CHAPTER 5

REPORTING AND ANALYSES OF THE EMPIRICAL DATA

5.1 INTRODUCTION

Following the methodology presented in chapter four, chapter five is divided into two parts: A and B. Part A deals with frequency analysis of the responses while part B is concerned with the factor analysis of the data. The purpose of this chapter is to provide the main results obtained in the sequence of the current study. The discussion of the results of the study is reserved for chapter six. However, some pertinent comments on the results are made at certain stages of the chapter five, which draws prominent comparisons (similarities), noting differences and significances substantiated by numerous tables containing a wealth of data, and by illustrative figures. The tabulated data resulted from a frequency analysis done for each variable or item of the survey questionnaire used in conducting this research. A total of 109 items were examined: 14 items for principals, 20 items for teachers and 75 for learners (see appendices D1, E1 and F1). Obviously, besides tables reflecting disaggregated items to get an overview, the results of the frequency analysis also had to be tabulated to reduce the bulk of the text only the most essential data were included and the rest were relegated to an appendix to ensure access to comprehensive information (e.g. tables of disaggregated items).

The use of factor analysis was explained in chapter four. Basically, the frequency analysis was undertaken to determine how many respondents of the different categories (principals, teachers and learners) each gave an alternative response to a particular question in the scope of the research (Runyon & Haber 1980; Howell 1992). Cross-tabulations and correspondent chi-squares were determined in this regard. Note that according to Foster (1998:144-145):

> The chi-square test is only valid if three conditions are met. First, the data must be independent: no respondent can appear in more than one cell of the table. Secondly, no cell should have an expected frequency of less than 1. The output from SPSS tells (…) the minimum expected frequency, so it is simple to check whether this condition has

> been met. If the test is not valid, (one) must either alter the data table by amalgamating categories (…) to remove cells with small expected frequencies, or collect more data. The third requirement is that no more than 20% of the Expected Frequencies in the table can be less than 5.

This criterion is also argued or suggested by many other scholars such as Huizingh (2007), Green & Salkind (2005) and Foster (1998).

In pertinent cases some categories were merged with lesser data to meet the stated chi-square criteria (*cf*. appendices D2 *cf.* D2a and E2 *cf.* E2a). However, the original data were retained to enable the reader to form personal judgements. The sample precluded the need for further data collection. Furthermore, the information lost by grouping categories in pertinent cases does not affect the main findings of the study. Runyon and Haber (1980:39) note in this regard that "some of the scores have such low frequency counts that we are not justified in maintaining theses scores as separate and distinct entities".

A. FREQUENCY ANALYSIS

5.2 RESULTS OF THE QUANTITATIVE ANALYSIS OF PRINCIPALS' QUESTIONNAIRES

5.2.1 Principals who participated in the study

Niassa, Sofala, and Maputo City principals who participated in the study numbered 124 of which 94 were males and 30 females (see Table 5.1).

Table 5.1: Provincial representation of participating principals in the study

		Province			
		Niassa	Sofala	Maputo City	Total
Gender	Male	32	45	17	94
	Female	9	15	6	30
Total		41	60	23	124

5.2.2 Academic qualifications of participating principals in the study

5.2.2.1 Inter-and provincial comparison of participating principals' academic qualifications

One (2.4%) of the principals from Niassa Province had only completed a primary school education while 13 (31.7%) had been educated to the level of junior secondary school. Twenty-six (63.4%) had earned a senior secondary qualification; and finally only one (2.4%) had a tertiary qualification (see Table 5.2).

In Sofala 16 (26.7%) principals had a junior secondary education, 19 (31.7%) had a senior secondary education and three (5.0%) had a tertiary education (see table 5.2). In Maputo City two (8.7%) principals had a junior secondary qualification, 17 (73.9%) had a senior secondary qualification and 4 (17.4%) had a tertiary qualification. Note that in Maputo City all principals had been educated beyond primary school while the vast majority had a senior secondary qualification (see Table 5.2). Comparing the qualifications of principals across the three provinces also yielded interesting results. According to Table 5.2 all but one of the Sofala principals (i.e. 94.1% of the Primary category of the sample) had only a primary education (i.e. 12.9% of the whole sample of 124) while 17 of 23 principals from Maputo City (i.e. 73.9% of the sample within Maputo City) had a senior secondary qualification (see table 5.2).

Table 5.2: Comparison of academic[11] qualifications of principals from the three provinces that participated in the study

			Principals' Academic Qualifications				Total
			Primary Education Qualific.	Junior Secondary Education Qualific.	Senior Secondary Education Qualific.	Higher Education Qualific.	
Province	Niassa	Number	1	13	26	1	41
		% within province	2.4%	31.7%	63.4%	2.4%	100.0%
	Sofala	Number	16	19	22	3	60
		% within province	26.7%	31.7%	36.7%	5.0%	100.0%
	Maputo City	Number	0	2	17	4	23
		% within province	.0%	8.7%	73.9%	17.4%	100.0%
Total		Number	17	34	65	8	124
		% within province	13.7%	27.4%	52.4%	6.5%	100.0%

[11] In the context of this thesis, for academic qualification read schooling before professional qualification gained through teacher education or by means of a training programme.

5.2.2.2 Comparison of the academic qualifications of respondents by gender

Table 5.3: Comparison of principals' academic qualifications by gender

			Principals' Academic Qualifications				Total
			Primary Education Qualific.	Junior Secondary Education Qualific.	Senior Secondary education Qualific.	Higher Education Qualific.	
Gender	Male	Number	13	26	49	6	94
		% within Gender	13.8%	27.7%	52.1%	6.4%	100.0%
	Female	Number	4	8	16	2	30
		% within Gender	13.3%	26.7%	53.3%	6.7%	100.0%
Total		Number	17	34	65	8	124
		% within Gender	13.7%	27.4%	52.4%	6.5%	100.0%

Table 5.4 illustrates that 94 male principals and 30 female principals participated in the investigation. Thirteen male (13.8%) and 4 female (13.3%) principals respectively had a primary education while 26 male (27.7%) principals and 8 female (26.7%) principals had a junior secondary academic qualification.

Further, 49 male (52.1%) and 16 female (53.3%) had a senior secondary qualification; and finally six male (6.4%) and 2 female (6.7%) principals had a tertiary academic qualification.

In a nutshell, the difference between male and female principals' academic qualifications is statistically insignificant at all recorded levels. Table 5.5 cf 5.5a, confirms this finding, giving both the Pearson chi-square and the Likelihood ratio a value of 0.990, which is greater than 0.05, the statistical significance cut-off for chi-square tests.

Table 5.4 a: **Comparison by gender of participating principals' academic qualifications** (after merging cells together with an expected frequency below 5)

			Principals' Academic Qualifications			Total
			Primary Education Qualific.	Junior Secondary Education Qualif.	Senior Secondary Education Qualif.	
Gender	Male	Number	13	26	55	94
		% within Gender	13,8%	27,7%	58,5%	100,0%
	Female	Number	4	8	18	30
		% within Gender	13,3%	26,7%	60,0%	100,0%
Total		Number	17	34	73	124
		% within Gender	13,7%	27,4%	58,9%	100,0%

Table 5.5: **Chi-square tests on gender-based comparison of participating principals' academic qualifications**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	0,021(a)	3	0,999
Likelihood Ratio	0,021	3	0,999
Linear-by-Linear Association	0,018	1	0,894
N of Valid Cases	124		

A 2 cells (25,0%) have expected count less than 5. The minimum expected count is 1,94.

Table 5.5a: **Chi-square tests on gender-based comparison of participating principals' academic qualifications** (after merging cells together with an expected frequency below 5)

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	0,021(a)	2	0,990
Likelihood Ratio	0,021	2	0,990
Linear-by-Linear Association	0,017	1	0,896
N of Valid Cases	124		

a. 1 cells (16,7%) has expected count less than 5. The minimum expected count is 4,11.

5.2.3 Training in school management

Table 5.6 provides a summary of the total training principals had in school management or related field specialization. Forty principals (32.3%) indicated that they had regular or formal training in school management, while 47 (37.9%) stated

their managerial expertise had been gained from in-service experience. Participants in the study numbered 124.

Table 5.6: Comparison of principals' school management training in three participating provinces

			Principals' Training in School Management			
			Regular/Formal Programmed	Self-training	Induction Workshop	Total
Province	Niassa	Number	16	17	8	41
		% within province	39. 0%	41.5%	19.5%	100.0%
	Sofala	Number	16	22	22	60
		% within province	25.0%	36.7%	36.7%	100.0%
	Maputo City	Number	8	8	7	23
		% within province	34.8%	34.8%	30.4%	100.0%
Total		Number	40	47	37	124
		% within province	32.3%	37.9%	29.8%	100.0%

Table 5.6 shows that of the 40 principals who indicated that they had regular or formal training in school management, 16 (40%) were from Niassa, 16 (40%) from Sofala and 8 (20%) from Maputo City. Out of 47 principals who reported that they were self-taught 17 (36.2%) were from Niassa, 22 (46.8%) from Sofala and 8 (17.0%) from Maputo City.

Out of 37 (principals who participated in the research and attended induction workshops on School Management, 8 (21.6%) were from Niassa Province, 22 from Sofala (59.5%) and 7 (18.9%) from Maputo City. Notably, out 124 principals who had attended "Regular or Formal Programmed" training in School Management, 16 out of 41 (39.0%) came from Niassa; while 16 out of 60 (25.0%) came from Sofala; and 8 out of 23 (34.8%) belonged to Maputo City.

Table 5.6 shows that the majority of respondents (37.9% of the sample) were self-taught through experience in the workplace. This proportion was constant for all three provinces. The self-taught principals from Sofala numbered 22 out of 47 (46.8%). The rest underwent training by means of induction workshops, which is therefore the preponderant means of training for the sample group. By contrast very few respondents (8 out 41, i.e. 19.5%) from Niassa received training by this means (*cf.* table 5.6).

5.2.3.1 Extent of principals' experience as school managers

The investigation revealed that out 124 principals from the selected three provinces 78 had between one and five years', 27 had more than five and less than eleven years', 12 had between eleven and fifteen years' and 7 had sixteen years' experience and more. Table 5.7 presents a comparison of principals' experience as managers in schools from the three provinces included in the study.

Table 5.7: Comparison of principals' experience as school managers in the three participating provinces

			Number of years Managing School				Total
			1-5 Years	6-10 years	11-15 years	16 years and more	
Province	Niassa	Number	26	9	5	1	41
		% within province	63.4%	22.0%	12.2%	2.4%	100.0%
	Sofala	Number	43	13	2	2	60
		% within province	71.7%	21.7%	3.3%	3.3%	100.0%
	Maputo City	Number	9	5	5	4	23
		% within province	39.1%	21.7%	21.7%	17.4%	100.0%
Total		Number	78	27	12	7	124
		% within province	63.0%	21.8%	9.7%	5.6%	100.0%

It is clear from the table that the extent of principals' experience as school managers varied considerably between provinces and period categories. This finding is supported by the Pearson chi-square and Likelihood ratios of 0,006 and 0,009 respectively, both lower than 0.05, the statistical significance cut-off value for chi-square tests (see table 5.8).

Table 5.8: Chi-square tests on comparison of principals' experience as school managers from three provinces

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.979(a)	6	0,006
Likelihood Ratio	17.103	6	0,009
Linear-by-Linear Association	4.906	1	0,027
N of Valid Cases	124		

(a) 5 cells (4.7%) have expected count below 5. The minimum expected count is 1.30.

5.2.3.2 Extent of experience as school managers from three provinces reflected by gender

A comparison by gender of principals' experience as school managers from three provinces is reflected in the table 5.9.

Table 5.9: Comparison by gender of extent of principals' experience as school managers in three provinces

			Number of years				Total
			1-5 years	6-10 years	11-15 years	16 years and more	
Gender	Male	Number	56	22	10	6	94
		% within gender	59.6%	23.4%	10.6%	6.4%	100.0%
	Female	Number	22	5	2	1	30
		% within gender	73.3%	16.7%	6.7%	3.3%	100.0%
Total		Number	78	27	12	7	124
		% within gender	62.9%	21.8%	9.7%	5.6%	100.0%

Out 94 male principals 56 (59.6%) had between one and five years' school management experience, while 22 out 30 female principals (73.3%) fell in the same category. Twenty two male principals had six to ten years experience (23.4%), while five female principals (16.7%) fell in the same category. Ten male (10.6%) and 2 female principals had eleven to fifteen years' school management experience, while six male (6.4%) and 1 female (3.3%) had 16 years experienced and more of school management.

5.2.4 School principals' attitudes to their leadership role in the process of curriculum implementation in their schools

As noted in the introduction to this chapter, the attitudes of principals from the relevant provinces were examined through fourteen disaggregated variables and a corresponding number of cross-tables were therefore produced and included in the appendix. These individualized cross-tables are summarised in table 5.10.

Table 5.10: Summary of principals' attitudes to their leadership role in the process of curriculum implementation in their schools

Variables	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
V10. I try to promote student achievement under the new curriculum, by cultivating close relationship with teachers, other staff members, students and parents.	2 (1.6%)	3 (2.4%)	4 (3.2%)	39 (31.5%)	76 (61.3%)
V11. I try to promote student achievement under the new curriculum, putting in place an action plan produced collectively in school for effective implementation of the new curriculum.	0 (0.0%)	2 (1.6%)	13 (10.4%)	52 (41.9%)	57 (46.0%)
V12. I try to promote student achievement under the new curriculum, through effective professional development.	1 (0.8%)	1 (0.8%)	12 (9.7%)	57 (46.0%)	53 (42.7%)
V13. I try to promote student achievement under the new curriculum, by challenging teachers and students continuously to fulfil curriculum goals.	6 (4.8%)	9 (7.3%)	9 (7.3%)	28 (22.6%)	72 (58.1%)
V14. I try to promote student achievement in the context of new curriculum, by holding regular and productive staff meetings.	2 (1.6%)	4 (3.2%)	13 (10.5%)	52 (41.9%)	53 (42.7%)
V15. I try to promote student achievement under the new curriculum, by coordinating and managing the learning process in the context of the new curriculum.	0 (0.0%)	2 (1.6%)	8 (6.5%)	45 (36.3%)	69 (55.6%)
V16. I try to promote student achievement under the new curriculum, by promoting collaboration among teachers so that they can develop new skills by sharing professional knowledge about the new curriculum.	1 (0.8%)	1 (0.8%)	5 (4.0%)	40 (32.3%)	77 (62.1%)
V17. I try to promote student achievement under the new curriculum, by monitoring teachers' performance under the new curriculum.	2 (1.6%)	1 (0.8%)	13 (10.5%)	51 (41.1%)	57 (46.0%)
VI8. I try to promote student achievement under the new curriculum, by maximizing the amount of school time used for learning under new curriculum.	4 (3.2%)	5 (4.0%)	16 (12.9%)	55 (44.4%)	44 (35.5%)
V19. I am satisfied that a new school organization is being implemented to cope with the demand of new curriculum.	2 (1.6%)	5 (4.0%)	8 (6.5%)	40 (32.3%)	69 (55.6%)
V20. I am satisfied that teachers are diligent in their endeavour to observe interdisciplinarity in the lessons plans they make according to the new curriculum.	0 (0.0%)	1 (.8%)	9 (7.3%)	41 (33.1%)	73 (58.9%)
V21. I am satisfied that the school climate is exemplified by sharing and cooperation that conduce to effective curriculum implementation.	1 (0.8%)	6 (4.8%)	8 (14.5%)	43 (34.7%)	56 (45.2%)
V22. I am satisfied that teachers are using a variety of active methods in their teaching as required by the new curriculum.	0 (0.0%)	2 (1.6%)	7 (5.6%)	50 (40.3%)	65 (52.4%)
V23. I am satisfied that the school has already developed the local curriculum.	6 (4.8%)	11 (8.9%)	20 (16.1%)	41 (33.1%)	46 (37.1%)

The figures discussed below (reflected in Table 5.10) show that respondents' attitudes to their leadership role in implementing the new curriculum in their schools were highly positive and that there were obstacles in the way of maximizing school time for learning under the new curriculum:

- Developing close relationships with teachers, other staff members, students and parents (92.8%);
- Bring into operation an action plan produced collectively in school for effective implementation of the new curriculum (87.9%);
- Rendering effective professional development program on new curriculum (88.7%);
- Challenging teachers and students continuously to fulfil curriculum goals (80.7%);
- Undertaking regular and productive staff meetings on the new curriculum (84.6%);
- Coordinating and managing learning process in the context of the new curriculum (91.9%);
- Promoting collaboration among teachers through which they were developing new skills by sharing professional knowledge regarding to new curriculum (94.4%);
- Monitoring continuously teachers' performance on new curriculum (87.1%).

