APPENDIX A

Table 1: Profile of Implementation conceptualized for the

Natural Science Learning area of Curriculum 2005 -

Adapted from Rogan and Grayson, 2001

Table 1: Profile of Implementation conceptualized for the Natural Science
Learning area of Curriculum 2005 - Adapted from Rogan and Grayson,
2001

Level	Classroom interaction	Science Practical Work	Science in Society	Assessment
1	**Teacher:** Presents content in a well-organized, correct and well-sequenced manner, based on a designed lesson plan. Provides adequate notes. Uses textbook effectively. Engages learners with questions **Learners:** Stay attentive and engaged. Respond to and initiate questions	**Teacher** uses classroom demonstration to help develop concepts. Teacher uses specimens found in the local environment to illustrate lessons.	**Teacher** uses examples and applications from everyday life to illustrate scientific concepts. Learners ask questions about science in the context of everyday life.	Written tests are given that cover the topic adequately. While most questions are of recall type, some require higher order thinking. Tests are marked and returned promptly
2	**Teacher**: Textbooks are used along with other resources. Engages learners with question that encourage in- depth thinking. Learners: Use additional (to textbooks) sources of information in compiling notes. Engages in meaningful group work. On own initiative, offer a contribution to the lesson.	Teacher uses demonstrations to promote a limited form of inquiry. Some learners assist in planning and performing the demonstrations. Learners participate in closed (cookbook) practical work. Learners communicate data using graphs and tables.	Teacher bases a lesson (or lessons) on a specific problem or issue faced by the local community. Teacher assists learners to explore the explanations of scientific phenomena by different cultural groups.	Written tests include atleast 50% of the questions that require comprehension, application and analysis. Some of the questions are based on practical work.
3	**Teacher**: Probes learners' prior knowledge. Structures learning activities along "good practice" lines (knowledge is constructed, is relevant, and is based on problem solving techniques.) Introduces learners to the evolving nature of scientific knowledge. **Learners:** Engage in minds-on learning activities. Make own notes on the concepts learned from	**Teacher** designs practical work in such a way as to encourage learner discovery of information. **Learners** perform 'guided discovery' type of practical work in small groups, engaging in hands-on activities. **Learners** can write a scientific report, which they can justify, their conclusions in terms of the data collected.	**Learners** actively investigate the application of science and technology in their own environment, mainly by means of data gathering methods such as surveys. Example here might include an audit of energy use or career opportunities that require a scientific background.	Written tests include questions based on see or unseen 'guided discovery' type activities. Assessment is based on more than written tests. Other forms of assessment might include reports on activities undertaken; creation of charts and improvised apparatus; reports on extra reading assignments.

	doing these activities.			
4	**Learners:** Take major responsibility for their own learning; partake in the planning and assessment of their own learning. Undertake long term and community-based investigations project. **Teacher:** Facilitates learners as they design and undertake long-term investigation and projects. Assists learners to weigh up the merits of different theories that attempt to explain the same phenomena	**Learners** design and do their own 'open' investigations. They reflect on the quality of design and collected data, and make improvements. **Learners** can interpret data in support of competing theories or explanations.	**Learners** actively undertake a project in their local community in which they apply science to tackle a specific need. An example might be on growing a new type of crop to increase the income of the community. **Learners** explore the long effect of community projects. For example, a project may have a short-term benefit but result in long term detrimental effects.	Performances on open investigations and community-based projects are included in the final assessment. **Learners** create portfolios to represent their 'best' work.

APPENDIX B

Table 2 : Profile of the Capacity to Support Innovation -

Adapted from Rogan and Grayson, 2001

Table 2 : Profile of the Capacity to Support Innovation - Adapted from Rogan and Grayson, 2001

