Appendix 1B7 'relevance' connecting maths with other subjects

Disign.	*mot*	*tcr*	*math*	*instr*	*cnstr*	*explanation*
T1	1	0	1	0	0	math should be integrated
T2	0	0	1	0	0	math then becomes easy
T3	1	0	1	0	0	students should see link to other subjects
T4	0	0	1	0	0	math should overlap with other subjects
T5	0	0	0	1	0	important for job opportunities
T6	0	0	0	1	0	students should know that maths is everywhere
T7	0	0	1	0	0	math should be in English (subject)
T8	1	0	1	0	0	students to be aware of -ve and +ve contributions of math
T9	0	0	0	1	0	in Agric and Geography, there're calculations
T10	0	0	0	1	0	pupils must know that math is everywhere
T11	1	0	1	0	0	math should not be treated as an isolated subject
T12	0	0	0	1	0	should be like teaching a cow - counting the legs
T13	0	0	1	0	0	link with other subjects
T14	1	0	1	0	0	students should be aware of interrelatedness
T15	1	0	1	0	0	teachers already good at isolating math
T16	0	0	1	0	0	to link to some subjects like Geography
T17	0	0	0	1	0	in social sciences math skills required
T18	0	0	0	1	0	in Science and Geography, calculations needed
T19	0	0	0	1	0	math is the most important subject, from first day of life
T20	0	0	1	0	0	there must be a link between the subjects
T21	0	0	1	0	0	There mustn't be any need to face math to do other subjects
T22	1	0	1	0	0	must see the collaborations with other subjects
T23	1	0	1	0	0	in English and other languages, there are numbers in words
T24	0	0	0	1	0	calculations found in many subjects
T25	0	0	0	0	0	we need procedures and truth solutions
T26	1	0	0	1	0	develop love and relevance to other subjects
T27	1	0	1	0	0	math should not be seen in isolation
T28	0	0	0	1	0	other subjects like Science use numbers
T29	0	0	1	0	0	integration makes learning meaningful just like in life
T30	0	0	0	1	0	in Physical Science and Geography, math is there
T31	1	0	1	0	0	should not be treated in isolation
T32	1	0	1	0	0	towards a more collaborative culture of learning
T33	0	0	0	1	0	Math, History and Science deal with numerals
	mot	*tcr*	*math*	*instr*	*cnstr*	
	12	**0**	**19**	**13**	**0**	95/99 (rating) third out of 8 in popularity

Appendix 1B8 'relevance' showing how useful maths is in life

Disign.	*mot*	*tcr*	*math*	*instr*	*cnstr*	*explanation*
T1	1	0	0	1	0	encourage them to know that math can make country rich
T2	0	0	0	1	0	to relate to life
T3	1	0	0	1	0	must realise that math can be related
T4	0	0	0	1	0	math is used in everyday life
T5	1	0	0	1	0	must realise that without math, there's no progress in life
T6	1	0	0	1	0	they must realise that the subject carries their futures
T7	0	0	0	1	0	math should be a vehicle for other subjects
T8	1	0	0	1	0	through realising situations in daily lives
T9	0	0	1	0	0	students should be aware: some fail in career without math
T10						unfilled
T11	0	0	0	1	0	they use math every time
T12	0	0	0	1	0	people will have greater chance of jobs
T13	0	0	0	1	0	make students use math in everyday life
T14	1	0	0	1	0	in context like building there is math
T15	1	0	1	0	0	math does need this formal presentation
T16	1	0	0	1	0	students will be able to understand math in their livelihood
T17	0	0	0	1	0	math is in social sciences
T18	0	0	0	1	0	students must realise that those with math get employed
T19	0	0	0	1	0	so that he can use math in selling for money (profit)
T20	0	0	0	1	0	with math, the student is marketable
T21	0	0	0	1	0	to read meters and graphs and locate positions
T22	1	0	1	1	0	to make students interested in math
T23	0	0	0	1	0	for builders, land surveyors, computer operators, doctors ...
T24	0	0	0	1	0	math determines destiny in the job market
T25	1	0	1	1	0	must encourage students & that they will get future rewards
T26	1	0	1	1	0	encourages students to learn if math is seen as useful
T27	0	0	0	1	0	with math, the student can follow career of her liking
T28	0	0	0	1	0	in order to use math in shopping
T29	0	0	1	0	0	they will use it to see connections
T30	0	0	0	0	0	if he has a specific goal
T31	1	0	1	1	0	seeing shortcoming without math, students will be motivated
T32	1	0	1	1	0	encourage better performance by stressing applied math
T33	0	0	0	0	0	agree

mot	*tcr*	*math*	*instr*	*cnstr*	
13	0	8	27	0	98/99 (rating) most popular out of 8

