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FRAMEWORK FOR ANALYSIS OF CLASS TALK (FACT) TO INFORM TEACHERS ABOUT THEIR PATTERNS OF COMMUNICATION TO PROMOTE MEANINGFUL LEARNING

Nasir Mahmood & Sumbul Asghar

Abstract: Observational studies in classroom interaction have long been source of informing readers about the classroom dynamics. The advent of modern technologies in 20th century has revolutionized the possibilities for observational researchers but methods of research have not been correspondingly reformed to utilize these emerging possibilities. This paper focused on development of a framework for analysis of class talk to inform teachers about pattern of communication that are most suitable for promoting meaningful learning. The rationale behind development of FACT emerged from limited scope of the classroom interaction being reported in the research at present. Review of literature revealed that very few studies refer to the full text of the classroom protocol but focus on selected extracts from class talk which best suits their research questions. Selected extracts sometime are used out of context and interpreted out of proportions. It becomes very difficult for the readers to envision the context in which the class talk occurred. FACT was developed to overcome the problem mentioned above and is based on studying class talk as it happens without /with minimum interference/manipulation, accounting for complete class talk to give image of the whole class and then focusing on any/more parts of the lesson as required and for having a framework analyzing sequence of lesson instead of isolated lesson. FACT focused on three dimensions of classroom interaction further sub-divided into two categories each. The categories were Nature of Talk (Uni-focal, Multi-focal), Content of Talk (Thematic, Contextual) and Participants of Talk (Teacher-student, Student-student). Interaction of these three dimensions leads to eight teaching approaches. It is assumed that all types of class talk will be covered in these eight teaching approaches. The use of this framework can be used a source of Continuous Professional Development (CPD) by the teachers to build patterns of talk potentially helpful in improving the effectiveness of their teaching.

Keywords: *Class talk, Interaction analysis, Continuous Professional Development (CPD)*

Introduction

Language and its effective use is one of those rare qualities for which human beings have been called the crown of the universe. All human beings develop a sound insight into the interpretative processes to derive meanings from the talk language and to use it to create meanings. This is partly a matter of grammar, partly of social etiquette, partly of culture, and essentially of assuming that others will perceive the same situation as we do. Our largely tacit knowledge of ourselves, of others, and of the conventions which shape interpersonal behavior, enables us to take part in all kinds of social interaction. The pragmatic theory of Grice 'Cooperative principle' (Grice, 1975, 1979) works effectively for successful communication. Communication is a complex process where participants integrate clues from each source of evidence, and act or react instantly on the basis of our judgment to engage in the talk. In our turn, we deploy such signals in ways which are normally consistent with our personalities but are also adapted to our shifting perceptions of those with whom we interact in the circumstances in which we do so. At a deeper level, this knowledge reflects processes which underlie all social interaction. Cicourel (1973), for example, lists among the basic 'interpretive procedures' which make orderly communication possible an assumed 'reciprocity of perspectives', mutual willingness to 'fill in' meanings which are meant but not stated, and a recognition that what is said now may not become clear until later in the interaction or may have to be reinterpreted in the light of past words and action. From a very different disciplinary perspective, Grice (1975) suggests a similar basis for orderly talk which he calls a 'co-operative principle'. This consists of a readiness to assume that our interlocutors' utterances mean something, and that it is our job to discern what that something may be. We therefore scan both talk and context for relevant evidence.

Importance of Teacher's Talk

Language is the teacher's main pedagogical tool. One important goal of education is to make students acquire, recognize and develop scientific ways of using language.

According to Neil Mercer, language is a powerful resource that guides the learners in the construction of knowledge. Research has shown that when teacher focus on the development of children language as a tool for reasoning, this can lead to significant improvement in the quality of children's problem solving and academic attainments. (Edwards, 1994). It is important to study how meanings and relations are organized in the class.

Research has shown that when teacher focus on the development of children language as a tool for reasoning, this can lead to significant improvement in the quality of children's problem solving and academic attainments. (Edwards, 1994). A critical analysis of the classroom language would expose how questions are customarily answered, turns are taken, silence is maintained and broken, to understand the verbal repertoire in educational settings (Hymes, 1979). In terms of practical pedagogy, processes involving argument, explication, hypothesis testing, justifying, etc., are emphasized, but these influential studies also have important implications for classroom enquiries where talk is the focus and the source of

data. If the development of understanding is 'a communicative accomplishment embodied in classroom discourse' (Edwards, 1994), talk itself has also to be recognized as jointly constructed. Pupil-talk thus provides not so much a window on to the individual pupil's thinking as to a collaborative discourse through which meanings are shared and constructed.

The most commonly found talk analysis framework are Brown (1975) and Flanders (1970) which were developed in early seventies. The technological facilities have tremendously changed over last four decades. The introduction of recording facilities has provided freedom of time and space. Instead of direct observation of class talk through manual observation sheets in time slots of 3-10 seconds had its limitations and too much dependence on the expertise of the observer which several time resulted in subjectivity of observed features of the class talk.

The sophisticated tools of audio and video recordings have allowed for stable, verifiable and accurate analysis of class talk from multiple angles to understand the multi-facet contribution of language in developing students' understanding of the content. Thus, the professional interest has increased in the recognition of the centrality of the class talk in the process of learning. It is important to study how meanings and relations are organized in the class. The research on this topic has its roots in the assumption that classroom community like other conversations use talk to pursue their interests and goals (Drew and Heritage, 1992). They want to get somewhere and their conversation serves like a vehicle. Speaker in a conversation may not have the shared goals but they can strive to achieve these through talk and joint action.

In class talk, we see people working out what they know and achieving what they can. What counts as knowledge may be arguable, in principle but under normal class room conditions, learners are likely to argue with a teacher's representation of the right answer. We cannot avoid the issues of power and control in the recognition of knowledge in classrooms, as a whole tradition of sociological and linguistic research has shown.

Constructing knowledge and understanding is a purposeful and persuasive process. People talk to create knowledge and a joint and social possession in class. Language is an individualized and social mode of thinking. Vygotsky (1978) believes and considers how the conversation which take place in and around learning activities constrain and extend the intellectual potential of individual learners.

Researches in the field:

Classroom language has always attracted the attention of the researchers to reflect upon the quality of teaching and learning. How an informed insight into the 'language of the classroom' might help teachers is still a haunting question for which we need a convincing answer. Researches have sought to transform their everyday intuitive experience into deeper, more systematic and more shareable insights in the academic (Edwards and **Furlong,** 1978, 1985; Westgate *et al*, 1985; Hughes and Westgate, 1988,

1990). The correlation of 'Knowing more' about classroom language will bring simple recipes for 'better' teaching is an oversimplified notion. It goes beyond such simple implications. The impetus for studying the classroom interaction didn't come from educational research. The movement was rather initiated by the disciplines of linguistics, especially sociolinguistics. Ethnographers of communication joined hands with the researchers in the field of education to study the phenomenon that studies the turn procedure and social and cultural factors in the classroom language (Hymes:1972). One of the main objectives is to see how talk is systematically patterned in ways which reveal speakers' perceptions of their relationship. Many researchers agree with Sinclair and Coulthard (1975) that classroom provide an attractive research setting since relationships are amply defined to clear its evidence in the language.

The first and foremost ends of the educational research of interaction analysis of class talk focused on the outcome of teaching. From there, the enquiry into complex interactions emerged, how knowledge is transmitted, displayed, impeded or avoided. In 1950s and 60s, the research was done by making the observational schedule of 3 seconds slot. It was a kind of immediate analysis which provided immediate feedback. This process was appreciable as it provided instant and prompt directions and helped in making urgent amendments for the waiting practitioner. Barnes raised the points of the predominance of closed questions and heavy constraints on what learners say in 1969 which marked a breakthrough in the field of education. Result was that teachers started talking less and more focused on devising contexts where learners talk took place naturally and communicative demands on the students.

