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EFFECTS OF TEACHING STRATEGIES ONSTUDENTS' MOTIVATION IN LEARNING OF MATHEMATICS AT SECONDARY LEVEL

Abstract

Mathematics is one of the core subject and knowledge for students to know, understand and participate in work to develop their interest, motivational skills and concept. A large number of students hesitate and argue that mathematics is a difficult subject so for therefore they do not take interest and feel difficult to understand it in traditional practicing way in schools. Random sampling used to collect data from respondents and total 100 students included in sample and obtained responses from them on a 5 points scale. Data was analyzed through SPSS. It is concluded that It is necessary to regulate the way of teaching strategies in teaching and learning process at secondary level that students develop their logic skills taking into explanation learning theories being stated the ability to solve the math problems in easy way.

Key Words: *Teaching Strategies, students' motivation in learning mathematics.*

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Introduction

In learning mathematics students argue that they face complications in gaining concepts. In teaching and learning process motivation refers greatness and determination of behavior, it shows the interest and choices of students make goals or avoid. In connection to education motivation refers to student desire, participation and willingness in the learning process to be successful and achieve their desired goals. Teaching strategies move the students towards involvement in activities and teaching interest in subject matter. Such motivational teaching strategies / approaches like as using models, material, objects, pictures, av-aids develop the intrinsic and extrinsic motivation towards learning mathematics at secondary level. Teaching styles and strategies by teacher is strong factor in motivating learners to learn with attention. Conducted study by Morshed (2013) acknowledged from several studies that at secondary level math performance was the lowest of all school subjects even failed to display adequate capability.

Mathematics is one of the core subject and knowledge for students to know, understand and participate in work to develop their interest, motivational skills and concept. A large number of students hesitate and argue that mathematics is a difficult subject so for therefore they do not take interest and feel difficult to understand it in traditional practicing way in schools. It is necessary to regulate the way of teaching strategies in teaching

and learning process at secondary level that students develop their logic skills taking into explanation learning theories being stated the ability to solve the math problems in easy way. Purwanti, D. E. (2013) renowned that previous studies has been conducted in different situation of education in enhancing motivational skills of students, using diverse types of cooperative learning teaching techniques. Some of them which help the students developing interest and motivation techniques are Jigsaw grouping, Group Investigation, learning Together and Team Games Tournaments.

According The Education for All Reported published in (2013/14) digital classroom can improve learning and connection the gaps among the less competent teachers. Furthermore use of technology can improve learning concepts and motivational skills among students in teaching mathematics as well. Few decades back cooperative learning had a straight input to successful learning consequences. Adeniran (2013) identified that teachers face difficulties to teach mathematics beside the nature of children they struggle children end up to hate learning mathematics. He was anxious that traditional learning method of memorization is harmless to the learning of mathematics at secondary level.

Koller, Baumart & Schnable (2004); Schwartz (2006) collection of researchers agree that distinguished level of motivation, interest, efficiency, pledge and engagement in activities can develop level of achievement. Steinkuehler (2010) suggested that

learning as a process of achieving knowledge, enhancing motivation skills through using multiple strategies of teaching and multimedia teaching practice to learn mathematics at secondary level. Different teaching strategies like as playing games and having fun in solving sums, pupil come across new words and develop their conceptual understanding regarding to the achieving the goals and motivation skills in learning mathematics.

Holzinger, Nischelwitzer & Meisenberger (2005) suggested that computer games directly upkeep teaching students to develop cognitive skills and knowledge to make decision by solving problems to learn by researching and seeking learning. However the government had arisen up creative question technique that some students yet not beyond mathematics proficiency level as compare to other subjects. This type of current practice in teaching mathematics at secondary level attributed to several factors may consist of gaps in preparation for teaching mathematics, lack of interest of teachers' in participation professional development and lack of applying effective instructional strategies in mathematics classrooms at secondary level students. This kind of practice failure to get students appropriately motivated for problem solving exercise in this regards. Cooperative learning teaching techniques carry out educational practice as reluctant Wyk (2011).

The basic problem in learning mathematics is that in what way students to think mathematically

inside narrow classroom situation. Only sound teaching strategies implementation can improve students' mathematical knowledge, concepts and way to link it with everyday life activities. Mostly students compliant that the lack of effectiveness and significance of mathematics block students own mental approach against using mathematical methods and failure to benefit from the mathematics interconnected taught to develop their understanding, interest and motivational skills.

Objectives

1. To find influence of inquiry based leaning on the students' motivation in learning mathematics at secondary level public schools
2. To find impact of co-operative leaning on the students' motivation in learning mathematics at secondary level public schools

Literature Review

Mathematics achievement is very closely related to affective variables like as self-concept, related self and parents' expectations. McLeod, (1992) affective variables have strong influence on learning and achievement of mathematics. It is well reported that such variables incudes on belief on mathematics learning, belief on self and belief on mathematics. Such types of students' perceptions of mathematics and mathematics learning are mathematics achievement, attitude towards mathematics, belief in mathematics learning and understanding, classroom environment and home background, conceptions of mathematics and learning habits and homework.