On the other hand, it is worthy of consideration the high level of satisfaction of the surveyed principals concerning:

- The new school organization was being implemented to cope with the requirements of the new curriculum (87.9%);
- Considerable efforts from teachers to observe interdisciplinary principle in the lessons plans they were making as set up in new curriculum (92%);
- The use of a variety of active methods by teachers in classroom practices as required by the new curriculum (92.7%);

Maximizing the amount of school time used for learning is one of the strategies applied by the surveyed principals to promote students' achievement under the new curriculum. Only 79.9% of principals who participated in the study stated that they

agreed with this strategy. Strikingly, 20.1% of the surveyed principals implicitly expressed their dissatisfaction with the level of school climate created in their schools by way of sharing and cooperation on all issues affecting implementation of the new curriculum. It is cause for concern that 29.8% of participating principals were dissatisfied with the progress made with the design and implementation of 'local curriculum' in their schools.

Thus, a comparison of principals of the three provinces efforts to promote students' academic under the new curriculum revealed that there was no significant difference between them for all items as shown in tables on chi-squares through the Pearson chi-square and Likelihood ratio which are greater than 0.05 (see Appendix D2 *cf* D2a, tables on chi-squares). The exception to this result was identified in three cases (See Appendix D2a, tables D2a.28, D2a.20 and D2a.22, $p \leq 0.05$). The first case was concerned with the principals' level of satisfaction with their leadership role, which was expressed in the development and initial implementation of the "local curriculum". It seemed that the level of satisfaction of principals of Niassa in this regard was relatively higher than in Maputo City and Sofala. Principals from Maputo City were relatively pessimistic about the "local curriculum" development within the schools and its inception implementation. The second case referred to the level of satisfaction of principals from the three provinces as a result of their leadership being translated into the new school organization, which is being implemented within their schools to cope with the requirements of the new curriculum. Maputo City principals were relatively less optimistic than those from the other two provinces. The third case concerned principals' level of satisfaction with their leadership, which is expressed in teachers' diligent efforts to observe the interdisciplinarity principle in the lesson plans they make in compliance with the new curriculum. Here too, the principals from Maputo City seemed relatively less optimistic about their leadership role than those from the other two provinces.

5.3 RESULTS OF THE QUANTITATIVE ANALYSIS OF TEACHERS' QUESTIONNAIRES

5.3.1 Teachers who participated in the study

Two hundred and twenty-one teachers (136 male and 85 female) from the provinces of Niassa, Sofala and MaputoCity (see Table 5.11).

Table 5.11: Provincial distribution of teachers who participated in the study

		Province			Total
		Niassa	Sofala	Maputo City	
Gender	Male	40	55	41	136
	Female	31	20	34	85
Total		71	75	75	221

5.3.2 Academic qualifications of teachers who participated in the study

5.3.2.1 Comparison of academic qualifications within and between provinces

The academic qualifications of teachers from the three provinces who participated in the study vary significantly ($p = 0.013, p \leq 0.05$) within each province and from province to province (see tables 5.12 and 5.13). Out of 221 of teachers engaged in this research 35 (15.8%) had a primary education, 56 (25.3%) junior secondary education, 119 (53.8%) had a senior secondary qualification and 11 (5.0%) a tertiary qualification (*cf*. table 5.12).

Fourteen (40%) out of 35 teachers, who took part in the investigation and had a primary education were from Sofala. The case of Maputo City was also very impressive. Nine (81.8%) out of 11 teachers, who had a tertiary education were from that province, in addition, 46 (61.3%) of 119 participants who had a senior secondary education were also from Maputo City as were 11 (31.4%) who had a primary education. In spite of this obvious contrast, teachers Maputo City had better academic qualifications overall than teachers from the other two provinces. In fact, out of 221 teachers who took part in the study, the overall picture of academic qualifications looks as follows:

- Holders of a primary qualification: 10 (4.5%) were from Niassa, 14 (6.3%) from Sofala and 11 (5.0%) from Maputo City.
- Holders of a junior secondary qualification: 23 (10.4%) were from Niassa, 24 (10.9%) from Sofala and 9 (4.1%) from Maputo City.
- Holders of a senior secondary qualification: 38 (17.2%) were from Niassa, 35 (15.8%) from Sofala and 46 (20,8%) from Maputo City.
- Holders of a tertiary qualification: none from Niassa (0.0%), 2 (0.9%) from Sofala and 11 (4.1%) from Maputo City.

It is worth mentioning that the majority overall of teachers from the three provinces had a senior secondary education (see Table 5.12 *cf.* 5.12 a).

Table 5.12: Comparison of academic qualifications of teachers from the three participating provinces

			Academic Qualifications				Total
			Primary Education Qualific.	Junior Secondary Education Qualific.	Senior Secondary Education Qualific.	Higher Education Qualific.	
Province	Niassa	Number	10	23	38	0	71
		% within province	14,1%	32,4%	53,5%	0,0%	100%
	Sofala	Count	14	24	35	2	75
		% within province	18,7%	32,0%	46,7%	2,7%	100%
	Maputo City	Count	11	9	46	9	75
		% within province	14,7%	12,0%	61,3%	12,0%	100%
Total		Count	35	56	119	11	221
		% within province	15,8%	25,3%	53,8%	5,0%	100%

Table 5.12a: Comparison of academic qualifications of teachers from the three participating provinces (after merging cells together with an expected frequency below 5)

			Academic Qualifications			Total
			Primary Education Qualific.	Junior Secondary Education Qualific.	Senior Secondary Education Qualific.	
Province	Niassa	Number	10	23	38	71
		% within province	14,1%	32,4%	53,5%	100,0%
	Sofala	Count	14	24	37	75
		% within province	18,7%	32,0%	49,3%	100,0%
	Maputo City	Count	11	9	55	75
		% within province	14,7%	12,0%	73,3%	100,0%
Total		Count	35	56	130	221
		% within province	15,8%	25,3%	58,8%	100,0%

Table 5.13: Chi-square tests on comparison of academic qualifications of teachers from the three participating provinces

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21,826(a)	6	0,001
Likelihood Ratio	24,459	6	0,000
Linear-by-Linear Association	5,458	1	0,019
N of Valid Cases	221		

(a) 3 cells (25,0%) have expected count below 5. The minimum expected count is 3,53.

Table 5.13a: Chi-square tests on comparison of academic qualifications of teachers from the three participating provinces (after merging cells together with an expected frequency below 5)

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12,728(a)	4	0,013
Likelihood Ratio	13,668	4	0,008
Linear-by-Linear Association	2,476	1	0,116
N of Valid Cases	221		

a 0 cells (0,0%) have expected count below 5. The minimum expected count is 11,24.

Since the cut-off value is for statistical significance below than 0.05, the Pearson chi-square value equal to 0.013 and the index for Likelihood ratio equal to 0.008 indicate that there is a statistically significant difference between academic qualifications of teachers from the three provinces.

5.3.2.2 Teachers' academic qualifications by gender

A total of 136 male teachers from the three provinces participated in the study. Out of these 17 (12.5%) had primary education qualifications, 39 (28.7%) had junior secondary education qualifications, 72 (52.9%) had senior secondary education qualifications and 8 (5.9%) had higher education qualifications.

A total of 85 female teachers from the three provinces took part in the study. Out of these 18 (21.2%) were in possession of a primary education qualification, 17 (20.0%) had junior secondary education qualifications, 47 (55.3%) had senior secondary education qualifications and 3 (3.5%) had higher education qualifications.

Comparing the academic qualifications by level and gender, a striking result was obtained: out of a total of 35 teachers holding primary education qualifications, 17 (48.6%) were males while 18 (51.4%) were females. Out of a total of 56 teachers holding junior secondary qualifications, 39 (69.6%) were males and 17 (30.4%) were females. Out of 119 teachers holding a senior secondary qualification 72 (60.5%) were male while 47 (39.5%) were female. Out a total of 11 teachers with tertiary qualifications, 8 (72.7%) were male and 3 (27.3%) were female (see table 5.14).

Given the proportions of males and females, (61.5% and 38.5% respectively), the differences in academic qualifications by gender are not significant. This result is supported by chi-square tests (*cf.* Table 5.15): Pearson chi-square and Likelihood ratio values are both 0.197, that is, above 0.05, which is the cut-off value for statistical significance.

Table 5.14: Comparison of participating teachers' academic qualifications by gender

			Academic Qualifications				
			Primary Education Qualific.	Junior Secondary Education Qualific.	Senior Secondary Education Qualific.	Higher Education Qualific.	Total
Gender	Male	Number	17	39	72	8	136
		% within gender	12,5%	28,7%	52,9%	5,9%	100,0%
	Famale	Number	18	17	47	3	85
		% within gender	21,2%	20,0%	55,3%	3,5%	100,0%
Total		Number	35	56	119	11	221
			15,8%	25,3%	53,8%	5,0%	100,0%

Table 5.15: Chi-square tests on participating teachers' comparison of academic qualifications by gender

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4,676(a)	3	0,197
Likelihood Ratio	4,682	3	0,197
Linear-by-Linear Association	0,951	1	0,329
N of Valid Cases	221		

(a) 1 cell (12,5%) has expected count below 5. The minimum expected count is 4,23.

5.3.3 Professional qualifications of teachers from the three participating provinces

Out of 221 teachers from the three provinces who took part in the study, 17 (7.7%) held a CFPP Teaching Certificate, 41 (18.6%) a IMP Teaching Certificate, 101(45.7%) a IMAP Teaching Certificate, 2 (0.9%) a UEM-Teaching Certificate, 8 (3.6%) a Bachelors degree, 4 (1.8%) a "Licentiate" degree and 48 (21.7%) other qualifications. The pedagogical qualifications of teachers from the three provinces are compared in table 5.16 which shows considerable variety in their teaching qualifications although they teach the same level. Most of them (101 or 45.7%) had IMAP qualifications. Notably, too a significant number of teachers (48 or 21.7%) had "other" (i.e. unspecified) qualifications and out of 17, 9 (52.9%) teachers holding a CFPP qualification came from Niassa province which also contributed no "Licenciates" to the sample, while Maputo City produced no-one with a UEM certificate.

Careful comparison of the figures reflected in table 5.16 reveals that on the whole teachers' qualifications across the three participating provinces do not vary significantly. This finding is confirmed by Pearson chi-square and Likelihood ratio values of 0.127 and 0.101 respectively, which are greater than 0.05, statistical significance cut-off value (see table 5.17).

Table 5.16: Comparison of professional qualifications of teachers from the three participating provinces

			Pedagogical Qualifications					Total
			CFPP *	IMP**	IMAP***	UEM (Education Certificate)	Other Qualific.	
Province	Niassa	Number	9	11	29	3	19	71
		% within province	12,7%	15,5%	40,8%	4,2%	26,8%	100%
	Sofala	Number	2	12	41	3	17	75
		% within province	2,7%	16,0%	54,7%	4,0%	22,7%	100%
	Maputo City	Number	4	20	28	9	14	75
		% within province	5,3%	26,7%	37,3%	12,0%	18,7%	100%
Total		Number	15	43	98	15	50	221
		% within province	6,8%	19,5%	44,3%	6,8%	22,6%	100%

*Teacher training or education course with upper primary education as admission requirement after National Independence in 1975. Before the National Education System (SNE) created in 1983, upper primary ended at Grade 6, which then became grade 7. Initially the CFPP course was exclusively professional, including Portuguese (because it was the medium of instruction in schools), didactics, educational psychology and pedagogical practice for primary schools as subjects, taught over six months, later extended to a year with a view to improved professional competence. The course then was upgraded to extend over three years during which the focus was not only teaching skills according to SNE requirements, but also on development to an extent that placed at on the same level as a junior secondary education (first cycle of secondary education). It is important to note that the CFPP course was always professionally geared for lower primary education (grade 1 to grade 5).

** Teacher training course to prepare teachers for upper primary level (Grades 5 and 6) before SNE, changed since to grades 6 and 7. The entrance level was a junior secondary education. Similarly, the IMP course offered professional as well as academic content to the extent that it received recognition as equivalent to a senior education qualification.

*** Teacher training course offered to prepare teachers for lower as well as upper primary education (grades 1 to 7). Admission requirement l is a junior secondary education. Initial duration of programme was two years, reduced to one year from 2006.

Note: additional information on educational requirements set for teachers is given in subsection 6.3.2.

Table 5.17: Chi-square tests on comparison teaching qualifications of Teachers from the three participating provinces

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17,208(a)	8	0,028
Likelihood Ratio	16,537	8	0,035
Linear-by-Linear Association	0,442	1	0,506
N of Valid Cases	221		

(a) 2 cells (13,3%) have expected count less than 5. The minimum expected count is 4,82.

5.3.4 Teachers' practical experience of upper primary level (EP2) teaching in the three participating provinces

The majority of surveyed teachers have been working at the upper primary level for five years or less. Indeed, out of 221 teachers from the three participating provinces, 125 (56.6%) had between one and five years of teaching experience at upper primary level; 61 (27.6%) have been working for 6 to 10 years; 22 (10.0%) for eleven to fifteen years; and only 13 (5.9%) for sixteen years and more (see Table 5.18 *cf.* 5.18a).

In all provinces, we found that there is a significant difference in teaching experience at EP2 among surveyed teachers. Table 5.19a supports this finding, giving Pearson chi-square and Likelihood Ratio values of 0.000, which is below 0.05, the cut-off value for the statistical significance. Interesting results are also apparent from Table 5.18. For instance, out of 13 surveyed teachers from the three provinces who had 16 years and more of teaching experience at upper primary level, 12 (92.3%) were based in Maputo City. Meanwhile, 54 (72.0%) out of 75 teachers whit five years' experience or less were based in Sofala.

Thus, in spite of significant differences across provinces in years of experience, the various groups are relatively balanced in Maputo City (see Table 5.18). A comparison by gender of teachers' experience at the upper primary level (EP2) shows negligible differences i.e. 55.9% and 57.6% for male and female teachers with five years' experience or less, 29.4% and 24.7% respectively for males and females working teaching for six and ten years; 8.1% and 12.9% respectively for males and female teaching for 11 to 15 years; and 6.6% and 4.7% respectively for males and females working 16 years and more. This low variance is corroborated by Pearson chi-square

and Likelihood Ratio values of 0.570 and 0.574 respectively, which are greater than 0.05, the cut-off significance value for chi-square tests (see Table 5.21).