With the passage of time, the question of validity questioned the research methodology used for talk analysis. It was considered a flawed procedure since the observer was distracted by so many questions at the same time and he could give no second reading to his observation. The next procedure designed was of recording the lessons and then analyzing them. It all started in 1970s and it is hard to find any transcripts of class room talk before 1970. Massialas and Zevin's transcribed data is an exception. The age of technology directed the attention of researchers to using technology in making a record of the interaction in the classroom and then study it in minute details and put a check and balance system on various portions. Availability of discreet cassettes and radio microphones made the task of getting the data in detailed form easy. The researchers have been relieved of the hectic job of filling in the classroom protocol. Recording classroom talk, listening and transcribing came in vogue. It helped reveal the characteristics of teacher learners' interaction which remained shrouded for a long time. This process was not taken with smile altogether. Continuous interpretation and frequent re-interpretation are among the intricacies which confer upon talk both its fascination and its intricacy as an object of study. This can best be done when we can resort to data more than one times and focus on each and every minute detail. The critics raised objection against these procedures as they assert that it was a slow, laborious and arduous process. The recording of one hour took 15 to 20 hours for transcriptions because of details and complexity.

Various Frameworks used for class talk analysis

Various methods for analyzing analysis in the classroom have been devised. Let's see their merits and demerits and scrutinize how successful they are. Most popular interaction analysis systems were developed by Flanders (Flanders, 1970) and Brown (Brown, 1975) in 1960's for coding teacher and student behavior in the classroom by using the classroom protocol. Interaction Analysis System developed by Brown became famous for its simplicity of use (Kono, 1993; p.118). Since some of its categories remained debatable for their depth to encompass all dimensions of classroom interaction, soon the need for improvement was felt. Flanders tried to find solution and his system was widely adopted by most of the researchers with occasional manipulations at times to suit the individual researcher's objectives but mainly the framework remained the same.

Their categories are too broad. Time slots are too small. It is difficult to observe in real time observation.

Dialogic Teaching

The only model that is found to be best suited today is the dialogic model of interaction analysis. The term 'Dialogue' is used in a broad sense to mean the interchange of ideas between one source and another (NK). By narrowing down this broader term for educational activities, it has been observed that little attention has been given to the relationship between the quality of talk and learning outcomes though there has been a good deal of research on the classroom talk. Neil and Karen have included dialogues such as teacher student exchanges and discussions among the students and further explained the functions of those dialogues. The dialogic model of interaction has been very important as researchers contend that from a sociocultural perspective, human beings are seen as creatures who have a unique capacity for communication and whose lives are normally led in groups, communities and societies based on the shared ways of using language to get things done. This perspective raises the possibility that the educational success or failure may be explained by the quality of educational dialogue. Learning is generally associated with gaining knowledge, with the acquisition of some facts or skills while development usually implies some change of a progressive nature. It invokes ideas of some sort of growth, the emergence of new entity or arrival of a new state of affairs. Dialogue is considered very important in making children progressively more able to carry out intellectual activities.

Language is a principled means for establishing shared understanding, testing out possible solutions and trying to reach some agreement. Thinking together is an important part of life but it has traditionally been ignored in schools. In the recent years, collaborative learning has begun to be appreciated. Research has shown that certain factors contribute to making the joint activities productive. Moreover, it is also seen that how dialogue with the teachers can help learners in learning. The findings of the research offer clearer and more secure understanding of how teacher student dialogue can be used

to do research. Research in the field has shown that the dialogue between teacher and student can help plan the activities to ensure that the opportunities are provided for teachers and the students to construct knowledge and understanding together.

Keeping in view the limitations and deficiencies in terms of framework, recording and analysis in the contemporary talk analysis tools/framework this framework rests on the following rationale basis;

1. FACT allows studying class talk as it happens without /with minimum interference/manipulation.
2. It will account for complete class talk to give image of the whole class and then focusing on any/more parts of the lesson as required.
3. Instead of analyzing class talk as disjointed act this framework will use a sequence of minimum three lessons or one content unit as basis for meaningful analysis.

Framework for Analysis of Class Talk (FACT)

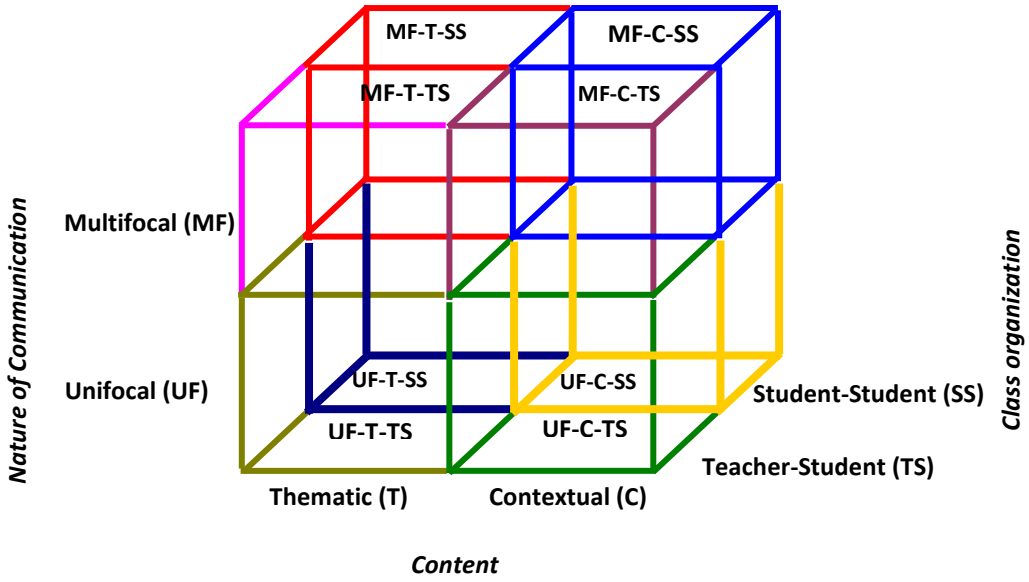


Figure 1: **Framework for analysis of class talk (FACT)**

Dimension of FACT

I. Nature of Communication

1. **Unifocal:** Talk moves along one same line. Uni-track, unwillingness to change, assertion of idea by implication, no consideration for alternative thought,
2. **Multifocal:** various aspects of the ideas under consideration are entertained. Perspectives put forward are encouraged or perhaps invited. A shift in starting position of the participants is expected.

   (one scientific concept is essentially taken up in both unifocal and multifocal talk)

II. Content Contextualization

1. **Contextual:** Involves talk related to disc9ipline, instruction leading to successful execution of academic work in class, socialization etc aiming at setting stage of academic work to take place efficiently.

2. **Thematic:** Involves talk specific to the subject being studies..

III. Class organization

1. **Teacher-Student:** A situation in which teacher is addressing whole class and students also has opportunity to contribute willingly and/or on nomination by teacher.
2. **Student-Student:** Situation involving two or more students working in groups to perform task at hand.

