



**FACTORS MILITATING AGAINST ASCENSION OF WOMEN TO LEADERSHIP
POSITIONS IN EDUCATION**

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ABSTRACT

This study seeks to investigate the factors hindering the rise of women to leadership positions in educational management. A total of 250 respondents made up of teachers and educational administrators were selected to complete a questionnaire. The raw data consisting of 18 original factors were subjected to factor analysis with the view to identifying new composite factors that could explain the reasons why many women fail to make it to educational leadership. In all, seven factors were identified. These were: failure of women to attain higher education and general mentality towards women in leadership, behavioural factors of women, biasness towards women in attaining higher positions and men's attitude towards women in higher positions. These factors consequently constrain women's advancement to educational leadership. It is recommended that the Girl Child Education Unit in all educational directorates should embark on a more vigorous campaign by organizing regular workshop and seminars to educate women on the need to further their education.

Keywords: factors, constraining, women advancement, educational leadership.

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1. INTRODUCTION

For hundreds of years, women have been traditionally assigned the role of bearing and taking care of children as well as house-keeping while their men counterparts are the ones concerned with education, business and politics. A mixture of societal changes and technological developments happening over the last 50 years have, however, facilitated the entry of women into the labour market and caused the need for the social role of women to be re-defined. Besides being mothers and wives, women also contribute significantly towards nation building. Just as their male counterparts, they have talents and capabilities and are more able to perform leadership functions and roles effectively and efficiently.

In most male-dominated societies, females are regarded as the inferior of the species. Because of this, women are relegated to the background when it comes to positions that matter much regarding major societal decision making. Roles such as administration and disposal of property, leadership roles in societal affairs including education, religion and governance exclusively belong to males. Even the right of choice in respect to entry to conjugal union is denied to women. While it is known that such discriminatory practices exist in countries, their prevalence and cultural value systems and norms that perpetuate them are not adequately understood.

In Ghana, according to Ghana Statistical Service (2013), women form 51.2% of the total population of the country but lag behind men in leadership positions in various human endeavours. The political scene shows that women are under-represented in positions of power and authority. In 2012 parliamentary election in Ghana, only 30 women were elected out of the 275 parliamentarians.

A sustainable development process in any country is the responsibility of both men and women. It has been observed that although Ghanaian women play a significant role in development, progress and survival of many communities, only a few of them are found in managerial positions of human endeavours.

Women the world over have been under-represented in key managerial positions. Realising the important roles women play in society and their under-representation in key decision making processes, the United Nations, in crafting the Millennium Development Goals (MDGs), made a special provision for women advancement. Of the eight key goals under the MDGs, promoting gender equality and women empowerment featured prominently as goal three.

Despite the various efforts aimed at enhancing women participation in leadership, the situation has not improved much. The educational landscape in Ghana is no exception. For instance, throughout the history of Ghana, the country can boast of only one female to have been a Vice Chancellor of a public University. Again, casting our mind back to the lower levels of education, men tend to dominate the managerial positions when it comes to headship of educational institutions and directorates in Ghana. A look at the number of women holding leadership positions in education at all levels compared to the number of men in such positions indicates consistent male dominance. Women are largely found in subordinate positions in educational sector in the country. This stereotype tradition of male leadership structure of educational institutions in Ghana has almost made management patriarchal in nature.

This scenario raises the following questions: Do the women decline to accept responsibilities as leaders in educational management? Or are they discriminated against by the appointing authorities in the selection of people to head educational institutions? Answers to these and other such questions require an in-depth investigation. It is to address such questions that this study has been undertaken on the factors constraining women's advancement to educational leadership in the Ho Municipality.

The general objective of the study is to determine factors that constrain women's advancement to educational leadership in the Ho Municipality. Specifically, the study seeks to find out how traditional roles and family obligations, self-image, organizational culture and educational attainment constrain women's advancement to educational leadership in the Ho Municipality.

