Investigating the Influence of the School-Level Environment on the Implementation of Outcomes-Based Education in the Limpopo Province of South Africa

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INTRODUCTION

Along with the introduction of a democratic political dispensation in 1994, South Africa has been overhauling its existing education system by gradually phasing in an Outcomes-Based Education (OBE) approach to teaching and learning through Curriculum 2005 (C2005). This bold step was in line with international trends—moving away from the content-driven curriculum emphasising examination results and moving towards an emphasis on facilitating life-long learning (Department of Education, 1997).

Past research indicates that difficulties in implementing the new curriculum could be the result of under-resourced schools and inadequately trained teachers (Chisholm et al., 2000). The present research, conducted in the Limpopo Province – one of the poorest provinces in South Africa – was initiated to establish the extent to which school-level factors (e.g., resources and principal support) impact on the implementation of the new curriculum. This paper reports the initial phase of the study, during which a questionnaire was designed and validated to assess school-level factors likely to influence the implementation of OBE in the South African context.

OBJECTIVES

1. To develop and validate a questionnaire to assess teachers' perceptions of the school-level environment as a measure of readiness to implement and support Outcomes-Based Education in South Africa.
2. To examine teachers' perceptions of the actual and preferred school-level environment in high schools in South Africa.
3. To investigate whether teachers involved in OBE perceive the learning environment differently from teachers not involved in OBE.

BACKGROUND AND THEORETICAL FRAMEWORK

The present study examined teachers' perceptions of their school-level environment and its influence on the implementation of Outcomes-Based Education (OBE). The learning environment or climate is widely acknowledged as a vital aspect of the life of an organisation or school (Fraser, 1998). The influence of the learning environment on the education process has received a great deal of attention, and there has been much progress in the conceptualisation and assessment of learning environments (Fraser, 1994, 1998). Whilst different qualitative and quantitative approaches have been used in conducting research in the field of learning environments, the use of questionnaires to assess students' perceptions has been the predominant method.

Historically, schools have been viewed as organisations, operating similarly to other social groups in that they have their own goals, rules and regulations, roles, hierarchies of authority, forms of compliance, and communication patterns (Dorman, 1998; Dorman, Fraser & McRobbie, 1997). These aspects constitute the school environment, which brings a range of contributory factors that are considered pivotal to the successful implementation of new curricula. Research conducted by Brookover, Schweiter, Schneider, Beady, Flood and Wisenbaker (1978) and Vyskocil and Goens (1979) has shown that the school-level environment influences students' cognitive outcomes, values, personal growth and satisfaction. To date, however, little research has been carried out to help teachers to assess and improve the environments of their own schools.

Past instruments used to assess the school-level environment include the College Characteristics Index (CCI; Stern, 1970) and the Organizational Climate Description Questionnaire (OCDQ; Halpin & Croft, 1963). Freiberg's (1999) book, *School Climate*, identifies numerous instruments and a range of alternative measures that can be used to assess the school-level environment. One such instrument, the School-Level Environment Questionnaire (SLEQ; Fisher & Fraser, 1990, 1991a, 1991b) was designed to assess school teachers' perceptions of psychosocial dimensions of the environment of the school. The SLEQ has been used successfully in two African countries, namely, Nigeria (Idiris & Fraser, 1997) and Rwanda (Earnest & Treagust, 2001, 2002). The SLEQ has been used for a range of purposes, including school improvement (Fisher & Fraser, 1991a), examining patterns of transition during middle school (Chung, Elias, & Schneider, 1998), an investigation of teachers' perceptions of their work environment (Fisher & Grady, 1998), as an indicator of teacher morale (Young, 1998) and in comparing special education and mainstream settings (Adams & Adams, 2000).

RESEARCH METHODS

Questionnaire data were collected in the Limpopo Province of South Africa from 403 teachers in 54 secondary schools located within a 50-kilometre radius of Polokwane, the provincial capital, with 46 schools being from rural areas, five schools from township (i.e., semi-rural) areas, and three schools from urban areas.

