

'Oh, the Usual': The Usefulness of Curriculum Genres to Explain Students' Interpretations of Mathematics Lessons¹

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Although learning must arise out of students' own interpretations of their classroom experiences, their voices are not often the focus of educational research. This paper locates students' experiences of mathematics lessons within the framework of 'curriculum genres', the term Christie (1993) uses to define the distinctive ways teaching-learning activities are staged and socially structured through language. The usefulness of this language education construct for analysing mathematics learning is discussed.

During recent years there has been a major shift in educational research emphasis towards the learning which occurs within a normal school environment (Doyle, 1990). As a result the interactions of teachers and learners as they go about their usual business of teaching and learning have become of more central concern to mathematics research (Kanes & Atweh, 1993; Pegg, 1989). This interest in the learning environment as a whole has meant that the more fundamental social processes of classroom culture are now seen to be directly relevant to mathematics education (Bauersfeld, 1992; Weissglass, 1992).

Mathematics researchers have begun to look to other disciplines for different ways of conceptualising learning. Investigations into the role of language in learning mathematics has provided some useful new insights (Ellerton & Clarkson, 1992). For example, Atweh (1993) used Halliday's Functional Theory of Language to analyse language interactions in two mathematics classrooms and reported distinctive differences in the way language structured the social context of the learning, even though the same curriculum content was dealt with.

While such research reports clearly recognise the importance of students as the objects of these teaching-learning processes, there appear to be few studies which centrally focus upon the students' own experiences or interpretations of the classroom interactions (Erickson & Shultz, 1992). And yet, it is surely the students' interpretations of the teaching-learning activities which determine entirely the learning that has occurred. While it is clear that teaching is directly concerned with communicating the contents of a curriculum to students, to focus so much attention on what teachers *intend* to convey to students misses the crucial aspect of the communication process.

If a person wants to communicate, and expresses a message, if there is no-one to interpret, or if the interpretation is impossible for some reason, no communication occurs. Similarly, the very nature and content of the message depends, not upon the expression, but on the interpretation. Whatever the interpretation is, that is what the message becomes. (Garner, 1994, p127)

In this paper, students' reported experiences of mathematics lessons will be analysed using insights from Christie's (1993) work with 'curriculum genres', the term she uses to define the distinctive ways teaching-learning activities are socially constructed through language. The concept arises out of systemic linguistic theories and makes use of functional grammar analysis. Although Christie's work has been largely associated with language education, the principles involved may well be just as relevant to mathematics learning and provide a useful way of contextualising students' experiences and interpretations.

What is a Curriculum Genre?

Anyone who has had even a passing involvement in the language learning areas of the curriculum in the last few years would have encountered the term 'genres' in reference to particular forms of written text, such as a 'narrative genre' or a 'report genre'. The term can also apply to oral forms of language.

Christie (1985) suggested that there are two kinds of general purposes which feature in the language used for most situations. One purpose is 'to initiate, maintain and foster relationships' and the other is 'for the negotiation of *content* of some kind' (p7). Genres are the various, yet distinctive, ways that those two kinds of purposes come together to form socially constructed meanings from the particular patterns of language interaction in which people engage. The key features of a genre are that it is socially constructed through language, has a goal, and develops through stages to reach that goal. Different genres have their own distinctive language features which help to communicate the particular meanings intended.

Christie (1993) points out that the classroom is a place in which language plays a central role in structuring the teaching-learning activities in which students are engaged, and that 'the social processes in which they [teachers] participate with their students in the pursuit of various goals are structured in distinctive ways, making them instances of particular genres' (p155). She applies the term 'curriculum genres' to distinguish the different types of lessons which she describes as the 'staged, goal driven, purposive activities in which students are initiated into ways of working, thinking and dealing with experience valued in an English-speaking culture' (p155).

Of importance for genre identification and analysis is the 'schematic structure' of a particular instance of curriculum genre. This includes reference to 'obligatory stages', which are so named because they are essential to any instance of a particular genre, and 'optional stages', which refers to those stages which may or may not be evident (Christie, 1993, p166). A schematic structure provides a framework for constructing the distinctive features which make a particular curriculum genre recognisable as such.

Teachers, consciously or unconsciously, communicate the conventions, modes and social behaviours associated with a particular curriculum genre via two language registers. Christie claims these are built in different ways through the language choices made by the teacher while guiding students into new ways of knowing and working. These registers appear to broadly equate to the two general language purposes previously mentioned.

First there is the *pedagogical register*, so called because it is concerned with structuring the pedagogical goals of the teaching-learning activity, such as those associated with the students' behaviour, the way in which tasks are to be engaged with, the movement from one stage of the lesson to the next, and the general management of the classroom environment. Secondly there is the *content register* which is concerned with the lesson 'content'; the knowledge and ways of working associated with the fields of experience encompassed by a particular curriculum genre (Christie, 1993, p156).

While any instance of a curriculum genre must begin by bringing to the fore the pedagogical register, at some point the content register must be foregrounded, if relevant learning is to occur. Christie (1993) claims that the two registers must 'converge for a sustained period of time' (p156) if the curriculum genre is to be successful in supporting this learning. In other words, the parts of the lesson which are concerned with organising students and explaining how to go about the tasks (the pedagogical goals), should support and must not detract from the actual understandings that the lesson is intended to develop (the content goals).

