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Evaluating Classroom Interaction Towards Maintaining A Student Centered Classroom Environment Using Flanders Technique

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***Abstract*—In this paper, an attempt was made to analyze patterns of classroom interaction between teachers and students at secondary school level using Flanders interaction analysis category system. This was necessitated by the increasing demands towards the study of various process variables in the classroom settings which are vital for greater productivity. Flanders technique was x-rayed and a review of some empirical studies based on the technique was made, coupled with an observational study evaluating classroom interaction in a secondary school lesson. The observational study, guided by four research questions, revealed among other things that the teacher spent greater percentage of the verbal instruction time doing all the talking. More so, the teacher exhibited direct influence in his motivation and control of the students. This has a lot of effect on the students, since they tend to perform more favorably and develop competency in a student centered classroom environment that provides opportunities for students to engage in intensive and structured process of interaction.**

Keywords—Classroom interaction, Flanders interaction analysis category system

I. INTRODUCTION

In any classroom, there is observed a constant action and interaction going on between students and teachers, teachers and students, and among students themselves. Classroom interaction promotes students' participation in the course of instruction. Classroom Interaction is a vital educational strategy that is capable of enhancing learning. The growing interest in the role of classroom interaction became a vital factor for researchers due to the fact that it creates opportunities for the classroom community to develop basic knowledge and skills [1].

Classroom interaction is the sum total of activities taking place within the classroom between the teacher, the student, and the instructional materials during the teaching-learning process [2]. Classroom interaction embodies all of the classroom activities ranging from spoken to non-spoken interaction. The verbal interaction deals with the discussions that take place between the teachers and students or among the students for effective learning while the non-verbal interaction centers on the non-communicative aspects of interaction. When the classroom becomes adequately interactive, it yields greater output. This is because, for students to practice critical thinking, they need to participate in the discourse of the subject matter. Thus effective classroom interaction has great relevance in generating a student-centered classroom environment. A student-centered classroom environment is one in which both teachers and students collaborate to produce learning patterns suitable to the needs of each individual child [3]. Some of its key components according to them are that the students have a voice and a choice. It is also **defined as "one where the focus of instruction is shifted from the teacher to the student with the end goal of developing students who are autonomous and independent by placing the responsibility of learning in the hands of the students"** [4]**.** A student-centered classroom emphasizes collaboration and deemphasizes teacher direct talk generally characterized by lecture [5]. The teacher in such a classroom is more of a participator and co-learner in the class activities offering corrections where necessary. The students are motivated to reflect and synthesize existing knowledge.

Besides, it is opined that interaction provides the learner opportunity to analyze target language structure and get meaning out of the classroom events [6]. It also gives learners the opportunities to insert the receiver structures of classroom events into their own speech [7]. In the course of classroom interaction, feedback is expected. This is important given that it enables the teacher to ascertain the strengths and weaknesses of students in a given subject area for progression in learning. It provides students with constructive criticism, helps them understand their present position, what they are required to do next, thus gaining self- motivation. More so, feedback gives the teacher an idea of the area in the curriculum that is in dire need of revision. Thus to enrich the classroom interaction, both teachers and students should have fair and adequate opportunities to provide feedback about the learning situations. Feedback could be informal, formal, formative, student peer, evaluative, descriptive, constructive, etc. It can equally be explicit and implicit in nature [2]. The feedback aspect of classroom interaction is key for learning any language. Implicit feedback which is corrective embodies requests for clarifications which the teacher does by rephrasing the learners' utterance by modifying one or more sentence components [8]. Also, effective classroom interaction can increase students' language performance [9]. Other relevance of classroom interaction includes but is

not limited to improvement of students' self-esteem, self-motivation, academic self-concept, enhancement of skills, enthusiasm, and overall success [10]. In view of these relevancies, every teacher should be abreast of the interaction patterns existing in their classrooms, to ensure that they are effective. Thus, in order to make teachers aware of classroom interaction patterns, there is a need to adopt some techniques for analyzing classroom interaction patterns.

