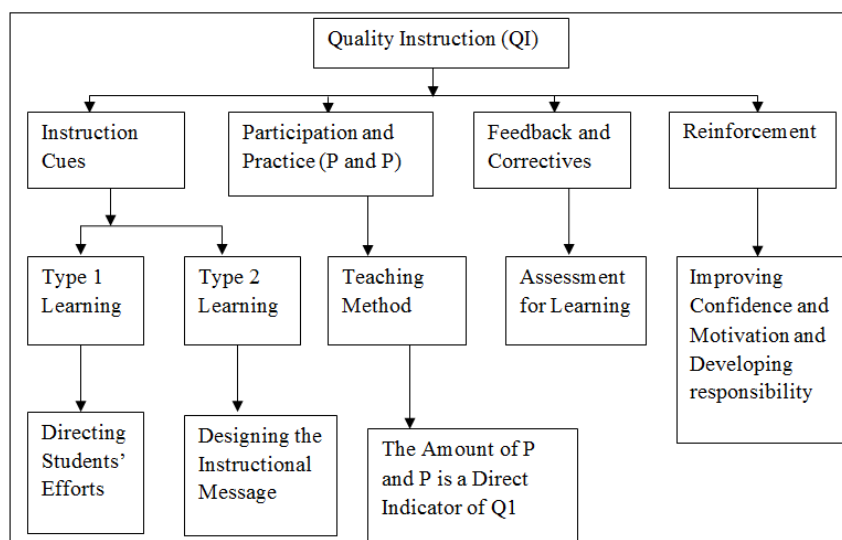


Fig-1: Components of quality instruction in mastery learning
Source: McCabe (1986) [20]

Figure-1 shows the main elements of quality instruction that define ML pedagogy. They include directing students' effort and designing the instructional message by the teacher. The teaching method of ML ensures the participation and practice on the part of the student, activities that lead to effective learning. The method has provision for feedback that guides the teacher to effect correctives where necessary. While using the method, the teacher is urged to use reinforcement with respect to all deserving cases. Reinforcement leads to the improvement of confidence, motivation and the development of responsibility on the part of the learner.

In a meta analysis by Guskey and Gates [21] which involved 27 studies, and it addressed student achievement, student retention, time variables, student affect and teacher variables. It was found that students in ML programmes showed overwhelmingly more positive results in achievement than those in traditional programmes. Effects in language arts (grammar and reading) and social studies were slightly larger than those attained in science and mathematics classes. However, Bloom had suggested that effects would be largest in mathematics and science since learning in these subject areas was generally more highly ordered and sequential. Students under the ML pedagogy retained what they had learned longer, both in short-term and long-term studies. They required a decreasing amount of corrective over a series of instructional units. They developed more positive attitudes about their ability to learn, and even ML teachers developed more positive attitudes toward teaching, higher expectations for students, and greater personal responsibility for learning outcomes.

Another meta-analysis involved 46 studies and was conducted by Guskey and Pigott [22]. Its objective was to find out how effective the typical group-based ML programme was. It was found that there were

positive effects on student achievement and across all levels of education. Also found were positive effects upon students' retention of materials. Remediation time spent by students and instructors significantly decreased as the student reached higher instructional units. ML pedagogy students generally liked the subject they were studying more, were more confident of their abilities in that subject, felt the subject was more important, and accepted greater, personal responsibility for their learning than students who learned under non-mastery conditions. One study among those 46 in the meta-analysis, found that expectations formed by ML pedagogy teachers about students' abilities were increased owing to the fact that students had far greater achievement than the teacher originally anticipated. Finally, another study found that teachers who used ML began to feel better about teaching and their roles as teachers [22].

Kulik *et al.*, [23] conducted a meta – analysis which involved 108 studies. It focused on outcome measures: performance on examinations at the end, attitude towards instruction, attitude towards content and course completion. The performance on examinations of students that were taught through ML pedagogy, showed positive effects on achievement at the end of instruction. The majority of studies showed a positive correlation in students' attitudes towards instruction and content of ML programmes. Finally, the benefits obtained from ML were found to be enduring, not short term and no significant increase in time – on – task was found.

Turning to studies that have isolated specific aspects of ML pedagogy, Dunkelberger's and Heikkinen's [24] investigation of repeated testing was reported. Achievement was examined using subjects who were allowed to repeat tests and subjects who were allowed only one attempt to the test. The findings of the study showed no significant correlation between

achievement and repeatable testing. Cognitive gains obtained from ML were found to be related to a combination of remediation and retesting, not retesting alone.

Clark, Guskey and Benninga [25] examined the effect of ML pedagogy on achievement and motivation. They found that the ML group demonstrated higher levels of achievement, fewer absences and more motivation toward learning course material than the traditional group. In addition, Wentling [26] compared a ML group to a non-ML one as to how feedback relates to achievement. The areas that were examined included immediate cognitive achievement, attitude towards instruction; time spent on instruction and delayed cognitive achievement. There were distinct forms of feedback: no feedback, partial feedback (knowledge of the correctness of response) and total feedback (knowledge of correct response). It was found that the ML group had superior achievement for both immediate cognitive achievement and long term retention in groups with partial feedback. However, time spent on instruction and attitude toward instruction showed no significant difference.

