

Analysis of the effectiveness of self questioning on the academic achievement of students having varied learning styles

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Abstract

Analysis of the effectiveness of Self-Questioning on the academic achievement of students having varied learning styles. Questioning which act as not only a cornerstone of all effective curriculum transaction, but a rich resource to promote intellectual involvement of learners in the learning task to advance student thinking, learning, achievement and provide valuable feedback. Effective use of questions serves as the first foundational skill for active processing of information and it helps students to deeply engage in orchestrated learning experience. The study intends to find out the effectiveness of Self Questioning on the academic achievement of students having varied learning styles. For that purpose, the investigator employed various tools like Learning style inventory, Lesson designs based on self-questioning and Test on Academic achievement. The analysis shows that even though the students prefer varied learning modalities, they exhibited remarkable improvements in their academic achievement in Malayalam language learning when they exposed to the select classroom practice. The study reveals that this type of classroom practice will enable the students to recall the content in a well worthy manner and the power of retention will be increased. The findings of the present study have implications for learners, teachers, curriculum designers and textbook constructors. Timely initiatives taken by the educational agencies related to quality of education with regard to the implementation of such practices provide a valuable space for deep success in the learning of Malayalam language.

Keywords: self-questioning practice, learning styles

Introduction

Questioning which act as not only a cornerstone of all effective curriculum transaction, but a rich resource to promote intellectual involvement of learners in the learning task to advance student thinking, learning, achievement and provide valuable feedback. Effective use of questions serves as the first foundational skill for active processing of information and it helps students to deeply engage in orchestrated learning experience. Art of generating questions is a way of opening students to discussion and to critical thinking and it facilitates development of learner's receptive

and expressive language competencies. Providing the 'question starters' while discussing the varieties of questions invites the learners to create different types of questions and explain the generated questions in a fruitful manner. In 'Teaching Thinking through Effective Questioning,' a comprehensive resource on questioning and questioning strategies, Francis, P Hunkin (1995)^[1] makes a strong case for the relationship between effective questioning, thinking and achievement. It offers a holistic, three stage approach to teaching students how to formulate better questions which are portrayed in Figure 1.

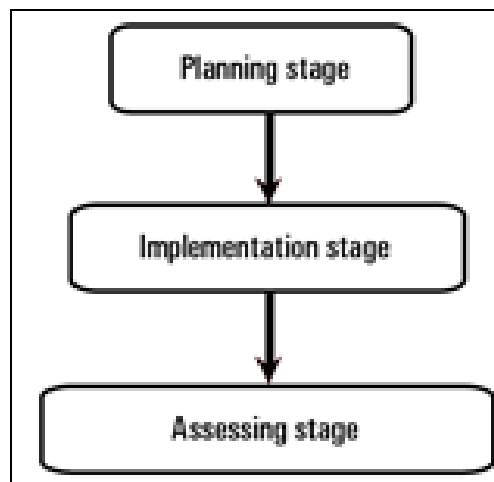


Fig 1: Hunkin's three stage approach for formulating better questions.

In the present study the investigator utilized the stages put forth by Hunkin towards eliciting questioning practices in a meaningful way. Planning stage consisting of activities that enable students to think about a given topic and formulate their own questions about it. Implementation is intended to use the questions learners developed, and monitor, modify and sense them as needed to meet their needs. Assessing stage is the stage of the process when students evaluate their questions as to their effectiveness.

Review of Related Studies

Shang and Chien (2010) [4] explored the effectiveness of self questioning strategy on EFL learners’ reading comprehension. Pate (2011) [2] found out the effects of regulatory self questioning on secondary level career and technical education. Berkeley *et al.* (2005) [5] investigated the effectiveness of self questioning strategy for improving student reading comprehension of grade level social studies text material.

Statement of the Problem

Analysis of the effectiveness of Self Questioning on the academic achievement of students having varied learning styles.