A. Classroom Interaction Analysis

Classroom interaction analysis is a technique that comprises objective and systematic observation of the classroom events for the study of teacher's class room behaviour and the process of interaction that takes place within the classroom [11]. It helps teachers in behavioural and instructional adjustment in such a manner that the teaching-learning process will be effective and purposeful. A system of classroom interaction analysis basically embodies the recording of classroom events in a meaningful way (encoding) as well as the arrangement of the data for useful display and analysis of the result in order to study patterns of teacher behaviour and classroom interaction (decoding) [11]. Classroom interaction examines human activities such as talk, non-verbal interaction, and the use of artifacts and technologies, identifying routine practices, problems, and the resources for their solutions. It is similarly described as a systematic observation that embodies a useful means of identifying, studying, classifying and measuring specific variables as the teacher and his/her students interact within teaching-learning situations [12].

Several attempts have been made to analyze the verbal and non-verbal components of the interactions between students and teachers in the classroom so as to determine situations in which teachers' verbal and non-verbal behaviours are related to students' achievement and attitude. Some researches provided the basis for the development of classroom interaction analysis procedures. They discovered among other things that when teachers are democratic in their classroom interactions, it makes the children to work more. More so there are more verbal behaviours in the classroom than nonverbal behavior [13,14].

The classroom interaction analysis procedure plays important role in the teaching-learning process. It gives a sort of feedback to teachers about their behavior in the classroom; it improves both teaching and learning; it enables the teacher as well as the observer to study the climate of the classroom and its effect on the achievement of students, and it provides both qualitative and quantitative information about the verbal behavior of the teacher and the students in the classroom. Classroom interaction analysis can be used for in-service and pre-service education in order to help teachers improve classroom instruction [15]. The technique provides a method of quantifying concepts that refer to spontaneous behavior and which could be measured only indirectly.

Based on the foregoing, several classroom interaction analysis systems have been developed as compiled. These include: Verbal interaction category system [VICS] (1966), Observational system for classroom interaction (OSIA), Interaction process analysis (1951), Teacher practices observational record (1967), Interpersonal communication behavior analysis (1963), Flanders expanded system (1963), Systems for analyzing lessons [SAL] (1966), System for the analysis of classroom communication [SACC] (1969), Teacher verbal and non-verbal behavior coding instrument (1967) among others [16]. However, of all these interaction analysis procedures, Flanders Interaction Analysis Category System developed in 1959, seems to be the most commonly used [17]. Thus, the present study focused mainly on Flanders Interaction Analysis Category System (FIACS) developed by Ned Flanders.

Ned Flanders originally developed the Flanders Interaction Analysis Category system for the purpose of categorizing the types and quality of verbal interaction in the classroom [15]. Ned Flanders established that more than 70% of the activities in the classroom consist of verbal behavior and between 50-80% of the time is spent by the teacher talking. According to him, you can measure verbal behavior with more reliability than non-verbal behavior. He further believes that the verbal behavior of a person is an adequate sample of his total behavior in the classroom. Since the time it was published, FIACS has become a widely used coding system to analyze and improve teacher-student interaction patterns. FIACS involves two basic processes which are the encoding and the decoding processes. In the encoding process, the observer memorizes the code number, gets a place of sitting, records the category number, while in the decoding process, the observer tabulates the matrix and interprets the matrix. Some advantages of FIACS include its ability to provide dependable, reliable, and objective analysis of verbal interaction in the classroom. The analysis forms a vital feedback that provides the teacher a means of comparing what actually happens in the classroom with his or her original intentions [18, 19].

Several studies have been conducted using Flanders Interaction Analysis Category System to analyze classroom interactions. For instance, analysis of verbal classroom interaction and its characteristics using Flanders' Interaction Analysis revealed that teacher talk was the most dominant aspect in verbal classroom interaction [20]. More so, the proportion of teacher direct talk was higher than teacher indirect talk. Exploraction of the classroom interaction characteristics in a mathematics class showed that the most dominant characteristics in urban classroom interaction were the content cross-ratio, student talk ratio, pupil initiation ratio [11]. Assessment of the student teachers of Commerce pedagogy of the year 2019-20 revealed that all student teachers have much interaction on teachers talk especially in the category of direct talk [12]. When classroom interaction was analyzed using Flander interaction analysis categories system (FIACS) technique at SMPN 13 KOTA BENGKULU IN 2013/ 2014 academic

