Promoting Students' Participation: Communicative Functions of Repair in a Nigerian Computer Science Classroom

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Abstract

This study investigated the influence of repair on Nigerian students' participation in a computer science classroom discourse. The sample involved a male teacher in a public secondary school teaching computer studies to 45 students. Data were collected qualitatively through video and audio-tape recording. The data were transcribed and analysed descriptively. The findings of the study revealed that the teacher explored various repair strategies such as reformulation, repetition, clarification, elicitation, paralinguistic signal and explicit correction to prompt students' involvement in the classroom discourse. Implications of the findings to teaching were discussed and recommendations were made accordingly.

Keywords: Students, Corrective feedback, Interaction, Computer Science

Introduction

In the last decades, interest in instructional process has drawn the attention of linguists to classroom discourse studies (Lee, 2007; Chen, 2007; Hall, 2007; Macbeth, 2004). Such growing attention has been attributed to the importance associated with verbal discourse in meaning making (Chin, 2006). Chin further notes that a common ground available in the literature on pedagogical discourse is the three-turn sequence interaction called "triadic dialogue" (Lemke, 1990 cited in Macbeth, 2004), or Initiation Response Evaluation (IRE) (Menham ,1979 cited in Chin, 2006), or Initiation Response Feedback (IRF) (Sinclair & Coulthard, 1975 cited in Macbeth, 2004). In other words, a classroom interaction primarily comprise of three actions: the teacher's initiation of questions, learners' responses', and the teacher's feedback on the correctness of the responses. The three-part move in a classroom discourse provides teachers the opportunity to ask questions which require predetermined low- order cognitive level short answers (Chin, 2006).

The quality of teacher-learners' interaction is an important factor in classroom discourse because both are key actors in the process of negotiation of forms and meaning. Interaction is the communication that ensues between the teacher and the learners or among students during lessons. In other words, classroom interaction is the process in which teachers and students have a reciprocal effect upon each other through what they say and do in the classroom or the successful transmission of messages between teachers and students (Dobinson, 2001). Meanwhile, emanating from the interaction hypothesis of Long (1996), feedback; an inherent element of negotiation and interaction process tend to facilitate learning (Nabei & Swain, 2002). Within the classroom context, successful teaching is discursively characterised by high quality of oral work and interactivity that encourage students' participation (Smith, Hardman, Wall, & Mros, 2003). Ideally, students are supposed to be more active than being passive during the classroom discourse, hence the need for their participation. Classroom discourse is recently witnessing a shift from the traditional teacher's dominated instruction referred to as "recitation of scripts" to participatory sessions (Tharp and Gallimore, 1988 cited in Smith, Hardman, Wall, & Mroz 2003).

Van-lier (1988) opined that some activities which naturally occur lead to repair, hence context of actions and repair are linked. As a matter of fact, Chen (2007) noted that "error" is an inherent element of language learning, development and use. Meanwhile, Schegloff, Jefferson and Sacks (1997) cited in Markee, (2008) observed that repair is omnipresent in all talk. The term "repair" is commonly mistaken for "correction of error", or "replacement of error". Repair sometimes involves "word search" which occurs when a word is not readily available to speaker or when there is no hearable error or mistake. Markee (2008) describes repair as the "self-righting mechanism" of talk that allows individuals to deal with problems that impede shared understanding of classroom interaction. Seedhouse (1997) illustrates repair as the treatment of trouble occurring in the interactive language use. In this study, repair will be treated as described by Panova and Lyster (2002) as any form of teacher's responses (verbal and non-verbal) directed towards reforming, transforming, disapproving, improving learners' utterances in the process of classroom interaction.

Repair initiation and repair outcome are two components of repair. Researchers (Schegloff, Jefferson and Sacks, 1977 cited in Seedhouse 1997; Macbeth, 2008; Nakamura, 2008) explicitly identified four possible ways of repair in classroom discourse: Self-Initiated Self-Repair (SISR), Self-Initiated Other-Repair (SIOR), Other-Initiated Self-Repair (OISR) and Other-Initiated Other-Repair (OIOR). The primary focus of this study is the OISR which involves participants' display of collaborative management of troubles and solutions. In OISR, the repair is not initiated by the participant that produces the trouble in the first turn, but the repair is done in the next turn by the "cause" of the trouble. Studying the classroom discourse in the different contexts, Seedhouse (1997), Chin (2006), Tedick (1998), and Nakaruma (2008) note that some of the repair strategies employed by teachers the classroom discourse include repetition, explicit correction, elicitation, explanation, reformulation of questions, clarification, etc. In the same vein, linguists have observed that some expressions used to initiate repair include "excuse me", "pardon", "huh", "hmm", "who", "when", "where", etc. (Schegloff, Jefferson and Sacks, 1997; Hall, 2007).