Furthermore, there are other studies that have isolated specific aspects of ML pedagogy in integrated Science, Agriculture, Social studies, Chemistry, Mathematics and Physics. Akinsola [27] examined the effect of ML pedagogy on achievement in Integrated Science. The study found that ML was more suitable in facilitating achievement in Integrated Science in Junior Secondary School than traditional pedagogy.

Ngesa [28] studied the impact of ML programme on academic achievement in secondary school Agriculture. ML groups scored statistically significantly higher than those who learned through the conventional method. The effectiveness of the ML approach on performance in social studies has also been investigated [29]. Adeyemi found that the ML pedagogy had a greater effect on performance than the conventional approach. Furthermore, Wachanga and Gamba [30] studied the effect of ML pedagogy on achievement in chemistry. They found that ML students had a statistically significant higher achievement than the regular methods group. Finally Koima [31] studied the effect of ML pedagogy on the study of mathematics and Wambugu and Changeiywo [32] examined the effect of ML approach on secondary school students' achievement in physics. Koima found that ML enhanced students' achievement in mathematics more significantly than conventional methods. Wambugu and Changeiywo found that ML was more effective than conventional methods in learning physics.

It has been reported that ML pedagogy has been found to be more effective than traditional pedagogy in the achievement of English language grammar and reading [21]. As such further research on

English Language Composition achievement is required. Further research is also required in the training of teachers that is necessary for them to conduct ML pedagogy appropriately. Finally, academic gains associated with remediation versus retesting need further research.

School-based implementations of ML pedagogy have yielded success in academic achievement. At a high school in Colorado, there were restructuring efforts based on demands for higher standards. Students were required to reach 75% in achievement on each unit. There were retakes for those who failed to meet the 75% requirement. The effort did lead to students achieving higher test scores academically and more students advancing to college since the transition to the ML programme [33].

Hill and Hounshell [34] have discussed an inventive approach to a summer school biology course in North Carolina, USA. Summer school is geared to those who failed the course previously. These students disliked both the school and the course they were forced to retake. They were monitored closely and required to achieve 80% on all graded work. The results showed improved achievement, decreased absenteeism and tardiness as well as improved attitudes from students, teachers and parents. Arredondo and Block [35] have looked at the efforts of two school districts that have successfully integrated ML along with thinking skills into their curriculum. Each district has shown considerable increase in achievement.

The Chicago Board of Education developed Chicago Mastery Learning Reading Programme (CMLR) in order to systematize ML as the instructional approach to reading throughout the city's schools. Organized on a ML model, CMLR is an integral part of Language arts instruction in many schools. It is a kindergarten through eighth grade programme and it consists of student workbooks, tests and teacher manuals dealing with word attack, study skills and comprehension concepts. CMLR has specific expected learning outcomes and standards of mastery for each unit together with a model that introduces and reiterates essential prerequisites in logical increments. This programme is very successful [36].

From the successful School-Based Implementations of ML pedagogy, theorists have made four conclusions about it. Firstly, it provides a model of teaching that is effective for a wide range of students. Secondly, it reduces the academic spread between the slower and faster students. Thirdly, the skills and concepts have been internalized and transferred to other areas of the curriculum. Fourthly, and finally, student attitude and self – image have also improved [37].

Three major generalizations can be derived from research on ML pedagogy. Firstly, ML is

effective in all the situations it has been applied. It is estimated that the average student enrolled in ML classes would achieve better than 80% to 85% of the students in non-mastery classes. Specifically, the ML pedagogy has dramatically enhanced students' retention, rate of learning, attitudes and self-perception [19, 17, 15]. Secondly, the key to effectiveness lies within the provision of feedback/corrective mechanism. The results of research [19] suggest that the standard must be sufficiently high so as to ensure that the desired learning has occurred. Specifically, the ideal standard lies in the interval between 85% and 95% [19, 17, 15].

Thirdly, ML is effective in a differential way. Students of lower ability do benefit more from ML than those of high ability. However, the latter do not suffer. Either they also benefit somewhat from the ML program or, at least, do not do any worse than their high ability counterparts in non-mastery programmes [38]. Similarly, research findings suggest that ML programmes have their greatest impact on students in grades 5 to 8 [39]. However, older students do also benefit from the pedagogy. For example, Ngesa [28] applied the ML pedagogy to Kenyan secondary school agriculture teaching. The ML groups scored significantly higher than the conventional learning groups. The hypothesis of the current study were informed by the information that is discussed above. This is the spirit in which the current study was undertaken to determine the effects of ML pedagogy on secondary school students' achievement in English language composition writing, in Nyandarua County, Kenya.