The development and validation of the questionnaire involved (1) conducting a review of Department of Education policy documents and national and international literature to identify dimensions that are central to the educational philosophy of OBE and C2005, (2) conducting interviews with school management teams and teachers to ensure that the dimensions were salient, (3) ensuring consistency with Moos's (1974) three general psychosocial dimensions of Relationship, Personal Development and System Maintenance/System Change, (4) developing two new scales, pertinent to the South African situation, as well as adapting and adopting scales and items from the widely-used School Level Environment Questionnaire (SLEQ; Fraser & Fisher, 1991a), (5) field testing the instrument with teachers and interviewing them about their responses, and (6) refinement of scales and items through statistical analysis and (7) generation of validity and reliability statistics for the refined scales.

FINDINGS AND RESULTS

Modifying the SLEQ for Use in South Africa

The SLEQ was considered to be an ideal questionnaire because its dimensions closely match central concepts identified in the literature and policy documents on OBE and C2005. The SLEQ was therefore modified to make it suitable for use in South Africa.

All eight scales from the original SLEQ were selected for use in South Africa, namely, Staff Freedom, Participatory Decision Making, Resource Adequacy, Work Pressure, Student Support, Professional Interest, Affiliation and Innovation. Two additional scales were developed for use in the present research, namely, Parental Involvement and OBE Familiarity, as they were considered to be relevant to the successful implementation of curriculum innovation in South Africa (i.e., C2005) by school management teams and teachers. A scale description, a sample item and the classification according to Moos's Scheme is provided for each scale (Table 1).

Teachers were requested to respond to items of the SLEQ-SA on a five-point scale with the alternatives of Almost Never, Seldom, Sometimes, Often and Almost Always. Historically, researchers have administered a separate actual and preferred version of questionnaires. To provide a more economical format, the SLEQ-SA included the actual and preferred scales in two separate columns on one sheet (see Aldridge, Fraser, Fisher & Wood, 2002). The first column is used for recording what teachers perceive is actually happening in their school and the second column is for recording what teachers would prefer to happen in their school. A copy of the SLEQ-SA used in the study is available form the authors.

Validating the SLEQ for Use in South Africa

Analyses of the data collected provided a basis for refining the instrument, as well as evidence for the validity and reliability of the SLEQ-SA. Principal components factor analysis was conducted for the original 30, items in 10 scales, with the conventionally-accepted minimum value of 0.30 for a factor loading being accepted as meaningful. Factor analysis led to the acceptance of a revised version of the SLEQ-SA comprising 51 items in seven scales (OBE Familiarity, Resource Adequacy, Work Pressure, Student Support, Parental Involvement, Professional Interest and Affiliation and Innovation) (see Table 2 in the appendix). Two of the original scales, Staff Freedom and Participatory Decision Making, were lost. For all other scales, the items loaded on their own scale and no other scale (with the exception of the Professional Interest and Affiliation scales that came together to form one scale, that was renamed Collegiality). Interviews with teachers indicated that they had confused the two issues and responded to items in similar ways, suggesting that teachers were referring to the degree of collegiality amongst the staff. For six of the seven environment scales, namely, OBE Familiarity, Resource Adequacy, Work Pressure, Student Support, Parental Involvement and Collegiality, the seven-factor structure is supported perfectly for the 51-item solution (i.e. each item has a factor loading at least 0.30 with its own scale and smaller than 0.30 with all other scales). Item 80 has a factor loading of 0.35 with OBE Familiarity, as well as a loading of 0.45 with its own scale of Innovation. In contrast with difficulties experienced in past studies in collecting an adequate sample size to perform a factor analysis, this study is one of the first to provide a satisfactory factor structure for a school-level environment questionnaire.

