

Comparison of Impact of Traditional and Modern Teaching Methods on Students' Performance at Elementary School Level

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Abstract

Teaching method acts as a fundamental catalyst of engineering the students learning at all levels. The present research explores the effect of lecture and word wall approaches on elementary level students in their academics with respect to their conceptual comprehension. The purpose of the study was pre-testing and post-testing experimental research that is equivalent group, while in the sample of study 50 students from class 5 were divided into two categories: 25 students in control and experimental classes. The data was collected through pretest and posttest in the form of written tests from students on weekly basis, which was analyzed via ANCOVA using SPSS. The results show that a modern teaching method, i.e. the word-wall, and a high conceptual understanding, enhances the performance of students in the experimental group. It also recommended that the students retain academic principles using modern assessment methods, adopt new teaching strategies and provide cognitive training.

Key Words: Word Wall (WW), Lecture method (LM), Student Performance, Control Group (CG), Experimental Group (EG)

Introduction

Activity based learning approach mainly enrich the learning of students to great extent. Teachers at elementary level often deliver the course content through lecture (i.e. chalk and talk) method while do not employ other vigorous teaching methodologies to improve the conceptual understanding of the students in their academia (Harmon, 2017). The students take handouts from the whiteboard without getting the main theme of the topic which promote cramming among the students. Orlich et al. (2012) was of the notion that the dominant segment of any academic process are the teachers who are responsible for the implementation of assigned curriculum. Similarly, Tao and Wong (2000) stated that lecture method has least effective method in terms of getting conceptual understanding on the topic concern reason being that the students can easily lose their concentration during the delivery of lecture.

Traditional Teaching Methodology: Lecture Method (LM)

The traditional methods of teaching i.e. lecture method are teacher centered and are predominantly employed by teachers in the classroom in order to deliver the topic to the students (Hightower, 2011). In LM, the conceptual understanding of students is related to the level of attention and personal involvement whereas the students in such methods are often passive learners.

In LM, the teachers deliver lecture to share the episteme with students and this medium is deemed as an important part of teaching – learning trajectory (Chen & Cheng, 2004; Lin Feng-pei, 2006; Shen & Qiang, 2002). However, the traditional method of teaching gives prominent role to teachers whereas the students gain maximum knowledge in a limited time. But on the same time, the conceptual understanding and critical thinking potentials of students are not developed as desired.

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Modern Teaching Methodology: Word Wall (WW)

WW method of teaching provides a pictorial illustration to the significant vocabulary selected from the topic of interest. In this method, the teacher provides instructions to the students regarding the selection of difficult and frequently used terminologies and definitions for prominent display on the walls of the classroom, which involves the teachers and students in effective teaching – learning trajectory. Because of visual representation of the words, the students may interact with the terminologies and helps in developing connection between the important concepts. WW method is mainly adopted by teachers at the elementary level in order to strengthen the conceptual understanding. Moreover, through WW method, the students get acquainted with the new terminologies and vocabulary and this strategy can be helpful in clarifying the complex academic concepts ([Harmon, 2017](#); [Harmon, Wood, Hedrick, Vintinner, & Willeford, 2009](#); [Williams and Minshew, 2010](#)).

It has been observed in the classroom the students often visualize the difficult terminologies and definitions, thus acts as a source of effective learning. The students most of the time, after visualizing the vocabulary, initiate discussion which are too effective for their learning. The selection of words is made from the course content taught by concerned teachers in the classroom. Through this method, the reading and writing skills of the students can be improved and deem helpful in developing of word bank by the students in a limited time (Williams & Minshew, 2010).

How to Prepare a Word Wall?