Statement of the Problem

Overall achievement in written English at KCSE has been fluctuating at the level of below 50% in the period between 1998 and 2006. The situation failed to improve between 2009 and 2012. However, Kenya is an ESL country in which students are expected to achieve higher standards, commensurate with the time, the resources, the ESL status of the language in Kenya and the effort used in teaching it. Nevertheless, teachers of written English continue to rely on TP, apparently undisturbed by its seeming inefficacy. However, empirical evidence suggests that in all the school subjects it has been experimented on, ML approach is

more effective than TP. In addition, the comparative effects of ML and TP in teaching writing in English was not known in Nyandarua County. This study sought to establish the comparative effects of ML and TP in achievement in writing in English classes in Nyandarua County, Kenya.

Research Hypothesis

The following null hypothesis was tested at .05 alpha level:

H₀₁: There is no statistically significant difference in achievement in English language composition writing between students taught using ML and those taught using TP.

RESEARCH METHODOLOGY

This section discusses the research methodology of this study. It deals with the following elements: research design, location of the study, target population, the sampling procedures and sample size, instrumentation, validity and reliability of research instruments, data collection and analysis procedures.

Research Design

The study made use of the quasi-experimental research approach, employing Solomon Three-group design. This strategy helped to achieve the purpose of this study: to determine the effect of ML pedagogy on student achievement. As the subjects of this study were secondary school students, they were grouped into intact classes. Therefore random assignment of subjects to experimental and control groups was not possible; thus Solomon Three-group design was the most appropriate in this study, because it enabled the researcher to manipulate two variables simultaneously. These variables included two teaching methods. Furthermore, Solomon Three-group design guarded against the threat to validity of the experiment as it was used to achieve three purposes: (a) to assess the effect of the experimental treatment relative to the control treatment; (b) to assess the effect of a pre-test relative to no pre-test; and (c) to assess the interaction between the pre-test and treatment conditions [39] In design notation this may be written as is shown in Table-3.

Table-3: The Solomon Three – Group Design

Group 1	Experimental (E)	RO ₁	X	O ₂
Group 2	1 st Control (C ₁)	RO ₃		O ₄
Group 3	2 nd Control (C ₂)			O ₅

Source: (Cohen & Manion 1989) [39]

Key:

RO = random assignment and observation
X = experimental treatment
O = observation

All the students in the treatment group and in the 2nd control group (or group 1 and group 3) were

taught writing for a period of one month using the ML pedagogy. Simultaneously, the 1st control group (or

group 2) was taught writing for the same period using TP.

Location of the study

This study was conducted in Nyandarua County Secondary Schools. The district spans five parliamentary constituencies. Moreover, Nyahururu and Ol'kalou towns are substantive urban centres. In addition, the problem of low achievement in English is prevalent in Nyandarua County. Their mean score in English at KCSE for six years (2003-2008) was 3.8 out of a maximum of 9 (D.E.O Nyandarua North, 2009; D.E.O Nyahururu, 2010) [40, 41]. The area that this study focused on is endowed with 184 secondary schools, 64 of which are public. Among the 64 public schools, 7 are County and 57 are sub-county in category. The social set up of the 184 secondary schools showed that 11 were single sex, while the

mixed schools predominated and were 173 in number (DEO Nyandarua North, 2008; DEO Nyahururu 2010) [42, 41]. Thus it was inferred that in the school environment described above, individual differences would be manifested regarding the following characteristic: cognitive ability, which was the concern of this study.

The Target Population

The target population of this study, which also is its accessible population, was all Form One students in Nyandarua County Public Secondary Schools. According to the District Education office registry in 2009 and 2010, the population of Form One students was 5779. Out of these 2,702 were girls, while 3,077 were boys. Table-4 summarizes the distribution of the target population in the location.

Table-4: Distribution of Secondary Schools, by Division in Nyandarua County

Division	Nyahururu Municipality	Ndaragwa	Oljoroook	Olkalou	Totals
No. of girls schools		3	3	2	8
No. of boys schools	4	1	1	0	6
No. of mixed schools	5	128	14	27	174
Total No. of Schools	9	132	18	29	188
No. of form one students in Girls Schools		227	189	135	551
No. of form one girls in mixed schools	283	804	188	876	2151
Total No. of form one Girls	283	1031	377	1011	2702
No. of form one students in boys schools	110	225	389	0	724
No. of form one boys in mixed schools	261	681	552	959	2453
Total No. of form one boys	371	906	941	959	3177
Total No. of form one students	654	1937	1318	1970	5879

Sample Size and Sampling Procedure

In order to include all sub-groups of the target population, stratified sampling was used in this study to determine the sample. As secondary school classes were intact groups, individual schools became the sampling units [9]. Since the study used Solomon Three Group Design, stratified and random sampling were used to select 9 schools, which were randomly assigned into E, C₁ and C₂. Each group comprised of one boys', one girls' and on mixed school. Each of the divisions of Ndaragwa, Ol'Joroook, Nyahururu Municipality and Olkalou sampled from the County

was represented to make the proportions of subgroups in the target population almost equal. The number of form one students of these schools based on gender was as follows: Ndaragwa 208 boys and 140 girls; Ol'joroook 204 boys and 61 girls; Ol'kalou 0 boys and 229 girls; Nyahururu Municipality 147 boys. Therefore, the sample was made up of 559 boys and 430 girls and the sample size was 989 students. This sample was appropriate for this study: in experimental studies it is desirable to have a minimum of 15 cases in each group [9]. Table-5 summarizes the distribution of the sample size in the location.