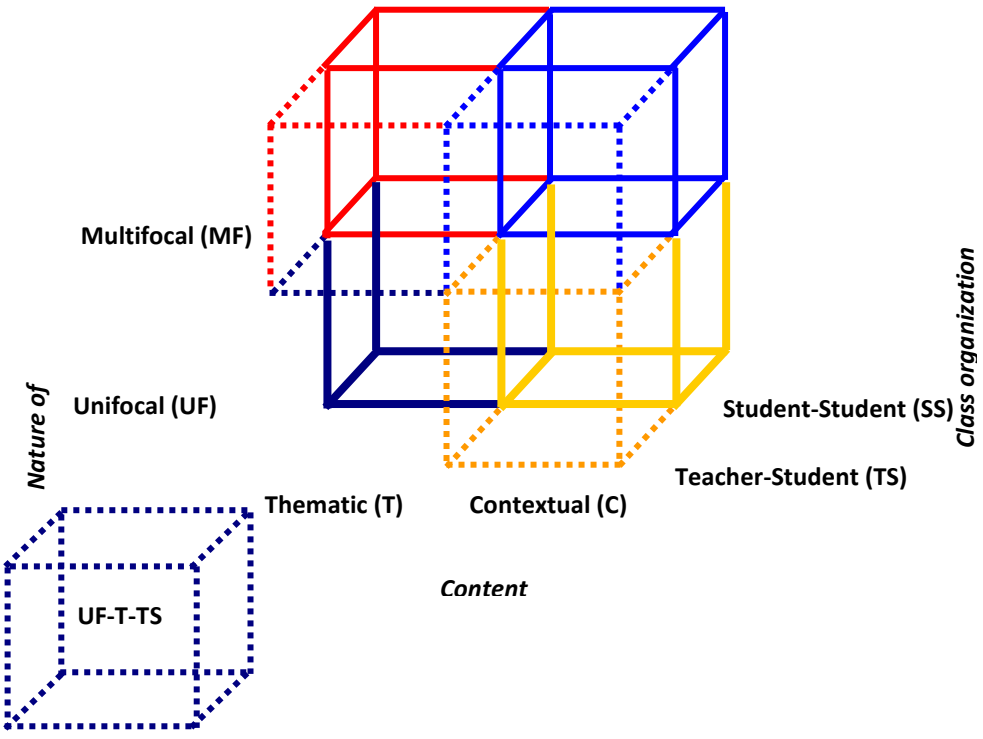
Teaching Approaches: Categories of Talk in FACT

On the basis of the dimensions of class talk described above following class talk categories can be put forward.

1. Unifocal- Thematic –Teacher & Student (non-interactive)
2. Unifocal - Thematic –Student & Student (non-interactive)
3. Unifocal - Contextual – Teacher & Student (non-interactive)
4. Unifocal - Contextual – Student & Student (non-interactive)
5. Multifocal- Thematic – Teacher & Student (interactive)
6. Multifocal - Thematic – Student & Student (interactive)
7. Multifocal – Contextual – Teacher & Student (interactive)
8. Multifocal – Contextual – Student & Student (interactive)

Each of the above categories are described to explain, define scope, characteristic and an example of nature of talk related the selected category.

1. Unifocal- Thematic –Teacher & Student



A. Description of the category

Teacher presents the concept to be learned in a very well prepared format like lecture. The conversation is full of informative words and terms and teacher hopes that students will establish the required connection and contextualization by themselves automatically. Familiarity with scientific language is taken for granted. Either teacher does not involve students in the lesson or ignores students' views. Lesson has no place for student views but proceeds in pre-decided manner with no practical flexibility. Teacher clearly asserts his/her point of view (without giving any attention to alternative views presented by students) on students. Review of previous lesson (s) is also part of this type to talk where teacher summarizes what he/she thinks is (or must have been) learnt during previous lesson(s).

B. Scope

1. Talk is very much structured (pre-decided) and full of informative words and terms.
2. Talk is dominated by teacher and delivers (throws) lot of information in relatively less time.
3. Students participation is either very low or not used by teacher to build lesson.
4. In case student participation is observed a visible disconnection of teacher talk and student contribution is visible.

C. Characteristics (of this episode of talk)

1. Predominantly teacher talk

2. Very organized and pre-planned set of content delivery or exchange.

3. Disjoint talk between teacher and students.

4. Teacher asserting his views with no/limited flexibility

D. Excerpt from transcribed data

Teacher: Do you remember the electric bell?

Student: Yes! [In chorus]

Teacher: Ok! Did you notice, did any of you actually hold onto the bell after it had…been working? What did you notice?

Suzanne: Vibration.

Teacher: Well, the arm vibrated, yes. Sound. What else did you notice?

Tom: It was loud.

Teacher: That's not quite what I am getting at.

Teacher: Remember the bell. There's the bell [holding up the bell in the front of the class]. You did the experiment. If held onto this bit here where the wires were [indicating], did you notice anything there?

Jason: There were sparks there.

Teacher: Heat, did you notice some heat?

Jason: There were sparks from there.

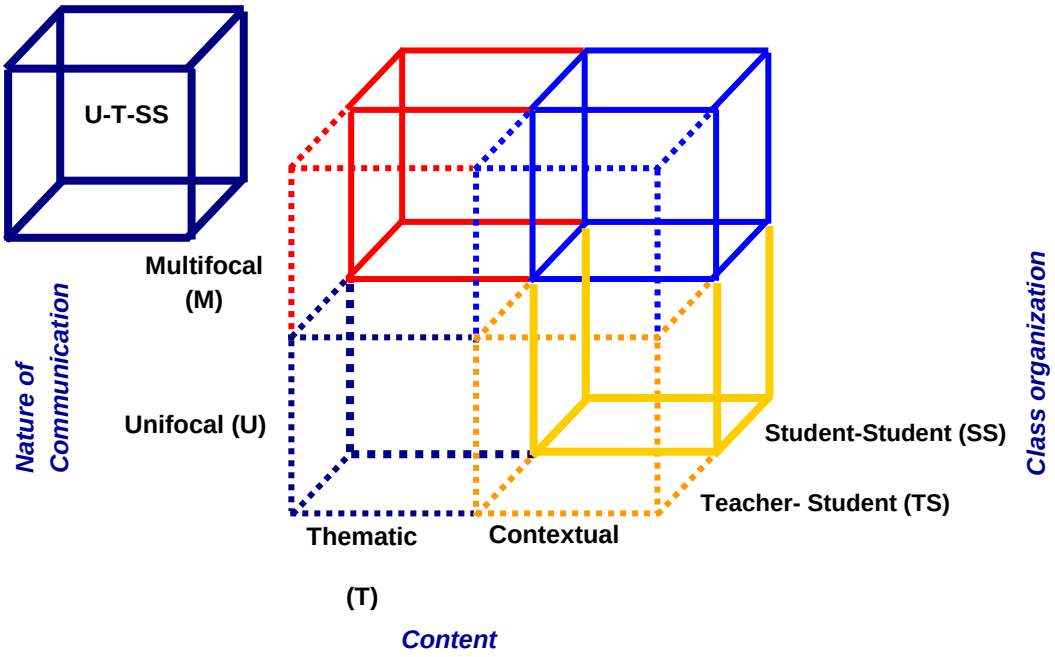
Teacher: There were?

Jason: Sparks.

Teacher: There were some sparks, yes. ***Let us just ignore the sparks a minute…some heat.*** There was a little bit of heat there with that one.

Mortimer, E. F. and Scott, P. H. (2003). Meaning making in secondary science classrooms. England: Open University Press. p. 85.

2 Unifocal - Thematic –Student & Student (non-interactive)



A. Description of the category

This refers to the part of the lesson where students are working in groups under the well described or listed guidance of the teacher with little liberty to change what has been delivered to them by the teacher (authority comes from guidelines or instructions). Another scenario can be where students are working in groups and one student from the group looks successful in asserting his/her views on others. He/she dominates the talk between group members and apparently succeeds in getting his/her thought conveyed. In this case the authority resides in position in class, superiority of knowledge socially accepted by others etc.

This will often happen in group with students of varying ability. Some students in the group enjoy greater acceptability among others in terms of his/her academic superiority. Such student leads the work and his finding/conclusion is accepted by the remaining students as correct with little or no contribution.

B. Scope (what can be accomplished?)

1. A clearly laid work plan prepared outside class by teacher or by one student (lacking signs of consultation with students) is followed strictly.
2. An individual from group is dominating the talk episode.
3. Going beyond what is planned and given to students is discouraged by group members.
4. Questions raised by group members are discouraged/turndown/remain unattended with out reason.
5. Ending at ONE conclusion not argued (for accepting or rejecting) by group members but accepted without understanding (by virtue of authority of presenter).

C. Characteristics (of this episode of talk)

1. Student-student talk without valuing every ones contribution.
2. Passive learners are visible in the episode.
3. Students not speaking their mind (lesser motivation).

D. Excerpts from transcribed data

In a sequence of lessons students were studying about theories explaining models for air expansion. Working in groups students have already developed some models explaining what happens when air expands? Teacher has heated some air in the test tube and filled balloon with that air to demonstrate the expansion of air and students are to explain what happened to air? This discourse is from students of age 14-15 years (year 8) in an attached school of a university in Brazil.