Table 5.18: Comparison of teachers' practical experience of upper primary level (EP2) teaching in the three participating provinces

			Number of years Teaching EP2				Total
			1-5 years	6-10 years	11-15 years	16 years and more	
province	Niassa	Number	42	25	3	1	71
		% within province	59,2%	35,2%	4,2%	1,4%	100%
	Sofala	Number	54	16	5	0	75
		% within province	72,0%	21,3%	6,7%	0,0%	100%
	Maputo City	Number	29	20	14	12	75
		% within province	38,7%	26,7%	18,7%	16,0%	100%
Total		Number	125	61	22	13	221
		% within province	56,6%	27,6%	10,0%	5,9%	100%

Table 5.18a: Comparison of teachers' practical experience of upper primary level (EP2) teaching in the three participating provinces (after merging cells together with an expected frequency below 5)

			Number of years teaching EP2			Total
			1-5 years	6-10 years	11-15 years	
Province	Niassa	Number	42	25	4	71
		% within province	59,2%	35,2%	5,6%	100,0%
	Sofala	Number	54	16	5	75
		% within province	72,0%	21,3%	6,7%	100,0%
	Maputo City	Number	29	20	26	75
		% within province	38,7%	26,7%	34,7%	100,0%
Total		Number	125	61	35	221
		% within province	56,6%	27,6%	15,8%	100,0%

Table 5.19: Chi-Square Tests on Comparison of Teachers' experience of upper primary level (EP2) teaching in the three participating provinces

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	38,825(a)	6	0,000
Likelihood Ratio	39,932	6	0,000
Linear-by-Linear Association	19,668	1	0,000
N of Valid Cases	221		

a. 3 cells (25,0%) have expected count less than 5. The minimum expected count is 4,18.

Table 5.19a: Chi-Square Tests on Comparison of Teachers' experience of upper primary level (EP2) teaching in the three participating provinces (after merging cells together with an expected frequency below 5)

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	35,512(a)	4	0,000
Likelihood Ratio	34,141	4	0,000
Linear-by-Linear Association	16,398	1	0,000
N of Valid Cases	221		

a 0 cells (0,0%) have expected count less than 5. The minimum expected count is 11,24.

Table 5.20: Comparison by Gender of Teachers' experience of upper primary level (EP2) teaching in the three participating provinces

			Number of Years Teaching EP2				Total
Gender	Male	Number	76	40	11	9	136
		% within gender	55,9%	29,4%	8,1%	6,6%	100,0%
	Female	Number	49	21	11	4	85
		% within gender	57,6%	24,7%	12,9%	4,7%	100,0%
Total		Number	125	61	22	13	221
		% within gender	56,6%	27,6%	10,0%	5,9%	100,0%

Table 5.21: Chi-Square Tests on Comparison by Gender of Teachers' experience of upper primary level (EP2) teaching in the three participating provinces

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2,011(a)	3	0,570
Likelihood Ratio	1,993	3	0,574
Linear-by-Linear Association	0,004	1	0,952
N of Valid Cases	221		

a 0 cells (,0%) have expected count less than 5. The minimum expected count is 5,00.

5.3.5 The attitudes and beliefs of participating teachers

The attitudes and beliefs of the teachers who participated in the investigation are presented in table 5.22. As noted in the introduction to this chapter, the attitudes and beliefs of respondents from the three provinces were examined on the basis of twenty disaggregated variables, from which resulted an equal number of correspondent cross-tables incorporated in the appendix. Table 5.22 provides an overview of the results obtained from the individualized cross-tables. It is important

to note that the respondents in the neutral category were undecided. Therefore, in analysing the results of the study, the respondents opting for neutrality were considered to be expressing negative sentiment, while the fact that respondents who opted for the strongly disagree, disagree and neutral categories were lower than 20% overall is regarded as expressing positive sentiment (see Table 5.22).

Table 5.22: Summary of attitudes of participating teachers towards implementation of the new curriculum

Variables	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
V24. I feel like I belong at this school.	7 (3.2%)	5 (2.3%)	28 (12.7%)	66 (29.9%)	115 (52.0%)
V25. I feel that the school organization is changing and enabling successful implementation of the new curriculum.	12 (5.4%)	17 (7.7%)	36 (16.3%)	81 (36.7%)	75 (33.9%)
V26. I feel that teaching the new curriculum is fun at this school.	18 (8.1%)	28 (12.7%)	29 (13.1%)	64 (29.0%)	8 (37.1%)
V27. I feel acknowledged for good work in the context of the new curriculum.	14 (6.3%)	19 (8.6%)	36 (16.3%)	67 (30.3%)	85 (38.5%)
V28. I feel intrinsically rewarded for doing my job well in the context of the new curriculum.	37 (16.7%)	32 (14.5%)	31 (14.0%)	61 (27.6%)	60 (27.1%)
V29. I work with colleagues who treat me with respect.	5 (2.3%)	2 (.9%)	19 (8.6%)	66 (29.9%)	129 (58.4%)
V30. I work with colleagues who listen if I have ideas about doing things better in the context of the new curriculum.	4 (1.8%)	10 (4.5%)	26 (11.6%)	78 (35.3%)	103 (46.6%)
V31.My principal/ principal assistants/ learning cycle leader/ learning area coordinator is an effective instructional leader.	8 (3.6%)	7 (3.2%)	40 (18.1%)	79 (35.7%)	87 (39.4%)
V32.My principal/ principal assistants/ learning cycle leader/ learning area coordinator facilitates communication effectively.	1 (0.5%)	9 (4.1%)	34 (15.4%)	80 (36.2%)	97 (43.9%)
V33. My principal/ principal assistants/ learning cycle leader/ learning area coordinator supports me in my work with students under the new curriculum.	2 (0.9%)	9 (4.1%)	46 (20.8%)	72 (32.6%)	92 (41.6%)
V34. My principal/ principal assistants/ learning cycle leader/ learning area coordinator supports shared decision making.	5 (2.3%)	8 (3.6%)	51 (23.1%)	82 (37.1%)	75 (33.9%)
V35. My principal/ principal assistants/ learning cycle leader/ learning area coordinator allows me to be an effective instructional leader.	4 (1.8%)	8 (3.6%)	48 (21.7%)	73 (33.0%)	88 (39.8%)
V36. My principal/ principal assistants/ learning cycle leader/ learning area coordinator is effective in helping us to realize the vision on which the new curriculum is predicated.	5 (2.3%)	12 (5.4%)	48 (21.7%)	78 (35.3%)	78 (35.3%)
V37. I realize that the new curriculum has clear learning objectives, and that it emphasizes the acquisition of basic skills.	14 (6.3%)	13 (5.9%)	37 (16.7%)	75 (33.9)	82 (37.1%)
V38. I realize that effective professional development is helpful in fulfilment of curriculum goals.	8 (3.6%)	14 (6.3%)	50 (22.6%)	82 (37.1%)	67 (30.3%)
V39. I realize that student achievement can increase through active learning methods.	9 (4.1%)	13 (5.9%)	38 (17.2%)	85 (38.5%)	76 (34.4%)
V40. I realize that student achievement data are an important tool for improvement of student learning.	11 (5.0%)	13 (5.9%)	43 (19.5%)	86 (38.9%)	68 (30.8%)

V41. I realize that effective parent involvement and other stakeholders is needed for successful implementation of the new curriculum.	4 (1.8%)	5 (2.3%)	33 (14.9%)	51 (23.1%)	128 (57.9%)
V42. I have the opportunity to develop my teaching skills individually and co-operating with other colleagues on the new curriculum.	6 (2.7%)	12 (5.4%)	27 (12.2%)	67 (30.3%)	109 (49.3%)
V43. I have the opportunity to grow professionally under the new curriculum dispensation	13 (5.9%)	6 (2.7%)	36 (16.3%)	56 (25.3%)	110 (49.8%)

Table 5.22 shows that the majority of participating teachers recorded positive sentiments regarding:

- School ownership (V24);
- Mutual respect among teachers (V29);
- Sharing innovative ideas (V30);
- Principals' facilitating effective communication (V32);
- Importance of involving parents and other stakeholders (V41)

In regard to the four variables (V24, V29, V32 and V41) above, there was no significant difference between teachers' opinions across the participating provinces. This finding was supported by chi-squares calculation, which is $p \geq 0.05$ (See Appendix E2 *cf.* Appendix E2a, tables on chi-squares; for V24, E2a.2, $p = 0.131$; for V29, E2a.12, $p = 0.107$; for V32, E2a.18, $p = 0.263$; for V41, E2a.36, $p = 0.051$). Significant difference with regard to V30 ($p = 0.000$, E2a.14) was the only exception.

Taking Appendix E2, table E2.37 into consideration, findings show that Maputo City had more teachers than Niassa and Sofala saying that implementation of the new curriculum had give them opportunities to develop individual teaching skills and cooperate with other colleagues. Appendix E2, table E2.11 indicates that Niassa had more teachers who expressed mutual respect than Sofala and Maputo City. Moreover, table 5.22 revealed a widespread negative feeling among respondents about many other research variables. These feelings were reflected in attitudes and beliefs towards implementation of the new curriculum. However, it was also noticeable that the level of negative feelings varied significantly across the three provinces. This finding is underpinned by chi-squares through the Pearson chi-square values, which are less than 0.05, implying significant difference among variables. Except three variables, which drew equally negative ratings, there was no

significant difference of opinions across the three provinces about implementing the new curriculum. These variables were:

- Shared decision-making (V34, see Appendix E2a, table E2a.22, $p = 0.395$);
- Principals' help to reach new vision (V36, see Appendix E2a, table E2a.26, $p = 0.196$);
- Professional growth (V43, see Appendix E2a, table E2a.40, $p = 0.515$).

5.4 RESULTS OF STUDENTS' QUESTIONNAIRES

5.4.1 Students who participated in the study

As shown in table 5.89, 384 students (211 male and 173 female) from Niassa province, 1 319 (778 male and 541) from Sofala, and 1 002 (480 male and 522 female) from Maputo City. Thus, 2 705 students participated in this research of which 1 469 were males and 1 236 were females. The students came from 38 schools: 11 in Niassa, 15 in Sofala and 12 in Maputo City. (See table 5.24)

Table 5.23: Provincial representation of students who participated in the study

		Province			Total
		Niassa	Sofala	Maputo City	
Gender	Male	211	778	480	1469
	Female	173	541	522	1236
Total		384	1319	1002	2705

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Table 5.24: Schools and number of students involved in the study by province

		Province			
		Niassa	Sofala	Maputo City	Total
Schools	EPC UNIDADE 2			48	48
	EPC UNIDADE 6			123	123
	EPC 25 de JUNHO			132	132
	EPC 3 de FEVEREIRO			75	75
	EPC HEROIS MOCAMBICANOS--BAGAMOYO			50	50
	EPC 25 de SETEMBRO			77	77
	EPC BAIRRO do JARDIM			118	118
	EPC da MUNHUANA			110	110
	EPC LURDES MUTOLA			42	42
	EPC A LUTA CONTINUA			96	96
	EPC 16 de JUNHO			106	106
	EP INHACA			25	25
	EPC MACURUNGO		199		199
	EPC 12 de OUTUBRO--BEIRA		171		171
	EPC MUNHAVA		92		92
	EPC 25 de SETEMBRO--BEIRA		78		78
	EPC AGOSTINHO NETO		93		93
	EPC INHAMIZUA		67		67
	EPC 11 de NOVEMBRO		50		50
	EPC GUARA-GUARA 2		99		99
	EP2 SEDE-BUZI		95		95
	EPC AMILCAR CABRAL		43		43
	EPC SENA-CAIA		54		54
	EPC HEROIS MOCAMBICANOS		49		49
	EP2 MAROCANE--BEIRA		98		98
	EPC TICA		73		73
	EPC JOSSIAS TONGOGARA		58		58
	EPC Ngame	15			15
	EPC de Naossa	15			15
	EPC de Malica	19			19
	EP2 Eduardo Mondlane	38			38
	EP2 Novos Horizontes	101			101
	EPC de Namacula	27			27
	EPC A Luta Continua--Lichinga	50			50
	EPC Nzinji	25			25
	EPC Ngongoti	25			25
	EPC de Nsauca	44			44
	EPC Nhansenhenje	25			25
Total of students		384	1319	1002	2705

5.4.2 Perceptions, beliefs and attitudes of learners regarding the new curriculum

The perceptions, beliefs and attitudes of learners regarding the new curriculum are summarized in Table 5.25. The respondents in the neutral category were undecided. Analysis of the results of the study shows that neutrality expressed negativity while the fact that the collective response in the strongly disagree, disagree and neutral categories amounted to less than, or equal to 20%, expressed positive sentiment. As noted in the introduction to this chapter, the perceptions, beliefs and attitudes of learners across the three provinces were ascertained through seventy-five disaggregated variables, from which resulted an equal number of corresponding crosstables that are incorporated with the appendix. An overview of results from those individualized crosstables is contained in Table 5.25.

Table 5.25: Summary of perceptions, beliefs and attitudes of participating learners regarding the new curriculum

Variables	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
V118: Beyond my textbooks I don't read other books.	1176 (43.5%)	415 (15.3%)	508 (18.8%)	280 (10.4%)	326 (12.1%)
V107: My preferable textbook is Local Language textbook.	192 (7.1%)	177 (6.5%)	1148 (42.4%)	524 (19.4%)	664 (24.5%)
V96: I think that the important subject is Local language.	204 (7.5%)	158 (5.8%)	1074 (39.7%)	515 (19.0%)	754 (27.9%)
V86: In the teaching of the new curriculum, time is spent in whole-class discussions with the teacher.	457 (16.9%)	381 (14.1%)	512 (18.9%)	688 (25.4%)	667 (24.7%)
V85: In the teaching of the new curriculum, time is spent listening to the teacher talk.	561 (20.7%)	375 (13.9%)	393 (14.5%)	594 (22.0%)	782 (28.9%)
V68: Students at this school respect other students who are different from them.	382 (14.1%)	349 (12.9%)	526 (19.4%)	749 (27.7%)	699 (25.8%)
V53: Other students at this school treat me with respect.	333 (12.3%)	373 (13.8%)	489 (18.1%)	789 (29.2%)	721 (26.7%)
V76: My teachers care about me.	222 (8.2%)	272 (10.1%)	593 (21.9%)	835 (30.9%)	783 (28.9%)
V55: The work at this school is challenging.	295 (10.9%)	283 (10.5%)	491 (18.2%)	776 (28.7%)	860 (31.8%)
V90: In the teaching of the new curriculum, time is spent analyzing individual or class performance.	285 (10.5%)	309 (11.4%)	465 (17.2%)	872 (32.2%)	774 (28.6%)
V113: My preferred textbook is Crafts/Arts textbook.	172 (6.4%)	187 (6.9%)	656 (24.3%)	869 (32.1%)	821 (30.4%)
V88: In the teaching of the new curriculum, time is spent reading.	339 (12.5%)	306 (11.3%)	344 (12.7%)	729 (27.0%)	987 (36.5%)
V52: I am treated with respect by the office staff.	249 (9.2%)	287 (10.6%)	428 (15.8%)	840 (31.1%)	901 (33.3%)
V46: I feel challenged at this school	285 (10.5%)	300 (11.1%)	371 (13.7%)	723 (26.7%)	1 026 (37.9%)
V71: My teachers understand when students have personal problems.	240 (8.9%)	223 (8.2%)	470 (17.4%)	850 (31.4%)	922 (34.1%)