Table 1:
Description of Scales in the SLEQ-SA and their Classification According to Moos's Scheme

Scale Name	Description of Scale	Sample Item	Moos's General Category
	The extent to which ...		
OBE Familiarity	... teachers have been trained to use teaching and assessment strategies associated with OBE.	I feel confident about developing OBE learning activities. (+)	Personal Development
Parental Involvement	... parents are involved in their children's education at both an individual and school level.	Parents discuss learners' performance with teachers. (+)	Relationship
Student Support	... there is a good rapport between teachers and students and students behave in a responsible self-disciplined manner.	There are many disruptive, difficult students in the school. (-)	Relationship
Affiliation	... teachers can obtain assistance, advice and encouragement and are made to feel accepted by colleagues.	I feel that I could rely on my colleagues for assistance if I should need it. (+)	Relationship
Professional Interest	... teachers discuss professional matters, show interest in their work and seek further professional development.	Teachers frequently discuss teaching methods and strategies with each other. (+)	Personal Development
Staff Freedom	... teachers are free to set rules, guidelines and procedures, and free of supervision to ensure rule compliance.	I am often supervised to ensure that I follow directions correctly. (-)	System Maintenance and System Change
Innovation	... the school is in favour of planned change and experimentation, and fosters individualisation.	Teachers are encouraged to be innovative in this school. (+)	System Maintenance and System Change
Resource Adequacy	... support personnel, facilities, finance, equipment and resources are suitable and adequate.	The supply of equipment and resources is inadequate. (-)	System Maintenance and System Change
Work Pressure	... work pressure dominates the school environment.	Teachers have to work long hours to keep up with the workload. (+)	System Maintenance and System Change

Items are scored 1, 2, 3, 4 and 5, respectively, for the responses Never, Seldom, Sometimes, Often and Always. Negative items are scored in reverse.

To provide further support for the reliability and validity of the SLEQ-SA, we generated statistics for the internal consistency reliability and discriminant validity for both the actual and preferred forms of the questionnaire, together with the ability to differentiate between schools for the actual form. Results are reported in Table 3. The internal consistency (Cronbach alpha reliability coefficient) for each scale of the actual form of the SLEQ-SA ranges from 0.69 to 0.92 when using the individual teacher as the unit of analysis and from 0.76 to 0.94 when using the school mean as the unit of analysis. For the preferred form, the internal consistency reliability ranges from 0.57 to 0.93 for individual as the unit of analysis

and from 0.71 to 0.94 for the school mean as the unit of analysis (Table 3). For each scale for both the actual and preferred forms, the internal consistency results can be considered acceptable, thereby supporting the reliability of the SLEQ-SA.

As a convenient index, the mean correlation of a scale with other scales was calculated to provide an indication of the degree to which the scales are unique in what they assess. The discriminant validity (or scale independence) for scales in the actual version of the SLEQ-SA ranges between 0.04 and 0.22 with the individual teacher as the unit of analysis and between 0.16 and 0.40 with the school mean as the unit of analysis. For the preferred version of the SLEQ-SA, the mean correlation of a scale with other scales ranges between 0.21 and 0.47 for the individual as the unit of analysis and between 0.13 and 0.47 for the school mean as the unit of analysis. These results, reported in Table 3, suggest a degree of overlap between the dimensions that each scale assesses. However, the factor analysis results attest to the independence of factor scores on the SLEQ-SA.

To ascertain whether the actual version of each SLEQ-SA scale is able to differentiate between the perceptions of teachers in different schools, an analysis of variance (ANOVA) was calculated for each scale (Table 3). School membership formed the independent variable. The ANOVA results indicate that, with the exception of Innovation, each SLEQ-SA scale is able to differentiate significantly ($p<0.01$) between the perceptions of teachers in different South African high schools. Overall, the results of the analysis suggest satisfactory reliability and validity for the South African version of the SLEQ.