There are Some Important Steps Involved in Preparation of WW for a Certain Class. This Includes:

1. Preparation of WW
 - a) Selection of essential vocabulary
 - b) Process of developing concept mapping
2. Creating worksheet for students
3. WW placement
4. Building of classroom wall
5. Integration of complete student record sheet and WW ([Chen & Cheng, 2004](#); [Handy, 2004](#); [McNeal, 2004](#); [Tao & Robinson, 2005](#))

The research support that the WW method enhances the students conceptual understanding, development of critical thinking and academic concepts. The WW method fuses the learning of students in terms of theory and practice where the students have a sense of academic freedom among them which boost their academic concepts ([Jackson & Ash, 2011](#); [Turner et al., 2009](#)).

Objectives of the Study

- a) To explore the effectiveness of lecture and word wall methods in terms of conceptual understanding of class 5th students
- b) To make viable recommendation for the improvement of teaching methods of science teachers based on experimentation results

Literature Review

The focus of elementary teachers is primarily on clarifying the academically technical and complex concepts through word wall method. In a science textbook, most of the concepts are trailing to link the basic concepts to higher and complex concepts ([Baumann et al., 2007](#); [Berne & Blachowicz, 2008](#); [Ellison et al., 2005](#); [Jasmine & Schiesl, 2009](#); [Rycik, 2002](#); [Tao & Robinson, 2005](#)). Besides these, word wall is also applicable in languages and arts including all the essential component especially reading and writing. Eventually a word wall encompasses high frequency words, morphology of words, exact usability of vocabulary, correct pronunciation, incorrect usability of words by students, words with baffling alphabets at lower grades and develop focus of teachers to provide suitable time and attention to each and every student in a class ([Baumann et al., 2007](#); [Ganz, 2008](#); [Jasmine & Schiesl, 2009](#)). A study was conducted by Rycik (2002) on 18 primary level teachers who were using

high frequency words, development of students' vocabulary and usability of words in sentences in groups. The results were positive as the engagement of students in academic activities were enough positive and after sometimes the students seems to be independent learners while the teacher only act as the guide. The response rates of word wall at elementary level was attractive and yield good results.

In another study, Jasmine and Schiesl (2009) observed the teachers of first class regarding the development of fluency in a language among students through rigorous application of word wall as a teaching method in classroom. Initially the teachers focus on enhancement of the students' fluency through WW method and consistently providing the reference material in the classroom. The students face difficulty in developing fluency skills and were unable to develop link with the reference materials, so in order to search for the reason, Jasmine and Schiesl (2009) executed a research on students of Class 1st, the results of that research was that the teachers are required to involve the live participation of students in their academic activities. The students perform well when the teachers focus on the participation of students in classroom activities and then encourage them to work in groups. The students eventually got mastery on the fluency of words and were in a better position to use these words in making sentences in the classroom.

The effectiveness of WW teaching method was also found good in higher classes when applied by the teachers during their classroom's activities (Baumann et al., 2007; Ganz, 2008). The teachers also use the word wall method in teaching number of writing and vocabulary dimensions to the students (Finch, 2010; Ganz, 2008) while the students when make some mistakes in writing the words with difficult pronunciation, the teachers encourage to learn that word through word wall method. The teacher encourages the students to write a misspelled word through word wall and place it on prominent place in the class that the students may sight the same consciously and unconsciously, and this strategy yield good results. These words were used by all the students throughout the year which helps them in concept mapping and developing links of complex academic topics. Through this approach, the dictation and vocabulary of students was also improved thus yielding desired outcomes by the students.

According to Ganz (2008) in a vocabulary program, the students were provided cards up in which the students were supposed to write course related terminologies and their definition. The prefixes and suffixes of those words were colored. The results of this activity as conducted by Ganz (2008) states that the vocabulary scores of the students in their annual performance was high, which means that the word wall method yields the desired outcomes and results if implemented in an enthusiasm and spirit.

Besides the vocabulary development of students, the word wall also shows good results was the knowledge of the students over the given time period. An experimental study was conducted by Baumann et al. (2007), where 20 students of class 5th were taken as sample. The pre and posttest were made in August and May respectively and up on the comparing of results, it was found that the knowledge of students was enhanced. The experiment also concluded that the student's vocabulary retention skills was also significantly improved which was a good addition.