Appendix 1B22 The problems of 'relevance'

Design.	*mot*	*tcr*	*math*	*instr*	*cnstr*	*explanation*
T1	1	1	0	0	0	lack of student motivation; teachers should seek motivation & training
T2	1	0	0	1	0	students think maths is artificial & does not relate to their real lives
T3	0	1	0	1	0	students unable to apply maths in everyday because of our teaching
T4	1	0	0	0	0	students enjoy discovering maths not being given answers
T5	1	0	0	0	0	students take maths as difficult and are disappointed & not loving
T6	1	0	1	0	1	students lack maths basics and fear maths
T7	0	0	1	0	0	mathematics is not meaningful to most pupils
T8	0	0	1	1	0	learners study maths without attaching meaning to their everyday
T9	0	0	0	0	1	environmental (e.g. language) problems faced by rural-based pupils
T10	0	0	0	1	0	students fail to apply mathematics to real live problems
T11	1	0	0	1	0	students do not realise maths can be applied outside school
T12	1	0	0	0	0	students have that fear for maths
T13	1	1	0	1	0	students are not made aware that maths is useful for their lives
T14	0	0	1	1	0	when teacher cannot make connections to convince & clarify pupils
T15	1	0	1	1	0	lack of skills, attitudes & the ability to apply maths in everyday lives
T16	0	0	1	1	1	students fail to make connections as geometry cannot be applied
T17	1	1	0	0	0	because of rote teaching most students are distracted: no meaning
T18	1	0	0	0	1	students commitment & negative perception towards maths
T19	0	0	0	0	1	lack of teaching aids, parental care & socio-economy
T20	0	0	0	0	0	no response
T21	0	1	0	1	0	concrete & real life application or practicality missing
T22	0	1	0	0	0	maths is not concrete like other subjects; it is too abstract
T23	1	0	0	0	1	students lazy, have negative attitudes & do not consult teachers
T24	1	0	0	1	0	students do not see how useful maths is in their lives
T25	1	0	0	1	0	students believe maths is only in school & don't relate it in their lives
T26	1	1	1	0	1	students are unwilling to work: no encouragement & understanding
T27	0	1	0	1	0	teachers do not relate mathematics to everyday experiences
T28	1	0	0	1	0	students take maths as monster; do not see relevance & usefulness
T29	0	0	0	1	0	students tend to separate maths from everyday experiences
T30	0	0	1	0	0	students do not understand all topics
T31	0	0	1	0	0	students do not relate maths to everyday
T32	0	0	1	1	0	students cannot understand why they have to study irrelevant geometry
T33	0	1	0	0	1	students are lazy & do not think critically
	16	**9**	**10**	**16**	**8**	
	mot	*tcr*	*math*	*instr*	*cnstr*	