2. REVIEW OF LITERATURE

Leadership is of great importance in educational administration because of its far reaching effects on the accomplishment of school programmes, objectives and the attainment of the educational goals. Because the topic of leadership has fascinated people for centuries, various definitions abound.

Yukl (2006) defined leadership as the process of influencing others to understand and agree about what needs to be done and how to do it and the process of facilitating individuals and collective efforts to accomplish shared objectives. In the views of Mills (2005), leadership is a process by which one person influences the thought, attitudes and behaviours of others. That is to say leadership is the ability to get other people to do something significant that they might not otherwise do. It is energizing people towards a goal. Leaders set direction(s) for followers, they help visualize what must be achieved and they encourage and inspire their followers. Without leadership a group of human beings can quickly degenerate into arguments and conflicts because they see things in different ways and lean towards different solutions.

According to Okumbe (1998), leadership is seen as a process whereby one person influences others to do something of their own volition, neither because it is required nor because of fear of consequences of non-compliance. To him, leadership is a process of encouraging and helping others to work enthusiastically toward objectives. He maintains that leadership is the human factor that binds together and motivates a group towards goals by transforming the group's potentials into reality. He maintains that the essence of leadership is followership. In other words, it is the willingness of the people to follow that makes a leader.

Leadership theories have been an essential element in identifying and developing leaders in today's workforce. According to Peretomode (1992), three broad approaches have characterized the study of leadership. They are the trait theories, behaviour theories and situational or contingency theories.

According to Zaccaro, Kemp and Bader (2004), trait leadership is defined as integrated patterns of personal characteristics that reflect a range of individual differences and foster consistent leader effectiveness across a variety of group and organizational situations. The theory of trait leadership developed from early leadership research which focused primarily on finding a group of heritable attributes that differentiated leaders from non-leaders.

Behavioral theories of leadership are based upon the belief that great leaders are made, not born. Rooted in behaviourism, this leadership theory focuses on the actions of leaders not on mental qualities or internal states. According to this theory, people can *learn* to become leaders through teaching and observation. The underlying assumption of the behavioural theories is that the leader's behaviour will evoke a specific behaviour in the follower. The follower's resulting behaviour, or action, will cause the leader to interpret his original action and either reinforce or extinguish subsequent similar behaviour (Davis and Luthans, 1979).

Situational or contingency theorists examine the interactive effects of leadership style and situational factors. Westburgh (1931) suggested that the study of leadership must include the affective, intellectual, and action traits of the individual as well as the specific conditions under which the individual operates. Case (1933) viewed leadership as a function of three factors. These were, the personality traits of the leader, the nature of the group and its members and the event or problem confronting the group.

3. GENERATION OF THE DATA

This section deals with the study area, research design and population of the study, sample and sampling procedure, data collection procedure and data analysis.

The study was carried out in Ho, the Volta Regional capital of Ghana. This research was a cross-sectional survey which is descriptive in nature and employed the quantitative approach. The quantitative approach was based on designing a questionnaire to solicit for information from the respondents.

The population from which the sample was drawn was made up of the entire teachers and educational administrators in Ho. The target population constituted the female and male teachers and heads of Primary Schools, Junior High Schools, Senior High Schools and the District and Regional Directorate of Education in Ho.

The selection of the various schools into the sample was done after collecting statistics from the District and Regional Directorate. From the list of schools collected, it was discovered that only a few schools were headed by females. Therefore, if a random sampling technique was applied to select schools for the study, the researchers could have ended up having the vast majority of schools with male heads and would not give a true representation of the views of both sexes. In view of this, there was a deliberate selection of schools to obtain a representative sample of institutions headed by a male or a female.

A sample size of 250 respondents comprising 190 teachers, 23 schools administrators, 35 office administrators, 1 District Director and 1 Regional Director of Education. However, female administrators were deliberately selected into the sample. Questionnaire was used in gathering the data. This instrument was preferred because all the respondents were well educated and could read and understand the questions very clearly.