Cheng & Wong, (1991) stated that majority of the students thought that tackling mathematics problems, word problems, numerical problems and understanding the mathematics lessons are very difficult. Though some students like mathematics observed it as an important subject but such of them did not have confidence in learning mathematics as their level of studies upward.

Nyaumwe, Bappoo, Buzuzi and Kasiyandima (2004) have been criticized that teacher centered methods do not make learners conceptual development and do not motivates to encourage problem solving skills in learners. On the other hand a learner centered teaching strategies supports learners in developing mathematical thinking and encouraging them to remark the teacher help they develop understanding in mathematics (Brodie, 2006). The literature review findings show that applying relevant, interesting and more teaching strategies effects on students' motivation at secondary level that they took interest in learning mathematics. Some innovative teaching methods and related teaching strategies like as cooperative learning, direct instruction and problem based instruction in learning mathematics put positive impact towards taking interest of learners to learn mathematics smoothly. Such activities draw upon newspaper article or experiential learning activities develop statistics concepts and put positive influence on carrier and lives of the learners (Zewotir, 2014).

Smith & Martinez-Moyano, (2012) stated that in teaching initial statistics courses researchers indicate that traditional methods often observed fruitless and students getting nervous because they consider mathematics as a difficult field. In its place, researchers believe that cooperative learning or small group activities should replace traditional methods to encourage students more critical situation learner in mathematical concepts (Garfied& Ben-Zvi, 2008). Steen, (2001) in present years, in the mathematics classrooms has been an increased emphasis on using real life setting so that learners can connect to the matter. Young learners do not memorize mathematics. They took interest talking, thinking and learning by doing (Ontario Ministry of Education, 2003). Play time assigning students analytical questions promote thinking and extend their learning. Such instructional recommendations of using teaching strategies students develop their motivation about having meaning, not problem that hold meaning, consenting for inspiration, supportive different problem solving methods and support (Student Achievement Division, 2011).

Students become co-constructors of knowledge from side to side learning through multiple activates like as communicating their ideas, justifying their work, asking questions (Wagganer, 2015). The multiple teaching strategies for development of students' conceptual understanding about learning math, developing interest and high achievement put positive effects. Pedagogy and ways improve success

in mathematics using appropriate and effective strategies at secondary level students (Giford, 2014). Some teaching strategies like as memorizing mathematics is not appropriate strategy for developing understanding of students. Motivation and taking interest in learning mathematics researchers suggest fluency in ability to apply and use of steps or strategies for different problem to solve it confidently. Nevertheless, mathematics classes often focus on routine understanding and drills (Protheroe, 2007).

At secondary level stage students need to work on interest and rich mathematical problems it should be practicing ongoing and continuous practice. Integration of games in teaching process contributes learners' more achievement in learning mathematics (Moore, 2016). Making mathematics more accessible and enjoyable teacher can share connection of mathematics to real-world environment. Smith & Martinez- Moyano, (2012) stated that traditional methods in teaching mathematics make students nervous and viewed as unproductive at the results students consider mathematics difficult field. On the other hand, cooperative learning, small group and variety of strategies in teaching mathematics at secondary level develop students' conceptual understanding and motivational skills.

Hypothesis

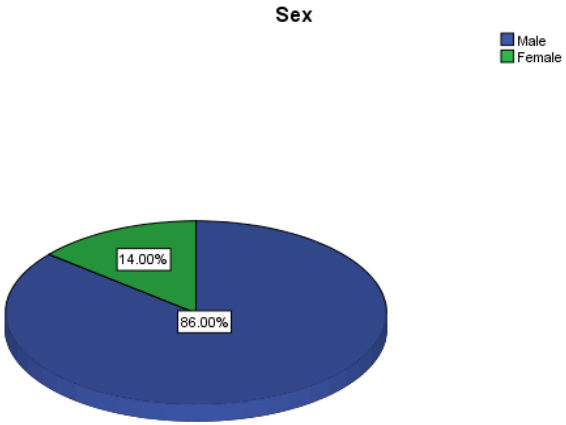
1. Inquiry based leaning has positive and significant impact on the students' motivation in learning mathematics at secondary level public schools
2. Co-operative leaning has positive and significant impact on the students' motivation in learning mathematics at secondary level public schools

Methodology, Results & Interpretation

Quantitative design of research has used. Data collected from schools at secondary side through random sampling. The complete description of data is as under:

