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RELEVANCY OF REFLECTIVE TEACHING ON TEACHING COMPETENCY AMONG MATHEMATICS TEACHERS IN SENIOR SECONDARY SCHOOLS IN ADAMAWA STATE

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ABSTRACT

Reflective teaching is not a new teaching approach but less is always said and heard about it. Mathematics is a subject that demands student's participation and positive attitudes, therefore teachers need to employ all possible teaching approaches that can make mathematics friendly and interesting to students. The current study examined the relevancy of reflective teaching on teaching competency among mathematics teachers in senior secondary schools Adamawa state. The broad objectives of the study include to determine how reflective teaching influence lesson planning, lesson delivery and classroom management. The study adopted survey research design. The study randomly selected two mathematics teachers across sixty senior secondary schools at rate of twelve schools per education zone. This gives total 120 mathematics teachers. Vice-principal academic and form teachers were used as research assistants for rating teachers' effectiveness regarding lesson planning, lesson delivery and classroom management using "Teachers Teaching Effectiveness Assessment Scale (TTEAS)" while Teachers Reflective Teaching Questionnaire (TRTQ)" was administered to sampled teachers to access level of reflective teaching. The data were analysed using linear regression analysis at 0.05 level of significance. The study found that those teachers who practice reflective teaching are more effective in lesson planning, lesson delivery and classroom management than those who don't. The study recommended for inclusion of reflective teaching in teachers institute training, government provision for facilities of reflective teaching as well as training for teachers on reflective teaching.

Keywords: Reflective teaching, lesson planning, lesson delivery and classroom management.

Introduction

In education setting, teachers are the main actors both as curriculum implementers and as role model for the students. Alarcoa and Moreira (2013) argued that reflective teaching is among the strategies suitable to put teachers in the right position of being more active and involved in every school activities that can bring expected change in our education as well as in our students. As tastes of society are changing and requirements for career opportunity are continually changing it is then require of teachers to show reflective capability to adjust their teachings to actual demands. Mathematics is one of the subjects suitable for preparing students to meet the dynamic changes in educational demands. The scientific advancement as well as technological development in every society depends largely on mathematical applications and models, which all mathematics teachers have to improve their teaching capability to meet the requirement for such tasks.

In most cases, teaching mathematics require effective lesson planning, lesson delivery and classroom management among other factors. Meanwhile, only those teachers that can effectively link the pervious lesson experiences to the current content being delivered can appropriately achieve the desired expectations for the curriculum. This likely properly placed reflective teachers above others, since the purpose of reflective teaching is to consider the pervious occurrences, experiences, classroom happenings and idea shared with other profession before plan for recent lesson. However, it is not also unlikely for those teachers that prepared and mastered their subject well ahead of lesson period without necessarily being reflective of last occurrences to have equally well lesson plan, lesson delivery and classroom management. Therefore, the current study is an item to be considered for the actual effects of reflective teaching on the teaching effectiveness of mathematics teachers regarding lesson planning, lesson delivery and classroom management in senior secondary schools in Adamawa state, Nigeria.

Aim and Objectives of the Study

The aim of this study is to ascertain the relevancy of reflective teaching on teaching competency among mathematics teachers in senior secondary schools in Adamawa state. And the objectives of the study are:

1. to determine the effect of reflective teaching on lesson planning ability of mathematics teachers
2. to examine the effectiveness of reflective teaching on mathematics teachers lesson delivery
3. to determine the effect of reflective teaching on mathematics teachers classroom management

Hypotheses

H_{01}: There is no significant influence of reflective teaching ability of mathematics teachers on their effectiveness in lesson planning.