The questionnaire consisted of two sections with section A dealing with personal data while section B deals with general information. Section B of the questionnaire sought the respondents' views on whether there were some factors that hinder women's advancement to educational leadership position. The respondents were asked to provide answers where possible in the second section, and also, to indicate their level of agreement or otherwise with the eighteen variables using the Likert scale;

1= Strongly Disagree, 2= Disagree, 3= Agree, 4= Strongly Agree.

3.1 Description of variables under study

A brief description of the variables is presented below:

Educational attainment

- V1 *Low level of education*
- V2 *No opportunity for further education*
- V3 *Women generally do not strive hard for educational attainment*

Self image

- V4 *Women in leadership positions normally feel bossy*
- V5 *Women in general are not accommodative*
- V6 *Women generally lack confidence*
- V7 *Women leaders are accused of abusing their powers*

Bias and discrimination

- V8 *Appointment committees discriminate against women*
- V9 *Attitude of men towards women's work*
- V10 *Subordinates show preference for males as heads*

Organizational culture

- V11 *Promotion is not based on performance*
- V12 *Working conditions are not suited to women*
- V13 *Lack of organizational policies to support women career progression*

Traditional roles and family obligation

- V14 *The belief that a woman's office is the kitchen*
- V15 *Men are supposed to protect women*
- V16 *Husbands negative attitude towards women's work*

V17 *Being married and having to work at a different place where the family lives*

V18 *Over burden of domestic responsibilities*

4. RESULTS AND DISCUSSION

The main statistical tool used for the analysis was factor analysis. Factor analysis is an advanced statistical tool generally denoting a class of procedures primarily used for data reduction. In many researches, there may be large number of variables, most of which are correlated and which must be reduced to a manageable level. The processes of factor analysis in finding out salient constructs among many indicator variables are achieved by answering certain vital questions about the data.

These questions are;

1. Does the data qualify for factoring?
2. Is there inter correlations among the variables?
3. How many salient factors are possible?
4. What are the possible labels for the extracted factors?

Answering these questions means a salient construct would be found for the data.

4.1 Preliminary data analysis

Table 4.1 reveals that, gender distribution of respondents are quite evenly spread with 51.6% of the respondents being male and 48.4% of the respondents representing female. This implies that results from this research can be attributed to responses from both gender.

The distribution of respondents by age indicated in table 4.2 shows that majority (35.2+40.4=75.6%) of the respondents are ranging between the ages of 30-49. This means that approximately 76% of the time views leading to any conclusion drawn from this research could be attributed largely to respondents of that age group.

From Table 4.3, 25 (10%) of the respondents are single without children and 8 (3.2%) of the total respondents are single with children. 52 (20.8%) of the respondents are married without children and finally majority (165) representing 66% of the total respondents are married with children. This might be significant since marital status in relation to child birth could be a contributing factor with regards to leadership of women in education.

Out of a total of 129 female respondents, majority of them (90) hold a certificate in diploma and below as presented in table 4.4 with the remaining 39 holding certificates above diploma. Furthermore, majority of male respondents hold certificates above diploma as highlighted in Table 4.4.

4.2 Further analysis

Reliability Analysis	
Reliability Coefficients	
Number of Cases	250
Cronbach's alpha	0.72
Number of Item	18

Source: Field Data, 2015

The Alpha value of 0.72 shows a convincing level of consistency in the data generated for analysis. This further indicates the scale used is uni-dimensional and hence responses to similar or homogenous indicators are about 72% consistent with each other.

Table 4.5 shows that there are high mean values recorded for some indicator variables as highlighted. This suggests that they have been rated high by majority of the respondents.