Of particular interest for mathematics education is Christie's (1993) description of the processes which structure the content registers operating in curriculum genres. Christie describes how the content register for any particular curriculum genre is drawn from the relevant field of experience outside the school but, in order to make it accessible to novices, it changes in character when it is relocated in the social contexts of schooling. So the 'insights, skills and ways of going about dealing with problems'

(p156) which characterise the way mathematicians (and other users of mathematics) operate in the social contexts of the wider community have been transformed in ways which were intended to be appropriate for the initiation of learners into this field of experience, forming a mathematics content register.

The Students

The data analysed for this study were taken from those obtained in an earlier investigation of students' understanding and attitudes towards mathematics. Twelve students were interviewed on two occasions, once towards the end of year seven primary school and again half way through year eight. Several questions in each of the interviews asked students to talk about the characteristics of their mathematics classrooms and the mathematics they were learning. They were also asked if they had any advice for their teachers.

Each of the twelve students was from a different year seven classroom in nine metropolitan schools. In year eight they attended two secondary schools and were placed in eight different class groups. Five of the class groups were taught two separate maths units by different teachers, although in several cases, two class groups were taught by the same teacher. Overall it has been calculated that the twelve students were reporting their direct experiences of a total of twenty two different teachers of mathematics in eleven schools.

Data Analysis

Initially the notion of the existence of a distinct type of curriculum genre which could be classified as a typical 'mathematics curriculum genre' was examined. If such a genre was identifiable, one would expect that students would respond easily to questions that asked them to describe their mathematics lessons.

One would also expect there to be some recognisable schematic structure in the students' descriptions of their lessons, through which one might identify some obligatory stages and perhaps some optional stages as well.

Clearly this study cannot attempt to analyse the actual language features through which a mathematical curriculum genre might be constructed, given that the data consists of students' descriptions of what happens in mathematics lessons and not lesson transcripts. However, it may be possible that some evidence of the distinctions between the pedagogical register and the content register may be revealed in the language used by the students in their descriptions.

Mathematics Lessons as Curriculum Genres

The consistency with which students described what they would expect to happen in a mathematics lesson was striking. In no case did a student seem confused by the question or be unable to respond. Furthermore, it was clear from the responses of some students that they considered this to be common knowledge. When asked what was expected in their mathematics lessons, one student responded, 'Oh, the usual!' clearly assuming that the interviewer would understand. Several others responded with variations of 'the normal sorts of things'. One student stated, 'Mental!', clearly expecting the one word to fully convey information about that activity and how it was organised.

It was very clear from these responses that the students themselves believed there was a standard format for mathematics lessons and that the interviewer already knew what that was. This in itself suggests that the students had experienced instances of a particular kind of mathematics curriculum genre.

All students went on to describe a set of consistent features which could clearly define the schematic structure of a curriculum genre. Most responses revealed two obligatory stages. The first would be what Christie (1993) refers to generally as the 'task

orientation stage' (p166) where students find out about the way they are to be engaged with the learning activity, and the second involves engagement with the actual task. The following examples are typical of the descriptions given by the students (the task orientation stage is shown in italics):

Well our teacher just tells us to get out our pads and pencils and stuff like that. Then turn to page whatever, and then we have to do the questions from the book.

She just reminds us how to do it, then she gives us some on the board
Oh, we have a book and he tells us the exercise and how to do it and then you copy it and do an answer statement. *The teacher shows us* and then we do it.

She gives out the book and she tells us what page and all that and then she explains how to do it and then we have to do the exercises.

There were some cases in which no explicit task orientation stage was mentioned, but it seems clear that the teacher had previously structured this aspect. Students themselves had no doubt as to what was to happen, for example:

Well, we just automatically take out our pads and we rule up in three columns and then he puts up some maths on the board and then we write down the answers and that.

Only one student went on to describe a closure stage; 'They call out the answers and we mark it'. All the rest finished their description at the task engagement, or 'doing' stage. A number of students also mentioned what could be called an optional stage in the structure. This described what students were to do if they could not proceed with the task for some reason:

We put our hand up and she comes around and helps us.

Well, you go up to the teacher and then she explains them.

There were a number of students who went on to mention tasks other than the more usual written exercises, though in every case these were predicated by the word 'sometimes'. For example: '*sometimes* we measure, we go out and have to measure things, perimeters and areas and everything'; '*sometimes* we have competitions on the board'; '*sometimes* we just play maths games'.

There seems to be little doubt that the kinds of lesson descriptions given by the students are consistent with the characteristics Christie (1993) associates with instances of a specific curriculum genre. What is unavoidably disturbing is the experiences of mathematics that these students appear to be accumulating. It seems that a very restrictive but consistent type of mathematics curriculum genre has dominated in these classrooms.