Appendix 1B23 How to develop a 'relevant' lesson

Design.	*mot*	*tcr*	*math*	*instr*	*cnstr*	*explanation*
T1	0	0	0	1	0	by emphasising real life activities & careers
T2	0	0	1	1	0	by using an orange cut in different parts to teach fractions
T3	1	1	1	0	0	by teachers making maths simple, interesting but challenging
T4	0	0	1	1	0	by using real life word problem involving change to teach operations
T5	0	0	0	1	0	maths is the only subject that relate to everyday activities like 'diketto'
T6	0	0	0	0	0	No Response
T7	0	1	1	1	0	teachers should use real situation not meaningless numbers
T8	0	0	1	1	0	by using planning a township students can be guided thro' feasibility
T9	0	0	0	0	1	students are unable to work out word sums and are lost in language
T10	0	1	1	0	0	using examples to enhance understanding
T11	0	0	1	1	0	using rhymes, songs and contexts like ages to teach numbers
T12	1	1	1	0	0	by teaching from known to unknown and making jokes & activities
T13	1	0	1	1	0	teaching perimeter students must be aware of maths in daily fencing
T14	0	0	1	1	0	students' intuitive daily measuring for them to come up with measuring
T15	0	0	0	0	0	No Response
T16	0	0	1	1	0	linear programming using student's daily profit from selling oranges ...
T17	0	0	0	0	0	No Response
T18	1	0	0	1	0	by making pupils aware that daily activities like building is maths
T19	0	0	0	1	0	students should use maths to help himself after school in his business
T20	1	1	1	0	0	many students are afraid of maths which is not practical
T21	0	0	1	1	0	teaching surface area using a tin of fish as teaching aid
T22	0	0	1	1	0	grade 10 visiting a construction site to calculate trigonometry on site
T23	1	0	1	1	0	using students' careers interests to motivate them into learning maths
T24	1	1	1	0	0	teaching systematically & courageously to interest & motivate students
T25	0	0	1	1	0	2 sheep give 2 lambs yearly, shepherds will know how many in 4 years
T26	0	0	1	1	0	using shopping profit/loss for students to learn 4 basic operations
T27	0	0	0	1	0	asking pupils how they can relate a topic of choice to their everydays
T28	1	0	1	1	0	making maths challenging but relevant to taxi-driver counting & change
T29	0	0	1	1	0	from budgeting to graphical representation of everyday shopping
T30	1	1	0	0	0	teacher must know students' shortcomings & how to work with them
T31	1	0	0	1	0	inculcating relevance by narrating a story at start of any concept
T32	0	0	0	1	0	designing a geyser related to mensuration to highlight careers
T33	0	0	1	1	0	oranges used as media for teaching fractions
	10	**7**	**21**	**23**	**1**	
	mot	*tcr*	*math*	*instr*	*cnstr*	

Appendix B1 Extracts of group interview discussions

1 'Relevance' making mathematics meaningful

Group A T: Yahoo, they must give you the practical lesson will be informal and it will be easy for the learners to asscciate what they are learning with real life they won't hate maths any longer, because they see what happens outside concerning the geometry
Group B children will learn more easier about something that they clearly understand. So, from my experience, I found that children even end up enjoying the lesson and they can have an input on the lesson ESKOM need to bring electricity in home town... How are those electrical wires being connected? Most pupils would respond. They see them.
Group C There're childs with the face clocks everyday. So how do I link the angles to face clocks? We're trying to avoid using the abstract You assess students' analytic skills of reading data [with the football examination item]
Group D so that students be made aware that mathematics is not only in classrooms. the wall, it's going up, it must be perpendicular to the floor. The table ... this angle is 90°. And I also indicated that such an activity encourages creative thinking on the part of the learner
Group E the rail-way lines, they know they are parallel. It's just that they cannot associate it because it's practical children can work ... they associate themselves with that. They must find sense in what they are doing. Why do we need x?
Group F how many buildings around you are circular? interpret information. pizza relates to the angle around a point comes round to 360°.

Group A an architect or what. He can be able to use the knowledge he got when he was in school. the construction site and in future he can be able to do what they saw.
Group B if OK is selling some oranges. She will know the cost price and the selling price and the profit.
Group C
Group D you go to technikons ... you find that the requirement there is mathematics
Group E when he goes to market to buy some stocks, he has to know exactly which type of fruit he must buy most, that is moving faster than the other so that he can gain maximum profit.
Group F you may the go to tertiary ....boiler makers and people that have to be dealing primarily with round structures definitely need information about areas, the whole concept of volume.

3 Problems of 'relevance'

Group A It is time-consuming They need somebody who is responsible so that they mustn't get out of control [in trips]
Group B What if the distance is long between the two curves is not the same throughout but they don't meet. Are they still parallel? What forms a circle? Is not [it] a line? Maybe after school he is selling oranges ... when coming to a classroom situation, he is the one lacking behind. You have to cover the syllabus
Group C the students have a different definition of good when they say that Amazulu is going up.
Group D Do you think that school mathematics is sufficient? Is it enough; is it necessary? There are some people, they never even go to school, but they can construct. In rural areas there is no construction Disadvantages of a field trip ... they would need transport. Some constructions are maybe high ... some pupils are afraid.
Group E Like language can serve ... contributory There are not enough trained teachers. Do we need textbooks?
Group F If you are here [not a rural area], the circular [houses] are in those other fancy buildings Basically we associate soccer with boys If the concept they are trying to assess is based on a real life that the children know, then they may give biased answers. Maybe we can use the teams from abroad ... to avoid such answers. the pupils don't know about the foreign clubs. There are concepts which cannot be related