From the correlation matrix, there exist multi correlations among the variables, which is a necessary condition for performing factor analysis. The highest negative correlation value of -0.58 is recorded between being married and having to work at different place where the family lives (V17) and lack of organizational policies to support women career progression (V13). Other high correlations were identified between low level of education (V1) and women generally do not strive hard for educational attainment. Also, there is a high correlation of 0.42 between appointment committees discriminate against women (V8) and promotion is not based on performance (V14). There was a high correlation between women generally are not accommodative (V5) and women leaders are accused of abusing their powers. Furthermore, there was no correlation between men are supposed to protect women (V15) and Women in general are not accommodative (V5), and over burden of domestic responsibilities (V18) and promotion is not based on performance. Finally, the information obtained from the correlation matrix may be used to construct factor grouping that might be existing in the data set. The factor groupings that may be obtained are depicted below:

$$f_1 = \{V_1, V_3\}$$

$$f_5 = \{V_8, V_{11}\}$$

$$f_2 = \{V_4, V_5, V_6, V_{13}, V_{18}\}$$

$$f_6 = \{V_{12}, V_{13}, V_{17}\}$$

$$f_3 = \{V_5, V_7\}$$

$$f_7 = \{V_{18}, V_{16}\}$$

$$f_4 = \{V_{17}, V_{13}\}$$

With the KMO value of 0.64 from table 4.7, we say that the test is to some extent adequate for factoring. This suggests that factor analysis is quite appropriate and the correlation matrix is appropriate for factoring. Furthermore, the Bartlett's test of sphericity tests the adequacy of the correlation matrix, and yielded a value of 1.479 and an associated level of significance smaller than 0.001. Thus, the hypothesis that the correlation matrix is an identity matrix can be rejected, i.e., the correlation matrix has significant correlation among at least some of the variables.

From Table 4.8, it can be seen that out of the original indicator variables, only seven (7) have eigenvalues greater than or equal to one. In the factor extraction, two rules were adopted which are the eigen value and scree plot which are indicated in the report. Taking the eigen value rule into consideration seven (7) factors were retained for rotation. These seven factors accounted for 21.00%, 12.43%, 10.51%, 8.68%, 6.98%, 6.56% and 5.84% of the total variance, respectively, for a total of 72.00%. The scree plot below, however suggest a seven-factor solution.

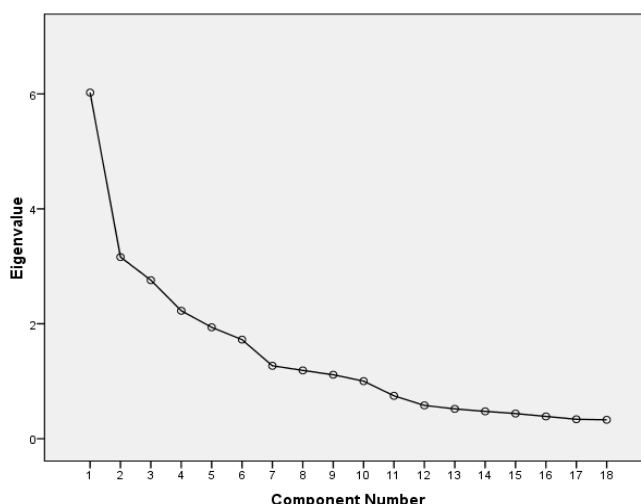


Figure 4.1: Scree Plot of Original Variables

Figure 1 depicts a scree plot which is a plot of eigenvalue against the number of factors. Taking a critical look at the scree plot, it can be seen that the "elbow" of the diagram occurs at the

seventh component. This suggest that the number of factors that must be considered for extration cannot exceed seven (7).

The rotated component matrix presented in table 4.8 shows seven (7) factors after varimax rotation. Factors 1, 4 and 5 are made up of variables that appears to reflect two motives; that is, failure of women to attain higher education and general mentality toward women in leadership (e.g. women in leadership position normally feel bossy, women do not strive hard for education attainment, women leaders are accused of abusing their power, no opportunity for further education, the believe that a woman's office is the kitchen, attitude of women towards work, lack of organizational policies to support women career progression etc.).The second factor contains five variables that clearly reflect the behavioural factors of women (e.g. women in general are not accommodative, women generally lack confidence, women in leadership position normally feels bossy etc.). Factor three (3) contains variables that directly explains men attitude towards women in attaining higher position (e.g. husband's negative attitude towards women's work, over burden on domestic responsibilities, men are supposed to protect women, attitude of men towards women's work etc.).