1. Carolina: What happened is the particle got bigger.

2. Raquel: The particles expanded……

3. Carolina: Expanded…

4. Raquel: That's model three. [referring to the number of the model on the sheet distributed by the teacher].

5. Carolina: what do you think, Ricardo?

6. Ricardo: Nothing…… I don't know.

7. Carolina: Hey! We have to answer here. We saw the balloon fill up, didn't we? But we have to answer… explain…

8. Raquel: We have to explain, air when heated, expands.

9. Carolina: Expands. The air particles expand when heated because there's empty space between the particles.

10. Edward: It's the air that expands.

11. Carolina: It isn't the air that expands! It's the particle that expands.

12. Raquel: Ah, now we have to draw here… the model that we have chosen… [they start drawing].

13. Carolina: Here, look, we have to describe the model. How do we describe the first [test tube]?

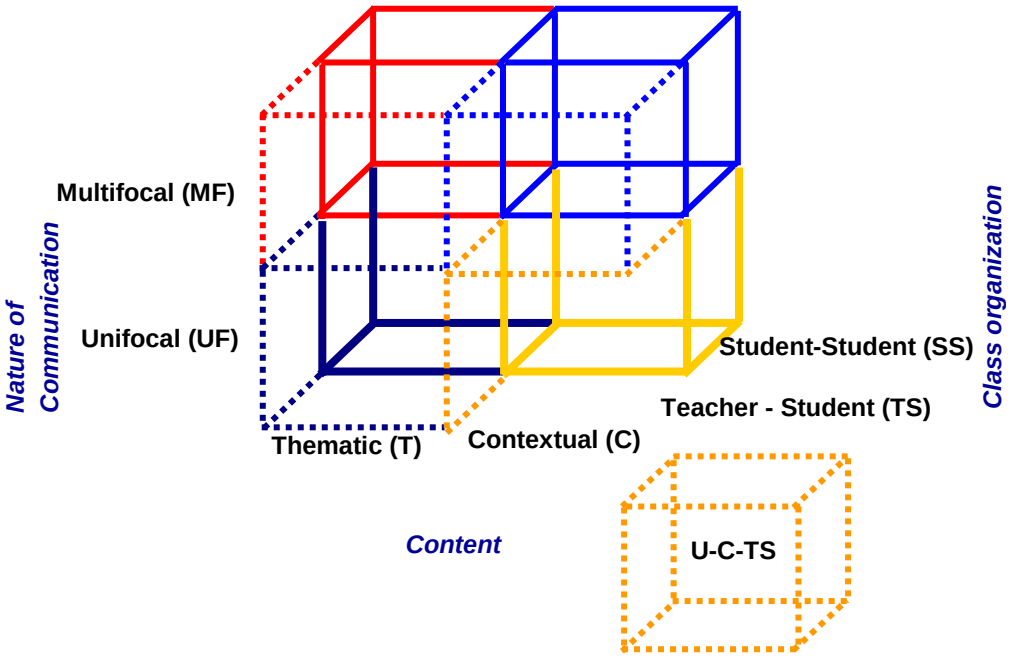
14. Edward: Normal.

15. Carolina: Normal. The particles have their normal size. Now, in the second [test tube], they have got bigger, expanded, filling a bigger volume, haven't they?

16. Edward: Yes.

Mortimoer, E. F. and Scott, P. H. (2003). Meaning making in secondary science classroom. Open University Press, McGraw Hill Education. p. 85.

3 Unifocal - Contextual – Teacher & Student (non-interactive)



A. Description of the category

This category of talk deals with two types of talk i.e. talk related to organization/ discipline of class and talk on plan of work, rules of class work, ways of recording information and nature of participation expected from students. Both these types of talk have very close relation with conduct of the lesson but are not directly focused on content to be learned. Ability to successfully think, plan and carry out set the mood for working on actual knowledge development activity in the class. This type of talk usually found in the beginning of the lesson but can be found in any part of the lesson e.g. after completion of an activity and assembling students to share results.

Pattern of interaction: I_s-R_s-E_s

B. Scope (what can be seen in the text?)

1. Teacher or any students assigned with this duty by teacher bringing discipline to the class and getting students settled for attending the lesson

2. Teacher or any students assigned with this duty by teacher communicating work plan and making sure it is understood by all students.
3. Students asking for elaboration of some instruction or guidelines told by teacher.

C. Characteristics (of this episode of talk)

1. Talk dominated by teacher or students to whom teacher assigned by the teacher.
2. Students-teacher talk for explanation of some of the instructions/guidelines.
3. Students compliance to given instructions.

D. Excerpts from transcribed data

The hardness of rocks

Teacher is introducing the topic and explaining the method of working on the topic.

T: 'Now children, look at these. I have got five different stones. They're all different. What I want you to is think an experiment to find out which is the hardest. Work in pairs. One person from each pair form a queue here and I'll give you some stones. When you finish, write about what you did in your science books. Remember how we do that? I've put a list of titles on the board to remind you. Everyone know what you've got to do? OK, let's get started.'

Newton, D. P. (2002). Talking sense in science: Helping children understand through talk. London: RoutledgeFalmer Press.pp.69-70.

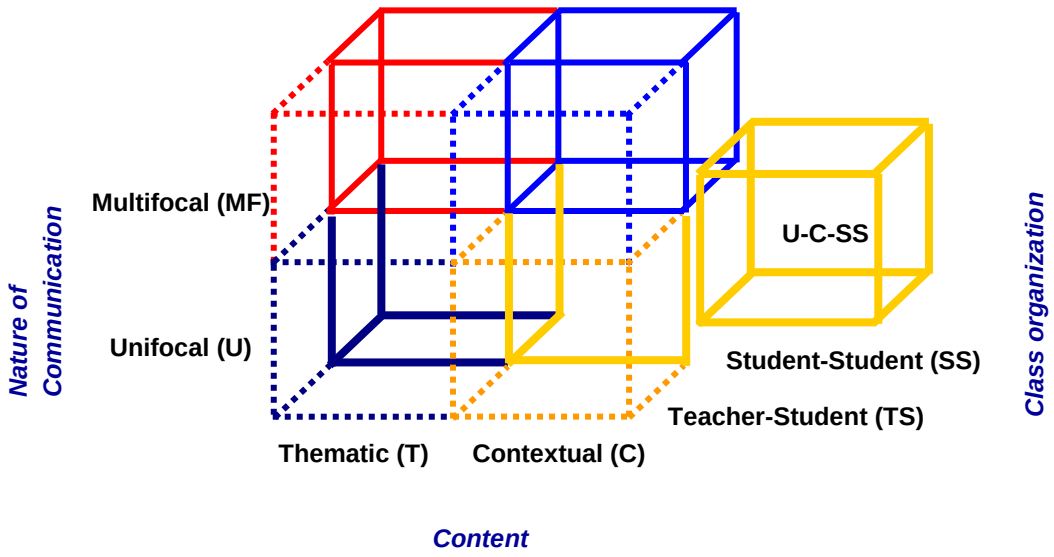
This is taken form *Walker and Adelman (1975, pp. 40-41) as reported in Investigating Classroom Talk by A. D. Edwards and D. P. G. Westgate*. Teacher is trying to get students attention.

T: can you sit down in your seats please (6 second pause). We're waiting for some people at the back (20 second pause). Oh look you two boys- do you really want me to start getting angry about it? (2 second pause)

We are still waiting for you people at the back (6 second pause). Right, now. Now you're all sitting down could you look all look this way please (10 second pause).

Thank you. Now then. Someone asked me very good question. They said why we can't just carry on mucking around with all these things. Why do we have to write it all down…. (p. 121)

4. Unifocal - Contextual – Student & Student (non-interactive)



A. Description of the category

Teacher announces pre-decided plan of activities for each group (or same instruction for all groups) with very little or no consultation with the students. The talk is focused on what students are expected to do during the course of the lesson in the manner most suitable for them in the opinion of the teacher. Within groups, one student dominates the other student being at edge in comparison to other group members by virtue of better academic position in the group, strong communication skill or prior knowledge about the content under focus. In cases, where teacher has asked some students by name to be group leader in an activity and the leader decides everything with out any concern for what other members feel about it.