Table-5: Sample Distribution by classroom social set up in Selected Secondary Schools in Nyandarua County

Division	No. of Girls Schools	No. of Boys Schools	No. of Mixed Schools	Total No. of schools	No. of form 1 girls	No. of form 1 boys	Total No. of form 1 students.
Ndaragwa	1	1	1	3	140	208	348
Ol'joroook	0	1	2	3	61	204	265
Ol'kalou	2	-	0	2	229	0	229
Nyahururu Municipality	1	-	-	1	-	147	147
Totals	4	2	3	9	430	559	989

Stratified sampling was also employed to assign schools to either experimental or control groups because the school social structure was heterogeneous

in the divisions of the location. Thus the experimental schools were located in the Ol'joroook and the Ol'kalou divisions, while all the schools in Ndaragwa

division were assigned to the control group. This was in order to control contamination of ML materials by using geographical separation. Finally, after schools were assigned their respective pedagogies, using the stratified sampling procedure, they were assigned either to pre-test: post-test or to post –test only groups, using the random sampling procedure [39].

Instrumentation

The following instruments were used in this study. There was a Composition Achievement Test and the study also used an elaborate Mastery Learning Pedagogy module for teachers. The instruments were developed by the researcher using the following process: (a) Definition of objectives; (b) Definition of the target population; (c) Review of related measures; (d) Development of item pool(s) (e) Preparation of prototypes; (f) Evaluation of prototypes [9].

Composition Achievement Test (COMPAT)

The COMPAT was used to measure the entry behaviour of the subjects in terms of achievement in composition skills. For comparative purposes the COMPAT was, in addition, used to measure the terminal behaviour of the subjects in terms of achievement in composition skills. The two sets of data (the pre-test generated set of data and the post-test generated set of data) were compared to determine the effect of the two learning methodologies.

Three writing tasks borrowed from the KNEC were set. Relying on KNEC on the writing tasks ensured that subjects were working on materials they ought to have been familiar with. It was ensured that the set tasks were similar in weight to justify optionality. The optional condition catered for individual differences of preference of writing subjects [4].

The scoring scheme of the composition which the subjects wrote was derived from a six-trait analysis of writing skills, including (i) beginning (ii) character (iii) conflict (iv) diction/spelling (v) episodes (vi) handwriting (vii) sentence (viii) paragraph (ix) punctuation (x) closure (xi) theme [43, 4]. Both the pre-test and the post-test involved students carrying out writing tasks whose degree of mastery of writing skills was established through the derived analysis evaluation of writing.

Development of ML Instructional Materials

The development of ML instructional materials was executed systematically. The materials to be used in this study were based on the Kenya Institute of Curriculum Development (KICD) English syllabus. The objectives which Form One should achieve in composition during the selected term were adopted. A module for ML teachers was produced. This was in order to help each teacher stick as closely as possible to the ML strategy. The module for the ML teachers consisted of guidance and practice materials. In

addition, the module was provided with continuous assessment tests. The training period was a five-day week.

Validity and Reliability of Research Instruments

Before data collection, the validity of the COMPAT was determined. The types of validity that were relevant to this study were content, construct, and face validity. Content validity for COMPAT was established by an objective comparison of the test items with writing skills. However, all the aspects of validity were determined with the help of five test experts from Egerton University.

Piloting was carried out on Monday April 30th, 2012 at Nyandarua High School in Nyandarua County using, form one students. Data was collected using the Test – Retest method. This method assessed the degree to which test scores were stable over time [44]. The level of reliability that was to be accepted would have to be Cronbach's alpha 0.7 and above. However, the level of reliability of the COMPAT was of Cronbach's alpha 0.9.

Data Collection

To be allowed to do research the researcher applied for a research permit from the office of the National Commission for Science, Technology and Innovation. When the permit was granted, the researcher turned to the County Commissioner and the relevant District Education Officers (D.E.O's). Accordingly, the D.E.O's were informed and asked for letters of introduction to the principals of the selected schools. With the letters of introduction, the researcher approached one school at a time to arrange to be introduced to the relevant teachers whose classes were involved in the study.

After the preliminaries and the training of teachers the ML teachers were supplied with materials and asked to begin the experiment. Thus the pre-test groups took their tests. Finally, all the groups in the study did take their post-tests.

The data collected using the COMPAT was numerical. Students' compositions were scored based on the marking scheme derived from a six-trait analysis of writing skills. After coding the data, the researcher proceeded to have the data keyed into the computer. The data was subsequently analysed using the Statistical Package for Social Sciences (SPSS) version 17.0 for Windows. Descriptive statistics (the Mean and Standard Deviation) were used to describe and organize the data while inferential statistics were used to test the hypothesis of the study [45]. The hypothesis of the study was tested at the alpha level of .05.