Irrespective of the strategy used by teachers, Jung (199) and Swain (1995) argued that repair in the classroom discourse is a pedagogical tool that enhances learners' metalinguistic awareness. This is because L2 learning takes place through the exposure of learners to comprehensible input, thus such learners need teachers' feed back to correct ungrammaticality. Earlier research findings indicate that learners gain a lot when their interlocutors contribute to their input by modifying their messages in the process of classroom discourse (Pica,Young & Doughty, 1987); L2 acquisition is increased through modified output in the course of negotiation of meaning and forms (Swain, 1985 cited in LiesBscher & Dailey-O'cain, 2003); learners have the opportunity to note, identify and adjust to the gap between the inter-language forms and the target forms (Schmidt & Frota, 1986 cited in Panova & Lyater, 2002). Meanwhile, since repair in the classroom context is a co-managed and co-constructed process, Nakaruma (2008) therefore observes that negotiators or participants should endeavour to ensure that they do not give room for a total communication breakdown before some actions are taken.

In a classroom, teaching and learning become more effective and valued amidst a high level of discourse. Slimani (1989) found a strong relationship between learners' up-take and their participation in the classroom. Literature shares a common view on the need to promote interactivity in L2 classrooms (Northcott, 2001). Andrew (2005) argued that when students are actively engaged in the classroom, they are more responsibly involved in critical and cognitive thinking. Teacher-students and peer-to-peer discourse is a key to students' active participation as well as a pedagogical scaffold that allows learners' active involvement. It therefore becomes paramount that the teacher needs to guide or assist the classroom discourse on inter-psychological place. Unfortunately, four decades after independence, Nigerian students' proficiency in L2 is still low (Adesemowo, 2005).

With the continued growth and integration of technology into education industry, learners in developing countries such as Nigeria need a deeper understanding of the content and concepts of Information and Communication Technology for effective learning. Despite the significance of interaction in the instructional process, investigations into classrooms discourse indicate that inadequate systematic teaching method to attend to students' errors contribute negatively to learning (Lyster & Ranta, 1997). Scholars (Chin, 2006; Chen, 2007; Nathan, 2007; Seedhouse, 2002; Nakamura, 2008) have conducted studies on repair and classroom discourse in developed and developing countries, but there seems to be a dearth of studies in this direction in computer classrooms in Nigerian education system. This study was therefore carried out to identify the various forms of corrective strategies employed by the Nigerian teachers and the extent to which such strategies could enhance students' participation in Nigerian secondary school computer classrooms.

Methodology

Design

The study adopted a descriptive survey research design to find out the repair strategies used to facilitate learners' participation in computer studies lessons.

Sample

The context of this study was a computer classroom in a Nigerian secondary school in Ijebu-North Local Government, Ogun State. All the learners were Nigerians who speak a common mother tongue (Yoruba language). Classroom instruction was given in English language. The sample involved a male teacher in a public secondary school teaching computer studies to 45 students whose age ranged between 16 and 18 years. Multi-stage sampling technique was used for the sample selection. All public secondary schools in Ijebu-North Local Government were stratified into two groups based on whether or not Computer Studies was taught as a subject in year four. To therefore select the sampled school for this study, names of schools where computer studies was offered as a subject were subjected to simple random sampling techniques by balloting.

Measure

Data used for the study were collected qualitatively through video and audio-tape recordings. The teacher was pre-informed of the video-recording of his classroom interaction for the study. The topic "programming" taught by the teacher was video-recorded, while observations and analysis of the data were based on the first 15 minutes and 10 seconds of the 40 minutes lesson. The camcorder was placed at the back of the class to cover the activities of both the teacher and the learners. In order to triangulate the data collected, a post-repair audio-taped interview was conducted after the class to measure students' attitude towards the teacher's strategies of repair in the course of the classroom discourse.

Data Analysis

Results

The various repair strategies utilised by the teacher in the course of teaching included reformulation, repetition, clarification, elicitation, paralinguistic signal, and explicit correction to prompt students' involvement in the classroom discourse.