Pattern of interaction: $I_{s/t}$-$R_{s/t}$-$E_{s/t}$

B. Scope (what can be seen in the text?)

1. Transfer of information in minimum time
2. Uniformity in the actions of groups to some extent.
3. Group talk dominated by one group member (about management of the activity at hand and role of different group members).

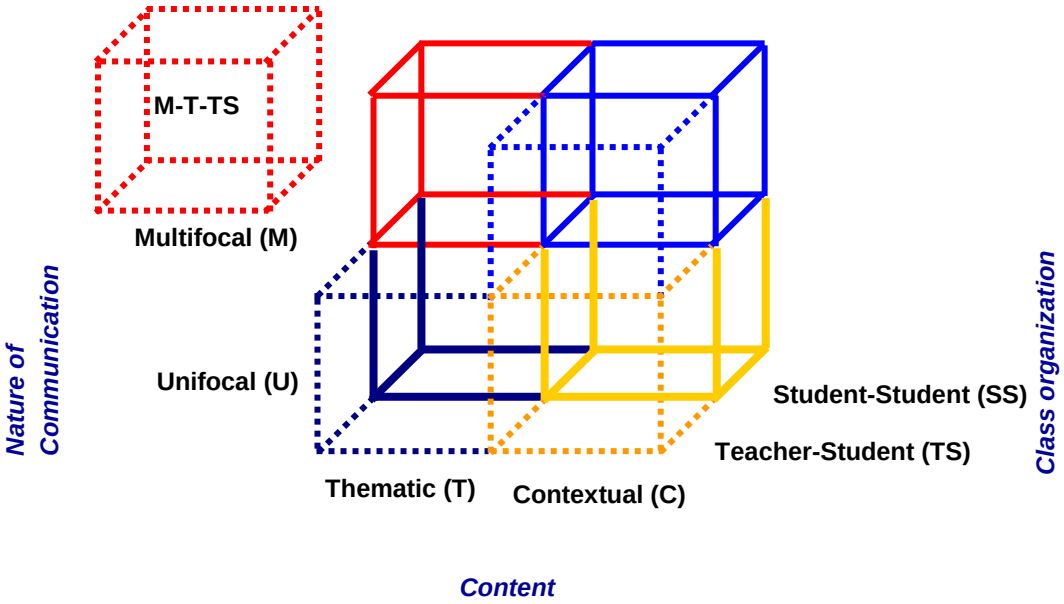
C. Characteristics (of this episode of talk)

1. Assertive dialogue among few members of the group or by teacher
2. Least consideration to feelings of others
3. Strong conviction in the words used to show least flexibility for possibility of change.
4. Authoritative sentence structure.

D. Excerpts from transcribed data

Among students and one student is clearly talking in the manner described above.

5. Multifocal- Thematic – Teacher & Student (interactive)



A. Description of the category

The talk is about the new concept introduced in the lesson or advanced level of the concept already introduced to students. The conversation is exploratory in nature and teacher values the responses given by students. Teacher questions are meaningfully designed and placed to urge students speak their mind and at the same time remaining connected to the ultimate goal of the lesson.

Pattern of interaction: $I_{s/t}$-$R_{s/t}$-$E_{s/t}$- $I_{s/t}$-$R_{s/t}$- $I_{s/t}$

B. Scope (what can be accomplished?)

1. Students making meaning about the topic under study.
2. Social plan for developing an agreed upon understanding of the phenomenon under discussion.
3. Construction of knowledge at individual level.
4. Sharing of findings at the end of any activity and reaching towards agreed upon conclusion.

C. Characteristics (of this episode of talk)

1. Presentation of mechanism through which each group or individual have reached the results or point he/she is making.
2. Arguing for the presented results and accepting changes if rightly pointed by other members of the class.
3. Teacher talk focused on raising points of agreement and disagreement from the discussion between different students.
4. Teacher setting questions to further the points brought by students and directing students towards scientifically accepted understanding of the concept in focus.

D. Excerpts from transcribed data

Episode 2: Have we actually repeated ourselves

The students are still seated around the teacher's table, and on the board the list of suggested things needed for rusting reads:

Rain, Damp, Moisture, Wet, Salt, Vinegar, Air, Condensation, Cold, Dark.

Lynne invites the students to look more closely at these suggestions:

1 **Teacher:** Now-what I'd like to do first of all is to look at these suggestions-because –is there anything that some of them actually have in common-have w actually repeated ourselves with any of the things that we've got on the board at the moment? Kevin, first of all then-what d'you think we've repeated ourselves with?

2. **Kevin:** Erm-rain, damp…then cold.

3. **Teacher:** Rain, damp.

4. **Teacher:** …What have we got in common perhaps with all the things we have underlined? What is it Kavin?

5. **Kevin:** They're all wet.

6 **Teacher:** well-they are all wet- so what do you mean by wet then? Is there something else about wet?

7 **Students:** No-wet [other mutters]

8 **Teacher:** what is wet perhaps?

9. **Students:** [chorus] Water! [Laughter]

10 **Teacher:** Water! Is that the key thing? Ketan, what do you think? Is water the key thing here that's linking all of these...

11 **Ketan:** Yes

12 **Teacher:** You've said rain, damp, moisture, wet, oh…condensation and what I'm asking you is 'what do you mean by that?' so what is the common link perhaps?

13. **Ketan:** s'all different forms of water

14 **Teacher:** Water. Yeah? Anyone disagree with that? That sounds reasonable? OK, so with all of those things w can link up and say that water is important.

Mortimoer, E. F. and Scott, P. H. (2003). Meaning making in secondary science classroom. Open University Press, McGraw Hill Education.

A lesson on the properties of materials-heat insulation

T: Think about the morning, Think about when you came to school. [Pause]. What was it like? Was it warm or cold?

C: It was cold. I could see my breath.

T: Yes it was cold, wasn't it? [Pause, while everyone agrees.] What do you wear when it's cold?

C: a coat.

T: Yes, a coat. [Pause]. Do you wear anything else to keep you warm?

C: A scarf and some gloves. Mine are on the radiator.

T: That's right. A scarf and gloves will keep you warm. How many of came with scarves this morning? [Pause]. Yes, a lot of you came with scarves so that you world be warm. [Pause]. I've brought some of my scarves. How many have I got? [Takes answers]. Which scarf do you think will keep me really warm? Which do you think will be the best one for a really cold day?

C: The red one, it's red.

T: So you think the red one will be best. Why do you think that?

C: Because it's red. I have got a red one. Mine…my scarf is warm.

T: Thank you, Fiona. Well you might be right. Let's all see your scarf. Look, everyone. Fiona's scarf does look a warm one. Why do you think it's warm. [Pause] Alison?

C: Because it's fluffy.