RESULTS AND DISCUSSION

This section presents research findings and discussion of this study that is entitled 'A Study of the

Effects of Mastery Learning (ML) Pedagogy on Secondary School English Language Composition Writing Achievement in Nyandarua County'. The study examined the Comparative effects of ML and Traditional Pedagogies on English Language Composition achievement. This section is based on the following hypothesis of the study:

Ho₁: There is no statistically significant difference in English Language Composition writing achievement between all the students taught composition skills using ML pedagogy and all those taught the skills using TP.

Quasi – experimental research involving Solomon Three-group design was used in this study. The three groups required by this design were as follows.

First, the experimental group (E) which had 316 students and was taught composition skills using the ML pedagogy, took both a pretest and a posttest. Second, control group one (C₁) comprising of 348 students, was compared to the experimental group. It was taught composition skills using the TP, and took the pretest and the posttest. Third, control group two (C₂) consisting of 325 students, used to assess the effect of a pretest relative to no pretest and the interaction

between the pretest and the treatment conditions, took the posttest only. Control group two (C₂) was taught English Language Composition using ML pedagogy [39].

The total number of students in this study was 989, comprising of 559 males and 430 females. The instrument for collecting data was Composition Achievement Test (COMPAT). The COMPAT involved writing an imaginative composition or a story. All the 989 students wrote a composition each.

The Pre-Test Results

Experimental research requires a pre-treatment pre-test to establish the pre-treatment relative status of the groups that make up the sample with respect to the characteristics in question [9]. In this study, the intention of using the pre-test was to establish the suitability of comparing the experimental group (E) and the control group (C₁) by finding out how homogeneous or how heterogeneous they were with respect to English Language Composition achievement and motivation. Groups that are homogeneous are most appropriate for experimental studies, since any post-treatment changes could be attributed to treatment only [39]. Table-6 shows the pre-test comparison of E and the C₁ on COMPAT.

Table-6: Comparison of Pre-test Mean Scores on COMPAT for E and C₁

Pedagogy	N	Mean	SD	df	t-value	p-value
ML	316	40.96	13.22	662	2.86	.65
TP	348	38.05	12.95			

Not significant ($t(662) = 2.86, \alpha = .05$)

According to Table 6 the pre-test COMPAT means difference between the experimental group (mean = 40.96, SD = 13.22) and the control group (mean = 38.05, SD = 12.95) was 2.91. Apparently, the experimental group had a greater mean score than the control group. However, this means score difference was not statistically significant at the 0.05 level; $t(662) = 2.86, p = .65$. Consequently, the experimental group and the control group were at the same level of achievement in English Language Composition writing before being subjected to their different treatments.

Comparison of English Language Composition Writing Achievement Between all the Students Taught Composition Skills using ML Pedagogy and all those taught using TP

The hypothesis of this study was based on the question of whether or not there was any statistically significant difference in the post-test on COMPAT between E and C₁. Table-7 presents students' post-test mean scores on the COMPAT.

Table-7: Students' Post-test mean Scores on COMPAT

Group	N	Mean	SD
E	316	53.70	12.07
C ₁	348	39.34	12.06
C ₂	325	54.50	14.55

Examining Table-7 makes it clear that both the means of the groups taught composition skills using ML pedagogy: E(mean = 53.70) and C₂ (mean = 54.50), were each greater than the mean of the group that was taught the skills using TP: C₁(mean = 39.34) by 14.36 and 15.16 respectively.

What at first seems to be true by examining Table-7 is the conclusion that ML pedagogy gave rise

to higher composition achievement results than TP, and that the former was more effective than the latter. However, what this result did not reveal was whether or not the difference was statistically significant enough in order to make such a conclusion. To do this one way ANOVA was conducted, and Table-8 presents the results of the analysis.

Table-8: One way ANOVA Comparison of Students' Post-test mean scores on COMPAT by Pedagogy

Source	Sum of Squares	Df	Mean Square	F-value	p-value
Between groups	49236.24	2	24618.12	147.160*	.000
Within groups	164946.39	986	167.29		
Total	214182.63	988			

*significant at the .05 level

The results of the ANOVA presented in Table 8 reveal that the mean scores of the experimental group (mean = 53.70, SD = 12.07, C_1 (Mean = 39.34, SD = 12.06) and C_2 (Mean = 54.50, SD = 14.55) were statistically significantly different at the .05 level: ($F(2,986) = 147.160$, $p = .000$). However, it is not

revealed where the significant differences lie. Consequently, it was necessary to conduct a Sheffe post hoc multiple comparison test to resolve the issue. Table 9 presents the results of the post hoc multiple comparison test.

Table-9: Pair-wise Difference in Post-test Mean Scores on COMPAT

Pairs	Mean Difference	P- Value
E vs C_1	14.35*	.000
E vs C_2	0.80	.737
C_1 vs C_2	15.15*	.000

*The mean difference is significant at the .05 level

The information presented in Table-9 shows that the means differences are significant at .05 level. These are the mean differences of the pairs E vs C_1 and C_1 vs C_2 respectively: p-value = 0.000 in both cases. The significance of the means differences is in favour of E and C_2 , whose treatment was ML pedagogy. Thus far, there is evidence to justify the conclusion that ML

pedagogy was more effective in teaching English Language Composition skills than TP. However, the need to be absolutely certain that ML pedagogy was more effective than TP in the teaching of the skills in question, made the comparison of mean gain to be undertaken. Table 10 is a comparison of mean gain on COMPAT for E and C_1 .