Hypotheses of the study

1. There is no significant difference in the academic achievement of Visual students with regard to the implementation of Self Questioning strategy
2. There is no significant difference in the academic achievement of Auditory students with regard to the implementation of Self Questioning strategy
3. There is no significant difference in the academic achievement of Kinesthetic students with regard to the implementation of Self Questioning strategy

Objectives of the study

1. To identify the learning styles based on the sensory modalities of students selected for the study
2. To identify the effectiveness of Self Questioning on Visual students
3. To identify the effectiveness of Self Questioning on Auditory students
4. To identify the effectiveness of Self Questioning on Kinesthetic students

Sample selected for the study

165 Secondary school students from four schools belong to three districts of Kerala namely, Pathanamthitta, Alappuzha and Kottayam were selected for the study.

Methodology adopted for the study

In the present study, a mixed method of research design, incorporating both quantitative and qualitative data collection and analysis was used.

Tools employed for the study

Learning style inventory, Lesson designs based on self questioning, Test on Academic achievement.

Procedure adopted for the study

Preparation and Standardization of learning style inventory

The investigator prepared a learning style inventory with special reference to the sensory modalities of students. Opinion and suggestions of experts were used for qualitative process of standardization and the students’ scores were taken for the quantitative aspects. The draft inventory was subjected to the experts’ opinion and they were requested to validate and rate it. It was administered to 150 students and the statements for which ‘t’ value is greater than or equal to 1.75 was regarded as an item The finally selected 60 statements were arranged from 1-60 numbers in such a way that the first 20 (1-20) statements were meant for ‘Visual’ learning style group, the next 20 (21-40) for the ‘Auditory’ learning style group and the last 20 (41-60) for Kinesthetic’ learning style group.

Validity & Reliability

Investigator discussed the items with various experts in the field of language education and made modifications in the items and hence ensured content validity. For establishing reliability Test-retest reliability co-efficients were calculated. Co-efficients of co-relation for Visual learning style scores, Auditory learning style scores, Kinesthetic leaning style scores were 0.918, 0.904 and 0.929 respectively which means it was reliable. After identifying the learning styles of the students, the investigator implemented the sequential phases mentioned earlier towards practicing Self Questioning. For that purpose, varied types of questions were used. Students in the experimental group were given opportunities to practice this strategy with their topic. The next section deals with the results obtained from the analysis of the scores of students having varied learning styles. The effectiveness of the classroom practice, Self Questioning among varied learning style groups of students was analyzed by comparing the pre test and post test achievement scores of them in both experimental group and the control group.

1. Analysis of the effectiveness of ‘Self Questioning’ on Visual students.

The descriptive statistics of pre and post test achievement scores were found out and described in the Table below.

Table 1: Descriptive statistics of pretest and post test achievement scores of Visual students in experimental group and Visual students in control group.

Variable	Group	N	AM	SD	SE	LCL	UCL
Pre	Contl.	29	4.07	2.00	0.37	3.31	4.83
	Exptl.	32	5.34	2.35	0.42	4.50	6.19
Post	Contl.	29	9.59	2.37	0.44	8.69	10.49
	Exptl.	32	19.13	1.13	0.20	18.72	19.53

From table 1, it is understood that the pre test achievement scores in the control group and in the experimental group are approximately equal to the population mean.

Determining the effectiveness by using ANCOVA

ANCOVA with pre experimental status in achievement as co variate was employed to investigate the effectiveness of the classroom practice, S.Q in improving academic achievement

of Visual students in their Malayalam language learning. The details are given in Table below.

Table 2: ANCOVA of post test achievement scores of Visual students in experimental group and Visual students in control group by eliminating the effect of pre test achievement scores.

variable	SV	SS	df	MSS	F	P
Adj. post	BV	1258.12	1	1258.12	372.33**	<0.01
	WV	195.99	58	3.38		
	T	1454.10	59			

** : Significant at 1% level (P<0.01), R squared=0.876 (Adjusted R Squared=0.872)

It shows that the experimental and control groups differ significantly in the post test achievement scores. (F=372.33, P<0.01). It can be inferred that the experimental group performed better than the control group. The comparative bar

diagram of pre test, post test and Adj. post test achievement scores of Visual students in both experimental group and control group is shown in Figure 2.