V91: I work well under the new curriculum when I am working in projects or research.	235 (8.7%)	216 (8.0%)	481 (17.8%)	928 (34.3%)	845 (31.2%)
V102: I think that the important subject is Crafts/Arts.	162 (6.0%)	191 (7.1%)	564 (20.9%)	953 (35.2%)	835 (30.8%)
V73: My teachers have confidence in me.	184 (6.8%)	232 (8.6%)	500 (18.5%)	952 (35.2%)	837 (30.9%)
V74: My teachers know me well.	184 (6.8%)	216 (8.0%)	506 (18.7%)	850 (31.4%)	949 (35.1%)
V114: My preferred textbook is Visual/ Aesthetic Education Textbook.	125 (4.6%)	175 (6.5%)	552 (20.4%)	928 (34.3%)	925 (34.2%)
V75: My teachers listen to my ideas.	173 (6.4%)	229 (8.5%)	442 (16.3%)	922 (34.1%)	939 (34.7%)
V87: In the teaching of the new curriculum, time is spent working in small groups.	269 (9.9%)	218 (8.1%)	332 (12.3%)	868 (32.1%)	1 018 (37.6%)
V115: My preferred textbook is Music Education textbook.	114 (4.2%)	159 (5.9%)	532 (19.7%)	869 (32.1%)	1 031 (38.1%)
V104: I think that the important subject is Music Education.	119 (4.4%)	151 (5.6%)	527 (19.5%)	916 (33.9%)	992 (36.7%)
V92: I work well under the new curriculum when the teachers are leading discussions with the whole class.	182 (6.7%)	214 (7.9%)	388 (14.3%)	996 (36.8%)	925 (34.2%)
V79: My teachers give me individual attention when I need it.	225 (8.3%)	233 (8.6%)	318 (11.8%)	1 027 (38.0%)	902 (33.3%)
V93: I work well under the new curriculum when I am working in a small group.	153 (5.7%)	212 (7.8%)	410 (15.2%)	962 (35.6%)	968 (35.8%)
V89: In teaching the new curriculum, time is spent answering questions from a book or worksheet.	258 (9.5%)	258 (9.5%)	255 (9.4%)	786 (29.1%)	1 148 (42.4%)
V94: I work well under the new curriculum when I am working by myself.	220 (8.1%)	208 (7.7%)	333 (12.3%)	819 (30.3%)	1 125 (41.6%)
V84: The new curriculum will contribute to my education in reference to my ability to cope with technology.	150 (5.5%)	159 (5.9%)	443 (16.4%)	811 (30.0%)	1 142 (42.2%)
V59: Schooling is fun here.	209 (7.7%)	204 (7.5%)	336 (12.4%)	838 (31.0%)	1 118 (41.3%)
V54: The people responsible for what I learn are my teachers.	230 (8.5%)	217 (8.0%)	273 (10.1%)	703 (26.0%)	1 282 (47.4%)
V103: I think that the important subject is Visual/ Aesthetic Education.	113 (4.2%)	181 (6.7%)	532 (19.7%)	943 (34.8%)	936 (34.6%)
V44: I feel safe at this school.	239 (8.8%)	234 (8.7%)	243 (9.0%)	739 (27.3%)	1 250 (46.2%)
V49: I assess my own work.	225 (8.3%)	199 (7.4%)	283 (10.5%)	836 (30.9%)	1 162 (43.0%)
V58: I am personally responsible for what I learn.	204 (7.5%)	244 (9.0%)	255 (9.4%)	765 (28.3%)	1 237 (45.7%)
V65: Students at this school have opportunities to learn from each other.	179 (6.6%)	207 (7.7%)	306 (11.3%)	972 (35.9%)	1 041 (38.5%)
V109: My preferred textbook is Social Sciences textbook	85 (3.1%)	154 (5.7%)	454 (16.8%)	955 (35.3%)	1 057 (39.1%)
V77: My teachers make learning fun.	133 (4.9%)	155 (5.7%)	392 (14.5%)	956 (35.3%)	1 069 (39.5%)
V50: Teachers treat me with respect.	154 (5.7%)	176 (6.5%)	334 (12.3%)	805 (29.8%)	1 236 (45.7%)
V98: I think that the important subject is Social Sciences .	80 (3.0%)	127 (4.7%)	420 (15.5%)	985 (36.4%)	1 093 (40.4%)
V97: I think that the important subject is English.	91 (3.4%)	143 (5.3%)	384 (14.2%)	898 (33.2%)	1 189 (44.0%)
V57: I feel successful at school.	99 (3.7%)	147 (5.4%)	370 (13.7%)	1 081 (40.0%)	1 008 (37.3%)
V108: My preferred textbook is English textbook.	87 (3.2%)	132 (4.9%)	387 (14.3%)	867 (32.1%)	1 232 (45.5%)
V105: I think that the important subject is Physical Education.	80 (3.0%)	110 (4.1%)	405 (15.0%)	8 15 (30.1%)	1 295 (47.8%)
V116: My preferred textbook is Physical Education textbook	88 (3.3%)	115 (4.3%)	394 (14.6%)	798 (29.5%)	1 310 (48.4%)
V110: My preferred textbook is Moral and Civic Education textbook.	69 (2.6%)	112 (4.1%)	413 (15.3%)	861 (31.8%)	1 250 (46.2%)
V45: I feel like I belong at this school.	132 (4.9%)	165 (6.1%)	288 (10.6%)	943 (34.9%)	1 177 (43.5%)
V67: Participating in extracurricular activities is important to me.	114 (4.2%)	118 (4.4%)	350 (12.9%)	985 (36.4%)	1 137 (42.0%)
V72:My teachers help me gain confidence in my ability to learn.	109 (4.0%)	144 (5.3%)	325 (12.0%)	977 (36.1%)	1 150 (42.5%)

V51: School administrators treat me with respect.	116 (4.3%)	167 (6.2%)	267 (9.9%)	847 (31.3 %)	1 308 (48.4%)
V64: I am doing my best at school.	88 (3.3%)	136 (5.0%)	319 (11.8%)	898 (33.2%)	1 264 (46.7%)
V70 My teachers expect me to do my best.	121 (4.5%)	114 (4.2%)	311 (11.5%)	878 (32.5%)	1 281 (47.4%)
V99: I think that the important subject is Moral and Civic Education.	76 (2.8%)	102 (3.8%)	363 (13.4%)	884 (32.7%)	1 280 (47.3%)
V61: I think this is a good school.	105 (3.9%)	134 (5.0%)	266 (9.8%)	1 020 (37.7%)	1 180 (43.6%)
V48: Teachers encourage me to asses the quality of my own work.	127 (4.7%)	158 (5.8%)	220 (8.1%)	846 (31.3%)	1 354 (50.1%)
V66: Students at this school have opportunities to learn about each other.	114 4.2%)	130 (4.8%)	244 (9.0%)	947 (35.0%)	1 270 (47.0%)
V63: Doing well in school makes me feel good about myself.	91 (3.4%)	110 (4.1%)	276 (10.2%)	990 (36.6%)	1 238 (45.8%)
V69: My teachers expect students to do their best.	99 3.7%)	104 (3.8%)	291 (10.8%)	912 (33.7%)	1 299 (48.0%)
V83: The new curriculum will contribute to my education in reference to my ability to present information.	78 (2.9%)	99 (3.7%)	317 (11.7%)	992 (36.7%)	1 219 (45.1%)
V47: I understand how to apply what I learn to real life/ situations.	82 (3.0%)	90 (3.3%)	273 (10.1%)	972 (35.9%)	1 288 (47.6%)
V112: My preferred textbook is Natural Sciences textbook.	46 (1.7%)	61 (2.3%)	296 (10.9%)	852 (31.5%)	1 450 (53.6%)
V78: My teachers are excited about the subjects they teach.	72 (2.7%)	70 (2.6%)	228 (8.4%)	831 (30.7%)	1504 (55.6%)
V60: I like this school.	107 (4.0%)	88 (3.3%)	173 (6.4%)	827 (30.6%)	1 5 10 (55.8%)
V101: I think that the important subject is Natural Sciences.	46 (1.7%)	64 (2.4%)	234 (8.7%)	868 (32.1%)	1 493 (55.2%)
V82: The new curriculum will contribute to my education in reference to my ability with Mathematics.	63 (2.3%)	58 (2.1%)	207 (7.7%)	909 (33.6%)	1 468 (54.3%)
V111: My preferred textbook is Mathematics textbook.	57 (2.1%)	55 (2.0%)	191 (7.1%)	599 (22.1%)	1 803 (66.6%)
V80: The new curriculum will contribute to my education in reference to my ability to write.	53 (2.0%)	57 (2.1%)	145 (5.4%)	866 (32.0%)	1 584 (58.6%)
V117: Beyond my textbooks, I read other books.	66 (2.4%)	34 (1.3%)	130 (4.8%)	534 (19.7%)	1941 (71.7%)
V56: I find what I learn in school to be relevant to real life.	53 (2.0%)	56 (2.1%)	126 (4.7%)	703 (26.0%)	1 767 (65.3%)
V81: The new curriculum will contribute to my education in reference to my ability to read.	47 (1.7%)	51 (1.9%)	129 (4.8%)	793 (29.3%)	1 685 (62.3%)
V100: I think that the important subject is Mathematics.	42 (1.6%)	35 (1.3%)	128 (4.7%)	563 (20.8%)	1 937 (71.6%)
V106: My preferred textbook is Portuguese textbook.	49 (1.8%)	21 (.8 %)	113 (4.2%)	490 (18.1%)	2 032 (75.1%)
V62: I like to learn.	35 (1.3%)	30 (1.1%)	86 (3.2%)	536 (19.8%)	2 018 (74.6%)
V95: I think that the important subject is Portuguese.	45 (1.7%)	24 (0.9%)	68 (2.5%)	535 (19.8%)	2 033 (75.1%)

Table 5.25 illustrates that the perceptions, beliefs and attitudes of learners regarding the new curriculum may basically be divided into two groups that are respectively negative and positive about the change in that aggregate responses to the categories of strongly disagree, disagree and neutral is deemed negative if it is equal to or above 20%, if the rating does not exceed 20%. There were significant differences on both the positive and the negative side. These observations were corroborated by

chi-square tests through Pearson chi-square and Likelihood ratio values below the statistical significance cut-off value of 0.05 for chi-square tests (see appendix F2).

However, there was no significant difference in students' opinions about the following items:

- School learning relevancy to real life situations (V56, see Appendix F2, Table F2.30, $p = 0.068$);
- Level of importance of Portuguese, which they are taught in the context of the new curriculum (V95, Appendix F2, Table F2.124, $p = 0.128$);
- Level of importance of Mathematics, which they are taught in the context of the new curriculum (V100, Appendix F2, Table F2.138, $p = 0.278$);
- Teachers' attitude towards individual student's learning at school (V70, Appendix F2, Table F2.60, $p = 0.054$);
- Safety in schools by gender (V44, Appendix F2, Table F2.4, $p = 0.084$)
- Learning towards real world relevance under the new curriculum: regarding skills, by gender (V81, Appendix F2, Table F2.86, $p = 0.055$)

As can be seen, chi-square tests values are equal to or above the statistical significance limit of 0.05 ($p \geq 0.05$).

B. RESULTS OF THE PRINCIPAL COMPONENT FACTOR ANALYSIS

5.5 INTRODUCTION

As explained earlier, this study deals mainly with educators' and learners' opinions on curriculum implementation in Mozambican schools, to which end a comprehensive questionnaire was designed and divided into four sections to cover the following components as described in chapter 4, from paragraph one onwards:

- Nine variables in Section A covered respondents' bibliographical information (i.e. principals (head teachers), teachers and learners).
- Section B dealt with variables 10 to 23, addressing principals' opinions of school leadership (i.e. its impact).

- Section C included variables 24 to 43, exploring teachers' beliefs, attitudes, ability, confidence and capacity-building initiatives in connection with the new curriculum.
- Section D dealt with variables 44 to 118 exploring learners' beliefs and attitudes about school and learning under the new curriculum.

Given the above theoretical foundations (*cf.* Chapter 4 on Methodology), the results of factor analysis are presented in sections 5.5 and 5.6. Analysis is splint into first-order investigative factor analysis and second-order confirmative factor analysis. The former identified the related variables that can be clustered to form a single variable or factor sufficient evidence was gathered to form a hypothesis about the number of factors inherent in the data. A second-order confirmative factor analysis to assess the validity and reliability of factors gleaned from the first-order investigative factor analysis. (See section 4.5.2 of this thesis) was conducted.

5.6 RESULTS OF THE FIRST-ORDER INVESTIGATIVE FACTOR ANALYSIS

5.6.1 Factors underlying principals' responses (variables 10-23)

Analysis of participating principals' responses to the questionnaire produced four factors with eigenvalues greater than one. Cumulatively these factors account for 60.714% of total explained variance which is made up of the eigenvalues calculated as 4.722, 1.442, 1.251 and 1.084 (*cf.* Table 5.26). Regarding the use of explained variance as criterion, Garson (2006:11) observes that:

> Some researchers simply use the rule of keeping enough factors to account for 90% (sometimes 80%) of the variation. Where the researcher's goal emphasizes parsimony (explaining variance with as few factors as possible), the criterion could be as low as 50%.

Therefore, 60.71% total explained variance can be seen as remarkably high, because it is imperative to determine "… how many factors have appreciable influence and have loadings that can be reliably estimated" (Cliff 1987:358).
Figure 5.1 is shows the Cattel's scree test applied to principals' responses. It is important to note that:

- The plot decreases from left to right. In terms of eigenvalues, there is a large difference between the first and second components. The first eigenvalue corresponding to the first component is three times or more the size of the eigenvalue of the second component.
- It can be seen that the curve begins to flatten between factors 4 and 5.
- Only four factors should be retained since the eigenvalue of factor 5 is less than 1.

In the present case concerning principals' responses (see Table 5.27), through the first order factor analysis, the following factors were identified as the main underlying attitudes:

- Factor 1: School restructuring and reculturing
- Factor 2: Mutual support and professional development
- Factor 3: Innovative teaching initiatives
- Factor 4: Leadership

The factor analysis clustered the opinions of respondents into four factors. These factors captured all items (responses) that show a high internal consistency, meaning that a single commonality was shared within a given factor. It is important to note that, according to Green and Salkind (2005:317) "the percent of variance of the variables accounted for by the factor is equal to the eigenvalue divided by the total amount of variance of the variables times 100". For einstance, the eigenvalue associated with the first factor is 4.722 and the percent of total variance accounted for by the first factor is (4.722:14) x 100 = 33.731. Let us take two more examples (e.g. concerning factors 4 and 14), in order to make explicit the rule of the percent of variance of the variables accounted for by the factor. The eigenvalue linked with the fourth factor is 1.084 and the per cent of total variance accounted for by the fifth factor is (1.084:14) x 100 = 7.746. The eigenvalue connected with the fourteenth factor is 0.191 and the percent of total variance accounted for by the fourteenth factor is (0.191:14) x 100 = 1.364. In section 4.5.2 of this thesis, it was highlighted that eigenvalues are helpful in deciding how many factors should be used in the study.