Level	Physical Resources	Teacher Factor	Learner Factor	School Ecology and Management
1	Basic building-classroom and one office, but in poor condition. Toilets available Some textbook-not enough for all	Teachers is under-qualified for position, but does have a professional qualification	Learners have some proficiency in language of instruction, but several grades below grade level	Management: a timetable, class list and other routine are in evidence. The presence of the principal is felt in the school at least half the time, and staff meetings are held at times. Ecology: school functions i.e. teaching and learning occur most of the time, albeit erratically. School is secure and access is denied to unauthorized personnel.
2	Adequate basic building in good condition. Suitable furniture-adequate and in good condition. Electricity in at least one room. Textbook for all. Some apparatus for science	Teacher has the minimum qualification for position. Teacher attends school/classes regularly. Teacher is motivated and diligent. Enjoys his/her work. Teacher participates in professional development activities. Teachers have a good relationship with and treatment of learners.	Learners are reasonably proficient in language of instruction. Learners attend school on a regular basis. Learners are well nourished. Learners are given adequate time away from home responsibilities to do school work	Management: Principal is present at school most of the time and is in regular contact with his/her staff. Timetable properly implemented Extramural activities are organized in such a way that they rarely interfere with scheduled classes. Teachers/learners who shirk their duties or display deviant behavior are held accountable. Ecology: responsibility for making the school function is shared by management, teachers and learners to a limited extent. A School Governing Body is in existence. School functions all the time i.e. learning and teaching always take place as scheduled.
3	Good buildings, with enough classrooms and a science room. Electricity in all room. Running water. Textbooks for all pupils and teachers. Sufficient science apparatus. Secure premises. Well kept grounds	Teacher is qualified for position and has a sound understanding of subject matter. Teacher is an active participant in professional development activities. Conscientious attendance of class by teacher. Teacher makes an extra effort to improve teaching.	Learners are proficient in language of instruction Learners have access to quiet, safe place to study Learners come from supportive home environment Learners can afford textbooks and extra	Management: Principal takes strong leadership role, is very visible during school hours Teachers and learners play an active role in school management Ecology: everyone in the school is committed to making it work Parents play active role in School Governing Bodies and

			lesson Parents show interest in their children's progress	in supporting the school in general.
4	Excellent buildings One or more well equipped science laboratory Library or resource center Adequate curriculum materials other than textbooks Good teaching and learning resources (e.g. computers, models) Attractive grounds Good copying facilities.	Teachers is over-qualified for position and has an excellent knowledge of content matter Teacher has an extraordinary commitment to teaching Teacher shows willingness to change, improvise and collaborate, and has a vision of innovation Teacher shows local and national leadership in professional development activities	Learners are fluent in the language of instruction Learners take responsibility for their own learning Learners are willing to try new kinds of learning	Ecology: There is a shared vision The school plans for support and monitoring Collaboration of all stake-holders is encouraged and practiced Management: there is a visionary but participatory, leadership at the school.

APPENDIX C

Table 3 : Profile of Outside Support –

Adapted from Rogan and Grayson, 2001

Table 3 : Profile of Outside Support - Adapted from Rogan and Grayson, 2001

Level	Type of encouragement and support			Dominant change force evoked by agency	Monitoring mechanism and accountability
	Physical Resources Categories of resources: Buildings, apparatus, curriculum materials (print and electronic), computer, etc.	*Design of Professional Development*	*Direct support to learners*		
1	Provision supplements what exists but not enough to support the intended changes. Provision is in one category only.	Information on policy and expected changes are presented to school based personnel. Typical mode is short, one short workshop	Provision of basic needs, such as lunches and places to study	Bureaucratic. Change is brought about by top down directives to bring about change	Inspections by authorities are undertaken
2	Provision completely covers what is required to effect the intended change in one category, or partly sufficient in two categories.	Example of 'new' practices are suggested by the policies, are presented to school based personnel, who are given an opportunity to engage in these practices in a stimulated situation. Typical mode is a series of short workshop lasting for one year.	Basic academic needs are catered for in the form of extra lessons.	Charismatic Change is brought about by top down inspiration and encouragement	Inspections are undertaken in collaboration with school-based personnel.
3	Provision completely covers what is required to effect the intended change in two categories, or partly sufficient in three categories.	Professional development is designed by school based personnel depending on which new practices they wish to implement, and implemented using both inside and outside support. Typical mode consists of both external and school-based INSET for two to three years.	Enriched academic needs are catered for in the form of field trips and other enrichment type activities.	Professional Change is brought about by encouraging role players to embrace codes of conduct and standards of teaching and learning.	School-based personnel monitor own progress, but report to authorities.
4	Provision completely covers what is required to effect the intended change in three categories, or covers categories and is partly sufficient in all four categories.	Communities of practice take full responsibility for their own continued professional growth, and for school governance and curriculum implementation, calling on outside support as appropriate. Typical mode consists of ongoing school-based and directed professional INSET.	Complete academic and personal support is provided, usually in the form of bursaries.	Learning Communities Developing communities that develop shared values and goals regarding educational practice and a commitment to put these into practice bring about change.	School-based personnel undertake all monitoring.

APPENDIX D

INTERVIEW QUESTIONNAIRES

(not available)

APPENDIX E

SAMPLE OF SCHOOL DOCUMENTS COLLECTED

(not available)

APPENDIX F

EXTRACTS OF INTERVIEW RESPONSES

(not available)