year, the study revealed that the teacher talk was the most dominant classroom interaction during the observation [10]. Additionally, for both teachers A and B, the content cross was the most dominant characteristic during the observation. Also, analysis of teacher and student's talk in the classroom interaction by using FIACS, revealed that the percentage of teacher talk at the first meeting was 53.50%, the second meeting 51.82%, and the third meeting 54.24%. More so, characteristics of the teacher talk are content cross, teacher control, and students participation. The findings of the study further revealed that the types of teacher talk are controller, director, manager, facilitator and resource [21]. Most previous researches on classroom interaction focused on verbal classroom interaction using FIACS was mostly foreign, hence the present work was carried out to apply FIACS in analyzing interaction patterns that focused on teachers' influence, motivation, and control in a Nigerian classroom lesson.

This study utilized Flanders Interaction Analysis Category system for the purpose of observing and analyzing the interaction between the teacher and his students in a senior secondary III geography lesson. The following research questions guided this observational study:

- What kind of influence did the teacher exert in the interaction process as shown by the 1/d ratio?
- What kind of emphasis did the teacher give to motivation and control in the interaction process as shown by the revised 1/d ratio?
- What was the percentage of teacher talk in the interaction process?
- What was the percentage of student talk in the interaction process?

METHODOLOGY

The observation was carried out using a senior secondary III geography class in a secondary school in Awka town. Flanders Interaction Analysis Category system was used to categorize the types and quality of verbal interaction in the classroom and to plot the information on a 10 by 10 matrix so that it could be analyzed and interpreted. In the system, the classroom interaction is broken down into three main sections. These are the teacher talk, the students' talk and silence or confusion all making up ten categories. Categories under the teacher are: Accepting feeling (1) Praises, encourages (2), Accepts ideas (3), Asks questions (4), Lectures (5), giving directions (6), and Criticizing or justifying (7). Under the students' talk are: Student talk response (8), and Student talk as initiation (9). The last category is Silence or confusion (10). These categories are presented in an abridged form as shown below:

TABLE 1: FLANDERS'S INTERACTION ANALYSIS CATEGORIES (FIAC)

Teacher Talk	1. Accepting feeling. Accepts and clarified an attitude or feeling tone of a pupil in a non-threatening, manner. Feelings may be positive or negative. Prediction and recalling feelings are included. 2. Praises or encourages. Praises or encourages pupils' action or behaviour. Jokes that release tension, but not at the expense of another individual; nodding head, or saying "Urn hm?" go on, are included. 3. Accepts or uses ideas of pupils. Clarifying, building, developing ideas suggested by a pupil. Teacher extensions of pupil ideas are included but the teacher brings more of his ideas into play. Shift to category five.
	4. Asks questions. Asking a question about content or procedure, based on teacher ideas with the intent that a pupil answer. 5. Lecturing. Given the facts or opinions about content or procedures; expressing his own ideas, giving his own explanation, or citing an authority other than a pupil.
	6. Giving direction. Direction, commands or orders to which a pupil is expected to comply. 7. Criticizing or justifying authority. Statements intended to change pupil behaviour from non-acceptable to acceptable pattern: bawling someone out, stating why the teacher is doing what he is doing; extreme self-reference.
Pupil Talk	8. Pupil-talk in response to teacher: Talk by pupils in response to teacher. Teacher initiates the contract or solicits pupil statements or structures the situation. Freedom to express own ideas is limited.
	9. Pupil-talk-initiated by the pupils. Talk by pupils which they initiate: expressing own ideas: initiating a new topic: freedom to develop opinions and a line of Thought. Like asking thoughtful questions: going beyond the existing structure.
Silence or confusion	10. Silence or confusion. Pauses, short periods of silence, and periods of confusion in which communication cannot be understood by the observer

From N. Flanders, Analyzing teaching behaviour, 1970 in Seale (2007) Ned Flanders: Interaction Analysis.