According to Field (2000:437), "to discover what common variance really exists between variables we must decide which factors are meaningful and discard any that

are too trivial to consider" One criterion is to retain all factors that have eigenvalues greater than one (Kaiser, 1960 and Cliff, 1987). As shown in table 5.26, they were only listed values to the first five factors, 63.64% of the total explained variance (common variance between variables or present in the data). Field (2000:436) notes in this regard "[…] eigenvalues associated with a variate indicate the substantive importance of the factor. Therefore, it seems logical that we should retain only factors with large eigenvalues". Another important remark related to the clustered opinions of respondents into factors is made by Thompson (2004:97) as follows: "[…] all real factors involve multiple variables, and to this extent must be named in a manner reflecting the overall pattern of contributions of different variables to the factor's definition". Table 5.27 summarizes the exercise of identifying the four factors obtained as a result of the first-order factor analysis of participating principals' responses to the questionnaire. In fact it is a challenging exercise to determine a common name that reflects the multiple variables encompassed by the factor. Moreover, as Field (2000) points out, in an ideal world a variable should have a high factor loading to only one factor, namely a large co-ordinate for one of the axes, and low coordinates for any other factor. However, it does not look like that in many real cases. According to Bryman and Cramer (1999) factor loading or correlation is the relationship between each item or variable with a factor, and many researchers consider all loadings in excess of 0.3 regardless of whether any variables are thereby implicated in more than one factor. Looking carefully at the Table 5.27, we see that the I.7.2.1; V19, I.7.2.5;V23, I.7.1.7;V16, I.7.2.3;V21 and I.7.1.6;V15 do not have a (relatively) high factor loading to only one factor. That is to say, according to Field (200:425), these variables measure different aspects of some common underlying dimension (see Table 5.27). Nevertheless, as can be seen from Table 5.27, each variable mentioned above is 'particularly higher' than only one factor that "specially belongs". Anyway, it is important to remain aware that there are variables that measure different aspects of some common underlying dimension. In other words, some of the items representing other factors have high internal consistencies with other factors. Going back to the case of factors derived from principals' responses (*cf*. Table 5.27), interesting issues may be raised. For instance, in the case of I.7.2.3; V21 (I am satisfied that sharing and cooperation on all issues enabling effective implementation of the new curriculum characterizes the school climate) we see that this item or variable simultaneously measures the efforts towards school restructuring

and reculturing, as well as mutual support towards innovative teaching initiatives. In view of the factor loading we also note that the variable relates particularly to the third factor – innovative teaching initiatives as that it loads most highly on the third factor, although its correlation with the first and second factors varies somewhat. Effectively, as emphasized earlier in this thesis, if effective change at school level towards successful teaching and learning is desired, then the school should embark on school restructuring and reculturing, which entails mutual support and professional development, to which end innovative teaching initiatives are required as a key characteristic of a new way of school organization and work (see section 1.6.5).

Table 5.26: Total variance explained by the principal-component factor analysis of Principals' responses

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4,722	33,731	33,731	4,722	33,731	33,731
2	1,442	10,300	44,030	1,442	10,300	44,030
3	1,251	8,938	52,968	1,251	8,938	52,968
4	1,084	7,746	60,714	1,084	7,746	60,714
5	,940	6,713	67,427			
6	,866	6,188	73,615			
7	,750	5,361	78,976			
8	,628	4,486	83,462			
9	,574	4,101	87,563			
10	,477	3,404	90,967			
11	,432	3,088	94,055			
12	,368	2,630	96,685			
13	,273	1,951	98,636			
14	,191	1,364	100,000			

Figure 5.1: **Cattell's scree test on principals' responses, showing the amount of variance explained in terms of eigenvalues**

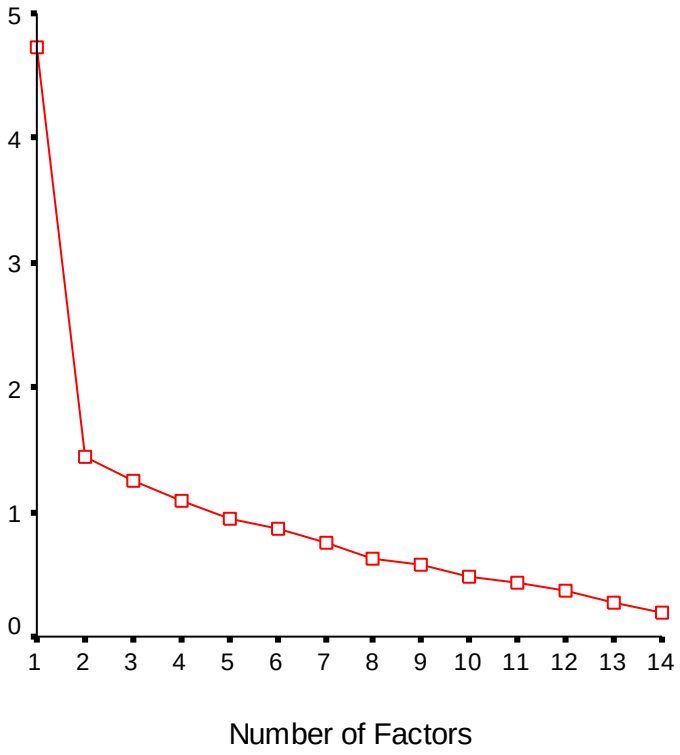

Table 5.27: Rotated factor pattern matrix of the four factors on principals' responses extracted during the first-order factor analysis

Items/ variables	Factors			
	School restructuring and reculturing	Mutual support and professional development	Innovative teaching initiatives	Leader-ship
I try to promote student achievement under the new curriculum, by maximizing the amount of school time used for learning under new curriculum. (I.7.1.9;V18)	.788	.203	.034	.213
I try to promote student achievement under the new curriculum, by challenging teachers and students continuously to fulfil curriculum goals. (I. 7.1.4; V13)	.776	-.130	-.021	.261
I am satisfied that a new school organization is being implemented to cope with the demand of new curriculum. (I.7.2.1; V19)	.753	.342	.225	-.054
I am satisfied that the school has already developed the local curriculum. (I.7.2.5; V23)	.596	.313	.278	-.026
I try to promote student achievement under the new curriculum, by cultivating close relationship with teachers, other staff members, students and parents. (I.7.1.1; V10)	.117	.739	-.028	.122
I try to promote student achievement under the new curriculum, putting in place an action plan produced collectively in school for effective implementation of the new curriculum. (I.7.1.2; V11)	.043	.705	.285	.387
I try to promote student achievement under the new curriculum, through effective professional development. (I.7.1.3; V12)	.285	.604	.071	.005
I try to promote student achievement under the new curriculum, by promoting collaboration among teachers so that they can develop new skills by sharing professional knowledge about the new curriculum. (I.7.1.7; V16)	.019	.448	.440	.000
I am satisfied that teachers are using a variety of active methods in their teaching as required by the new curriculum. (I.7.2.4; V22)	.220	.029	.834	.048
I am satisfied that teachers are diligent in their endeavour to observe interdisciplinarity in the lessons plans they make according to the new curriculum. (I.7.2.2; V20)	-.036	.101	.729	.078
I am satisfied that sharing and cooperation on all issues I am satisfied that the school climate is exemplified by sharing and cooperation that conduce to effective curriculum implementation. (I.7.2.3; V21)	.426	.322	.482	.211
I try to promote student achievement under the new curriculum, by coordinating and managing the learning process in the context of the new curriculum. (I.7.1.6; V15)	.286	-.001	.457	.380
I try to promote student achievement in the context of new curriculum, by holding regular and productive staff meetings. (I.7.1.5; V 14)	.086	.092	.086	.887
I try to promote student achievement under the new curriculum, by monitoring teachers' performance under the new curriculum. (I.7.1.8; V17)	.245	.414	.118	.579

5.6.2 Factors underlying teachers' responses (variables 24-43)

The first-order factor analysis of teachers' responses (variables 24-43) of the questionnaire produced five factors with eigenvalues greater than one. This number of factors was confirmed through Cattell's scree test. The curve begins to flatten between factors 5 and 6. Factor 6 has an eigenvalue below 1. So, only five factors should be retained (see Figure 5.2).

Together the five factors amount to 66.181% of the total variance and their eigenvalues were calculated as 7.815, 1.752, 1.452, 1.119 and 1.098 respectively (Table 5.277). The factors are as follows:

- Factor 1: Leadership
- Factor 2: Rewarding
- Factor 3: Effective teaching
- Factor 4: Capacity building
- Factor 5: Positive work environment

In Table 5.28, values were only listed for the first five factors, cumulatively amounting to 66.18% of the total variance explained (common variance between variables or present in the data). As noted in section 5.6.1, it should be considered that remark: "…eigenvalues associated with a variance indicate the substantive importance of the factor. Therefore, it seems logical that we should retain only factors with large eigenvalues" Field's (2000:436).

As Field (2000) notes further that ideally a variable should have a high factor loading to only one factor, that in a large coordinate for one of the axes, and low coordinates for any other factor. However, in many real cases a variable is associated with more than one factor. I also decided to follow the same criterion. Looking carefully at the table 5.29, we see that the I.8.3.6;V36, I.8.1.6;V28, I. 8.1.3;V25, I.8.4.5;V38, I. 8.4.4;V40, I.8.4.5;V41, I.8.1.2;V24 and I.8.2.2; V30 do not have a (relatively) high factor loading to only one factor. That is to say, according to Field (200:425), these variables measure different aspects of some common underlying dimension (see Table 5.29). Nevertheless, as can be seen from Table 5.29, each variable mentioned above is 'particularly higher' than only one factor that "specially" belongs. Bryman

and Cramer (1999:280) note that “in general the meaning of a factor is determined by the items which load most highly on it”. Anyway, it is important to borne in mind that there are variables that measure different aspects of some common underlying dimension. Going back to the case of factors derived from teachers’ responses (*cf*. Table 5.29), interesting issues may be raised. For instance, in the case of I.8.1.6; V28 (I feel intrinsically rewarded for doing my job well in the context of new curriculum) we see that it measures two factors: “leadership” and “rewarding”. Considering the factor loading, we have to conclude that the variable “specially” belongs to the second factor “rewarding”. Obviously, rewarding may be understood as one aspect of leadership. Brown, Oke and Brown (1982:9) observe that: “the life of a teacher is not an easy one but there are some long term intrinsic rewards even if the extrinsic rewards are fairly minimal”. For the long term “intrinsic rewards” calls for a dedicated and hardworking teacher whose efforts are rewarded by the satisfaction or compensation derived from the success of learners rather than salary (which cannot for that reason be neglected). In this sense leadership contributes significantly to an environment that motivates teachers for their high commitment to their students’ success (see section 1.6.4 about situating an innovation in a conducive organizational or social context).

Table 5.28: Total variance explained by principal-component factor analysis of teachers' responses

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7,815	39,076	39,076	7,815	39,076	39,076
2	1,752	8,759	47,835	1,752	8,759	47,835
3	1,452	7,260	55,094	1,452	7,260	55,094
4	1,119	5,595	60,689	1,119	5,595	60,689
5	1,098	5,492	66,181	1,098	5,492	66,181
6	,807	4,036	70,217			
7	,772	3,859	74,077			
8	,621	3,104	77,180			
9	,559	2,793	79,973			
10	,514	2,569	82,543			
11	,479	2,395	84,938			
12	,462	2,308	87,246			
13	,428	2,141	89,387			
14	,386	1,930	91,318			
15	,362	1,811	93,129			
16	,343	1,716	94,845			
17	,308	1,539	96,384			
18	,292	1,462	97,846			
19	,227	1,136	98,982			
20	,204	1,018	100,000			

Figure 5.2: Cattell's scree test on teachers' responses showing the amount of variance explained in terms of eigenvalues

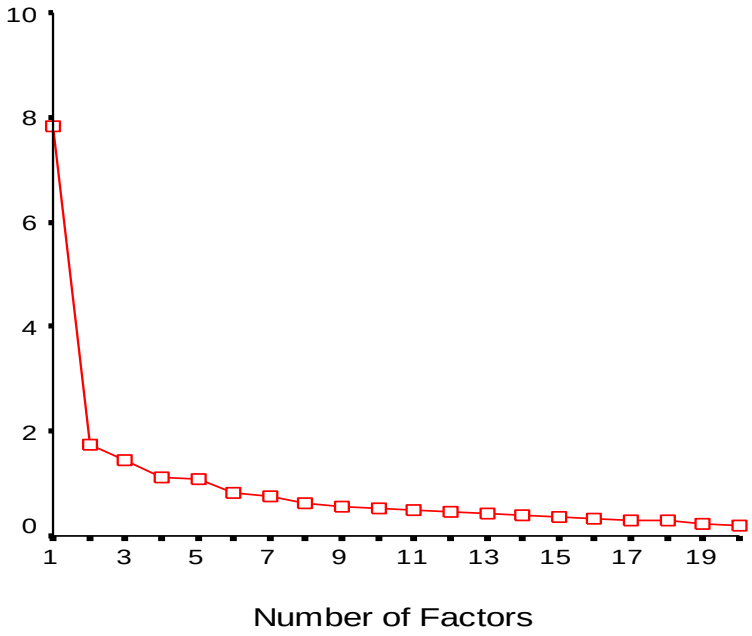

Table 5.29: Rotated factor pattern matrix of the five factors on teachers' responses extracted during the first order factor analysis

Items/ Variables	Factors				
	Leadership	Rewarding	Effective teaching	Capacity building	Positive work-environment
My principal/ principal assistants/ learning cycle leader/ learning area coordinator is an effective instructional leader. (I.8.3.1; V31)	.842	.103	.107	.042	.022
My principal/ principal assistants/ learning cycle leader/ learning area coordinator facilitates communication effectively. (I.8.3.2; V32)	.794	.047	.163	.023	.177
My principal/ principal assistants/ learning cycle leader/ learning area coordinator allows me to be an effective instructional leader. (I.8.3.5; V35)	.690	.196	.201	.240	.074
My principal/ principal assistants/ learning cycle leader/ learning area coordinator supports me in my work with students under the new curriculum. (I.8.3.3; V33)	.683	.218	.222	.299	-.035
My principal/ principal assistants/ learning cycle leader/ learning area coordinator supports shared decision making. (8.3.4; V34)	.678	.188	.194	.210	.141
My principal/ principal assistants/ learning cycle leader/ learning area coordinator is effective in helping us to realize the vision on which the new curriculum is predicated. (I.8.3.6; V36)	.633	.370	.174	.248	.029
I feel that teaching the new curriculum is fun at this school. (I.8.1.4; V 26)	.081	.840	.132	.096	.095
I feel intrinsically rewarded for doing my job well in the context of the new curriculum. (I.8.1.6; V28)	.322	.735	.158	.092	-.010
I feel acknowledged for good work in scope of the new curriculum. (I.8.1.5; V27)	.145	.732	.147	.232	.144
I feel that the school organization is changing and enabling successful implementation of the new curriculum. (I. 8.1.3; V25)	.172	.668	.394	-.079	.222
I realize that student achievement can increase through active learning methods. (I.8.4.3; V39)	.184	.229	.770	.200	.201
I realize that the new curriculum has clear learning objectives, and that it emphasizes the acquisition of basic skills. (I.8.4.1; V37)	.154	.263	.726	.213	.003
I realize that effective professional development is helpful in fulfilment of curriculum goals. (I.8.4.5; V38)	.361	.124	.705	.107	.209
I realize that student achievement data are an important tool for improvement of student learning. (I. 8.4.4; V40)	.224	.192	.610	.376	-.011

Items/ Variables	Factors				
	Leadership	Rewarding	Effective teaching	Capacity building	Positive work-environment
I have the opportunity to develop my teaching skills individually and co-operating with other colleagues on the new curriculum. (I.8.5.1; V42)	.172	.191	.198	.815	.119
I have the opportunity to grow professionally under the new curriculum dispensation. (I.8.5.2; V43)	.228	.121	.197	.766	.094
I realize that effective parent involvement and other stakeholders is needed for successful implementation of the new curriculum. (I.8.4.5; V41)	.274	-.019	.329	.428	.131
I work with colleagues who treat me with respect. (I.8.2.1; V29)	.062	.180	.002	.295	.798
I feel like I belong at this school. (I.8.1.2; V24)	.072	.046	.399	-.081	.677
I work with colleagues who listen if I have ideas about doing things better in the context of the new curriculum. (I.8.2.2; V30)	.304	.448	.027	.158	.497

5.6.3 Factors underlying students' responses (variables 44-118)

The following factors (F1-F15) were deduced with reference to students' responses (variables 44-118) to the questionnaire after their subjection to a first order factor analysis (Table 5.31 and figure 5.3):

F1: Preference for Art and Moral Education

F2: Portuguese, Mathematics and Natural Sciences perceived as the most important subjects

F3: Guidance and supportive role of teachers

F4: Student expectations and self-learning motivation

F5: Friendly school environment

F6: Curriculum relevancy to real life

F7: Civic and Moral Education, Social and Natural Sciences perceived as the most important subjects

F8: Supportive school environment

F9: Teachers' competence

F10: Classroom practice

F11: Learning value awareness

F12: Relationships among students

F13: Preference for English as a subject

F14: Preference for Physical Education as a subject

F15: Preference for Mathematics textbook

These fifteen factors cumulatively cover about 47% of the total variance, and their eigenvalues were calculated at 16,227; 4,925; 3,639; 2,469; 2,242; 2,201; 1,949; 1,865; 1,826; 1,734; 1,716; 1,666; 1,641; 1,591 and 1,581 respectively (see Table 5.30).

