

Marketing Educational Services in Qatar: A Multivariate Analysis

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Abstract

Despite the continuous marketing efforts using various marketing mix components, the parents attitudes towards private schools is still a decisive factor in achieving marketing success. This study is a pioneer in this respect since it lays foundation for selection of optimal marketing mix and is considered a pioneer in the field of marketing education applied to the State of Qatar. Although, there has been an increase interest in research in factors influencing schools choice options available to parents, the subject of choosing whether to send a child to a public or private school in the Middle East and especially in the Arab Gulf Countries has been relatively neglected in the current marketing literature. A questionnaire for such purpose was designed and a random sample of 648 respondents in public and private schools were investigated. Factor analysis is used to test the relationships between the interrelated variables. The principle component method, with Varimax rotation, is also used in order to reduce the large number of explanatory variables to a limited underlying factors. Factors scores were then applied as predictive variables in multiple discriminant analysis to find out which, if any, of the identified factors predict Qatar parents interest to send their children to a certain type of schools.

Introduction

In recent years, Qatar registered a remarkable progress in different economic and social aspects. As far as the educational sector, this period witnessed a rapid growth in both quality of education and quantity of schools. Private schools number has increased from 158 in 1995 to 217 in 2000 as compared to 205 and 218 for public schools respectively. Table 1 shows that total students enrolled in private schools increased from 31,666 in 1995/96 to 35,685 in 1999/2000. This number represented almost 32% of the total students in 1995 increased to 33.63% in 2000 (Annual Statistical Abstract, 2001).

This increase could be attributed to the huge projects of oil and gas, which the government established in recent years. It is worth mentioning that Qatar ranks third in terms of gas reserves after Russia and Iran. Proven gas reserve is estimated at 5.8 trillion cubic feet (Qatar Petroleum, Annual Report, 2001). This well help in attracting more projects and increase the number of expatriates with their families which will affect the number of students in private schools.

Table 1
Students in Private Schools by Type of School and Sex

Type of schools		2000-99	99-98	98-97	97-96	96-95	95-94
Public Schools	M	34416	34925	34039	33210	32878	32378
	F	36010	36092	34967	33940	33281	32507
	T	70426	71017	69006	67150	66159	64885
Private Arab Schools	M	6188	6122	5694	7499	7016	6095
	F	4049	3888	3717	5989	5662	4621
	T	10235	10010	9411	13488	12678	10716
Private Foreign Schools	M	13742	13240	13559	13042	11369	11374
	F	11709	11125	10573	10970	9237	9576
	T	25451	25365	24132	24012	20606	20950
Total Private Arab & Foreign	M+F	35685	34375	33543	37500	33284	31666

Source: Annual Statistical Abstract (2001), State of Qatar, The Planning Council

A survey was conducted to assess the quality of educational services in Qatar and to gather opinions of parents' attitudes towards those services provided by public and private schools (private Arab and private foreign). Those parents have a free choice to enrol their children in any of the three types of schools in Qatar. 800 questionnaires were hand-delivered by the author to schools' principles in public and private schools who were then asked to distribute them randomly to parents through their children. 648 questionnaires were returned resulting in a response rate of 81%.

Lovelock et al. (1976) recommended a personal delivery and collection of questionnaire as being particularly appropriate for conducting surveys of consumers' attitudes and behaviour patterns as was the case in this research.

Respondents were asked to indicate the importance of number of statements using a five point scale (1 = not important at all, 5 = extremely important). The Questionnaire also collected information on a number of socio-economic characteristics of the respondents. Factor analysis and multiple discriminant analysis were used to analyse the survey findings.

This research is divided into five sections. Section one provides the importance of the research. Section two examines the main sample characteristics. Section three summarises the results of factor analysis. Section four applies factor scores as predictors in multiple discriminant analysis. Lastly, section five summarises the main conclusions and policy implications of the research.

Importance of the Research

This study intends to investigate the attitudes of Qatar parents towards public and private schools and to examine the main factors affecting their choice of schooling.

It is worth mentioning that most recent studies in Qatar have focused on the educational aspects only. The quality of educational services provided by private schools has never been assessed. To the best of the author's knowledge, this research is the first to touch upon such subject from a marketing perspective and to bridge the gap in the literature.

Sample Characteristics

Table 2 presents the summary of the characteristics of the sample used in this study. The data in the table show that:

1. The median age category (20-39 years group) consisted of more than 94.1% of the total respondents.
2. In terms of the level of education, the respondents in this sample were considered highly educated. However, 86.3% of the respondents had B.Sc. degree.
3. Approximately 80% of the respondents had an average monthly income of 8000-18000 QR. (almost \$2191-4931).
4. Two thirds of the respondents were Qatar nationals with the remainder 36.4% of who were expatriates.
5. Around two thirds of the sample (61.1%) were male whereas 38.9% were female.