Finally, factor six (6) and seven (7) reflect biasness towards women in attaining higher positions (e.g. promotion is not based on preference, appointment committees discriminate against women and subordinates show preference for male as leaders). The blend of some factors is totally a subjective decision in reducing the extracted factors into smaller and more meaningful and manageable set of factors. Presently the factor configuration appears to have four (4) militating factors against leadership of women in education (that is failure of women to attain higher education and general mentality toward women in leadership, behavioural factors of women, biasness towards women in attaining higher positions and men attitude towards women in attaining higher position).

The varimax transformation matrix presented in table 4.9 shows that the first factor is the most important of all. The sixth factor is the next most important followed by the third. The next most important is the fifth factor, the second factor is next followed by the forth factor and finally the seventh factor.

5. CONCLUSION

Indeed, women representation in educational leadership is relatively low in Ho due to the following seven (7) salient factors which must be addressed in order to increase women's participation in educational management. These factors are; failure of women to attain higher education and general mentality toward women in leadership, behavioural factors of women, biasness towards women in attaining higher positions and men attitude towards women in attaining higher position.

Furthermore, the cross tabulation of respondents educational qualification by gender revealed that majority of the female respondents interviewed hold below post-graduate diploma whilst majority of the male respondents hold first degree and beyond. Also the result to this study indicates that 66% of the time, women's advancement to educational leadership are married and with children; implying that most of these respondents have family obligations to performed.

6. REFERENCES

- [1]. Adoo-Adeku, K. (1992). Some gender issues in developing a functional literacy Programme in Ghana. *Ghana Journal of Literacy and Adult Education*, 5 (1), 56.
- [2]. Asamaoah, M. L. (1997). *Women in educational leadership in the Volta Region of Ghana*. Unpublished masters' thesis, University of Cape Coast, Cape Coast, Ghana.

- [3]. Ary, D., Jacobs C. L & Razavieh A., (2002) *Introduction to research in Education*. USA: Wadsworth Thompson Learning.
- [4]. Addi-Raccah, A., & Ayalon, H. (2002). Gender inequality in leadership positions of teachers. *British Journal of Sociology of Education*, 23(2), 157-177. doi: 10.1080/014256902-20137693
- [5]. Anamuah-Mensah, J. (1995). *The race against underdevelopment: A mirage or reality*. Unpublished paper delivered at the Third Deans Lectures, University of Cape Coast, Cape Coast.
- [6]. Ankomah, Y. A. (1998). Participation in secondary education in Ghana: The case of females in rural BrongAhafo. *Journal of Educational Management I*, (1), 83-93.
- [7]. Borcelle, G. (1985). *Jobs for women: Pleas for equality of opportunity*. Paris: UNESCO.
- [8]. Biklen, S.K. & Brannigan, M.B (1980). *Women and educational leadership*. Canada D.C Health and Company.
- [9]. Brownell. J. (1994). Personality and career development: A study of gender differences. *Cornell Hotel and Restaurant Administration Quarterly*. 35(2), 36-45.
- [10]. Brown, C. K., Ghartey, N. K. T. & Ekumah, E. K. (1996). *Women in Local Government in Ghana: A case study of Central Region*. Accra: Friedrich Erbert Foundation Ghana Office.
- [11]. Case, C.M. (1933). Leadership and conjunction. *Sociology and Social Research*, 17, 510-513.
- [12]. Coleman, M. (2001). Achievement against the odds: The female secondary headteachers in England and Wales. *School Leadership & Management*, 21(1), 75-100. doi: 10.1080/13632430120033054
- [13]. Cramer, J., 1980. Fertility and female employment: problems of causal direction. *American Sociological Review* 45, 167-190.
- [14]. Derue, D. S., Nahrgang, J. D., Wellman, N., & Humphrey, S. E. (2011). Trait and behavioural theories of leadership: An integration and meta-analytic test of their relative validity. *Personnel Psychology*, 4(1), 7-52.
- [15]. Davis, T.R.V. & Luthans, F. (1979). Leadership reexamined: A behavioral approach. *Academy of Management Review*, 4, 237-248.
- [16]. Daresh, J. (2001). *Supervision as proactive leadership, Prospect heights*. Illinois: Waveland Press, Inc.
- [17]. Dolphyne, A. F. (1991). *Emancipation of Women: An African Perspective*. Accra: Ghana University Press.
- [18]. Dirasse, L. (1991). *Researching the top women managers in Eastern and Southern Africa*. ESAMI; Nairobi.
- [19]. Eagly, A. H., & Johnson, B. T. (1990). Gender and leadership style: A meta-analysis. *Psychological Bulletin*. 108(2), 233-256.
- [20]. Foa, U.G. (1957). Relation of worker's expectation to satisfaction with supervisor. *Personnel Psychology*, 10, 161-168.
- [21]. Gibb, C.A. (1951). An experimental approach to the study of leadership. *Occupational Psychology*, 25, 233-248.
- [22]. Ghana Statistical Service. (2012). 2010 Population and Housing Census: *Summary of Final Report*. Accra
- [23]. Gyekye, O. L., Aryeetey Bortei-Doku, P., Tsikata, D., Mama, A. & Amos-Wilson, P. (1998). *Women in public life*. Accra: Institute of Statistical, Social & Economic Research (ISSER) University of Ghana, Legon.
- [24]. Galton, F. (1869). *Hereditary genius*. New York: Appleton.