Research indicates that the implication of word wall provides the desired teaching outcomes both at elementary and secondary levels. This teaching method even address multiple topics and the students feel comfortable because they are fully involved in the teaching learning trajectory. Whilst the teaching, the performance of each student can be monitored as in most of the cases; the teacher make groups of students and group leaders provides feedback about the students of their groups in a comprehensive way (Harmon, Wood, Hedrick, et al. 2009; Harmon, Wood, & Kiser, 2009; Routman, 2003; Yates et al., 2011).

According to Yates et al. (2011) the application of WW is effective in teaching the vocabulary of any subjects at elementary level because the major feature of this teaching method is the placement of word or difficult terminology in a prominent place of class or school. So, such concepts which are difficult for students, when are placed in a classroom or school corridors, the students interact them all the times which results in clarification of those baffling concepts. Most of the time, the teacher selects those words which provides a platform to students in concept making and linking of words with other terminologies. Thus, this activity eventually clarifies the overall topic and acts as a summary of the lesson. The ultimate outcome of word wall method gained in the form of improved the vocabulary learning and their maximum retention skills and enriching the knowledge of students.

Methodology

Nature of the study

The Current Study was Experimental Research Focusing on Pretest and Posttest Equivalent Group Design. The Study Design was Given as Below:

	Pretest	Treatment	Posttest
WW (Experimental group)	O ₁	X _t	O ₂
LM (Control group)	O ₁	-	O ₂

The graphical representation O₁ shows the pre-test scores of students in Control Group (CG) and Experimental Groups (EG), X stands for the treatment of EG, and O₂ stands for posttest scores of students in CG and EG (Johnson & Christensen, 2017).

The population of the study constitutes 60 students from class 5th. The sample size of study constitutes 50 students selected through test re-test approach. In this approach, three tests were taken from the population on various occasion and acts as a foundation for selection of students for the study. These tests were marked by their respective teachers and the following categories were made:

- i) Students with Excellent performance 80% and Above
- ii) Students with moderate performance 60% - 79%
- iii) Students with low performance 59% and below

From the above categories, 10 students were selected from each category (i) and (iii) while 30 students from moderate category. The students were then equally distributed among the groups being termed as CG and EG (25 students in each group). The process of randomization was made to allocate the students in the group i.e. control and experimental (which was made through draw method). The teachers of control group were not provided any special training while the teachers of experimental group were provided training through various modules for a period of 2 weeks. For teaching purpose, the Gagne's lesson plan was used during the entire period. The duration of experimentation was for 10 weeks i.e. from 29th October 2018 to 05th January 2019 in which one unit per week was taught by CG and EG teachers. The variables like teachers' experience, teachers' qualification, class duration and location were controlled.

The validity of the research instrument was checked via focus group design i.e. tests were given to the teachers of science subject for validation. Moreover, the Q – sorting techniques were made which helps in the position and arrangement of questions in the tests.

Data Collection and Analysis

There were ten chapters in the subject of General Science for class 5th. From each chapter, 20 Multiple Choice Questions were developed with one mark each for an item and were employed on students of CG and EG for checking their conceptual understanding. The students of CG and EG were taught through LM and WW round the week respectively. The pretest conducted was employed on CG and EG before the start of the lesson and posttest was applied on both groups after the completion of lesson. The pretests and posttest were marked and then analyzed through *students test* and *Analysis of Co-Variance (ANCOVA)*.

Discussion and Results

The collected data through pretests and posttests was analyzed through independent t tests and ANCOVA. Initially, the analysis of cumulative data of ten weeks was made showing the effectiveness of WW and LM on the conceptual understanding of students of 5th class.

Test of Normality

Before the Application of Independent Sample T-Test, Test of Normality (NT) was Made for Checking the Nature of Pretest Data.