H_{02}: There is no significant influence of reflective teaching ability of mathematics teachers on their lesson delivery effectiveness

H_{03}: There is no significant effect of reflective teaching ability of mathematics teachers on their classroom management effectiveness

Literature Review

Reflective Teaching

According to De-Ville (2010), reflective teaching can be expressed as the ability of individual teacher to bridge their past experiences with recent. This suggests teachers' ability to integrate the pervious challenges, personal inconsistences as well as effective performance as teachers, into present classroom teaching activities. To reflect implies to self-study the past experiences and in the teaching job, to reflect implies linking what had transpire in the previous lesson with that which is expected to happen in current and the future lessons. The teachers' ability to accumulate their encounters with students and come up with modalities to correct the identified teaching lapses and forge-on as professional teachers is regarded as reflective teaching. Thus, reflective teachers can be identified as individual teachers that usually have a look-back in their past experiences and capable of reintegrating their experiences especially in a modified way into the present teaching job. De-Ville (2010) argued that reflective teachers are bound to be competent as teachers and be more completed than those teachers that work with instinct rather than learning form the past. Maura (2012) argued, not that reflective teachers are the most experienced by their years in services, but due to their reflective activities that are being carried out on daily basis, this makes them better equipped with experiences and gaining higher recalling capacity than rest of teachers that either wave off the classroom situation immediately after their lesson or politely forgotten the classroom occurrence in order not to carry past burden to their recent. Whenever a teacher

chooses to throw away experiences gained in their previous lesson, such a teacher may remain incompetent and inexperienced irrespective of years spent in services. Reflective teaching may be the best approach for every mathematics teacher when consider the fact that in their daily activities, they face the daunting task of expressing mathematical concepts to students of varying background, learning interest and different attitudes.

Reflective teaching and teaching effectiveness

Teaching mathematics with reflective teaching approach is likely to have impact on lesson planning. This is obvious because teachers that intended to link the pervious experiences in their classroom into recent classwork need to indicate in totality what happens in the previous lesson, as well as approach to improve or correct them. Lesson plan by reflective teachers is capable of anticipating the likelihood occurrences in the next class based on past experiences (Maura, 2012). Through reflective teaching approach, a mathematics teacher is likely to determine aspects that are likely to give difficulty in explanation as well as aspects that students are likely to find interesting. Such understanding can boost the comprehensiveness of lesson plan as well as promoting the adequacy of the lesson plan.

A mathematics teacher with reflective teaching approach is more likely to show more efficiency when delivering lesson. Taylor, Meyer, Wagner and West (2015) argued that through reflective teaching, mathematics teachers could always determine beforehand, the aspects that are likely to give the students tough time grasping. Reflective teaching approach also allows mathematics teachers to show consistency in their lesson presentation. Their experiences from pervious lessons may be handy to put teachers in position of determining when to present particular points and when to expose students to something new or strange. Jacobs, Vakalisa and Gawe (2011) argued that those teachers with reflective teaching approach are always effective in lesson delivery since most are capable of determining the exact time and style to be deployed for monitoring the students for comprehension of mathematics. The beauty of effective lesson delivery is that it allows teachers summarize the lesson and focus on positive gains made by students which can later directly reinforces the behaviours of students.

Teachers with reflective teaching approach are also expected to be excellent in their classroom management. According to Zwodiak-Myers (2009) one of the beauty of reflective teaching is the ability to consider what students' attitudes are likely to be in the classroom ahead of lesson period. Taylor *et al*. (2015) expressed that though classroom management implies the prevention of disruptive behaviour, it remains a difficult aspect of teaching for many teachers. In fact, classroom management is such a problematic area that causes some to leave teaching. Meanwhile, those teaching staff that had good experience of reflective teaching are the expert in handling classroom irrespective of age of learners. Jacobs *et al*. (2011) stated that among the major cause of difficulties in classroom management are negative student attitudes and indiscipline, which most teachers are not always prepared for. Through reflective teaching teachers are likely to have better ways of handling classroom disturbance and likely able to anticipate what may displeased the students in mathematics classroom.