With a view to economy (explaining variance with as few factors as possible), "[…] the criterion could be as low as 50%" (Garson 2006:11) to consider the total variance explained. However, given that the items or variables that correlate with each other measure the same factor, the factors with one or two variables were clustered into correlated factors. Thus, in the first-order factor analysis, the number of factors was reduced to eight. Cronbach's alpha reliability coefficient was determined for examining the level of inter-correlation of variables in each factor and the consistency of the results (see table 5.32).

Figure 5.3: Cattell's scree test showing the amount of variance explained in terms of eigenvalues of students' responses

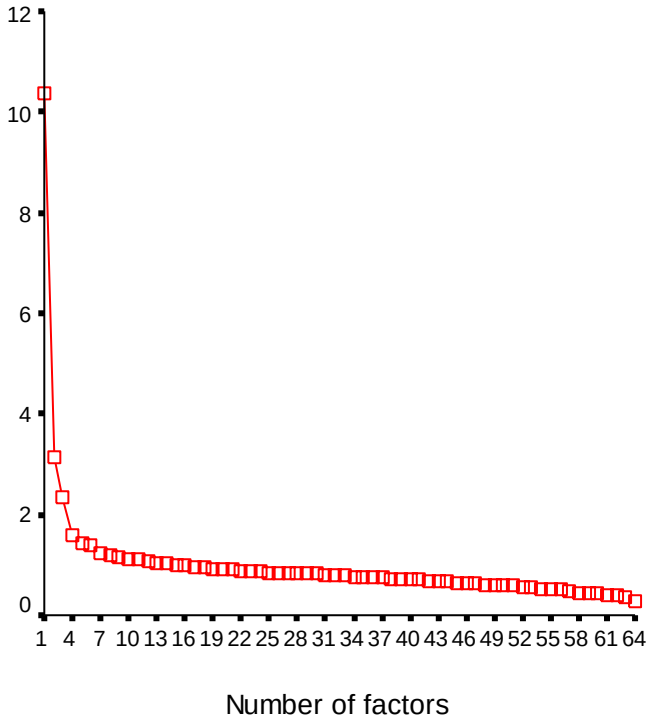

Table 5.30: Total variance explained by the principal-component factor analysis of students' responses

Factor	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10,385	16,227	16,227	10,385	16,227	16,227
2	3,152	4,925	21,152	3,152	4,925	21,152
3	2,329	3,639	24,791	2,329	3,639	24,791
4	1,580	2,469	27,260	1,580	2,469	27,260
5	1,435	2,242	29,503	1,435	2,242	29,503
6	1,409	2,201	31,704	1,409	2,201	31,704
7	1,247	1,949	33,653	1,247	1,949	33,653
8	1,193	1,865	35,518	1,193	1,865	35,518
9	1,169	1,826	37,344	1,169	1,826	37,344
10	1,110	1,734	39,078	1,110	1,734	39,078
11	1,098	1,716	40,794	1,098	1,716	40,794
12	1,066	1,666	42,460	1,066	1,666	42,460
13	1,051	1,641	44,101	1,51	1,641	44,101
14	1,018	1,591	45,692	1,018	1,591	45,692
15	1,012	1,581	47,273	1,012	1,581	47,273
16	,991	1,548	48,821			
. . .	. . .	. . .	. . .			
64	,270	,422	100,000			

Table 5.31: **Rotated factor pattern matrix of the fifteen factors extracted from students' responses during the first-order factor analysis** (excluding the items with lower loading)

Variables/ Items	Factors				
	Preference to Art and Moral Education	Portuguese, Mathematics and Natural Sciences as the most important subjects	Student expectations and self-learning motivation	Factor 4	Factor 5
My preferred textbook is Crafts/Arts textbook. (I.9.31.8; V113)	,731	-,019	,023	,027	,037
My preferred textbook is Visual/ Aesthetic Education Textbook (I.9.31.9; V114)	,707	,115	,068	,041	,008
I think that the important subject is Music Education. (I.9.30.10; V104)	,643	,064	,157	,043	,168
My preferred textbook is Music Education textbook. (I.9.31.10; V115)	,623	,133	,078	,035	,162
I think that the important subject is Crafts/Arts. (I.9.30.8; V102)	,621	-,051	,046	,056	,032
I think that the important subject is Visual/ Aesthetic Education. (I.9.30.9;V103)	,583	,018	,041	,019	,012
My preferred textbook is Moral and Civic Education textbook. (I.9.31.5; V110)	,456	,190	,003	,127	,019
My preferred textbook is Portuguese textbook. (I.9.31.1; V106)	,048	,592	,026	,003	,050
I think that the important subject is Mathematics. (I.9.30.6; V100)	,004	,569	,060	,132	,015
I think that the important subject is Portuguese. (I.9.30.1; V95)	,022	,535	,103	,039	,083
Beyond my textbooks, I read other books. (I.9.32.1; V117)	,048	,510	-,006	,224	,038
My preferred textbook is Natural Sciences textbook. (I.9.31.7; V112)	,254	,461	-,011	,024	-,007
My teachers care about me. (I. 9.26.8; V76)	,091	-,021	,594	-,040	,170
My teachers understand when students have personal problems. (I.9.26.3; V71)	010	,042	,573	,084	,132
My teachers Give me individual attention when I need it. (I.9.26.11; V79)	,075	-,005	,554	,139	,158
My teachers have confidence in me. (I.9.26.5; V73)	,072	,066	,472	,243	,043
My teachers know me well. (I.9.26.6 ; V74)	,129	,141	,453	,085	-,034
My teachers help me gain confidence in my ability to learn. (I.9.26.4; V72)	,143	,096	,351	,305	,122
My teachers are excited about the subjects they teach. (I.9.26.10; V78)	,137	,282	,301	,243	,250

Variables/ Items	Factor 1	Factor 2	Factor 3	Student expectations and self-learning motivation	Friendly School Environment
I am doing my best at school. (I.9.21; V64)	,045	,060	,018	,615	,012
My teachers expect me to do my best. (I.9.26.2; V70)	,022	,038	,205	,553	,020
Doing well in school makes me feel good about myself. (I.9.20; V63)	,058	,155	,159	,520	,051
My teachers expect students to do their best. (I.9. 26.1; V69)	,026	,003	,125	,402	,066
I find what I learn in school to be relevant to real life. (I.9.13; V56)	,082	,279	-,098	,393	,292
I feel successful at school. (I.9.14; V57)	,109	,215	,192	,371	,065
I like to learn. (I.9.19; V62)	,035	,297	-,089	,332	,140
Participating in extracurricular activities is important to me. (I.9.24; V67)	,071	,019	,098	,297	,142
I like this school. (I.9.17; V60)	,125	,164	,130	,117	,685
I think this is a good School. (I.9.18; V61)	,118	,108	,201	,083	,656
Schooling is fun here. (I.9.16; V59)	,024	-,034	,116	,093	,613
I feel safe at this school. (I.9.1; V44)	,106	,055	,180	-,054	,443
I feel like I belong at this school. (I.9.2; V45)	,008	,046	-,025	,117	,348

Variables/ Items	Factor 3	Factor 4	Factor 5	Curriculum relevancy to real life	Civic and Moral Education, Social and Natural Sciences as the most important subjects
The new curriculum will contribute to my education in reference to my ability to read. (I.9.27.2; V81)	,080	,103	,139	,581	,051
The new curriculum will contribute to my education in reference to my ability to write. (I.9.27.1; V80)	,071	,060	,134	,580	,076
The new curriculum will contribute to my education in reference to my ability to present information. (I.9.27.4; V83)	,155	,116	,123	,545	,068
The new curriculum will contribute to my education in reference to my ability to cope with technology. (I.9.27.5; V84)	,144	,060	,130	,543	-,012
The new curriculum will contribute to my education in reference to my ability with Mathematics. (I.9.27.3; V82)	,112	,192	,036	,483	,096
I think that the important subject is Social Sciences. (I.9.30.4; V98)	,047	,112	,067	,044	,645
My preferred textbook is Social Sciences textbook. (I.9.31.4; V109)	-,035	,116	,036	,038	,548
I think that the important subject is Natural Sciences. (I.9.30.7; V101)	,027	,076	,016	,167	,482
I think that the important subject is Moral and Civic Education. (I.9.30.5; V99)	,038	,150	,156	,035	,466

	Factor 7	Supportive school environment	Factor 9	Factor 10	Factor 11	Factor 12
School administrators treat me with respect. (I.9.8; V51)	,026	,642	,037	,031	,065	,000
Teachers treat me with respect. (I.9.7; V50)	,023	,590	,034	,010	,001	-,038
I am treated with respect by the office staff. (I9.9; V52)	,166	,504	,026	,025	,159	,177
Teachers encourage me to asses the quality of my own work. (I.9.5; V48)	,090	,354	,013	,121	,164	-,080
I understand how to apply what I learn to real life/ situations. (I.9.4, V47)	-,031	,336	-,002	-,022	,144	,113

Variables/ Items	Factor 7	Factor 8	Teachers' competence	Classroom practices	Learning value awareness	Factor 12
My teachers make learning fun. (I.9.26.9; V77)	,015	-,004	,928	,020	,008	-,012
My teachers listen to my ideas. (I.9.26.7; V75)	,042	,104	,854	,056	,044	,103
In the teaching of the new curriculum, time is spent working in small groups. (I.9.28.3; V87)	-,046	-,021	,012	,741	,072	,017
I work well under the new curriculum when I am working in a small group. (I.9.29.3; V93)	,045	,057	,039	,661	,009	,032
In the teaching of the new curriculum, time is spent in whole-class discussions with the teacher. (I.9.28.2; V86)	,190	,054	,012	,410	,106	-,043
I work well under the new curriculum when I am working in projects or research. (I.9.29.1; V91)	-,004	,023	,029	,333	,124	,157
I am personally responsible for what I learn. (I.9.15; V58)	,029	,131	-,004	,103	,561	-,035
I assess my own work. (I.9.6; V49)	-,041	,134	,031	,079	,541	,024
The work at this school is challenging. (I.9.12; V55)	,172	,153	,012	,158	,334	,069

Variables/ Items	Factor 11	Relationships among students	Preference to English subject	Preference to Physical Education subject	Preference to Mathematics textbook
Students at this school have opportunities to learn from each other. (I.9.22; V65)	-,026	,592	,056	,007	,032
Students at this school respect other students who are different from them. (I.9.25; V68)	,259	,470	-,010	,017	-,010
Students at this school have opportunities to learn about each other. (I.9.23; V66)	-,093	,434	,114	,006	,037
Other students at this school treat me with respect. (I.9.10; V53)	,343	,421	-,122	-,155	-,117
I think that the important subject is English. (I. 9.30.3; V97)	,070	,002	,774	-,075	,009
My preferred textbook is English textbook. (I. 9.31.3; V108)	,031	,124	,708	,186	-,053
My preferred textbooks are Physical Education textbook. (I.9.31.11; V116)	,146	-,063	,076	,554	,001
I think that the important subject is Physical Education. (I.9.30.11; V105)	,174	-,198	,190	,315	,049
My preferred textbook is Mathematics textbook. (I.9.31.6; V111)	,017	,017	-,033	,010	,916

Table 5.32: Clustering of eight correlated factors extracted during first order factor analysis

Factors	Cronbach's Alpha	Clustering of variables
F1: Preference to Art subjects	0,8470	V113; V114; V104; V115; V102; V103 V116; V105
F2: Mathematics and natural Sciences perceived as the most important subjects	0,7399	V106; V112; V101; V111
F3: Competence of teachers and classroom practices	0,7669	V77; V75; V87; V93; V76; V71; V79 V73; V74; V86; V72; V91; V78
F4: Student expectations and self-learning motivation	0,6994	V64; V70; V63; V69; V56; V57; V62 V67
F5: Friendly and supportive school environment	0,7895	V60; V61; V59; V44; V45; V51; V50 V52; V48; V47; V65; V68; V66; V53
F6: Curriculum relevancy to real life and self-motivation	0,6633	V81; V80; V83, V84; V82; V58; V49 V55
F7: Preference to Moral Education and Social Sciences	0,7254	V110; V98; V109; V99
F8: Portuguese and English perceived as the most important subjects	0,6841	V106, V95; V97; V108; V117

5.7 RESULTS OF SECOND-ORDER CONFIRMATIVE FACTOR ANALYSIS

5.7.1 Confirmatory factor analysis of four factors extracted from principals' responses during the first order investigative factor analysis

In Table 5.33 showing the second-order factor analysis, two of four hypothetical factors extracted in the first factor analysis had eigenvalues of less than one. Therefore, the confirmatory analysis eliminated all but two factors that explained 39 percent of the total variance and produced eigenvalues of 1.730 and 2.170 respectively. Field (2000) notes that the retained factors reflect the common variance in the data although they do not full explain entirely the original variables. In other words, certain factors contain hidden values, reflected to some extent in the total variance explained by the isolated factors.

Table 5.33: Total variance explained by the maximum likelihood method of two factors derived from principals' responses during the second factor analysis

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.373	33.728	33.728	1.730	17.302	17.302
2	1.360	13.596	47.325	2.170	21.698	39.000
3	1.182	11.817	59.141	.917	9.166	48.166
4	1.005	10.048	68.189	.537	5.365	53.531
5	.816	8.159	77.347			
6	.688	6.878	84.226			
7	.533	5.335	89.560			
8	.405	4.048	93.608			
9	.341	3.409	97.017			
10	.298	2.983	100.000			

Which variables are subsumed by the extracted two factors?