Table 2 Summary of the Characteristics of the Sample

Characteristics	No.	%
Age:		
1. 20-29 yrs.	27	141.8
2. 30-39 yrs.	339	52.3
3. 40-49 yrs.	35	5.4
4. above 49 yrs.	3	.5
Education:		
1. High school or 2yrs. Diploma	59	9.1
2. B.Sc. degree	559	86.3
3. More than B.Sc. degree	30	4.6
Income:		
1. Less than 8000 QR.	113	17.4
2. 8000-13000 QR.	367	56.6
3. 13001-18000 QR.	150	23.1
4. Over 18000 QR.	18	2.8
Nationality:		
1. Qatar	412	63.6
2. Non Qatar	236	36.4
Sex:		
1. Male	396	61.1
2. Female	252	38.9

Results of Factor Analysis

Respondents were asked to indicate how important each of the 26 variables relating to their attitudes towards choosing a certain type of schools using 5-point scale ranging from 5= extremely important, to 1= not at all important. Table 3 provides the means and standard deviations of scores of the 26 variables related to parents preferences. The data in the table show that (VAR11, VAR16, VAR2 and VAR17) score respectively higher than other variables. Whereas, the main scores of (VAR10, VAR26, VAR25 and VAR22) are smaller than other scores.

Factor analysis was applied on the explanatory accepted data-reduction (Muliak, 1972). An examination of the correlations found a strong association between certain variables. This indicates that factor analysis is appropriate. Bartlett's test of Sphericity was applied to test the null hypothesis that the 26 variables are uncorrelated in the population. The test gave a value of 7696.5 which is highly significant leading to a strong rejection of the null hypothesis (Hair et. al, 1995).

On the other hand, the Kaiser-Meyer-Olkin (KMO) test of sampling and adequacy was also used. The test gave a value of .91907 which suggests the appropriateness of using principal components analysis to explore the existence of an underlying structure in the data (Baker, 1991).

Table 3
Means & Standard Deviations for Dealing With a Certain Type of Schools

	Mean	Std Dev.	Variables
VAR1	3.975	.790	Curriculum Suitability
VAR2	4.046	.767	Concentration on English Language
VAR3	3.843	.877	Initiating National Values
VAR4	3.991	.784	Especial Caring
VAR5	3.787	.825	Quality of Teachers
VAR6	3.799	.778	Teachers Salaries
VAR7	3.738	.803	School Location
VAR8	3.904	.865	Size of the Class
VAR9	3.804	.732	School Equipment
VAR10	2.793	1.083	Availability of Laboratories
VAR11	4.293	.548	Availability of Personal Computers
VAR12	3.997	.834	Availability of Transportation
VAR13	3.725	.938	Social and Recreation Activities
VAR14	3.741	.787	Suitable Cafeterias
VAR15	3.648	.858	Medical Cares
VAR16	4.062	.788	School Uniform
VAR17	4.012	.770	School Size
VAR18	3.948	.763	Student's Performance Evaluation
VAR19	3.485	1.002	Child's Happiness
VAR20	3.799	.794	School Reputation
VAR21	3.642	.822	School Co-operation With Parents
VAR22	2.485	.752	Reasonability of School Fees
VAR23	3.691	.874	Social Prestige
VAR24	3.642	1.145	Recommendation of Relatives and Friends
VAR25	3.448	1.034	Concentration of Religious Values
VAR26	3.324	1.138	School Segregation

Table 4 provides the final statistics and gives relevant information after the desired number of factors have been extracted. It can be noticed that the 26 attributes are reduced to five factors. The extracted five factors accounted for 59.0% of the total variance. The reproduced correlation matrix shows that 29% residuals are larger than 5% indicating an appropriate model fit (Johnson and Wichern, 1982).

Table 5 shows the results of the rotated factor matrix obtained by the Varimax procedure.