- [25]. House, R. J., Mitchell, T. R. (1974). Path-goal theory of leadership. *Journal of Contemporary Business*. 3: 1-97.
- [26]. Lewin, K., Lippitt, R. & White, R.K. (1939). Patterns of aggressive behavior in experimentally created social climates. *Journal of Social Psychology*, 10, 271-301.
- [27]. Loder, T. L. (2005). Women administrators negotiate work-family conflicts in changing times: An intergenerational perspective. *Educational Administration Quarterly*, 41(5), 741-776. doi 10.1177/0013161X04273847
- [28]. Mahitivanichcha, K., & Rorrer, A. K. (2006). Women's choices within market constraints: Re-visioning access to and participation in the superintendency. *Educational Administration Quarterly*, 42(4), 483-517. doi:10.1177/0013161X06289962
- [29]. Marini, M.M. (1984). Women's educational attainment and the timing of entry into parenthood. *American Sociological Review* 49(4) 491-511.
- [30]. Marshall, C. & Kasten, K. L. (1994). *The administrative career: A casebook on entry, equity and endurance*. Thousand Oaks, C.A: Corwin Press.
- [31]. Mills, D.Q. (2005). *Leadership: How to lead, how to live*. Mind Edge Press
- [32]. Mincer, J., & S. Polachek (1974). Family investments in human capital: Earnings of women. *Journal of Political Economy* 82 (2) 76-108.
- [33]. Morgan CT, King RA & Robinson NM (1981). *Introduction to Psychology*. London: McGraw-Hall.
- [34]. Northouse, P. (2007). *Leadership theory and practice*. Thousand Oaks, CA: Sage Publications.
- [35]. Okumbe, J. A. 1998. *Educational Management: Theory and practice*. Nairobi: Nairobi University Press.
- [36]. Peretomode, V.F. (1992). *Educational administration: Applied concepts and theoretical perspectives for students and practitioners*. Lagos: Jopa Educational Research and Publishers Ltd.
- [37]. Rimmer, C. & Davies, B. (1985). Women principals in education department high schools in Victoria. *The Journal of Educational Administration*, 23, (2), 153 -187.
- [38]. Rosenfeld, Rachel A. Race and sex differences in career dynamics. *American Sociological Review*. 45, 583-609.
- [39]. Silverman, F. (2004). Superintendent slot still lacks females. *District Administration*, 40(3), 16-16.
- [40]. Smith-Lovin, L., Tickamyer, A., (1978). Non recursive models of labor force participation, fertility behavior, and sex role attitudes. *American Sociological Review* 43, 541-557.
- [41]. Stogdill, R.M. (1974). *Handbook of leadership*. New York: The Free Press.
- [42]. Thaman, K. H., & Pillay, S. (1993). University of South Pacific: Women in higher education management in South Pacific – the case of University of South Pacific. In Mukherjee, H. & Kearney, M. (Eds.), *Women in higher education management*. (pp 107-122). Paris: UNESCO.
- [43]. Vianen, A.E.M., & Fischer, A.H. (2002). Illuminating the glass ceiling: the role of organizational culture preferences. *Journal of Occupational and Organizational Psychology* (75), 315-337.
- [44]. Vroom, V.H. & Mann, F.C. (1960). Leader authoritarianism and employee attitudes. *Personnel Psychology*, 13, 125-140.
- [45]. Westburgh, E.M. (1931). A point of view: studies in leadership. *Journal of Abnormal and Social Psychology*, 25, 418-423.
- [46]. Yukl, G. A. (2006) *Leadership In Organizations*, New Jersey. Prentice-Hall International.