To answer this question, a pattern matrix was drawn up that consisted of the rotated four factors extracted from the principals' responses during the exploratory factor analysis. The items or variables that correlate with each other measure the same factor. So, correlating variables were clustered into two new factors. The intercorrelation of variables was measured by Cronbach's alpha (see Tables 5.34 and 5.35). Thus, the following factors were identified from the rotated factor pattern matrix by reclustering factors:

- **Factor 1**: Leadership and capacity building
- **Factor 2**: Innovative classroom practices

Table 5.34: Rotated factor pattern matrix of the four factors on the responses of Principals extracted in exploratory factor analysis during the second order factor analysis (excluded items with lower loadings

Items/ Variables	Factor			
	Factor 1	Factor 2	Factor 3	Factor 4
I try to promote student achievement under the new curriculum, by maximizing the amount of school time used for learning under new curriculum. (I.7.1.9;V18)	.781	.183	.047	.150
I am satisfied that a new school organization is being implemented to cope with the demand of new curriculum. (I.7.2.1; V19)	.687	.369	.239	-.122
I try to promote student achievement under the new curriculum, by challenging teachers and students continuously to fulfil curriculum goals. (I. 7.1.4; V13)	.638	.022	.074	.209
I try to promote student achievement under the new curriculum, putting in place an action plan produced collectively in school for effective implementation of the new curriculum. (I.7.1.2; V11)	.032	.812	.269	.253
I try to promote student achievement under the new curriculum, by cultivating close relationship with teachers, other staff members, students and parents. (I.7.1.1; V10)	.149	.598	.034	.124
I try to promote student achievement under the new curriculum, through effective professional development. (I.7.1.3; V12)	.278	.410	.105	-.038
I am satisfied that teachers are using a variety of active methods in their teaching as required by the new curriculum. (I.7.2.4; V22)	.176	.035	.983	.027
I am satisfied that teachers are diligent in their endeavour to observe interdisciplinarity in the lessons plans they make according to the new curriculum (I.7.2.2; V20)	.021	.147	.469	.085
I try to promote student achievement under the new curriculum, by monitoring teachers' performance under the new curriculum. (I.7.1.8; V17)	.248	.205	.314	.215
I try to promote student achievement in the context of new curriculum, by holding regular and productive staff meetings. (I.7.1.5; V 14)	.162	.175	.130	.725

Table 5.35: Clustering of four factors into two confirmed factors of responses of surveyed Principals extracted during second order factor analysis

Factors	Cronbach's Alpha	Clustering of variables
Leadership and Capacity Building (1)	0.72	V18; V19; V13; V14
Innovative Classroom Practices (2)	0.68	V10; V11; V22; V20 V12; V17

Table 5.35 shows that factors 1 and 2 have a cronbachs alpha value of 0.72 and 0.68 respectively, which are greater than 0.60, indicating high internal consistency and are considered one-dimensional (linear combination).

Three further important conditions to support the result of this confirmatory factor analysis are met, namely the Kaiser-Meyer-Olkin measure of sampling adequacy (0.718), Bartlett's test (0.000) and the Goodness-of-fit test of .183 (see Tables 5.36 and 5.37).

Table 5.36: Kaiser- Meyer-Olkin Measure of Sampling (KMO) and Bartlett's test of Sphericity of two factors extracted from principals' responses during the second-order factor analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,718
Bartlett's Test of Sphericity	Approx. Chi-Square	318,351
	Df	45
	Sig.	0,000

The value yielded by Kaiser-Meyer-Olkin measure of sampling adequacy was 0.718, which is greater than 0.50, showing that a sufficient number of items are actually predicated by each factor. The value yielded by Bartlett's Test of Sphericity was 0.000, which is less than 0.05, indicating that the original variables correlate highly enough (but not so highly that they are identical) to provide a reasonable basis for factor analysis.

Table 5.37: Goodness-of-fit test on two factors extracted from principals' responses in the second-order factor analysis

Chi-Square	Df	Sig.
14,987	11	0,183

The goodness-of-fit test value is 0.183, which is greater than .05 and therefore not significant indicating that the numbers of factors to be extracted is adequate.

5.7.2 Confirmatory factor analysis of five factors extracted from teachers' responses during the first order investigative factor analysis

In Table 5.38 reflecting second-order factor analysis, three of five hypothetical factors extracted in the first factor analysis had eigenvalues below one. Therefore, the confirmatory analysis eliminated all but two factors that explained approximately 42.4 percent of the total variance and produced eigenvalues of 2.910 and 3.024 respectively (see Table 5.38). As noted by Field (2000) the retained factors reflect the common variance in the data although they do not fully explain the original variables. In other words, certain factors contain hidden values, reflected to some extent in the total variance explained by the isolated factors.

Table 5.38: Total variance explained by the maximum likelihood method of two factors derived from teachers' responses during the second factor analysis

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.587	39.904	39.904	2.910	20.788	20.788
2	1.445	10.324	50.228	3.024	21.599	42.388
3	1.226	9.046	59.274	.919	6.562	48.950
4	1.057	7.552	66.825	.896	6.398	55.348
5	.787	5.621	72.446	.567	4.049	59.398
6	.750	5.356	77.803			
7	.538	3.841	81.643			
. . .	. . .	. . .	. . .			
13	.282	2.012	98.021			
14	.277	1.979	100.000			

Which variables are subsumed by the extracted two factors?

To answer this question, a pattern matrix was drawn up that consisted of the rotated five factors extracted from the teachers' responses during the exploratory factor analysis. The items or variables that correlate with each other measure the same factor. Therefore, correlating variables were clustered into two new factors. The intercorrelation of variables was measured by cronbach's alpha (see tables 5.39 and 5.40). Thus, the following factors were identified from the rotated factor pattern matrix by reclustering factors:

- **Factor 1**: Leadership and rewarding
- **Factor 2**: Innovative classroom practices and capacity building

Looking carefully at the Table 5.39, we see that the items or variables **I.8.1.5; V28, I.8.4.2; V38 and I.8.4.1; V37** do not have a (relatively) high factor loading to only one factor. That is to say, according to Field (200:425), these variables measure different aspects of some common underlying dimension (see Table 5.39). Nevertheless, as can be seen from Table 5.39, each variable mentioned above is 'particularly higher' than only one factor that "specially" belongs. Bryman and Cramer (1999) note that "in general the meaning of a factor is determined by the items which load most highly on it". The same writers also emphasize that the issue to identify which items to ignore when interpreting a factor is arguable. Bryman and Cramer (1999) point out that many researchers consider all loadings in excess of 0.3 regardless of whether any variables are thereby implicated in more than one factor. I also decided the follow the same criterion. Anyway, it is important to note that some variables measure different aspects of a common underlying dimension. In other words, some of the items representing certain factors have high internal consistencies with other factors. The construction of the Table 5.40 which shows the clustering of five factors into two confirmed factors, based on the participating teachers' responses extracted during second-order factor analysis, is grounded on the fact that some variables measure different aspects of a common underlying dimension.

Table 5.39: **Rotated factor pattern matrix consisting of the five factors derived from the responses of teachers by the exploratory factor analysis during the second-order factor analysis** (excluding items with lower loadings)

Labelled items or variables	Factors				
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
My principal/ principal assistants/ learning cycle leader/ learning area coordinator is an effective instructional leader. (I.8.3.1; V31)	.782	.123	.127	.092	.038
My principal/ principal assistants/ learning cycle leader/ learning area coordinator facilitates communication effectively. (I.8.3.2; V32)	.729	.095	.204	.100	.067
My principal/ principal assistants/ learning cycle leader/ learning area coordinator allows me to be an effective instructional leader. (I.8.3.5; V35)	.644	.204	.168	.232	.145
My principal/ principal assistants/ learning cycle leader/ learning area coordinator supports shared decision making. (I.8.3.4;V34)	.578	.208	.261	.211	.054
I feel that teaching the new curriculum is fun at this school. (I.8.1.3; V 26)	.079	.730	.135	.106	.130
I feel intrinsically rewarded for doing my job well in the context of the new curriculum. (I.8.1.5;V28)	.320	. 709	.142	.096	.100
I feel acknowledged for good work in scope of the new curriculum. (I.8.1.4; V27)	.140	.707	.245	.198	.011
I realize that student achievement can increase through active learning methods. (I.8.4.3; V39)	.199	.216	.682	.0193	.295
I realize that effective professional development is helpful in fulfilment of curriculum goals. (I.8.4.2; V38)	.326	.155	.649	.145	.214
I feel like I belong at this school. (I.8.1.1; V24)	.087	.135	.439	.078	.041
I realize that effective parent involvement and other stakeholders is needed for successful implementation of the new curriculum. (I.8.4.5; V41)	.237	.088	.388	.283	.006
I have the opportunity to develop my teaching skills individually and co-operating with other colleagues on the new curriculum. (I.8.5.1; V42)	.166	.188	.148	.813	.0165
I have the opportunity to grow professionally under the new curriculum dispensation. (I.8.5.2;V43)	.224	.151	.251	.664	.064
I realize that the new curriculum has clear learning objectives, and that it emphasizes the acquisition of basic skills. (I.8.4.1; V37)	.174	.207	.355	.214	.869

Table 5.40: Clustering of five factors into two confirmed factors derived from responses of participating teachers during the second- order factor analysis

Factors	Cronbach's Alpha	Clustering of variables
Leadership and rewarding (1)	0.81	V31; V32; V35; V34; V26 V28; V27; V24; V41
Innovative classroom practices and capacity building (2)	0.82	V39; V38; V42; V43; V37

Table 5.40 shows that the factors 1 and 2 have a cronbachs alpha value of 0.81 and 0.82 respectively, which are greater than 0.60, indicating high internal consistency and that they are one- dimensional (linear combination).

Three further important conditions to support the result of this confirmatory factor analysis are met, namely the Kaiser- Meyer-Olkin measure of sampling adequacy (0.871), Bartlett's test (0.000) and the Goodness-of-fit test (0.352) (see tables 5.41 and 5.42).

Table 5.41: Kaiser- Meyer-Olkin Measure of Sampling (KMO) and Bartlett's Test of Sphericity of two factors on the responses of teachers retained in the second factor analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,871
Bartlett's Test of Sphericity	Approx. Chi-Square	1268,900
	Df	91
	Sig.	0,000

The Kaiser- Meyer-Olkin measure of sampling adequacy of 0.871, which is greater than 0.50, shows that a sufficient number of items are actually predicated by each factor. The Bartlett's Test of Sphericity of 0.000, which is less than 0.05, indicates that the original variables are correlated highly enough (but not so highly that they are identical) to provide a reasonable basis for factor analysis.

Table 5.42: Goodness-of-fit Test on two factors of three factors on the responses of Teachers retained in the second factor analysis

Chi-Square	Df	Sig.
33,397	31	0,352

The goodness-of-fit test is 0.352. It is greater than 0.05 and, therefore, not significant, indicating that the numbers of factors to be retained is adequate.

5.7.3 Confirmatory factor analysis of eight factors extracted from students' responses during the first- order investigative factor analysis

In table 5.43 reflecting the second-order factor analysis, four of eight hypothetical factors extracted in the first factor analysis had eigenvalues below one. Therefore, the confirmatory analysis eliminated all but four factors that explained close to 29 percent of the total variance and produced eigenvalues of 9.462, 2.388, 1.937 and 1.304 (See table 5.43). The retained four factors reflect the common variance in the data although they do not fully explain the original variables (Field, 2000). That is to say, certain factors contain hidden values, reflected to some extent in the total variance explained by the isolated factors.

Table 5.43: Total variance explained by the maximum likelihood method of four factors derived from students' responses during the second-order factor analysis

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10,306	19,818	19,818	9,462	18,197	18,197
2	3,228	6,209	26,027	2,388	4,593	22,789
3	2,595	4,990	31,017	1,937	3,724	26,514
4	1,454	2,797	33,813	1,304	2,508	29,022
5	1,385	2,664	36,478	,687	1,320	30,342
6	1,185	2,278	38,756	,720	1,384	31,726
7	1,182	2,273	41,029	,552	1,062	32,788
8	1,146	2,203	43,232	,509	,978	33,766
9	1,097	2,109	45,341			
. . .	. . .	. . .	. . .			
52	,302	,581	100,000			

Extraction Method: Maximum Likelihood.

Which variables are subsumed by the extracted four factors?

To answer this question a pattern matrix was drawn up that consisted of the rotated factor eight factors extracted from the students' responses during the exploratory factor analysis. Since the items or variables that correlate which others measure the same factor, certain variables were clustered with others building new factor. The

intercorrelation of variables was measured by means of the Cronbach alpha test (See tables 5.44 and 5.45).

Thus, by reclustering the following factors were identified from the rotated factor pattern matrix:

Factor 1: Student attitude to learning activity
Factor 2: Subject content of the curricular
Factor 3: Friendly and supportive school environment
Factor 4: Curriculum relevancy to real life and self-learning motivation

Looking carefully at Table 5.44, we see that the item or variable **I.9.26.4; V72** has simultaneously a (relatively) high factor loading on factors three and four. As noted earlier, according to Field (200:425) this variable measures different aspects of some common underlying dimension (see Table 5.44). Nevertheless, we also see, in table 5.44, that **V72** is 'particularly' higher in only one factor that "specially" belongs. Bryman and Cramer (1999) highlight that "in general the meaning of a factor is determined by the items which load most highly on it". Note that the same writers also emphasize that the issue to identify which items to ignore when interpreting a factor is arguable. Bryman and Cramer (1999) point out that many researchers consider all loadings in excess of 0.3 regardless of whether any variables are thereby implicated in more than one factor. Anyway, it is important to bear in mind that some variables measure several aspects of a common underlying dimension. In other words, some of the items representing certain factors have high internal consistencies with other factors. This fact is exemplified in Table 5.45 which consists in clustering eight factors so that they are reduced to four derived from participating students' responses during the second-order factor analysis.