Table 4 Results of Factor Analysis Final Statistics:

Variable	Communality *	Factor *	Eigenvalue	Pct of Var	Cum Pct
VAR1	.62678	* 1	8.92849	34.3	34.3
VAR2	.64769	* 2	2.55288	9.8	44.2
VAR3	.62335	* 3	1.60099	6.2	50.3
VAR4	.64154	* 4	1.17408	4.5	54.8
VAR5	.59949	* 5	1.08298	4.2	59.0
VAR6	.55948	*			
VAR7	.42534	*			
VAR8	.60238	*			
VAR9	.55539	*			
VAR10	.53698	*			
VAR11	.66654	*			
VAR12	.61651	*			
VAR13	.55066	*			
VAR14	.54496	*			
VAR15	.60783	*			
VAR16	.66109	*			
VAR17	.61958	*			
VAR18	.56674	*			
VAR19	.53993	*			
VAR20	.54442	*			
VAR21	.49042	*			
VAR22	.54047	*			
VAR23	.34803	*			
VAR24	.70471	*			
VAR25	.81654	*			
VAR26	.70259	*			

The rotated factor matrix obtained by Varimax procedure suggests the following:

1. Factor one has high coefficients on VAR1 (curriculum suitability), VAR2 (concentration on English language), VAR3 (initiating national values), VAR4 (especial caring), VAR5 (quality of teachers), VAR6 (teachers salaries), VAR9 (school equipments), VAR17 (class size), and VAR18 (student's performance evaluation). Therefore this factor may be labelled "quality of teaching".
2. Factor two has high coefficients on VAR8 (size of school), VAR12 (availability of transportation), VAR13 (social and recreation activities), VAR16 (school uniform), VAR19 (the child's happiness), and VAR20 (school reputation). Therefore, this factor may be labelled "school reputation".

Table 5 Rotated Factor Matrix
 VARIMAX rotation 1 for extraction 1 in analysis 1 - Kaiser Normalisation.
 VARIMAX converged in 8 iterations.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
VAR1	.69633	.36216	.07240	-.03024	.06773
VAR2	.68626	.38508	-.12894	-.10204	.03752
VAR3	.76471	.16386	-.03976	.04376	.09065
VAR4	.70803	.31753	.03092	.18290	.07078
VAR5	.70730	-.00286	.00071	.31065	.05199
VAR6	.61964	.15032	.08401	.34148	.17108
VAR7	.44873	.35730	-.06718	.26039	.15493
VAR8	.26625	.71531	.08137	.10602	.04433
VAR9	.52571	.32881	.10309	.39896	.03327
VAR10	-.16814	.16744	.05310	.41238	.55479
VAR11	.21388	.05081	-.01672	-.03403	.78535
VAR12	.39784	.65040	-.07585	.15619	-.07118
VAR13	.22971	.62304	-.01289	.07851	.32153
VAR14	.35879	.46391	-.00603	.44480	.05599
VAR15	.20911	.17305	.05861	.72753	-.03755
VAR16	.30891	.69963	-.03843	.23164	-.14507
VAR17	.66888	.31950	.04071	.21519	-.14877
VAR18	.55259	.26837	.04514	.40030	-.16458
VAR19	.01840	.52265	-.03463	.49050	.15697
VAR20	.17709	.67382	.03590	.20864	.11917
VAR21	.36054	.13520	.05266	.55346	.18183
VAR22	.32862	.43336	-.48562	-.04751	.08118
VAR23	.35986	.33474	.00766	.32616	-.00635
VAR24	.12786	.08118	.82212	.02341	-.07306
VAR25	.05239	-.03130	.90042	.04176	.01773
VAR26	-.04233	.01495	.83173	.02135	.09132

3. Factor three has high coefficients on VAR24 (recommendations of relatives and friends), VAR25 (religious reasons), and VAR26 (school segregation). Hence this factor may be labelled "religion".
4. Factor four has high coefficients on VAR15 (medical care), and VAR21 (school co-operations with parents). Hence factor 4 may be labelled "medical services".
5. Factor five has high coefficients for the variables which represent (availability of laboratories) VAR10 and (availability of personal computers) VAR11. Therefore, this factor may be labelled "laboratories and computers".

Multiple Discriminant Analysis of Factor Scores

The factors scores for the five factors were used in multiple discriminant analysis as explanatory items. The type of school, where school were divided into 3 groups, considered the dependent variable. Those groups are as follow:

1. Public schools
2. Private Arab schools
3. Private foreign schools

Table 6 Results of Multiple Discriminant Analysis

Number of cases by group

Type of School	Number of cases Unweighted	Weighted	Label
1	370	370.0	Public school
2	152	152.0	Private Arab
3	126	126.0	Private Foreign
Total	648	648.0	

Group means

Type of school	Fac1	Fac2	Fac3	Fac4	Fac5
1	3.80180	3.70811	3.63964	3.62162	3.52703
2	4.18713	4.17325	2.24123	3.82237	3.57895
3	3.90123	3.76720	4.46032	3.50000	3.54762
Total	3.91152	3.82870	3.4719	3.64506	3.54321