Table 1. Test of Normality

Group	Descriptive			NT					
	Statistics	Std. Error	Kolmogorov – Smirnov			Shapiro – Wilk (SW)			
			Statistics	Df	Sig	Statistics	Df	A	
Pretest	CG								
	Skewness (Sk)	0.27	0.46	0.20	25	.006	.92	25	.05
	Kurtosis (Ku)	-0.34	0.90						
	EG								
	Skewness	0.86	0.46	0.19	25	.019	.91	25	.04
	Kurtosis	1.14	0.90						

A *SW test* ($p > 0.05$) showed that the pretest scores for CG and EG were approximately normally distributed. Furthermore, the *Sk* of 0.27 (SE = 0.46) and a *Ku* of -0.34 (SE = 0.90) for CG and *Sk* of 0.86 (SE = 0.46) and a *Ku* of 1.14 (SE = 0.90) for EG shows normal distribution of the data. As the data are normally distributed, therefore, an independent t test was applied.

Independent Sample T Test

In Order to Check for any Significant Difference Between the CG and EG, an Independent Sample T Test was Applied.

Table 2. Group Statistics

Group	N	\bar{x}	Σ	σM
Pretest Control	25	6.08	1.11	.22
Experimental	25	6.36	1.68	.33

The above table shows that group statistics having mean value has no significant difference between the pretest of CG and EG, or we can say that both the groups have same attributes.

Table 3. Testing Assumption for T Test

		Levene's test for Equality of Variances	
		F	A
Pretest	Eq. Var. Assumed	3.15	0.08
	Eq. Var. not Assumed		

Prior to apply the t test, the assumptions are to be checked. The independent sample t test revealed that variance was assumed as equal due to greater *p* value (i.e. Sig.=0.08) than 0.05. Thus, the table revealed that the independent t test's assumption was fulfilled.

Table 4. Independent Sample Test

T – Test for Equality of Means						
T	v	α (2 Tailed)	$\mu_1 - \mu_2$	SE	Confidence Interval (0.05)	
					Lb	Ub
-.69	48	.49	-.28	.40	-1.09	.53
-.69	41.70	.49	-.28	.40	-1.09	.53

The table 1.4 showed that there was no violation made by Levene's equality of variance test i.e. $p = 0.08$. The table shows that the CG (Mean= 6.08, St. Dev.= 1.11) was approximately same to the EG (Mean= 6.36, St. Dev.= 1.68) for 5th class in general science subject, $t(48) = -.69, p = .49$. Based on pretest scores, it can be concluded that CG and EG are equal in all aspects.

Analysis of Covariance (ANCOVA)

The ANOCVA was applied on the data regarding the checking of effectiveness of WW and LM on the conceptual understanding of students at elementary level. First, an overall analysis of all the weeks were made followed by each week.

Table 5. Levene's Test of Equality of Error Variances

F	V ₁	V ₂	A
2.92	1	48	.09

The table 1.5 revealed that the Levene's test for Equality of Variances is higher (0.09) than level of significance, α (0.05), which means equal variance was assumed.

Table 6. ANCOVA Tests Results

Source	Type III SS	v	\bar{x}^2	F	α	Partial Eta ²
Corrected Model	256.72	2	128.36	113.40	.000	.82
Intercept	578.32	1	578.32	510.95	.000	.91
Pretest	5.84	1	5.84	5.16	.028	.09
Group	240.84	1	240.84	212.79	.000	.81
Error	53.19	47	1.13			
Total	14828.00	50				
Corrected Total	309.92	49				

The table 1.6 revealed that $F(v_1, v_{47}) = 212.79, p = .001$, indicating significant difference between the LM (CG) and WW method (EG). The partial Eta² values showed the degree of effect size following Cohen's protocols. The table 1.6 clearly indicates that the partial Eta² value was large (0.81), which shows the intensity of dependent variables (students' conceptual understanding) explained by independent variable (LM and WW teaching method) that is 81%.