Table 3:
Internal Consistency Reliability (Cronbach Alpha Coefficient), Discriminant Validity (Mean Correlation With Other Scales) and Ability to Differentiate Between Classrooms (ANOVA Results) for Two Units of Analysis for the Modified Version of SLEQ-SA

Scale	Unit of Analysis	No. of Items	Alpha Reliability		Mean Correlation with other Scales		ANOVA Eta²
			Actual	Preferred	Actual	Preferred	Actual
OBE Familiarity	Individual	8	0.77	0.81	0.18	0.38	0.30**
	School Mean		0.83	0.76	0.30	0.39	
Resource Adequacy	Individual	6	0.77	0.93	0.12	0.47	0.47**
	School Mean		0.85	0.94	0.16	0.47	
Work Pressure	Individual	7	0.69	0.80	0.04	0.21	0.21**
	School Mean		0.79	0.77	0.31	0.13	
Student Support	Individual	6	0.75	0.57	0.19	0.36	0.34**
	School Mean		0.88	0.71	0.33	0.32	
Parental Involvement	Individual	6	0.86	0.91	0.21	0.46	0.36**
	School Mean		0.92	0.91	0.40	0.45	
Collegiality	Individual	14	0.92	0.86	0.18	0.38	0.25**
	School Mean		0.94	0.88	0.33	0.44	
Innovation	Individual	6	0.77	0.82	0.22	0.37	0.18
	School Mean		0.76	0.85	0.34	0.43	

** $p<0.01$
The sample consisted of 403 teachers from 54 schools in South Africa.

The eta² statistic (which is the ratio of 'between' to 'total' sums of squares) represents the proportion of variance explained by class membership.

Teachers' Perceptions of the Actual and Preferred School-Level Environment

To examine whether the SLEQ-SA could be used to describe the school-level environment of schools in the Limpopo Province in terms of teachers' perceptions of their actual and preferred environment, descriptive analyses were used. MANOVA for repeated measures revealed a statistically significant ($p<0.01$) difference between teacher perceptions of their actual school environment and the one that they would prefer for the set of seven SLEQ dimensions overall. Because the multivariate test (Wilks's lambda) revealed significant actual-preferred differences overall, the ANOVA for repeated measures was interpreted for each individual SLEQ-SA scale (see Table 4). The results indicate that, for all scales, teachers would prefer a more favourable level of each SLEQ dimension than is currently perceived to be present (i.e. less Work Pressure and more of all other dimensions). These results replicate Templeton and Jensen's study (cited in Dorman, Fraser & McRobbie, 1997), which found that exemplary teachers perceive their school environments as having less work pressure, more freedom and greater professional interaction. Generally teachers identified Resource Adequacy and Work Pressure as key areas that need improvement (Fraser, 1999).

Table 4:
Average Item Mean, Average Item Standard Deviation and Differences (Effect Size and MANOVA for Repeated Measures) between Actual and Preferred Perceptions on the SLEQ-SA Using the School Mean as the Unit of Analysis

Scale	Average Item Mean[a]		Average Item Standard Deviation		Difference	
	Actual	Preferred	Actual	Preferred	Effect Size	*F*
OBE Familiarity	2.72	4.38	0.53	0.30	4.00	5.03**
Resources Adequacy	2.11	4.49	0.70	0.38	4.41	4.82**
Work Pressure	3.49	2.65	0.39	0.43	2.05	3.40**
Student Support	3.37	4.23	0.43	0.38	2.12	3.52**
Parental Involvement	2.36	4.58	0.54	0.35	4.99	4.99**
Collegiality	3.77	4.46	0.40	0.26	2.09	3.62**
Innovation	3.10	4.28	0.36	0.34	4.00	4.61**

**$p<0.01$
[a] As the number of items in each scale differed, the average item mean, or scale score divided by the number of items in that scale, was used to provide a meaningful comparison between scales.
The sample consisted of 403 teachers in 54 schools.

To examine the magnitudes of these actual-preferred differences, as well as their statistical significance (as recommended by Thompson, 1998a, 1998b), effect sizes were calculated in terms of the differences in means divided by the pooled standard deviation. The effect sizes range between two standard deviations and almost five standard deviations, suggesting very large differences between teachers' perceptions of the actual school-level environment and

that which they would prefer. Figure 1 provides a graphical profile of teachers' actual and preferred perceptions of their school-level environment in the Limpopo Province.