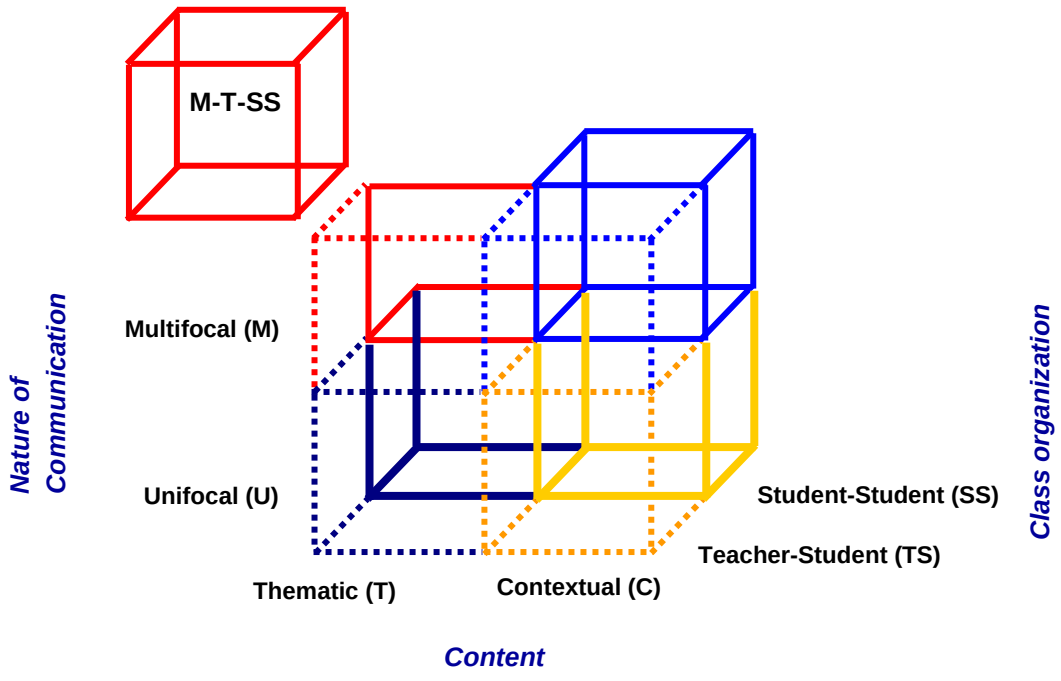
T: It is fluffy. Is my red scarf fluffy, too?

C: yes.

T: It is, isn't it? Well, what are going to do is find out if it really is the best scarf for keeping warm. What are we going to do Peter? [Takes responses].

Newton, D. P. (2002). Talking sense in science: Helping children understand through talk. London: RoutledgeFalmer Press.p.36.

6 Multifocal - Thematic – Student & Student (interactive)



A. Description of the category

The students are involved in understanding newly introduced concepts and working out different conceptual inconsistencies held by individual students or group of students. The dialogue is typically focused on posing questions (by teacher or by fellow students) aimed and bringing forth alternative concepts held by individuals and providing opportunity to group members for discussing them and reaching at the threshold where the shared understanding of the concept is developed. The language may or may not be scientific at this stage of the class talk.

Pattern of interaction: I_s-R_s-F_s/E_s-R_s- F_s/E_s -

B. Scope (what can be accomplished?)

1. Students arguing in favor of their opinion
2. Appreciating explanations put forward by other students
3. Questioning arguments put forward by others
4. Brining forth inconsistencies arising in their mind while making meaning of the task at hand.
5. Consensus on meaning looks emerging

C. Characteristics (of this episode of talk)

1. Predominantly student-student with occasional questions/comments from teacher
2. Students influencing each other's point of view

D. Excerpts from transcribed data

Neil Mercer, Guided construction of knowledge: talk amongst teachers and learners. pp. 12-13

… Next, I want to look at part of discussion which was captured by a teacher in a south London school who left a tape recorder running while a group of girls (aged 11-12) worked together on a mathematics problem. The problem was this:

> You have a square sheet of card measuring 15 cm by 15 cm and you want to use it to make an open cuboid container by cutting out the corners. What is the maximum capacity the container can have?

For our purpose here, it is useful to focus on one of the four girls, called Emily in the transcript (the other girls are represented as A, B, and C), Emily was considered by her teacher to be quite confident and able in mathematics. At the point the transcript begins the girl have made a box to the dimensions required out of card marked out in centimeter squares, but Emily is unhappy that the box seems to have got 'bigger' despite having lost its corners. This is because she has a fundamental misunderstanding about what they are doing. As you read, try to work out what her difficulty is.

SEQUENCE 2.3; Maximum Box

Emily: This box is bigger than what it should be' cos if you get 15 by 15 you get 225, but if you times um 9 by 9 times 3 you still get 243 and I haven't got that much space in my box.

A: You have.

Emily: But the 15 by….

B: It can be, it can work, I think.

Emily: But surely…

B: You cut off corners.

Emily: Yeh but that surely should make it *smaller*

B: I think that is right.

Emily: *(counting squares marked on the paper)* Hang on 1,2,3,4,5…

C: You' re not going to get 243.

Emily: I shouldn't get 243 'cos if the piece of paper only had 225 then, um…

C: Hang on, look … 9 times 9 how many was it up?

A: But don't you remember, Emily, it's got all this space in the middle.

Emily: Yeh, but…

A: It's got all that space in the middle.

C: It is right, Emily, it is , it should be that number.

Emily: But if I have apiece of paper with 225 squares, why should I get more?

A: Because you have all that space in the middle.

Emily: *(sounding exasperated)* No, it hasn't got to do any thing with it. If my piece of paper had only 225 squared on it, I can't get more out of the same piece of paper.

A: You can because you are forgetting, things go *up* as well, not just the flat piece of paper like that.

Emily: Oh yeh.

A: It's going up.

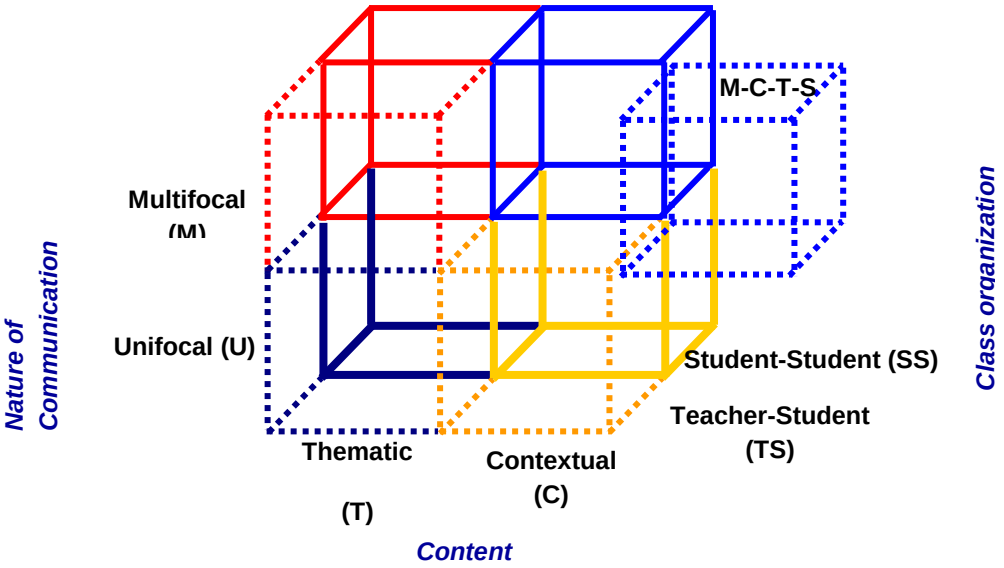
C: It's going up.

C: It's because, look, down here you've got 3 and it's going up.

Emily: Yeh.

C: It is right, it should be.

7 Multifocal – Contextual – Teacher & Student (interactive)



A. Description of the category

This type of class talk usually occurs at the start of a new sequence of lessons or an activity. It aims at working out the plan of action and manner in which class activities will be carried out. Teacher and students reach at a plan of action for the activities related to class work. Teacher's role is to guide and make sure the viability of the finally agreed plan of work for its probability to produce desired results and students role is to speak out the possibilities they have in mind and acknowledge the drawbacks of their suggested plans, if they withdraw their suggested plan or take along other class fellows, if there suggested plan is accepted. This kind of talk episode ideally results in giving a sense of ownership and active involvement to the students. If it happens in any other part of the lesson, it may be when teacher is collecting students' experiences after an activity ends and teacher's role is just to put student experience on the board without adding or deleting and information in what is being reported by students.

Pattern of interaction:

B. Scope (what can be accomplished?)

1. Teacher presenting the work and hand to students in inviting manner.
2. Encouraging students to bring new ideas.
3. Challenging viability of presented schemes of work and encouraging students to do the same.
4. Suggesting working relationship between class fellows in relation to task at hand.
5. Sharing nature of participation expected from students and ethics.