- [47]. Zaccaro, S. J., Kemp, C., & Bader, P. (2004). Leader traits and attributes. *The nature of leadership*. (pp. 101-124). Thousand Oaks, CA, US: Sage Publications, Inc.

Appendix

Table 4.1 Gender Distribution

Gender	Frequency	Percentage
Male	121	48.4
Female	129	51.6
Total	250	100.0

Source: Field Data, 2015

Table 4.2: Age Distribution of Respondents

Age Grouping	Frequency	Percentage
20-29	33	13.2
30-39	88	35.2
40-49	101	40.4
50-59	28	11.2
Total	250	100.0

Source: Field Data, 2015

Table 4.3: Distribution of Respondents by Marital Status in relation to child birth

Responses	Frequency	Percentage
Single without children	25	10.0
Single with children	8	3.2
Married without children	52	20.8
Married with children	165	66.0
Total	250	100.0

Source: Field Data, 2015

Table 4.4: Educational Qualification by Sex Distribution

	Gender		Total
	Male	Female	
Cert. A (4-Year)	5	8	13
Specialist	1	12	3
Diploma	23	70	123
PGCE/PGDE	14	6	20
B.Ed	68	26	74
M.Ed/M.Phil	10	7	17
Total	121	129	250

Source: Field Data, 2015

Table 4.5 Descriptive Statistics of Indicators

Variables	Mean	Std. Deviation
V1	3.36	1.241
V2	2.11	1.332
V3	3.59	1.116
V4	3.49	1.409
V5	3.12	1.157
V6	2.80	1.145
V7	3.55	1.229
V8	2.68	1.258
V9	3.00	1.169
V10	3.58	1.016
V11	2.10	1.093
V12	2.53	1.159
V13	2.74	1.292
V14	1.70	.965
V15	2.56	1.108
V16	2.76	1.151
V17	3.46	1.409
V18	3.17	1.365