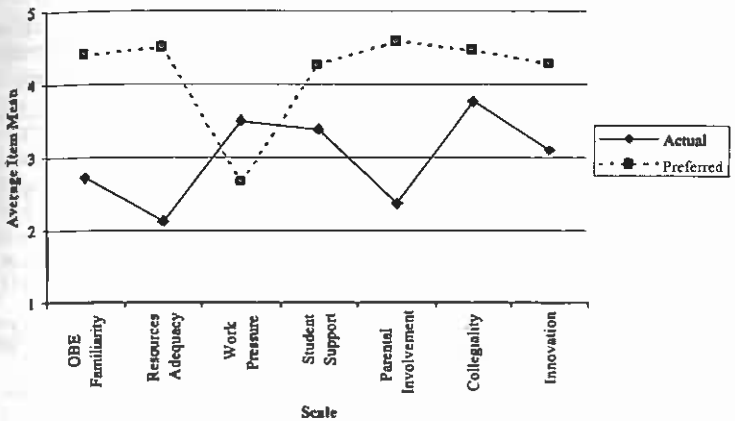

Figure 1. Difference Between teachers' perceptions on the Actual and Preferred versions of the modified SLEQ-SA.

Examining Differences Between Teachers Involved and Not Involved in OBE

As teachers involved in OBE and those who are not involved are not found in equal numbers in every school, the within-school mean was chosen as the unit of analysis to provide a matched pair of means. MANOVA for repeated measures revealed a statistically significant ($p<0.01$) difference between teacher perceptions of their actual school environment and the one that they would prefer for all seven SLEQ-SA dimensions. Because the multivariate test produced statistically significant results using Wilks's lambda criterion, the univariate ANOVA for repeated measures was interpreted for each individual SLEQ-SA scale to investigate whether teachers involved in OBE and those who were not had different perceptions of their school-level environment.

Table 5 reveals statistically significant differences for the actual form for two of the seven school-level environment scales, with teachers involved with OBE perceiving significantly more OBE Familiarity and Work Pressure than teachers who were not involved in OBE. The effect sizes for these two scales of the SLEQ-SA (0.98 and 0.74, respectively) indicate important differences in perceptions for these two scales. This finding is not unexpected, as it would be anomalous if teachers involved in OBE do not also exhibit greater familiarity with OBE approaches to teaching and learning than colleagues not involved in OBE. OBE approaches, however, do require more frequent formative assessment tasks which—given the very large class sizes experienced in the Limpopo Province with an average of more than 55 students per class—could well translate into increased work pressure on OBE teachers in comparison with their non-OBE colleagues. Table 5 also indicates that there were no significant differences between the types of school-level environment preferred by teachers involved in OBE and those who were not.

Table 5:

Average Item Mean, Average Item Standard Deviation and Difference (Effect Size and MANOVA for Repeated Measures) Between OBE and Non-OBE Teachers on the Actual and Preferred Versions of the SLEQ-SA Using the Within-School Mean as the Unit of Analysis

Scale	Form	Average Item Mean		Average Item Standard Deviation		Difference	
		OBE	Non-OBE	OBE	Non-OBE	Effect Size	*F*
OBE Familiarity	Actual	2.67	2.02	0.41	0.92	0.98	4.86*
	Preferred	4.39	4.17	0.30	0.63	0.47	1.23
Resource Adequacy	Actual	2.08	2.27	0.64	0.74	0.28	0.29
	Preferred	4.56	4.37	0.29	0.69	0.39	0.55
Work Pressure	Actual	3.67	3.29	0.33	0.63	0.79	5.87**
	Preferred	2.67	2.52	0.38	0.62	0.30	2.56
Student Support	Actual	3.29	3.33	0.60	0.45	0.08	0.04
	Preferred	4.19	4.44	0.37	0.56	0.54	2.52
Parental Involvement	Actual	2.38	2.50	0.61	0.96	0.15	0.12
	Preferred	4.63	4.43	0.32	0.65	0.41	0.94
Collegiality	Actual	3.80	3.66	0.51	0.54	0.27	0.50
	Preferred	4.53	4.49	0.21	0.43	0.13	1.14
Innovation	Actual	3.01	3.25	0.50	0.74	0.39	0.57
	Preferred	4.32	4.24	0.35	0.52	0.18	0.45