A reformulation is a recast of a previous erroneous utterance into more target-like form while preserving the original meaning (Nabei & Swain, 2002). This strategy was employed by the teacher to correct the learners' grammatical and phonological errors. The teacher easily reformulated the questions in order to negotiate learners' understanding so as to assist students' supply of the correct responses. Meanwhile, in all cases of reformulation noted in this study, little or no self-repair was carried out.

1.　　**T:** ... what makes a computer a system?
　　　L1: a computer is really a system
　　　T: ... computer as a machine with different parts
　　　L3: Yah! A computer is a system because it has many parts working together

Another repair strategy used by the teacher was repetition. This occurs when the teacher repeats the question or a mistake of the students by modifying his intonation (Heift, 2004; Scott, 2008). This strategy was used in example 2 to call the attention of the learners to the point of error and this helped the learners to make concerted efforts to negotiate meanings and forms in the process of classroom discourse.

2.　　**T:** ... When you have finished using a computer, all you do next is called?
　　　L2: Switch off
　　　T: Switch off (with rising intonation)
　　　L4: Shut down and then switch off.

The example below shows the teacher's use of clarification as a form of repair to activate learners' participation in the classroom. Clarification request was used as indicator or signpost to learner's errors or a demand for meaningful and explicit explanation. And according to Lyster and Ranta (1997) and Scott (2008), clarification requests are generally characterised by phrases like "pardon", "I don't understand", "excuse me" or "what do you mean?"

3.　　**T:** What is the main brain of computer component called?
　　　L1: Centre Process Unit
　　　T: Can you say that again?
　　　L2: Central Processing Unit

Elicitation as reflected in example 4 was explored by the teacher. Ranta (1997) noted that elicitation is often used when the teacher pauses and allows the learners to complete an utterance or the teacher requests a recast of an ill-formed utterance or when the teacher asks a referential question(s). Here in this study, the teacher invited students' participation by this method in such a manner that the instruction was organised around the scaffolding modes of W-H elicitation questions to probe the next piece of information from the learners and promote their cognitive development.

4.　　**T:** ... computer parts are majorly categorised into two and these are known as...
　　　L1: Hardware and emm, emm
　　　T: ...and what?
　　　L3: It is hardware and software
　　　T: They are hardware and software

The teacher was observed to have used paralinguistic signals. In the opinion of Ellis (2002), paralinguistic signal is a situation in which a teacher uses gesture to indicate that a learner committed an error. The data analysed showed that the teacher succinctly used the strategy to prompt students to more critical reasoning, and negotiation of meanings and forms as shown in example 5.

5.   **L1:** ... computer is a machine that manipulates data used to input, store, receive ...
      T: (shook his head)
      L2: ... a computer is an electronic machine. It has the ability to store, retrieve and process data.
      T: Good

Furthermore, explicit correction which provides explicit signals that there is a mistake in the previous utterance of students was used by the teacher as shown in Example 6 to motivate students' participation. In other words, explicit correction shows that student's utterance was ill-formed, while the correct form is instantly provided.

6.   **L2:** The keyboard is used to point to and select data on the computer screen.
         T: No, it is the Mouse that is used to point and select data on your computer screen

Extract 1

This is an extract of the audio-taped post-repair interview with some of the students after the lesson.
Q: How was the lesson?
L3: Hmmm-mm... Yes, interesting
Q: How did you feel when you got some answers wrong?
L3: Very, very bad
Q: What can you say about the instances your teacher corrected you in the class?
L2: ...he is friendly
L3: Excuse me, I feel shy...
Q: Why did you frown when one of your classmates supplied you the answer to one of the questions?
L2: eh! eh! I do not know.
Q: Do you feel happy if your friend corrects you in the class?
L4: Not, emm no.
Q: How best do you want to be corrected when you make mistakes in your response to questions in the class?
L6: Me? I correct myself...

Discussion

The study investigated the exploration of repair in computer classroom. The analysis of the classroom discourse revealed that the teacher's interactional strategies most of the time was the generator of learners' responses. The F-move in the circle of IRF was not much of evaluation but featured rather as more of supportive moves in the study. The turns between the teacher and the students featured more of students' active participation accompanied by critical thinking in the process of classroom discourse. As a matter of fact, the learners were more vocal and responsive in the classroom instructional process through the teacher frequent intervention. Lending support to the finding of this study, in a study of the impact of teacher's use of feedback and questioning techniques on the students' interaction in science classroom discourse in Singapore, Chin (2006) found that teacher's corrective feedback stimulated students' active reformulation and prediction, brainstorming, generation of ideas and drawing inferences.