Source: Field Data, 2015

Table 4.6: Correlation Matrix for the Variables

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18
V1	1																	
V2	0.20	1																
V3	0.44	-0.03	1															
V4	-0.27	-0.25	-0.12	1														
V5	0.17	0.05	0.26	0.41	1													
V6	0.10	-0.09	0.21	0.51	0.53	1												
V7	0.17	-0.18	0.22	0.12	0.38	0.32	1											
V8	-0.21	0.04	0.08	0.03	-0.05	-0.08	-0.14	1										
V9	-0.09	0.13	-0.21	-0.17	-0.15	-0.23	-0.10	-0.06	1									
V10	-0.16	0.09	0.09	0.07	0.12	0.05	-0.08	0.25	0.19	1								
V11	-0.06	-0.03	-0.21	0.05	-0.06	0.04	-0.12	0.42	0.20	0.09	1							
V12	0.15	0.32	0.24	-0.47	-0.07	-0.17	-0.05	0.04	0.24	0.15	-0.14	1						
V13	0.01	0.25	0.10	-0.50	-0.33	-0.36	-0.35	0.15	0.13	-0.01	-0.07	0.55	1					
V14	0.07	0.37	-0.04	-0.34	-0.12	-0.14	-0.20	-0.01	0.16	0.02	0.09	0.35	0.41	1				
V15	-0.22	-0.15	-0.12	-0.07	0.00	0.02	0.05	-0.01	0.21	0.01	0.20	0.13	-0.02	0.07	1			
V16	-0.03	-0.13	0.09	-0.28	-0.05	-0.03	0.15	-0.02	0.13	0.07	0.02	0.12	0.01	0.14	0.25	1		
V17	0.01	-0.18	-0.19	0.37	0.23	0.28	0.30	-0.01	-0.02	0.14	0.16	-0.47	-0.58	-0.26	-0.18	0.18	1	
V18	0.13	0.12	0.24	-0.42	0.04	-0.21	-0.05	0.13	0.29	0.12	0.00	0.33	0.15	0.30	0.22	0.55	-0.13	1

Source: Field Data, 2015

Table 4.7: KMO and Bartlett's Test

Measure	value
KMO Measure of sampling adequacy	0.635
Bartlett's test Critical value	1.479
Bartlett's test degree of freedom	153
Bartlett's significant value	0

Source: Field Data, 2015

Table 4.8: Total Variance Explained

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	3.779	20.995	20.995
2	2.236	12.424	33.419
3	1.892	10.513	43.932
4	1.563	8.684	52.616
5	1.256	6.977	59.593
6	1.181	6.561	66.154
7	1.052	5.843	71.998
8	.899	4.993	76.991
9	.731	4.059	81.050
10	.681	3.781	84.831
11	.563	3.127	87.958
12	.418	2.323	90.281
13	.373	2.073	92.354
14	.341	1.897	94.251
15	.307	1.706	95.957
16	.289	1.607	97.564
17	.229	1.273	98.836

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	3.779	20.995	20.995
2	2.236	12.424	33.419
3	1.892	10.513	43.932
4	1.563	8.684	52.616
5	1.256	6.977	59.593
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7	1.052	5.843	71.998
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10	.681	3.781	84.831
11	.563	3.127	87.958
12	.418	2.323	90.281
13	.373	2.073	92.354
14	.341	1.897	94.251
15	.307	1.706	95.957
16	.289	1.607	97.564
17	.229	1.273	98.836
18	.209	1.164	100.000

Source: Field Data, 2015

Table 4.8 Rotated Component Matrix

	Component						
	1	2	3	4	5	6	7
V17	-.865						
V13	.706	-.382					
V12	.662						
V6		.821					
V5		.818					
V4	-.346	.539	-.484				
V7		.431		-.372			
V16			.763				
V18			.696				
V9			.422	.393	-.403		
V2				.775			
V14				.673			
V1					.740		
V3	.364				.676		
V15			.481		-.579		
V11						.813	
V8						.799	.371
V10							.855

Source: Field Data, 2015

Table 4.9: Varimax Transformation Matrix

Component	1	2	3	4	5	6	7
1	0.639	-0.0526	0.331	0.450	0.016	0.043	0.034
2	0.236	0.464	0.242	0.043	0.724	-0.377	-0.040
3	0-.175	0.315	0.788	-0.010	-0.220	0.325	0.308
4	0.139	0.298	0-.441	0.383	0.183	0.572	0.505
5	0-.468	0.077	0.018	0.788	-0.139	-0.355	-0.089
6	0.513	0.510	-0.123	0.012	-0.610	-0.296	-0.038
7	0.064	0.232	0.032	0.167	0.039	0.524	-0.799

Source: Field Data, 2015

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