*$p<0.05$ **$p<0.01$

The sample consisted of 49 matched pairs of within-school means for OBE and non-OBE teachers.

DISCUSSION AND CONCLUSIONS

The present study was undertaken to examine the school-level environment of schools in the Limpopo Province of South Africa in which *Curriculum 2005* – a new outcomes-based approach to teaching and learning – is being implemented. An important contribution was the careful modification of the School-Level Environment Questionnaire (SLEQ) to make it suitable for the South African context. Modification of the SLEQ included the addition of two important scales relevant to the South African context, namely, OBE Familiarity and Parental Involvement. Analyses of the data collected from 403 teachers in 54 secondary schools resulted in the acceptance of a seven-scale factor structure. Each of the seven scales exhibited comparatively high internal consistency reliability and an ability to differentiate between the perceptions of teachers in different schools.

The results indicate that teachers would prefer significantly more OBE Familiarity, Resource Adequacy, Students Support, Parental Involvement, Collegiality and Innovation and less Work Pressure than they are currently receiving. This pattern, in which teachers prefer a more favourable learning environment than the one perceived to be present, replicates findings of past research (Fraser, 1998). An examination of the perceptions of teachers involved in OBE and those who are not revealed that those teachers involved in OBE are experiencing significantly more OBE Familiarity and Work Pressure than their counterparts who are not.

However, OBE and non-OBE teachers appear to be similar in their preferred school environment scores and in their perceptions of actual environment on the other five SLEQ-SA scales.

This study is noteworthy in that developing, refining, validating and using a modified version of the SLEQ has provided other researchers with a widely-applicable, parsimonious, valid and economical instrument for future use in assessing and monitoring teachers' perceptions of the school-level environment in South Africa. Further data collection is underway in an attempt to identify factors that contribute to variance in teachers' perceptions of their actual and preferred school level environment. It is also envisaged that, through the gathering of qualitative information, the study will illuminate whether it is possible to use the SLEQ-SA as a measure of readiness to implement and support Outcomes-Based Education in South Africa.

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APPENDIX

Table 2

Factor Loadings for a Modified Version of Actual Form of SLEQ-SA in South Africa

Item No	Factor Loading: OBE Familiarity	Resource Adequacy	Work Pressure	Student Support	Parental Involvement	Collegiality	Innovation
1	0.65						
3	0.79						
4	0.84						
5	0.73						
7	0.63						
8	0.54						
11		0.46					
12		0.65					
13		0.73					
14		0.74					
15		0.45					
16		0.53					
17			0.67				
18			0.70				
19			0.59				
20			0.50				
22			0.36				
23			0.52				
24			0.56				
25				0.60			
26				0.65			
27				0.67			
28				0.52			
29				0.68			
32				0.37			
33					0.71		
34					0.76		
35					0.60		
36					0.64		
37					0.62		
38					0.72		
41						0.71	
42						0.67	
43						0.65	
44						0.74	
45						0.73	
46						0.69	
47						0.84	
48						0.71	
49						0.66	
50						0.31	
51						0.51	
53						0.58	
54						0.70	
55						0.74	
74							0.51
76							0.38
77							0.68
78							0.63
79							0.56
80	0.35						0.45
% Variance	13.6	7.0	6.3	4.9	4.8	4.7	4.5

Factor loadings smaller than 0.30 have been omitted.

The sample consisted of 403 teachers in 54 schools.