Group standard deviations

Type of School	Fac1	Fac2	Fac3	Fac4	Fac5
1	.58138	.63243	.68264	.68871	.62628
2	.49993	.54688	.51066	.68910	.63586
3	.58495	.61719	.34476	.68118	.69693
Total	.58477	.63910	.95486.	69483	.64214

Pooled within-groups correlation matrix

	Fac1	Fac2	Fac3	Fac4	Fac5
Fac1	1.00000				
Fac2	.62763	1.00000			
Fac3	.42183	.39318	1.00000		
Fac4	.53793	.49628	.39510	1.00000	
Fac5	.15344	.28739	.11519	.26464	1.00000

Wilks' Lambda (U-statistic) and univariate F-ratio with 2 and 645 degrees of freedom

Variable	Wilks' Lambda	F	Significant
Fac1	.92762	25.1637	.0000
Fac2	.90955	32.0692	.0000
Fac3	.38343	518.5984	.0000
Fac4	.97556	8.0783	.0003
Fac5	.99890	.3551	.7012

Canonical Discriminant Functions

Fcn	Eigenvalue	Pct of Variance	Cum Pct	Canonical Corr	After Fcn	Wilks' Lambda	Chi-square	df	Sig
					0	.241170	914.508	10	.0000
1*	2.8376	97.24	97.24	.8599	1	.925526	49.764	4	.0000
2*	.0805	2.76	100.00	.2729					

Marks the 2 canonical discriminant functions remaining in the analysis.

Table 6 continued
Standardized canonical discriminant function coefficients

	Fun1	Fun2
Fac1	-.28825	.76131
Fac2	-.33255	.51265
Fac3	1.12254	.15338
Fac4	-.23647	-.78578
Fac5	.05796	.02860

Structure matrix:

Pooled within-groups correlations between discriminating variables and canonical discriminant functions (Variables ordered by size of correlation within function)

	Fun1	Fun2
Fac3	.78344*	.36891
Fac4	-.09771*	-.05366
Fac1	-.14176	.72946*
Fac2	-.17280	.66903*
Fac5	-.01512	.10247*

* denotes largest absolute correlation between each variable and any discriminant function.

Unstandardized canonical discriminant function coefficients

	Fun1	Fun2
Fac1	-.5110011	1.3496402
Fac2	-.5447503	.8397782
Fac3	1.8956043	.2590093
Fac4	-.3440351	-1.1431977
Fac5	.0901715	.0445010
(Constant)	-1.5609967	-5.3841322

Canonical discriminant functions evaluated at group means (group centroids)

Group	Fun1	Fun2
1	.44767	-.17965
2	-2.71783	.14164
3	1.96406	.35668

Table 6 continued

Test of Equality of Group Covariance Matrices Using Box's M

The ranks and natural logarithms of determinants printed are those of the group covariance matrices

Group	Rank	Log Determinant		
1	5	-6.546544		
2	5	-6.833487		
3	5	-6.203717		
Pooled within group covariance matrix	5	-6.097393		
Box's M	Approximate F	Degree	of freedom	
Significant				
290.17739	9.53628	30,	481965.3	.0000

Classification Results-

Predicted Group Membership

Count	Type of School	Public School	Private Arab	Foreign School
Total				
370	Public School	276	16	78
152	Private Arab School	14	138	0
126	Private Foreign School	18	0	108
%	Public School	74.6	4.3	21.1
100	Private Arab School	9.2	90.8	.0
100	Private Foreign School	14.3	.0	85.7

80.6% of original grouped cases correctly classified

Since there are three groups and five predictors, two discriminant functions can be estimated (Klecka, 1980). The estimation results of the three-group discriminant analysis are presented in table 6. The following comments can be suggested on these results:

1. An investigation of group means showed that factor 3 and to lesser extent factor 2 separate the groups more widely than the other three factors.
2. The pooled within-groups correlation matrix that is calculated by averaging the separate covariance matrices for all groups showed low correlation coefficient between predictors. Therefore, it could be concluded that there is no serious problem of multi-collinearity.