Table 5.44: **Rotated factor pattern matrix consisting of the eight factors derived from the students' responses during the second-order factor analysis** (excluding items with lower loadings)

Variables/ Items	Factor							
	1	2	3	4	5	6	7	8
My teachers care about me. (I. 9.26.8; V76)	,604	,078	-,003	,025	,033	-,004	,023	,052
My teachers listen to my ideas. (I.9.26.7; V75)	,511	,052	,058	,168	,027	,004	-,067	,046
My teachers have confidence in me. (I.9.26.5; V73)	,511	,085	,063	,246	,089	,015	-,057	,029
Students at this school respect other students who are different from them. (I.9.25; V68)	,497	,091	-,024	,058	,012	,019	,059	-,029
My teachers know me well. (I.9.26.6 ; V74)	,460	,114	,105	,132	,112	,021	-,087	,043
My teachers understand when students have personal problems. (I.9.26.3; V71)	,445	,062	,052	,163	,059	,010	,059	-,013
My teachers Give me individual attention when I need it.(I.9.26.11; V79)	,442	,087	,005	,173	,096	,036	,011	-,059
I am treated with respect by the office staff. (I9.9; V52)	,441	,100	,052	-,015	,077	,026	,084	,049
Teachers treat me with respect. (I.9.7; V50)	,415	,069	,117	,072	,082	,007	,173	,023
I feel safe at this school. (I.9.1; V44)	,412	,101	,065	-,036	,103	-,031	,228	-,030
Schooling is fun here. (I.9.16; V59)	,412	,070	,047	,109	-,008	,010	,356	,027
My teachers make learning fun. (I.9.26.9; V77)	,399	,134	,111	,231	,071	,004	,119	,066
School administrators treat me with respect. (I.9.8; V51)	,382	,061	,136	,089	,129	,028	,122	,042
Other students at this school treat me with respect. (I.9.10; V53)	,373	,093	,017	,071	-,030	-,005	,084	,054
Students at this school have opportunities to learn from each other. (I.9.22; V65)	,349	,104	,119	,298	,026	,013	,059	,010
The new curriculum will contribute to my education in reference to my ability to cope with technology. (I.9.27.5; V84)	,324	,211	,042	,078	,286	,062	,004	-,042
The new curriculum will contribute to my education in reference to my ability to present information. (I.9.27.4; V83)	,324	,146	,128	,159	,319	,042	,017	,015
Students at this school have opportunities to learn about each other. (I.9.23; V66)	,319	,078	,160	,305	,025	,045	,084	,023
I work well under the new curriculum when the teachers are leading discussions with the whole class. (I.9. 29.2; V92)	,308	,146	,094	,044	,133	,042	,020	,068
I work well under the new curriculum when I am working in small group. (I.9.29.3; V93)	,259	,150	,091	,097	,154	,042	,033	,039

Variables/ Items	Factor							
	1	2	3	4	5	6	7	8
I am personally responsible for what I learn. (I.9.15; V58)	,232	,087	,061	,052	,192	,065	-,003	,013
I assess my own work. (I.9.6; V49)	,221	,104	,107	,082	,144	,067	,014	,006
In the teaching of the new curriculum, time is spent working in small groups. (I.9.28.3; V87)	,165	,118	,085	-,014	,117	,012	,051	,012
My preferred textbook is Crafts/Arts textbook. (I.9.31.8; V113)	,174	,726	,045	,038	,027	,010	,039	-,181
My preferred textbook is Visual/ Aesthetic Education textbook. (I.9.31.9; V114)	,161	,677	,126	,051	,064	,023	-,001	-,036
I think that the important subject is Crafts/Arts. (I.9.30.8; V102)	,128	,673	-,027	,090	,117	,086	,036	,071
I think that the important subject is Visual/ Aesthetic Education. (I.9.30.9;V103)	,099	,659	,021	,105	,149	,082	,028	,171
I think that the important subject is Music Education. (I.9.30.10; V104)	,166	,595	,033	,046	,095	,110	,099	,143
My preferred textbook is Music Education textbook (I.9.31.10; V115)	,189	,563	,143	,030	-,003	,039	,100	-,004
My preferred textbook is Moral and Civic Education textbook. (I.9.31.5; V110)	,115	,489	,238	,150	,050	,031	,012	,124
I think that the important subject is Moral and Civic Education. (I.9.30.5; V99)	,050	,457	,144	,176	,078	,116	,096	,399
My preferred textbook is Social Sciences textbook. (I.9.31.4; V109)	,165	,418	,248	,127	-,021	,029	,017	,276
My preferred textbook is Physical Education textbook. (I.9.31.11; V116)	,152	,418	,260	,009	,070	,051	-,007	-,034
My preferred textbook is Portuguese textbook. (I.9.31.1; V106)	,062	,129	,657	,140	,153	,064	,104	,025
I think that the important subject is Mathematics. (I.9.30.6; V100)	,091	,089	,647	,151	,088	,063	,017	,067
My preferred textbook is Mathematics textbook. (I.9.31.6; V111)	,116	,141	,635	,081	,013	,048	-,004	,001
I think that the important subject is Portuguese. (I.9.30.1; V95)	,060	,057	,585	,220	,235	,102	,157	-,013
My preferred textbook is Natural Sciences textbook. (I.9.31.7; V112)	,136	,333	,472	,024	,111	-,001	-,024	,222
I think that the important subject is Natural Sciences. (I.9.30.7; V101)	,140	,302	,440	,065	,176	,012	-,014	,347
Beyond my textbooks, I read other books. (I.9.32.1; V117)	,073	,050	,386	,208	,196	,069	,074	,009
My teachers expect me to do my best. (I.9.26.2; V70)	,221	,060	,108	,478	,102	,036	,017	,028
I am doing my best in school. (I.9.21; V64)	,122	,087	,120	,433	,084	,040	,002	,079

My teachers expect students to do their best. (I.9. 26.1; V69)	,219	,084	,152	,427	,136	,015	,080	,043
Doing well in school makes me feel good about myself. (I.9.20; V63)	,206	,085	,166	,373	,057	,071	,035	,014
The new curriculum will contribute to my education in reference to my ability to write. (I.9.27.1; V80)	,168	,082	,254	,133	,589	,077	,084	,066
The new curriculum will contribute to my education in reference to my ability to read. (I.9.27.2; V81)	,192	,084	,293	,161	,576	-,012	,087	,024
The new curriculum will contribute to my education in reference to my ability with Mathematics. (I.9.27.3; V82)	,219	,113	,236	,233	,290	,050	,012	,018
I think that the important subject is English. (I. 9.30.3; V97)	,055	,244	,163	,109	,115	,833	,041	,146
My preferred textbook is English textbook. (I. 9.31.3; V108)	,071	,316	,244	,121	,073	,448	-,068	-,033
I like this school. (I.9.17; V60)	,346	,123	,153	,104	,135	-,001	,544	,051
I think this is a good School. (I.9.18; V61)	,437	,114	,100	,076	,083	-,004	,457	,007
I think that the important subject is Social Sciences. (I.9.30.4; V98)	,109	,389	,149	,169	,022	,133	,039	,446

Table 5.45: Clustering of eight factors into four confirmed factors derived from responses of participating students during the second order factor analysis

Factors	Cronbach's Alpha	Clustering of variables
Student attitude to learning activity(1)	0.6059	V70; V64; V69; V63; V117
Subject content of the curricular (2)	0.8854	V113; V114; V102; V103, V104; V115; V110 V99 ; V109; V116; V106; V100; V111; V 95 V112; V101, V97 ; V108; V98 ;
Friendly and supportive school environment (3)	0.8389	V76 ; V75 ; V73 ; V68 ; V74 ; V71; V79; V52 ; V50; V44 ; V59 ; V77 ; V51 ; V53 ; V65; V66; V87 ; V60 ; V61
Curriculum relevancy to real life and self-learning motivation (4)	0.6831	V80 ; V81 ; V84; V83; V92; V82; V93; V58; V49

Table 5.45 shows that the four factors have Cronbachs alpha value of 0,6059; 0, 8854; 0,8389 and 0,6831 respectively, all of which are greater than 0,60, indicating high internal consistency and are considered unidimensional. So, the reduction of factors yielded four confirmed factors. Two further important (fulfilled) conditions to support the result of this confirmatory factor analysis are the Kaiser-Meyer-Olkin measure of sampling adequacy valued at 0,932 and Bartlett's test figure of 0,000. (see Table 5.46)

Table 5.46: Kaiser- Meyer-Olkin Measure of Sampling (KMO) and Bartlett's Test of Sphericity of six factors on the responses of students retained in the second factor analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,932
Bartlett's Test of Sphericity	Approx. Chi-Square	37905,289
	Df	1326
	Sig.	0,000

The Kaiser-Meyer-Olkin value expressing sampling adequacy was 0,932, which is greater than 0,50, and therefore shows that a sufficient number of items are actually predicated by each factor. The value derived for Bartlett's test of sphericity was 0,000, which is below 0.005, indicating that the original variables correlate high enough (but not to the point of identity) to provide a reasonable basis for factor analysis.

Thus, the four components obtained as indicated were kept for further study.

5.8 SUMMARY

Following the methodology presented in chapter four, chapter five is divided into two parts: A and B. Part A deals with frequency analysis of the responses while part B is concerned with the factor analysis of the data. The factor analysis conducted in this research is comprised of first- order investigative factor analysis and second-order confirmative factor analysis. In the first order investigative factor analysis, related variables were identified that can be clustered to form one combined variable or factor. By this means sufficient evidence was gained to form a hypothesis about the number of factors underlying the data. A second-order confirmative factor analysis was conducted to assess the validity and reliability of the number of factors gained from the first order investigative factor analysis.

Participants in this study included 124 principals, 221 teachers and 2 705 students from the three selected provinces, namely Niassa, Sofala and Maputo City.

Significant variation ($p = 0.000, p \leq 0.05$) in the levels of principals' academic qualifications within and across the relevant provinces was noted. However, male and female principals' academic qualifications did not differ significantly within and across provinces ($p = 0.990, p \geq 0.05$). Sofala principals' academic qualifications were reported relatively lower than in the other two provinces at the time of the study. Participating teachers' academic qualifications varied significantly ($p = 0.013, p \leq 0.05$) within and across provinces, but differences between male and female teachers' academic qualifications were statistically insignificant ($p = 0.197, p \geq 0.05$). It is worth mentioning that the majority of the participating teachers had a senior secondary education on a level that was consistent throughout the three provinces.

The majority of principals who participated in the study (47 or 37.9% of the sample) had trained themselves for their school-management task. This applied for the total sample across the three provinces. The induction workshop was poorly attended in Niassa Province: Only 8 out of 41 (19.5%) participants in the investigation were trained by means of induction workshops. The teachers who participated in the research, held a variety of pedagogical qualifications despite the fact that they were teaching the same level, but most of them (101 or 45.7%) had IMAP teaching qualifications.

Participating principals' experience as school managers varied significantly ($p = 0.003; p \leq 0.05$) within the provinces and in each category of experience. Indeed, of the total of 124 drawn from the selected three provinces 78 principals had between one and five years' experience as school managers, 27 had more than five and less than eleven years, 12 between eleven and fifteen years and 7 sixteen years' experience. The reason for this variation is discussed in chapter six. Meanwhile, by gender there was no significant variation ($p = 0.389; p \geq 0.05$). There is a significant difference (($p = 0.000; p \leq 0.05$) in teaching experience at EP2 among surveyed teachers within and across the provinces. The majority of surveyed teachers have been working at upper primary level for five years or less. Indeed, out of 221 teachers from the three provinces who participated in the research, 125 (56.6%) had between one and five years of teaching experience at upper primary level; 61 (27.6%) have been working for between 6 and 10 years; 22 (10.0%) between eleven

and fifteen years; and only 13 (5.9%) for sixteen years and more. In spite of significant variation across provinces, in aged teaching experience groups, Maputo City appeared to be the province were those groups are relatively balanced. Strikingly, a comparison by gender of teachers' experience working at upper primary level (EP2) from the three provinces who participated in the study shows that there is no significant difference.

In general the attitudes of participating principals to their leadership role in implementation the new curriculum were highly positive, although they did intimate that there was a problem in maximizing the amount of school time used for learning under the new curriculum. It seemed that the level of satisfaction of Principals of Niassa Province regarding "local curriculum" development and its initial implementation was relatively at schools in the other two provinces (Maputo City and Sofala). The surveyed principals of Maputo City were more pessimistic in this regard. Another concern of principals from of Maputo City is related to the new school organization, which is being implemented within their schools to cope with the requirements of the new curriculum. In effect, compared with the surveyed principals from the other two provinces, participants from Maputo City reported the less satisfaction with the process of school restructuring and reculturing towards implementation of the new curriculum and with teachers efforts to maintain the interdisciplinarity principle in classroom practices as set up in the new curriculum. All these matters concerning principals' perceptions of their leadership role in the process of implementing the new curriculum are discussed in chapter 6 (section 6.2.3).

Broadly, the surveyed teachers expressed a lack of confidence in attitudes and beliefs about implementing the new curriculum. The majority of teachers who participated expressed positive feelings about: (1) school ownership - V24; (2) mutual respect - V29; (3) sharing innovative ideas - V30; (4) effective communication facilitated by principals - V32; (5) pertinent involvement of parents and other stakeholders - V41.

More teachers from Maputo City than from their counterparts declared that implementation of the new curriculum provided them with opportunities to develop

teaching skills individually and in collaboration with colleagues. Niassa Province placed second in the expression of this opinion. The discussion of the participating teachers' attitudes and beliefs follows in chapter six (section 6.3.4).

The perceptions, beliefs and attitudes of learners regarding the new curriculum are summarized in Table 5.25 and discussed in section 6.5 of chapter six. Some of the collected data synthesized in Table 5.25 are:

- A lower percentage of the surveyed students (22.5%) clearly stated that reading for them does not extend beyond their school textbooks.
- Other findings are that respondents are concerned about the issue of local languages. So, while 53.0% of participating students indicated explicitly or implicitly that they consider local languages to be unimportant, 56.0% actually declared that they actively dislike the local language textbook.
- According to the students' opinions expressed during the survey, there was a tendency to apply less teacher centred, monotonous or tedious methods in classroom practices. Hence 50.1%, 50.9%, 60.8%, 63.5% and 69.7% of the surveyed students unambiguously declared that in teaching of new curriculum, time is spent (1) in whole-class discussions with the teacher, (2) listening to teacher talk respectively (3) analyzing individual or class performance (4) reading and (5) working in small groups respectively. Concurrently, the students' opinions expose the incipient signs of the use of active learning methods in the classroom practices, which need to be consolidated. Therefore, the surveyed students stated unequivocally that they worked well under the new curriculum, when:
  - they were working in projects or research (65.5%);
  - the teachers were leading discussions with the whole class (71%);
  - they were working in small groups (71.4%);
  - they were working independently as individuals (71.9%).

As indicated, the above results and the quantitative analysis of students' questionnaires are discussed in section 6.5 of this research report.

Concerning principals' responses, through the first-order factor analysis, the following factors were identified as the main underlying attitudes:

- Factor 1: School restructuring and reculturing
- Factor 2: Mutual support and professional development
- Factor 3: Innovative teaching initiatives
- Factor 4: Leadership

In the process of confirmatory factor analysis, a rotate factor pattern matrix of these four factors on the responses of principals. So, two factors were identified from rotated factor pattern matrix through reclustering of factors, namely:

- Factor 1: Leadership and capacity building
- Factor 2: Innovative classroom practices

The first order factor analysis conducted on the teachers' responses (variable 24-43) of the questionnaire produced the following five factors:

- Factor 1: Leadership
- Factor 2: Rewarding
- Factor 3: Effective teaching
- Factor 4: Capacity building
- Factor 5: Positive work environment

In the process of confirmatory factor analysis, a rotate factor pattern matrix of these five factors on the responses of teachers was conducted. So, two factors were identified from rotated factor pattern matrix throw re-clustering of factors, namely:

- Factor 1: Leadership and rewarding
- Factor 2: Innovative classroom practice and capacity building

With reference to students' responses to the questionnaire after subjection to a first order factor analysis, eight factors were produced:

- F1: Preference for Art subjects
- F2: Mathematics and Natural Sciences perceived as the most important subjects

- F3: Competence of teachers and classroom practices
- F4: Student expectations and self-learning motivation
- F5: Friendly and supportive environment
- F6: Relevance of curriculum to real life and self-learning motivation
- F7: Preference for Moral Education and Social Sciences
- F8: Portuguese and English perceived as the most important subjects

In the process of confirmatory factor analysis, a rotate factor pattern matrix of these eight factors on the responses of the surveyed students was conducted. So, four factors were identified from rotated factor pattern matrix throw re-clustering of factors, namely:

- F1: Student attitude to learning activity
- F2: Subject content of the curriculum
- F3: Friendly and supportive school environment
- F4: Relevance of curriculum to real life and self-learning motivation

The discussion of the results of this research present in this chapter is provided in chapter six.