In the actual coding, 5 minutes were spent to get a general feel of the class. Time coding was used at an interval of 3 seconds. The coding was done only when verbal interaction formed a major part of the instructional activity. Codes were written as numbers according to the categories in columns of 20. This gives 20 x 3 = 60. This implies that in every one minute, 20 categories are coded. A total of 35 minutes were spent in the coding process and that gave a total of 700 categories and 35 columns.

After the coding, a 10 by 10 matrix was used to convert the raw data into a form that can be used for further analysis. These numbers were entered into the matrix in sequence pairs in such a way that each number was entered twice- once as the first number pair and once as the second number in a pair. The rows of the matrix represent the first number in the pair, and the column the second number in the pair. In carrying out this observation, the main focus was to determine the direct and indirect influence of teacher behavior through the I/d ratio, the emphasis the teacher gave in motivating or controlling the students (revised I/d ratio), and the percentage of times the teachers and students talked. The I/d ratio is determined by summing up the totals for columns 1, 2, 3, 4 and dividing the result by the sum of column totals in columns 5. 6 and 7. When this ratio is less than one, it implies that the teacher had a direct influence on students. To calculate the revised I/d ratio, the sum of the column totals for columns 1. 2, 3 was divided by the sum of column totals for columns 6 and 7. When the revised I/d ratio is less than one, it implies that the teacher's emphasis on motivation and control was direct which is not good. In essence they indicate the level of teachers

influence, domination, and effort towards motivation and control of the students

A. Checking Inter-observer Reliability

To determine the reliability of the instrument used for the observation, two observers trained in using FIACS to observe classroom interactions were used. The observers independently observed and coded the classroom interaction process of the lesson. Inter-rater reliabilities between the researchers coding and the two observers were then calculated using Spearman's formula. Correlation coefficients of 0.89 and 0.94 respectively were obtained.

III. RESULT

A. Research Question 1: What kind of influence did the teacher exhibit in the interaction process as shown by the I/d ratio.

The I/d ratio was determined by summing up the totals for columns 1, 2, 3, 4 and dividing the result by the sum of column totals in column 5. 6 and 7, "Table. 2." This resulted in an I/d ratio of 0.24 for the Geography lesson. Since this I/d ratio is less than one, it implies that the teacher had direct influence on the students during the interaction process. Also the content cross cells (4 and 5) are overloaded which is a reflection of the teachers emphasis on the subject matter

TABLE 2: MATRIX TABLE FOR THE CLASSROOM INTERACTION. CIRCLED FIGURES REPRESENT THE SCORES OBTAINED FROM THE GEOGRAPHY LESSON.

Category	1	2	3	4	5	6	7	8	9	10	Total
1											-
2		1		1	2			2			6
3		1	7	3	5	3	1		7	1	28
4				6	3		1	52		2	64
5		1		25	291	6	3	1	8	3	338
6				3	6	21	6			1	37
7			1	6	5	6	20		1	2	41
8		2	2	16	19		8	15	10	1	73
9		1	18	4	2		1	2	31	1	60
10					5	1	1	1	3	41	52
TOTAL		6	28	64	338	37	41	73	60	52	699
	%	1	4	9	49	5	6	10	9	7	

B. Research Question 2: What kind of emphasis did the teacher give to motivation and control in the interaction process?

To determine the kind of emphasis the teacher exercised in motivating and controlling the students, a revised I/d ratio was calculated. This is the ratio of pure indirect to the pure direct motivation of the teacher. To do this, the sum of the column totals for columns 1. 2, 3 was divided by the sum of column totals for columns 6 and 7. Through this process, a revised I/d ratio of 0.436 was derived for the Geography lesson. Since this is less than one, it implies that the teacher exhibited pure direct influence in the motivation and control of the students.

C. *Research Question 3: What was the percentage of the teacher and students talk?*

By summing up the columns on teacher talk (1-7), dividing by the overall total (699), and multiplying by 100, a 74% teacher talk was derived for the Geography lesson. This implies that the teacher spent 74% of the verbal interaction time doing all the talking.
Similarly, a percentage of students talk based on columns 8 and 9, was calculated as 19%, for the Geography lesson. This showed that the students only talked 19%, of the time spent in the verbal interaction.