Reflecting Teaching and students' Performance

It is worthy of note to examine how reflective teaching has been fair on students and their performances. Owede and Yusuf (2014) opined that teacher's competency is enhanced by the rate of adoption of reflective teaching. This view was also shared by Adler, Reed and Bapoo (2012), and Byrne and Willis (2008), they all independently proved that reflective teachers are better equipped and more competent to handle classroom activities than other teachers. However, the empirical search lights that attempted to examine the direct impact of reflective teaching on student's performance yielded different findings and conclusions. Studies by Adeniyi (2009) and Maura (2012) reiterated the positive impact of reflective teaching on students' performance, whereas, studies by Yara and Wanjohi (2011) and Alarcoa and Moreira (2013) argued that it is difficult to conclude that the variance in the performances of students can be explained by reflective teaching. Coincidentally, all the studies agreed that students in reflective teaching classrooms enjoyed orderliness of classes and getting adequate responses that can later positively influence the students' performance. Owede and Yusuf (2014) argued that among differences noticeable between other teachings and reflective teaching classes are usual cases of rowdiness as well as unsatisfactory looks on the faces of students in those classes where teaching are non-reflective. In the long run the reflective teaching that creates consistent classroom orderliness will positively impact on the performances of students. Study by Owede and Yusuf (2014) argued

that though, teachers' effectiveness is directly related with their rate of reflective teaching, there are still other aspects or factors that make it difficult to jump into conclusion that students attended classes from teachers with non-reflective teaching skills do performs less.

Research Method

This study is conducted in Adamawa state, in the North eastern part of Nigeria. The state has 310 senior secondary schools distributed among five education zones. The study adopted survey research design. The respondents were 120 mathematics teachers selected from 60 public senior secondary schools. Teachers were selected randomly at rate of two teachers per schools and twelve schools were selected from respective education zones, given total sixty schools and 120 mathematics teachers. The instruments for data collection were "Teachers Reflective Teaching Questionnaire (TRTQ)" and "Teachers Teaching Effectiveness Assessment Scale (TTEAS)". The TRTQ were administered to mathematics teachers while TTEAS were offered to vice principals administrative or form teachers in each participating schools for assessment of selected teachers. Data generated through instruments were analyses using Linear Regression Analysis (LRA) at 0.05 significance level.

RESULTS

H_{01}: There is no significant influence of reflective teaching ability of mathematics teachers on their effectiveness of lesson planning.

Table 1: Regression Analysis on Effect of Reflective Teaching on Lesson Planning Effectiveness of Mathematics Teachers

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.827	.516		5.477	.000
Reflective Teaching	.706	.050	.795	14.259	.000

Dependent Variable: Lesson Planning; R=0.795, R^2 =0.633, Adj.R^2 =0.630, F (1, 118) =203.325, p-value 0.000.

The results on Table 1 present the outcome of regression analysis on effect of reflective teaching on lesson planning effectiveness of mathematics teachers. The result of Analysis of Variance (F-Ratio) for the overall regression model fitness, revealed F (1,118) =203.325, P-value 0.000<0.05. Thus, the obtained p-value (0.000) is less than hypothetical p-value (0.05), this implies that model is fit. Also,

the results reveal R-value of 0.795, which indicates that independent variables have high level of prediction on the dependent variable (Lesson planning). Likewise, the standardized coefficient beta of 0.795 reported on the table indicated that the independent variable (Reflective teaching) can explain about 79.5% of the variability in dependent variable (lesson planning).

H_{02}: There is no significant influence of reflective teaching ability of mathematics teachers on their lesson delivery effectiveness

Table 2: Regression Analysis on Effect of Reflective Teaching on Lesson Delivery Effectiveness of Mathematics Teachers

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.477	.475		5.210	.000
Reflective Teaching	.656	.046	.798	14.363	.000

Dependent Variable: Lesson Delivery; R=0.798, R^2 =0.636, Adj.R^2 =0.633, F(1, 118)=206.308, p-value 0.000

The results on Table 2 present the outcome of regression analysis on effect of reflective teaching on lesson delivery effectiveness of mathematics teachers in senior secondary schools in Adamawa state. The result of Analysis of Variance (F-Ratio) for the overall regression model fitness, revealed F(1, 118) =206.38, P-value 0.000<0.05. Since the obtained p-value (0.000) is less than hypothetical p-value (0.05), this implies that model is fit. More so, the results reveal R-value of 0.798, which indicates that independent variables have high level of prediction on the dependent variable (Lesson delivery). Likewise, the standardized coefficient beta of 0.798 reported on the table indicated that the independent variable (Reflective teaching) can explain about 79.8% of the variability in dependent variable (lesson delivery).