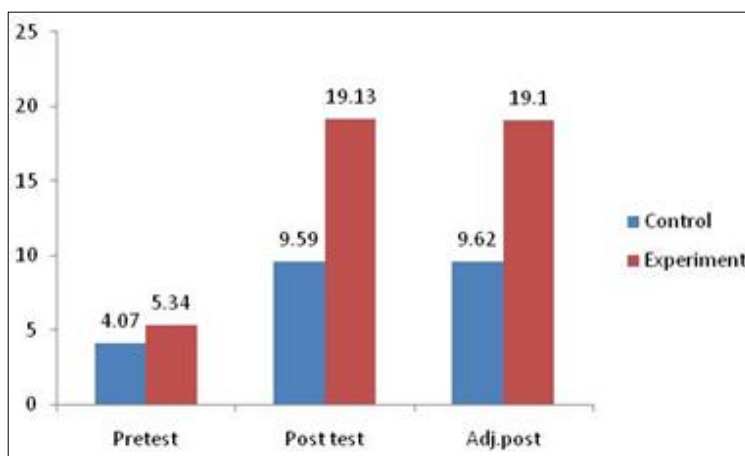


Fig 2: Comparative bar diagram of pre test, post test and Adj. post test achievement scores of Visual students in experimental group and Visual students in control group.

The graph indicates that the Visual students who were exposed to the select practice showed significant effect on the improvement in their academic achievement.

2. Analysis of the effectiveness of ‘Self Questioning’ on Auditory students

The descriptive statistics of pre and post test achievement scores of them were found out and described in Table 3.

Table 3: Descriptive statistics of pretest and post test achievement scores of Auditory students in experiment group and Auditory students in control group.

Variable	Gp	N	AM	SD	SE	LCL	UCL
Pre	Contl.	27	4.67	1.71	0.33	3.99	5.34
	Exptl.	28	4.96	1.79	0.34	4.27	5.66
Post	Contl.	27	8.93	1.62	0.31	8.29	9.56
	Exptl.	28	25.00	2.88	0.54	23.88	26.12

From table 3, it is understood that the pre test achievement scores in the control group and in the experimental group are approximately equal to the population mean.

Determining the effectiveness by using ANCOVA

ANCOVA with pre experimental status in achievement as co variate was employed to investigate the effectiveness of the

classroom practice namely S.Q in improving academic achievement of Auditory students. The details are given in Table 4.

Table 4: ANCOVA of post test achievement scores of Auditory students in experimental group and Auditory students in control group by eliminating the effect of pre test achievement scores.

Variable	SV	SS	df	MSS	F	P
Adj.post	BV	3512.09	1	3512.09	629.29**	<0.01
	WV	290.21	52	5.58		
	T	3802.30	53			

** : Significant at 1% level (P<0.01), R squared=0.924 (Adjusted R Squared=0.922)

ANCOVA shows that the experimental and control groups differ significantly in the post test achievement scores. (F=629.29, P<0.01). It can be inferred that the Auditory students in experimental group performed better than the

Auditory students in control group. The comparative bar diagram of pre test, post test and Adj. post test achievement scores of Auditory students in both experimental group and control group is shown in Figure 3.

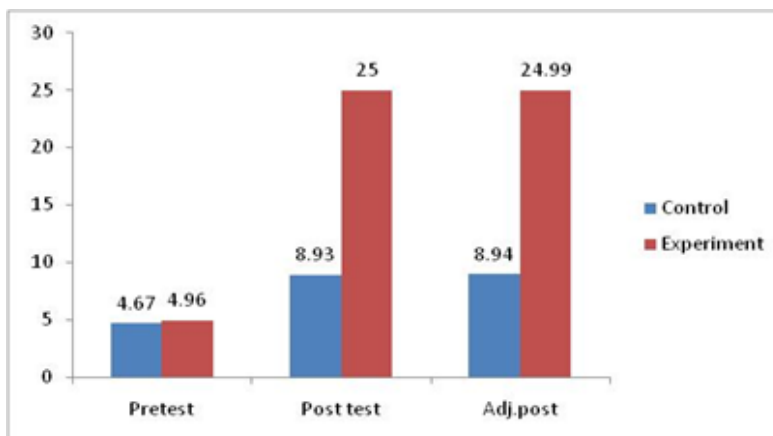


Fig 3: Comparative bar diagram of pre test, post test and Adj. post test achievement scores of Auditory students in experimental group and Auditory students in control group.