Table-10: Comparison of Mean Gain on COMPAT for E and C_1

Group	N	Mean Gain	Df	t-value	p-value
E	316	12.74	662	21.775*	.000
C_1	348	1.35			

*significant at .05 level

According to Table-10 the difference between the mean gain of E (mean Gain = 12.74) and the mean gain of C_1 (mean Gain = 1.35) was significant at .05 level ($t(662) = 21.775$, $p=.000$). Because of the above evidence, it was found to be a sound conclusion that ML pedagogy was more effective in teaching English Language Composition skills than TP.

This study found out that ML pedagogy was more effective than TP in teaching English Language Composition skills. In this, it was in agreement with other studies on the effectiveness of ML vis-à-vis that of TP with respect to teaching various subjects. Guskey and Gates [21] in their paper, 'Synthesis of Research on the Effects of ML in Elementary and Secondary Classrooms' point out that Bloom's approach to ML is not absolutely individualized. The only features that ML pedagogy and individualized instruction share are defining learning objectives well and appropriately sequencing them. In addition, they share the practices of regularly checking student learning and giving them immediate feedback. This is done through evaluating student learning in terms of criterion – referenced rather than norm – referenced standards. However, they differ

in terms of the bases and pace. While a vast majority of individualized programmes were individually – based and individually – paced, Bloom's ML programme was group-based and teacher – paced. Guskey and Gates [21], in their meta – analysis of ML studies concluded that all of the 25 elementary and secondary school studies reporting achievement outcomes showed positive effects as a result of the application of group – based and teacher – paced ML strategies. The results of this study correspond to these findings.

In this study, there was a significant mean gain for students who learned using ML pedagogy. Other group – based and teacher – paced studies whose results correspond to this study are as follows. Kulik; Kulik; & Bangert-Drowns [23] did a meta-analysis of 108 evaluations of Mastery Learning programs. This meta-analysis found out that performance on examinations at the end of the instruction period showed positive effects. In a similar vein Akinsola's study [27] in Nigeria on the effect of ML pedagogy on achievement in Integrated Science found out that ML pedagogy was more suitable in facilitating achievement in integrated science in the Junior Secondary School. Furthermore,

Guskey [46] agrees with these previous findings by observing that extensive research evidence gathered in Asia, Europe, South America and the United States shows that the careful and systematic application of ML principles can lead to significant improvements in student learning. It also happened that Ngesa [28] studied the impact of experiential and ML programmes on academic achievement in secondary school agriculture. The findings were that experiential and ML groups scored significantly higher than those who learned through the conventional group.

In addition, Adeyemi [29] conducted a study on the effectiveness of ML approach on performance in social studies and arrived at results that correspond to the findings of this study. He found that ML approach had a greater effect on performance than the conventional approach. Similarly, Wachanga and Gamba [30] studied the effects of ML pedagogy on secondary school students' achievement in Chemistry and discovered that ML pedagogy facilitated students learning of Chemistry better than the regular methods. And in a similar vein, Koima's study [31] established that ML approach enhanced student's academic achievement in mathematics more significantly than conventional methods. Even Wambugu and Changeiywo [32] studied the effects of ML approach on secondary school students' physics achievement. Like in this study, these researchers concluded that ML approach was more effective than the conventional methods.

An important factor in the effectiveness of the ML pedagogy and education in general is the teacher quality [32]. With this understanding in mind, in this study, the teachers were meticulously trained to be able to apply correctly the principles of ML pedagogy. In addition, they were not rigidly controlled, a requirement that Guskey [46] terms as one misinterpretation of ML. He goes on to state that, for effective implementation of ML pedagogy, what is emphasized are thoughtful and reflective teachers, and they are vital to the implementation of this learning methodology.

Bloom [47] opines that ML pedagogy was likely to enhance learning outcomes in most of all subject areas, but predicted that effects would be largest in mathematics and science since learning in those subject areas was generally more highly ordered and sequential. However, in their meta-analysis, Guskey and Gates [21], discovered that effect sizes in mathematics were lower than those in social studies and language arts (grammar, reading, vocabulary and foreign language). This study corresponds to these findings in that it led to a statistically significant mean gain in English language composition writing, which is an element of language arts.

The variable of instructional time is an issue in ML pedagogy. Bloom's belief was that students in a

ML pedagogy setting did not have to put in much more time on school tasks to achieve a high level of proficiency. Students taught through ML might need more time to reach proficiency in the initial stages of a course, but they should need less time to master more advanced material due to the firm grasp of fundamentals that they should gain from their initial effort [47]. In their meta-analysis, Guskey and Gates [21] found studies that confirmed Bloom's belief in progressive reduction of time spent on learning. In this study, the time set aside for learning was the same, three months, for the TP group and the ML pedagogy group. However, the latter did significantly better than the former. Thus this study corresponds to the studies cited above, showing that ML pedagogy does not need an inordinately large amount of time to be implemented well.