H_{03}: There is no significant effect of reflective teaching ability of mathematics teachers on their classroom management effectiveness

Table 3: Regression Analysis on Effect of Reflective Teaching on Classroom Management Effectiveness of Mathematics Teachers

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	3.669	.457		8.023	.000
Reflective Teaching	.617	.044	.791	14.055	.000

Dependent Variable: Classroom management; R=0.791, R^2 =0.626, Adj.R^2 =0.623, F(1, 118)=197.555, p-value 0.000

Table 3 presents the outcome of regression analysis on effect of reflective teaching on effectiveness of mathematics teachers in classroom management in senior secondary schools in Adamawa state. Analysis of Variance (F-Ratio) for the overall regression model fitness, revealed F(1, 118) =197.56, P-value 0.000<0.05. Since the obtained p-value (0.000) is less than hypothetical p-value (0.05), this implies that model is fit. More so, the results reveal R-value of 0.791, which indicates that independent variables have high level of prediction on the dependent variable (classroom management). Likewise, the standardized coefficient beta of 0.791 reported on the table indicated that the independent variable (Reflective teaching) can explain about 79.1% of the variability in dependent variable (lesson delivery).

Findings

Reflective teaching significantly influenced the effectiveness of lesson planning, lesson delivery and classroom management by mathematics teachers. This may not be unconnected with the fact that lesson planning depends largely on past experiences and future expectations, which only those mathematics teachers with reflective teaching approach can sufficiently take care of in their planning. The current finding agrees with that study conducted by York-Barr, Sommers, Ghere and Montie (2010) and Takahashi, Watanabe and Yoshida (2010) that there was significant difference in the effectiveness of lesson planning by those teachers with reflective teaching capability than those without reflective teaching approach. Also, studies by Taylor *et al*. (2015) Adler *et al*. (2012) and Yara and Wanjohi (2011) reiterated that those teachers with reflective teaching approach show more consistent in lesson delivery than others irrespective of subjects. Stanley (2013) and Adeniyi (2009) rated attitude and responsiveness of students to teachers during lesson delivery higher for those teachers adopted reflective teaching than those without reflective teaching approach. Studies by Priya, Prasanth and Prince (2017), Posthuma (2011) and Takahashi*et al*. (2010) reaffirmed that all teachers sampled in their study indicated better teaching through reflective teaching, however, most considered the approach as retarded, slow and time consuming. Majority of teachers believed that reflective teaching is not effective when the need to cover curriculum contents arise.

Pedro (2011) concluded that irrespective of subject in consideration only reflective teachers could be regarded as teachers that can bring out the best from students irrespective of their ages and background. The need for reflective teaching

approach include; to help students develop the skills they need to best take action in today's world; to accommodate the wishes of students and communities, and consider what is most beneficial for our society during teaching. Through reflective teaching students can develop positive skills of communication, critical thinking, collaboration, and problem-solving (Takahashi *et al*., 2010). Studies by Taylor *et al*. (2015) and Adeniyi (2009) showed that reflective teaching allow teachers to take the central position of change and come up with solution to society challenges of insecurity, mistrust, need for economic diversification and poor governances.

Conclusion

The findings from this study have shown that through reflective teaching teachers were in the best position to well plan their lesson, deliver the lesson and have good control on their classroom. This proved that mathematic teachers with reflective teaching approach are in the best position to positively engage students in various aspects of mathematics, which most students considered difficult and uninteresting.

Recommendations

1. Mathematics teachers in Adamawa state should be trained on different approach of achieving reflective teaching to enhance their teaching capability.
2. All necessary support from schools should be provided for the mathematics teachers to effectively put students through difficult aspects of mathematics through reflective teaching
3. Teachers' institutes in the state should be encouraged in training the pre-services teachers on various reflective strategies to prepare them for tasks ahead.

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