The graph indicates that the Auditory students who were exposed to the select practice showed significant effect on the improvement in their academic achievement.

3. Analysis of the effectiveness of Self Questioning on Kinesthetic students.

The descriptive statistics of pre and post test achievement scores of them were found out and described in Table 5.

Table 5: Descriptive statistics of pretest and post test achievement scores of Kinesthetic students in experimental group and Kinesthetic students in control group.

Variable	gp	N	AM	SD	SE	LCL	UCL
pre	Contl.	27	4.26	1.77	0.34	3.56	4.96
	Exptl.	24	4.71	1.68	0.34	4.00	5.42
post	Contl.	27	8.96	1.26	0.24	8.47	9.46
	Expt.	24	19.13	1.57	0.32	18.46	19.79

From table 5, it is understood that the pre test achievement scores in the control group and in the experimental group are approximately equal to the population mean.

ANCOVA with pre experimental status in achievement as co variate was employed to investigate the effectiveness of the classroom practice namely S.Q in improving academic achievement of Kinesthetic students over the present activity oriented modes of curriculum transaction. The details are given in Table 6.

Table 6: ANCOVA of post test achievement scores of Kinesthetic students in experimental group and Kinesthetic students in control group by eliminating the effect of pre test achievement scores.

variable	SV	SS	df	MSS	F	P
Adj. post	BV	1259.92	1	1259.92	690.07**	<0.01
	WV	87.64	48	1.83		
	T	1347.56	49			

** : Significant at 1% level (P<0.01), R squared=0.938 (Adjusted R Squared=0.935)

ANCOVA shows that the experimental and control groups differ significantly in the post test achievement scores. (F=690.07, P<0.01). It can be inferred that the experimental group performed better than the control group. The comparative bar diagram of pre test, post test and Adj. post test achievement scores of kinesthetic students in both experimental group and control group is shown in Figure 4.

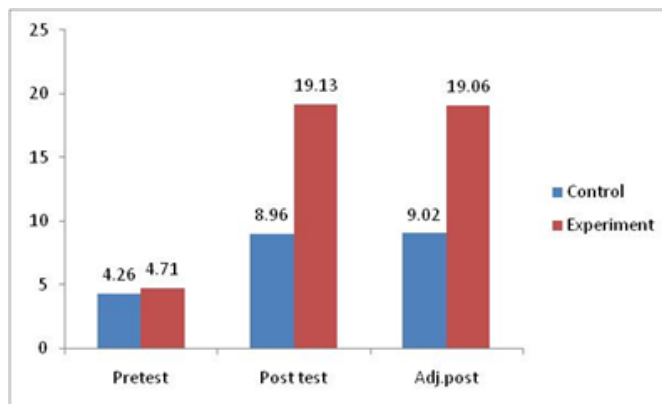


Fig 4: Comparative bar diagram of pre test, post test and Adj. post test achievement scores of Kinesthetic students in experimental group and Kinesthetic students in control group.

The graph indicates that Kinesthetic students who were exposed to the select practice showed significant effect on the improvement in their academic achievement. The analysis shows that even though the students prefer varied learning modalities, they exhibited remarkable improvements in their academic achievement in Malayalam language learning when they exposed to the select classroom practice.

Summary and conclusions

The study reveals that this type of classroom practice will enable the students to recall the content in a well worthy

manner and the power of retention will be increased. It supports the rationale behind the positive impact strategy instruction on the academic achievement of students and this highly participative and interactive instructional methodology allows the learner to build a mental state with confidence by utilizing guided practice and timely feedback. The practice on developing quality questions help to build a collaborative work culture among the students towards strengthening and invigorating their efforts to become responsible learners.

Pedagogical Implications

In order to internalize the process of language learning, a reorientation is needed to explicate the underlying features of classroom practices. The general impact of the study reveals that it is high time to orient towards differentiating instruction for creating an enriching environment. This instructional approach gives the students a sense of ownership over the learning process and focuses on individual needs. The findings of the present study have implications for learners, teachers, curriculum designers and text book constructors. Timely initiatives taken by the educational agencies related to quality of education with regard to the implementation of such practices provide a valuable space for deep success in the learning of Malayalam language.

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