Table 7. Marginal Means – Estimation

GROUP	CI (0.05)			
	\bar{x}	SE	Lb	Ub
Control	13.55	.58	12.37	14.73
Experimental	17.96	.61	16.73	19.20

The table 1.7 revealed that the marginal means (estimated) simply yields adjusted means (making pretest values as constant and removing their effects statistically) for each group. It is clear from adjusted means that EG has performed well in developing the conceptual understanding of students at elementary level.

Analysis of Ten Weeks Experimentation Data

The table 1.8 indicates the analysis of 10 weeks data of 5th class which clearly demonstrate the effectiveness of WW teaching method on students' academic performance along with the degree of impact.

Table 8. Analysis of 5th Class Data – Summary

Week	ANCOVA result	CG Vs EG	Effect size
1	F = 20, α = 001	EG	45%
2	F = 13, α = 001	EG	36%
3	F = 14, α = 001	EG	37%

4	F = 13, $\alpha = 001$	EG	36%
5	F = 13, $\alpha = 001$	EG	35%
6	F = 16, $\alpha = 001$	EG	40%
7	F = 21, $\alpha = 001$	EG	46%
8	F = 27, $\alpha = 001$	EG	53%
9	F = 30, $\alpha = 001$	EG	56%
10	F = 52, $\alpha = 001$	EG	68%

The table 1.8 shows the analysis of experiments of 10 weeks mentioning the positive performance of EG students in terms of their conceptual understanding when taught by WW teaching method. The table also indicates the degree of effectiveness of LM and WW teaching method in the form of effect size or partial Eta square. Mostly, partial Eta square for ten weeks experimentation was more than 35% thus revealing that the conceptual understanding of students of EG for ten weeks was high and optimistic. The effect size of each week shows the consistency of experimental group teachers in teaching the assigned subject and topics with dedication and commitment. The teacher of experimental group fully involves the students in teaching learning trajectory and yield the desired outcomes.

Findings, Conclusion and Recommendation

The study findings are based on the results of ANCOVA applied on the data collected from class 5th showing the conceptual understanding of EG students' for the topics "taxonomy and traits of animals", "taxonomy and traits of plants", "virus and bacteria", "Fungi and microbial infections,", "Seed structure", "Seed germination", "Pollution and its types", "Precautionary measures for pollution, biologically degradable and non-degradable materials", "Matter and particles arrangement after exposed to heat" and "procedure of changing the state of matter" were positive having 45%, 36%, 37%, 36%, 35%, 40%, 46%, 53%, 56% and 68% as mentioned in the table 1.8 respectively.

Discussion

The current study explored the effectiveness of teaching methodologies i.e. WW and LM and declares that the performance of teacher during teaching the subject of science to class 5th in EG through WW method was up to the mark. The effectiveness of WW method was high at lower level i.e. elementary level students and this was also supported by [Vintner et al \(2015\)](#) that teachers employ WW teaching method on students of secondary level, which enhances the capacity of vocabulary development and concept mapping among the students. The teacher taught the subject of science content for a period of ten weeks, thus yields a positive impact on students' academics. The reason behind such outcomes were the consistent mode of teaching opt by experimental teacher, provide opportunity to students for maximum participation in the subject matter, and involvement of the students by the teachers regarding the selection of word for enrichment of word bank. These factors collectively show positive outcome in terms of enhance and clarified academic concepts.

Conclusion

The study concluded that EG students perform good in their academics in terms of having high conceptual understanding that the students of control groups. The teacher taught the EG students via WW teaching method whereas the students of CG were taught through LM. The dedication and teaching performance of experimental group teacher was showing good results reason being that they involve the students in classroom activities, focus on their previous learning and conceptualize the preceding topics, create group competition in order to develop confidence level among students.

Recommendations

The study recommended that the school management may provide training to the teachers regarding the

innovative teaching methods along with the provision of physical facilities, conducive environment for initiating new methodologies in the classroom, maximum students' involvement in the process of teaching and learning, changing the modes of assessment and provides rubrics before the start of the course content and training to the students regarding the retention of terminologies and vocabulary.

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