SUMMARY AND CONCLUSIONS

Summary of Major Findings

The purpose of this study was to establish the effects of Mastery Learning pedagogy on secondary school students' learning of the English Language Composition writing. To achieve this aim, one objective was formulated and then operationalized by means of one null hypothesis.

From the pre-test results, it was established that the students taught using ML pedagogy and those taught using TP were originally homogeneous with respect to English language composition writing achievement. Their pre-test mean scores had no difference that was statistically significant. Therefore, to compare them in this study was appropriate and post-treatment differences were confidently ascribed to treatment only. After treatment, the experimental group (E) taught using ML pedagogy and the control group two (C₂), also taught using ML pedagogy, had post-test mean scores difference that was not statistically significant. However, the post-test means difference between C₂ and the control group one (C₁), taught using TP, was statistically significant in favour of C₂. Thus it was found that only the treatment, and not learning that may occur due to taking the pre-test, influenced the degrees of achievement among the different groups.

The hypothesis stated that there was no statistically significant difference in English language composition writing achievement between the students taught through ML pedagogy and those taught through the traditional approach. The results showed that the former had a statistically significantly higher achievement mean score in English language composition writing than the latter. Thus it was established that mastery learning approach was more effective than traditional pedagogy in enhancing the learning of English language composition writing. In this way the null hypothesis was rejected.

CONCLUSIONS

Firstly, it was established that students taught using ML pedagogy managed to score a significantly greater achievement in English language composition writing than those taught using TP. The sequel of this is that the former pedagogy is more effective than the latter in enhancing English Language Composition writing achievement.

Secondly, ML pedagogy had statistically significantly more positive motivation results in English Language Composition writing than TP in mixed secondary schools. It follows that in promoting English Language Composition writing motivation of mixed secondary schools, ML pedagogy is more effective than TP.

REFERENCES

- Kioko, A., & Muthwii, M. J. (2005). *New language bearings in Africa: A Fresh Quest*. Springer: Netherlands.
- Greenbaum S., & Quirk, R (2010). *A student grammar of the english language*: London Longman.
- Willard, K. C., & Keith, P. T. (1996). *U.S. Patent No. 5,536,242*. Washington, DC: U.S. Patent and Trademark Office.
- KNEC. (2006). *KCSE examinations report*. Nairobi: The KNEC.
- Davis K. W. (2008). 'Importance of writing' <http://www.manageyourwriting.com/importanceofwriting>. R 20/01/10
- KNEC. (2013). KCSE examination report, Nairobi: The KNEC.
- Gallagher, R. (2018). The 5 most Important Advantages of Education. Education, Lifestyle www.uk-school-of-english.com R15/4/2019.
- Mu, Congjun. (2005). A taxonomy of ESL writing strategies. In *proceedings redesigning pedagogy: research, policy practice* Singapore. Accessed: [https://eprints.qut.edu.au/secure.00000064/01/congjunmu paper.doc](https://eprints.qut.edu.au/secure.00000064/01/congjunmu%20paper.doc). R 22/07/14
- Borg, W. R. & Gall, M. D. (1989). *Education research: An introduction (Fifth Edition)* New York Longman.
- Kembu, S. E. (1993). A study of written composition: a survey of some factors influencing achievement in written composition in primary schools in Thika (unpublished thesis). Ruiru, Kenyatta University.
- Omwadho, B. O. L. (1984). Factors which influence the teaching and learning of written English in upper primary classes (unpublished thesis) Ruiru: Kenyatta University.
- Njoroge, C. W. (2002). Factors affecting availability, acquisition and utilization of resources in the teaching of English in selected Kenyan secondary schools (unpublished thesis) Ruiru: Kenyatta University.
- Block, J. H., & Burns, R. B. (1976). 'Mastery Learning'. *Review of Research*: (4), 3-49
- Bloom, B. S. (1984). The two-stigma problem: The search for methods of group instruction as effective as one-on-one tutoring. *Education researcher*, 13(6), 4-6.
- Guskey, T. R., & Pigott, T. D. (2009). *The journal of education scholar*. Google.com/scholar. R 14/10/13.
- Dolan, L. (1977-8). 'The status of mastery learning research and practice'. Administrator's Notebook, 26(3): 1-4. In Husen, T., & Postlethwaite, T. N. (eds). *The international encyclopedia of education*, (6), 3219-3229. Oxford: UK Pergamon Press.
- Burns, R. B. (1979). 'Mastery learning': does it work? in *educational leadership*, (37): 110-13.
- Anderson, I. W., & Block, J. H. (1985). Mastery learning, model of learning and teaching. In Husen T. and Postlethwaite, T. N. (eds). *The International encyclopedia of education* volume 6. Oxford UK: Pergmon Press (3219-3230).
- Block, J. H. (1972). 'Student Learning and Setting of Mastery Performance Standards'. In Husen, T., & Postlethwaite, T. N. (eds) *The International encyclopedia of education* (Volume 6). Oxford, UK: Pergmon Press (3219-3229).
- Mc Cabe, D. (1986). *The mastery learning workshop* Hong Kong: educational development centre, Hong Polytechnic University.
- Guskey, T., & Gates, S. (1986). Synthesis of research on the effects of mastery learning in elementary and secondary classrooms. *Educational leadership*, 43(8), 73-80.
- Guskey, T., & Piggot, T. (1988) Research on group- based mastery learning programs: A meta-analysis. *Journal of educational research*, 81(4), 197-216.
- Kulik, C., Kulik, J., & Bangert-Drowns, R. (1990). Effectiveness of mastery learning Programs: A Meta-analysis. *Review of educational research*, 60(2), 265-306
- Dunkelberger, G., & Heikkinen, H. (1984). The influence of repeatable testing on retention in mastery learning. *School science and mathematics*, 84, 590-597.
- Clark, C., Guskey, T., & Benninga, J. (1983). The effectiveness of mastery learning strategies in undergraduate education courses. *Journal of educational research*, 76(4), 210-214.
- Wentling, T. (1973) Mastery versus nonmastery instruction with varying test item feedback treatments. *Journal of educational psychology*, 65(1), 50-58.
- Akinsola, M. K. (1999). *Mastery learning, cooperative learning strategies and student achievement in integrated science*. <http://www.ipn.unikel.de/projekte/esera/book/bi32-aki.pdf> Germany. R 14/10/13.