The above analyses have been concerned primarily with those aspects of the genre which would have been constructed through the pedagogical register, and it is of interest that little if any content has been mentioned in that context. Most mentions of content in the data were in response to an initial question, 'What sorts of things do you do in maths?' which was originally intended to find out about the range of learning activities engaged in, not the content as such. In almost all mentions of content, the verb 'to do' was employed - students were 'doing' or had 'done' the mathematical processes and concepts mentioned:

We're just *doing* revision now, but division of decimals, fractions, time, we've *done* a little bit of litres and millilitres.

We are *doing* time on twenty four hour clocks and in the other one we are *doing* statistics.

We *do* percentages and fractions and decimals

The language used in these references to the content register probably suggests something of the way in which this is constructed in the lessons. It appears that no matter what the mathematical content, it is always 'done' in lessons. No student spoke of 'using' fractions, decimals or percentages for any purpose, or of being engaged in constructing, investigating, planning or even calculating.

One student even referred to the teacher's pedagogical activity as 'doing'; clearly, in the content register of this particular curriculum genre, teachers, as well as students, 'do' mathematics:

Some teachers *do* easy maths and they *do* all the same, and some teachers *do* all different sorts, like Mr Brown, he *does* addition, multiplication, division and all that we *do*, like in one subject.

Some students had very strong feelings about the ways they thought teachers could improve their mathematics learning for them. These seemed to fall into two categories. There were those who thought teachers could make mathematics more interesting through games and competitions:

Make it fun and not boring. Teach it with some enthusiasm, not like you are dead on two legs, 'cause Mr Smith's a bit like that. He's a bit boring to listen to. He could do like competitions on the board like we used to have in year seven and that was a lot of fun.

And others whose concern was that teachers' explanations were insufficient: He doesn't really help us. He just says, 'work out of the book', and he just goes and does his own stuff. If we ask him for help, he just like, just does it for us, but doesn't explain how to do it, so we don't really know how to.

Our teacher, she says we ask too much when she gives us an exercise to do and like some people don't understand it and they ask me because I'm pretty good at maths, and then we get in trouble. She should say it more, she should explain it more, like finding the area of a rectangle, she just says 'width times height' and she just does one and then we've got to do about seventeen out of the book.

Within both these categories though, it was the pedagogical register rather than the content register that students were asking teachers to adjust, suggesting perhaps that the students had a particular way of understanding the relationship between the two structures; namely that teachers could only adjust the pedagogical register because the content register was immutable.

Implications for future research

At the time these interviews were carried out, the concepts associated with Christie's (1993) notion of 'curriculum genres' had not yet been encountered. However applying some of those principles of analysis to the students' reported experiences revealed curriculum genre features which were easily identified from the data and suggests that the concept is a useful one for mathematics education research. Furthermore, the analysis has been helpful in contextualising the students' interpretations of their mathematics lessons and implies some mechanisms by which their experiences have been structured. The results of this study suggest a number of ways this form of analysis might usefully be developed in future research.

It is difficult not to be concerned about the contrast between the way teachers describe their pedagogical intentions in the research literature (Lubinski et al, 1994) and the way these students express their experiences. Considering these children's experiences directly reflected over twenty different classrooms, can we conclude that the restrictive curriculum genre reported by the students arose from a group of untypical classrooms, in which the teachers made no attempt to develop the mathematics learning required of the syllabus? Might it not be more realistic to suggest that the students' reported experiences were restrictive because their interpretations of the 'message' were very different than the 'message' their teachers intended to convey. In any case, we are still left with Garner's (1994) point that 'whatever the interpretation is, that is the message' (p127). Christie (1993) says that the ways teachers structure experience often operate at a subconscious level and are not visible for the 'close scrutiny or control' needed to enable their teaching to be a 'deliberate act' (p155). It is possible that insights gained by the use of curriculum genre principles to analyse actual lesson interactions, as well as students' reported experiences of the same lessons, may better illuminate the

way teaching practices and student learning is structured in language, so helping teachers to better construct their mathematics curriculum genres.

This study has also exposed some important implications for the process of change from the students' viewpoint. There is some evidence to suggest that students are not at all passive recipients of changes in their classrooms and schools and they do not always enthusiastically endorse and accept changes which their teachers and research suggests will benefit them and make their schooling more relevant (McQuillan & Muncey, 1994, p273). The concepts associated with curriculum genres may help clarify the sources of students' resistance to change.

It was evident in this study that students' advice to teachers was most appropriate for the type of curriculum genre typified in the students descriptions; 'Explain what I have to do in more detail, and make the exercises more fun' summarises their suggestions. However if, for example, a teacher wished to change to a genuine problem solving approach, any degree of real success would be highly unlikely unless both registers of the curriculum genre in which these students had been operating were completely restructured. Research into those processes from a student's point of view could help teachers gain insight into the way language can purposefully be used to structure a new curriculum genre for the mathematics they wished to teach.

Another way in which an awareness of curriculum genres could assist research is in providing a framework for understanding the processes by which the content register has been historically built for a particular purpose out of the wider mathematical field of knowledge. Analysis of the range of mathematics curriculum genres in operation may expose the ways in which they need to change, and provide mechanisms for effecting such changes.

NOTES: 1. This paper was presented at MERGA 18, 1995 in Darwin. However due to an oversight it was not published in that conference's proceedings.

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