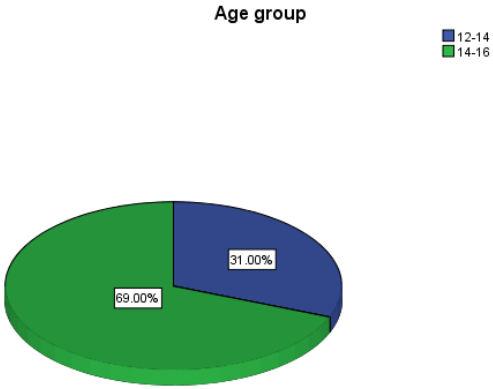
Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	86	86.0	86.0	86.0
	Female	14	14.0	14.0	100.0
	Total	100	100.0	100.0	



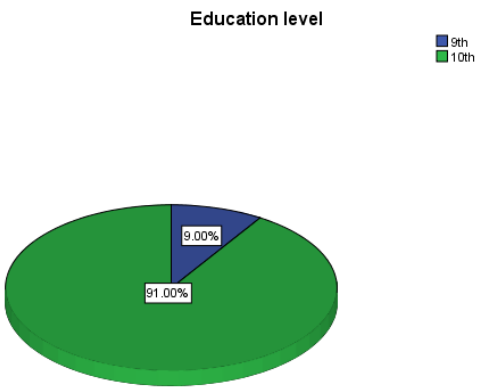
Age group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	12-14	31	31.0	31.0	31.0
	14-16	69	69.0	69.0	100.0
	Total	100	100.0	100.0	



Education level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	9th	9	9.0	9.0	9.0
	10th	91	91.0	91.0	100.0
	Total	100	100.0	100.0	



Reliability

Normality test and reliability is mandatory before all analysis which has performed in SPSS 22. All items entered and the results are below:

Variables Name	Items	Reliability
Inquiry based leaning	05	.925
Co-operative leaning	05	.930
students' motivation in learning mathematics	05	.914

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.977[a]	.955	.955	.13466

a. Predictors: (Constant), COOPERATIVELEARNING, INQUIRYBASELEARNING

To test model it is performed through the SPSS to testify fitness of mentioned model. All value of fitness criteria are at its normal range as value of R is .977, further squared to it shows a minor variation and after adjustment it became .955. Values shows that inquiry based learning and cooperative learning has 95% impact on students' motivation in learning mathematic.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.749	2	18.875	1040.822	.000[b]
	Residual	1.759	97	.018		
	Total	39.508	99			

a. Dependent Variable: MOTIVATIONINLEARNINGMATHEMATIC

b. Predictors: (Constant), COOPERATIVELEARNING, INQUIRYBASELEARNING

To test significance of model ANOVA test has performed, it signifies the relation between variables either as significant or not. After putting data it has noted that ANOVA is showing significance at .000 which is the highest at all.

Correlations

		INQUIRYBASELEARNING	COOPERATIVELEARNING	MOTIVATIONINLEARNINGMATHEMATIC
INQUIRYBASELEARNING	Pearson Correlation	1	.948**	.959**
	Sig. (2-tailed)		.000	.000
	N	100	100	100
COOPERATIVELEARNING	Pearson Correlation	.948**	1	.969**
	Sig. (2-tailed)	.000		.000
	N	100	100	100
MOTIVATIONINLEARNINGMATHEMATIC	Pearson Correlation	.959**	.969**	1
	Sig. (2-tailed)	.000	.000	
	N	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation test bonding between variables, it is tested inquiry based learning with itself which is 1. Inquiry based learning with co-operative learning which is 948 and inquiry based learning with the motivation in learning mathematics which is .959. From above results the hypothesis hence cleared as accepted that inquiry based learning has positive and significant impact on the students' motivation in learning mathematics. Hence proved co-operative learning has positive and significant impact on the students' motivation in learning mathematics at public secondary schools of Khairpur.

Discussion

The main objective of this current study is to investigate the effects of inquiry based teachings strategies on students' motivation in learning mathematics at secondary level. The responses of participants show that the current practice in teaching mathematics mostly traditional way chalk and board method is applied in secondary schools rather than

using activity based teaching practice. Instrument and effective cooperative learning method provide teachers great insight into areas to improve their teaching and students develop their understanding confidently in teaching mathematics Beswick et al. 's (2012).

Students in traditional way of teaching have difficulties to understand the subject of mathematics and feel anxiety taking the mathematics class. On the other hand, when the teacher use different teaching methods and involved students in class activities discuss in each other and other interesting teaching strategies students feel less or no anxiety in learning mathematics. Teachers of mathematics and statistics need to explore new and alternative teaching methods to improve students learning superiorities and motivation towards mathematics Mills (2015). It is not possible to distinguish that teachers use on method at all times but mostly use traditional way one way teacher centered teaching strategies. It is observed that students took interest in students centered activity based cooperative learning and inquiry based activities at secondary level.

Conclusion

It is observed from study that teaching strategies is a key motivating tool in the learning process. Students treat the subject mathematics as one of difficult subject among all, but it is the way of teaching which motives them to develop interest in learning mathematics at secondary level. It is finally proved that the teaching strategies such as inquiry based

learning and co-operative learning has positive influence on the students' motivation in learning mathematics at secondary level.

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