IV. CONCLUSION

The classroom observation carried out revealed that 74% of the classroom verbal interaction was dominated by the teacher's talk while the students talked for 19%of the time. The rest of the time was spent in silence or confusion. This agrees with the findings in a similar study which showed that the teacher talking in the class, spends about 50-80% or approximately 70% of the time [14]. This shows that the lesson observed was teacher-centered and the classroom climate was determined majorly by the teacher, through his instructional strategies, management of the class, and his contacts with his students in the classroom, the Flanders Interaction Analysis Category system adopted for the observation, revealed that the teachers did not pay much emphasis in creating opportunities that will help elicit students' talk and responses. This is in agreement with a similar study in which the percentages of teacher talk at the first meeting 53.50%, second meeting 51.82%, and third meeting 54.24% [20]. Similar findings in another study, revealed that for the teacher A, teacher talk was (66.15%), and students talk was (33.10%) while for teacher B, teacher talk was (70.39%), and students talk was (28.41%) [10]. Although teacher A was better than teacher B, it is still obvious that in terms of quantity of classroom talk, the teachers dominated.

Analysis of the teachers' talk revealed that the teacher adopted a direct rather than indirect kind of influence in interacting with the students. This is revealed from the I/d and revised I/d calculated which was less than one for the lesson. This shows that in the delivery of this lesson, the teacher's actions were directed more towards instilling conformity and compliance in the students. The students were not encouraged or motivated to participate freely in the

lesson. This agrees with the findings in a similar study which revealed that all the student teachers had much interaction on teachers talk especially in the category of direct talk [12]. This showed that the teacher talk was the most dominant classroom interaction during the observation. Additionally, for both teachers A and B, the content cross was the most dominant characteristic during the observation. The implication is that teachers exerted a dominative kind of influence over the students during the interaction process. This is not encouraging because students who have the tendency of performing better when they are allowed to share their thoughts and ideas have their initiation hampered during the teaching-learning process [17]. Thus, when teachers integrate students more in the learning process, they will show more initiative and give more voluntary contributions, but on the other hand, when the class is dominated by the teacher, students are more easily distracted from school work, show rejection of teacher domination and as well as develop a negative attitude. However, the level of each of the dominative and integrative teacher behaviours that produce desirable results in all situations is not established. This calls for further research.

A. What Can the Teacher Do?

Achieving a student-centered classroom environment is sometimes perceived by some teachers as an arduous task. To assist the teacher in monitoring, adjusting, and controlling classroom interaction towards that direction, the teacher should maximize the benefits of FIACS. The following can be done by the teacher:

- Proper and innovative structuring of the lesson plan, specifying teachers and students activities at short intervals. There should be incorporated in the plan more student generated activities and peer collaborations with teachers' guidance.
- Adopt open-ended questions and good listening skills.
- Have a clear understanding and internalization of the FIACS procedure.
- Self-appraisal of your lesson from time to time, through recording using smart phones or other recording devices, and subsequently applying FIACS to analyze and make corrections.
- Involvement of co-teachers to observe and analyze your lesson using FIACS and subsequent round table discussions for improvement.

V. CONCLUSION

It can be deduced from the foregoing that:

- The classroom interaction analysis procedure plays a vital role in the maintenance of a student centered classroom by providing both qualitative and quantitative information about the verbal behavior of the teacher and his students.
- Flanders Interaction Analysis Category system seems to be the most commonly used.
- From the observational study carried out, the teachers talk dominated the verbal interaction process.
- The teacher exerted a dominative kind of influence over the students during the classroom interaction process.
- The teachers exhibited a direct emphasis on the motivation and control of the students in the classroom interaction.
- The percentage of teacher talk was far higher than student talk in the lesson.
- The lesson was generally teacher-centered.

VI. RECOMMENDATIONS

The following recommendations are fallouts of the findings:

- Adequate measures should be adopted by the Government, supervisory bodies and school authorities to ensure regular analysis of classroom interactions for the purpose of improving teacher performance.
- Regular feedbacks of such classroom interaction analysis should be provided for the teachers. This will enable them to adopt strategies for improved performance.
- Student teachers and practicing teachers should be exposed to some basic rules for consistently encouraging student interaction.

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