28. Ngesa, F. U. (2002). Impact of experimental and mastery learning programmes on academic achievement in secondary school agriculture (unpublished thesis) Njoro, Kenya: Egerton University.
29. Adeyemi, B. A. (2007). *Learning Social Studies through Mastery Approach*. <http://www.academicjournals.org/ERR> Adeyemibabs2003@yahoo.com. R 14/10/13.
30. Wachanga, S. W., & Gamba, P. P. (2004). Effects of Mastery Learning Approach on Secondary School Students Achievement in Chemistry in Nakuru District Kenya. *Egerton Journal. Humanities, Social Sciences and Education*, 5(2), 221-235.
31. Koima, J. L. (2006). *Effects of mastery learning on students' academic achievement and motivation in secondary school mathematics in Baringo District*. IP II 208 100 23 Static Steadfast net/...../ R 14/10/13
32. Wambugu, P. W., & Changeiywo, J. M. (2007). Effects of Mastery Learning Approach on Secondary School Students' Physics Achievement. *Eurasia Journal of Mathematics, Science & Technology Education*, 4(3), 293-302.
33. Patterson, W. (1993). Moving forward mastery learning: one school's approach. *NASSP Bulletin*, 77(554), 96-99.
34. Hill, S. Jr., & Hounshell, P. (1991). Summer school remedial biology, an innovative approach. *The American biology teacher*, 53(3), 176-178.
35. Arrendondo, D., & Block, J. (1990). Recognizing the connections between thinking skills and mastery learning. *Educational leadership*, 47(5), 4-10.
36. Levine, D. (1985). *Improving student achievement through mastery learning programs*. San Francisco: Jossey- Bass.
37. Davis, D., & Sorrell, J. (1995) 'Mastery learning in public schools'. *Educational psychology interactive*. <http://chiron.valdosta.edu/whuitt/files/mastlear.htm> l. 21/01/09
38. Anderson, I. W., & Reynolds, A. (1979). 'The effect of mastery learning on the achievement of high ability students and the academic self-concept of low achieving students'. In Husen, T., & Postlethwaite, T. N. (eds) *The International encyclopedia of education*, 6. Oxford UK: Pergmon Press (3219-3229).
39. Cohen, L., & Manion, L. (1989). *Research methods in education* (Third Edition): London and New York: Routledge.
40. Mureithi, G. S. (2012). Constraints Facing Quality Assurance And Standards Officers In Supporting Curriculum Implementation In Public Secondary Schools In Nyandarua County-Kenya.
41. Wakaba, D. W. (2013). The impact of CDF on secondary schools curriculum implementation in Nyahururu District, Laikipia County. *Unpublished thesis. Kenyatta University*.
42. DEO Nyandarua North. (2008). Schools register (unpublished)
43. Hohn, R. L. (1995). *Classroom learning & teaching*. New York: Longman, 272-298.
44. Walsh, B. W., & Betz, E. N. (2001) *Tests and assessment*. Upper Saddle River, New Jersey: Prentice Hall.
45. Darlington, R. B., & Carlson, P. M. (1987). *Behavioural statistics: logic and methods*. New York: The Free Press.
46. Guskey, T. R. (2001). Mastery learning. In N. J. Smelser & PB Baltes (Eds) *International encyclopedia of social and behavioural sciences* (9372-9377) Oxford: Elsevier Science.
47. Bloom, B. S. (1974). An introduction to Mastery Learning Theory' in Block J. H. (ed) *Schools society and mastery learning*: New York: Holt, Rinerhart and Winston.