Teacher's use of reformulation was purposely intended to bring the attention of the learners to the grammatical errors in their expression as well as bring the content of discussion to the individual learners' context and simplification of questions. The data of this study show that the teacher basically employed this strategy as a non-obstructive tool in the communication process and this outcome tallies with the research outcome of Doughty and Varela (1998), and Panova and Lyster (2002). Meanwhile, the use of reformulation in this study was about 18% of the total repair strategies employed by the teacher and this is at variance with the finding of Panova and Lyster (2002) who found recast as the commonly and the most successfully used strategy by the teacher to prompt learners' participation in the classroom.

The teacher's use of elicitation formed 44% of the repair strategies used in this study to draw learners' responses. The W-H questions were systematically explored to promote internalisation of publicly displayed knowledge and forms of dialogic interaction within the classroom. With the teacher's use of elicitation strategy, the learners were given more opportunities of reflective thinking and reconsideration of the incorrect answers for more appropriate correct answers. Lending credence to this outcome, Walsh and Sattes (2005) cited in Nathan and Kim (2007) submitted that the use of elicitation in the classroom invites students' active learning and promotes cognitive development. In the same manner, Saunders and Goldenberg (1999) affirmed that elicitation technique in the class promotes reflective opportunities and conceptual restructuring for learners. Paralinguistic signal was used by the teacher once (4.34%) in this study. In this sense, the teacher only shook his head to show disapproval of the answer provided by a learner. The gesture led to series of negotiation of meaning which culminated into many students' responses/trials (active participation) in the classroom discourse.

The finding of Ellis (2002) which indicates that the use of gesture gives learners opportunities to identify the port of errors and readily make the necessary corrections corroborates the outcome of this study. Explicit correction, clarification requests and repetition were also used in the study as repair strategies. When explicit correction was used, there seemed to be a long "wait time" which was not intentionally meant to give the learners a time to re-think. Here the students were trying "to save their faces" as expressed by the interviewee during the post-repair audio-recording. In the same manner, previous researches have shown that learners are often negatively disposed to teacher's use of explicit correction strategy (Ellis, Basturkmen, & Loewen, 2001; Mackey, Gass & McDonough, 2000). No wonder, Scott (2008) remarked that explicit correction does not yield positive behaviour change of learners in classroom discourse in terms of participation. Chin (2006) also emphasised that explicit correction does not give learners the opportunity to be engaged in cognitive work to reason out the answer again; hence their level of participation in the classroom discourse is inhibited.

Clarification requests and repetition were also used by the teacher in this study to invite or draw out responses from the students as well call their attention to the incorrectness in the given responses. In consonance with the outcome of this study, Doughty and Varela (1998) while investigating whether corrective feedback could be integrated into a content-based ESL classroom and its effectiveness on grade 6 part-time ESL students, they found that repetition of learners' utterances with rising tone and additional stress on the point of error prompted students' participation as repair was done in each case. Muranoi (2000) also discovered that clarification request was an effective tool to draw learners' attention to problematic linguistic forms and facilitate their involvement more in the classroom discourse.

Judging from the students' responses in the audio-taped data extract, it is evident that most students preferred Student Initiated Student Response (SISR). Obviously, some of the learners were more comfortable with the teacher's repair strategies accompanied with politeness and this is evident with responses such as "... he is friendly". In view of this finding, one may be pressed to posit that teacher's repair strategies accompanied by politeness are likely to be acceptable to learners and are more likely to spur learners to active participation in the class.

Conclusion and Recommendation

Giving attention to the present trend in research focusing not just on the use of language in the classroom but also on the communicative designs that ensue in computer science classrooms in both developed and developing countries, there is the pressing need to inquire and understand how Nigerian computer science teachers in the present age use classroom talk as an instrument to foster forms and meaning negotiation as well as promote learners' active participation so as to improve learners' performance and the quality of education. Based on the findings of this study, it is obvious that repair or corrective feedback as a pedagogical tool promotes Nigerian learners' active participation in computer science classrooms.

In view of the recent findings, it is suggested that teachers should be very conscious of the verbal and the body language they use while trying to effect repair in computer classrooms so as to encourage more students' participation. Furthermore, computer studies teachers should strive to bring "passive" learners from their cocoons to a more meaningful classroom interaction by exploring elicitation technique that could prompt learners' responses. In the same vein, teachers of computer studies should make concerted efforts to encourage students' self-initiated responses. However, caution must also be made to ensure that such opportunity does not cause unnecessary bottleneck to effective interaction between the students and the teacher in the classroom; hence there is the need for further research in this direction.

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