C. Characteristics (of this episode of talk)

1. Pre-dominantly teacher-student talks with student-student exchange in it.
2. Establishing rules of the lesson, nature of participation of students
3. Sharing of individual experiences about conducting similar activity.

D. Excerpts from transcribed data

Episode 1: what was it about those places that made the nails go rusty.

At the start of the first lesson, thr students were gathered around Lynne's (teacher) table at the front of the room. Lynne begins by reviewing where various students had left their nails:

1. Teacher: You put them in some really interesting places. The sort of places you put them-Dawn put her on the slope outside in the garden, and Matthews, Andrew and Louise also put theirs outside in the garden…Now –er- Barry put his in a cement hole outside in a wall. Clare puts hers near the garage. Jill put hers in a cellar. Now all of those went rusty.

Lynne then collects ideas from the students on what it was about the places selected that made their nails go rusty.

2. Teacher: So-what I want to do – put on the board, is perhaps put down your ideas of what it was about the places that made your nail go rusty. What do you think it was- thinking about the places-that made your nails go rusty?

3. Haley: Damp

4. Teacher: Damp. Now- we'll put things up first of all, then we'll have a think about them in a minute. Right-so, damp[Lynne writes it on the board]. Yes-Cheryl?

5 Cheryl: Moisture

6. Teacher: Moisture [writes it on board]. Damp, moisture. Anything else? Gavin?

7. Gavin: I put in some mud in the garden.

8. Teacher: What was it about that mud that you think made yours go rusty?

9. Gavin: Cos it were all wet and all boggy.

10. Teacher: Wet-so it was wet again. Wet [writes it on board]. Right – wet. Any other idea-Matthew?

11. Matthew: Air.

12. Teacher: Air- right you think air could actually – right [writes it on board]. Air could make it go rusty. Flona?.

13. Flona: Condensation might.

14. Teacher: Condensation.- right [writes it on board]. Dawn?

15. Dawn: Could it be like- climate like- if it's hot or cold?

16. Teacher: Hot or cold. Do some other people think that hot or cold migt be something significant, in making something go rusty? Hot or cold- is that an idea-yeah? Hot. Which? Both of them or just one.

17. Dawn: Both.

18. Teacher: Haley's saying perhaps cold. Cold? [students mutter] Well, is there anybody who put theirs in a hot place and it went rusty? [mutters]. Don't forget you're thinking about where you put your nail- what it was- what thing in that place-were making it go rusty. Yes?

19. Student: Cold.

20. Teacher: Right [adds 'cold' to the list at board], have we got anything else it could have been? Anyone that hasn't given me an answer yet? No? Andrew then.

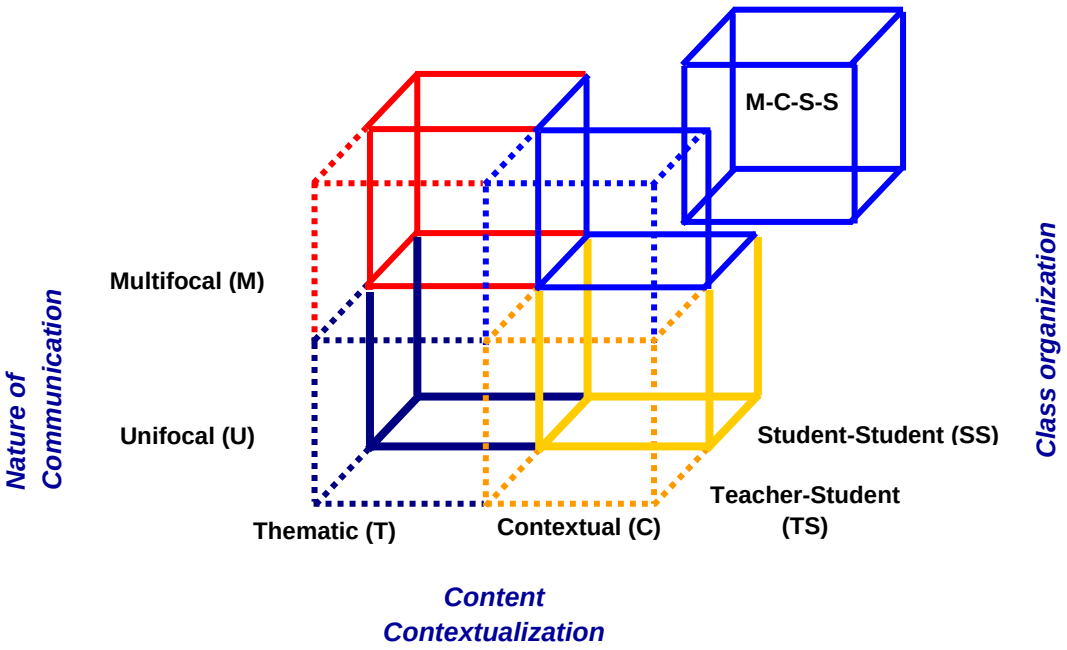
21. Andrew: On the bike- if I scrape me bike and leave it out in the rain, it goes rusty.

22. Teacher: So- what are you saying is making it rusty then? Which of these things, which is causing it to go…

23. Andrew: Rain.

Mortimer, E. F. and Scott, P. H. (2003). Meaning making in secondary science classrooms. England: Open University Press. pp. 51-52.

8 Multifocal – Contextual – Student & Student (interactive)



A. Description of the category

This applies to the lessons or any episode in a lesson starting with students divided in groups and assigned some task to perform. The content requires students to come up with a plan of work, methodology to perform an activity, decide some distribution of roles/duties in a joint project work given to them or other activities of this nature.

As students are supposed to decide something among them, a dialogue is expected among them to reach an agreed upon mean acceptable to all group members and suitable for accomplishing the task as well. Teacher may jump in for short period of time to overview and assess direction and sense of what is going on in the group.

Pattern of interaction: I_s-R_s-$F_{s/t}$-R_s-$F_{s/t}$-

B. Scope (what can be accomplished?)

1. Students trying to make acquaintance with each other and with the topic at hand
2. Clarify the rules of the group work for smooth working relationship
3. Describing role of each group member in the activity

4. Sharing previous learning of individuals potentially helpful in performing activity/task at hand

C. Characteristics (of this episode of talk)

1. Pre-dominantly student-student (occasionally teacher entering)
2. None of the students is in a position to dominate or assert. (Participation of equal basis
3. Appreciation of relevance of individual talk towards the accomplishment of task at hand can be seen emerging in this episode
4. Focused on building agreement on parameters of activity at hand.
5. Job description for each member of the group emerging
6. Satisfaction of individuals participating in talk with proceeding resulting from talk.

Discussion

The eight categories of talk described above completely cover the class talk and analysis will provide the reader with complete idea of the range of talk episodes and will clearly reflect the proportion of class talk forming the base of the discussion. Different groupings of these categories can point out various pattern of class talk helping to label the nature of class talk against pre-set criteria of talk. Few fetched possibilities are drawn below to elicit the possibility of scenario.

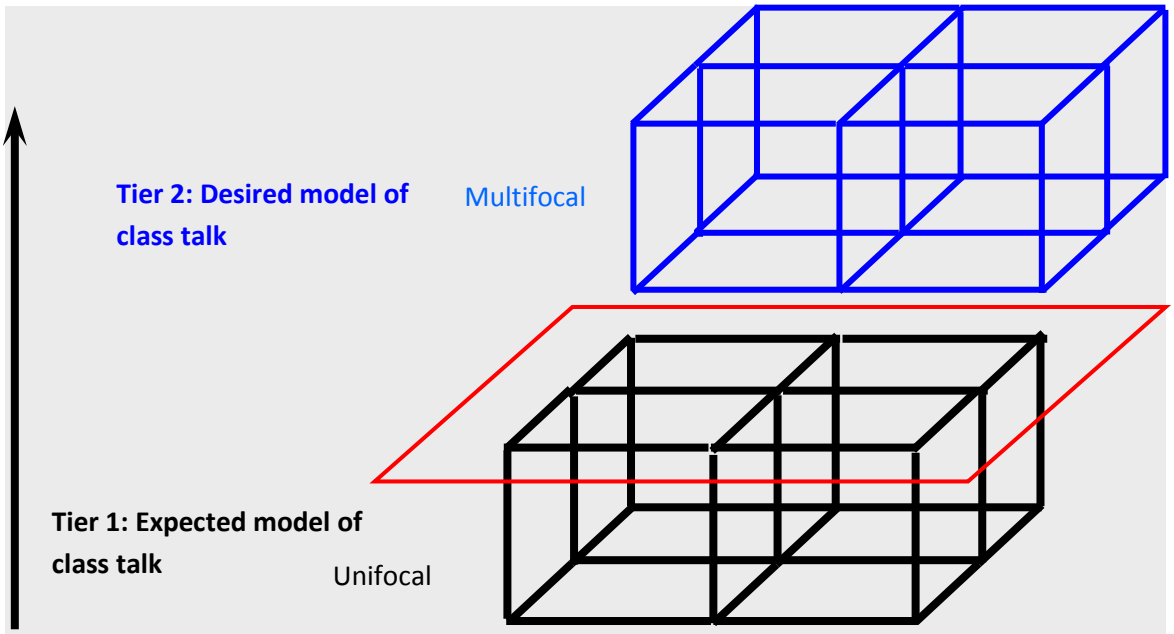


Figure: Two tier model of nature of communication

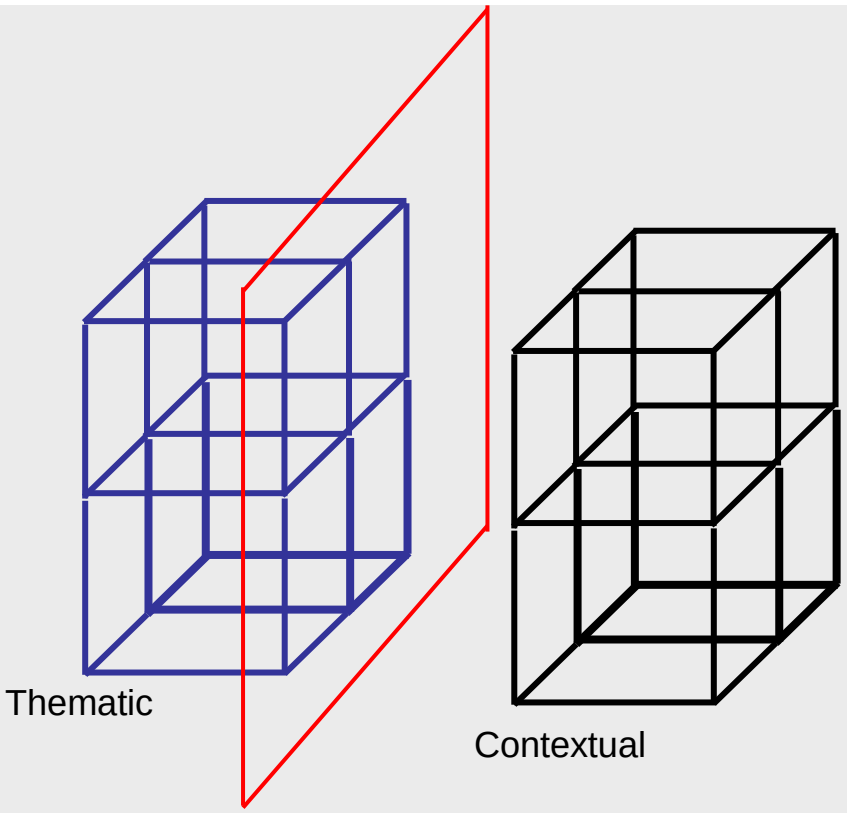


Figure: Two tier model towards content contextualization

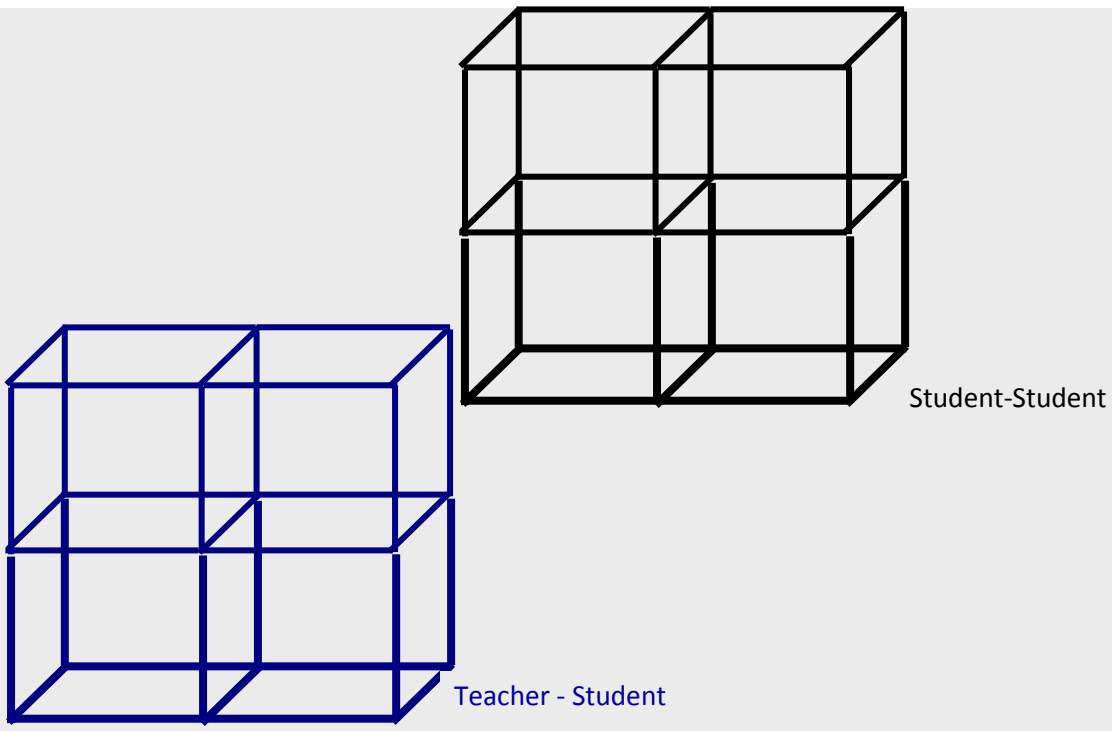


Figure: Two tier model towards pattern of class organization

References

Brown, G. (1975). Microteaching: a programme of teaching skills. London: Harper & Row Publishers Inc.

Flanders, N. A. (1970). Analyzing teaching behavior. Massachusetts: Addison-Wesley Publishing Company.

Vygotsky, L S (1978) Mind in Society. London. Harvard University Press

Kono, Y. (Ed.)(1993). Educational Psychology. Tokyo: Kawashima shyoten

Edwars, A. D. And Westgate, D. P. G. (1994). Investigating Classroom Talk (2nd ed.). London: The Falmer Press.

Grice, H. (1975). Logic and conversation. : P. Cole & J. Morgan, , *Syntax and semantics 3: Pragmatics*, 41-58. Academic Press, New York.

Cicourel, A.V. (1973). *Cognitive Sociology: Language and Meaning in Social Interaction.* London: Penguin. Free Press

Hymes, James L., Jr.. 1979. Early Childhood Education: Living History Interviews,

Book 3 Carmel, CA: Hacienda Press.

Drew, P and Heritage, J (1992) (eds) *Talk at Work: Interaction in Educational Settings.* Cambridge: Cambridge University Press.

Hughes, M. and Westgate, D. (1988). Re-appraising talk in nursery and reception classes, Education, 3-13 and 16, 2, pp. 9-15.

Hymes, D. (1972). On communicative competence, in Pride, J. and Holmes, J. (Eds.) Sociolinguistics, Harmondswork, Penguin Books.