3. The significance related to the univariate F ratios showed that when the predictors are considered individually, all predictors are significant in discriminating between the three group, with the exception of factor 5 (laboratory and computers).
4. The eigenvalues for function 1 and 2 are 2.83 and .081 respectively. The first function has the largest between-groups variability. This function accounts for 97.24% of the variability while function 2 accounts for the remaining 2.76% of the between-group variability.
5. The Wilk's lambda related to function 1 is .2412. This gives a chi-square value of 914.508 which is statistically significant at .0000 level. The Wilks' Lambda of function 2 has been removed is .9256. The significance level related with the second function is .0000, suggesting that it does contribute significantly to group differences (Morrison, 1969). These results show a simultaneous Wilks' lambda = .2232.
6. Since the value of Chi-square of each function is statistically significant at .05 level of significance, we reject the null hypothesis that the means of both functions are equal. Therefore, both functions suggest group separation.
7. Results also revealed that the canonical correlation for function 1 is .856; whereas for function 2, the correlation is .273. Therefore, the proportion of total variability explained by differences between groups is 73.9% for function 1 and 7.4% for function 2.
8. The standardised canonical discriminant function coefficients show a large coefficient for factor 3 (religion) and factor 2 (school reputation) on function 1. On the other hand, function 2 has relatively larger coefficients for factor 4 (medical services), factor 1 (quality of teaching) and factor 2 (school reputation). Similar results were found by an investigation of the structure matrix (Metwally, 1999).
9. The unstandardised canonical discriminant function coefficients provides the following two discriminant functions:

$$Z1 = -1.561 - .5110 F1 - .5447 F2 + 1.8956 F3 - .3440 F4 + .0902 F5$$

$$Z2 = -5.384 + 1.3496 F1 + .9398 F2 + .2590 F3 - 1.1432 F4 + .0445 F5$$
10. Group 1, public schools, has a large positive value on function 1. Since "religion" has a large positive coefficient on function 1, this suggests that parents who elect public schools for their children do so mainly for religion reasons. Those parents attach more importance to religion than to anything else when selecting a school. Group 2 parents on the other hand, has a large negative value on function 1. Since the "school reputation and "quality of teachers" factors have a large negative sign on this function, this indicates that parents who elect Arab private schools for their children do so mainly for school reputation and because of the quality of teaching these schools have. Group 3 has a large

positive value on function 1. Since factor three "religion" suggests a large positive sign in function 1, this provides that parents who elect private foreign schools for their children do so mainly for religious reasons also.

The level of significance of Box's M suggests that the null hypothesis with the covariance matrices are equal should not be rejected (Metwally, 1999).

The classification results based on the analysis sample suggest a hit ratio of 80.6%. This indicates that 80.6% of the cases are correctly classified. Since we have three groups of equal size, a chance hit ratio would be $1/3 = 33.3\%$ (Al-Khulaifi, Al-Sulaiti and Metwally, 2001). The improvement over chance is more than 25% suggesting at least satisfactory validity (Malhotra et al, 1996). The Press's Q statistic is given by:

$$\text{Press's } Q = \{648 - (3)(384)\}^2 / \{648(2)\} = 196$$

This value exceeds by far the critical value at .01 level of significance which is 6.63, suggesting that the predictions are significantly better than chance.

Conclusions and Implications

The main conclusions and implications of this research can be summarised as follow:

1. 648 parents were surveyed to find out how they evaluate schools in Qatar. Around 57.1% of the respondents choose public schools as compared with almost 43% for both private Arab and private foreign schools.
2. The respondents were asked to rate the importance of 26 schools attributes. Factor analysis was applied to reduce the explanatory variables to an appropriate level. On the other hand, Bartlett's test of Sphericity and Kaiser-Meyer-Olkin measure of sampling show that factor analysis is appropriate in determining the main reasons for selecting one type of school instead of the other.
3. A common principle component procedure with a rotation was used to reduce the underlying factors. This procedure resulted in the extraction of five meaningful factors, which were labelled as quality of teaching, schools reputation, religion, medical services, and laboratories and computers.
4. The factor scores of the five extracted factors were applied as predictors in multiple discriminant analysis. Results revealed two discriminant functions each has a significant chi-square.
5. The canonical discriminant functions investigated at group means (group centroid) together the structure matrix of the two discriminant functions suggest the following:
 - Respondent who choose public schools for their children do so mainly for religious reasons since these schools are segregated and their curriculum are supervised by the Ministry of Education

- Respondents who choose private Arab schools do so mainly for teaching quality and because of the reputation these schools have.
 - Respondents who choose private foreign schools do so mainly for religious reasons.
6. The policy implications to be derived from such analysis for private schools in Qatar are as follow:
- Private schools should emphasise more on reputation and work hard to keep good image of their institutions.
 - As far as teaching quality is concerned, teaching qualification, curriculum, labs and equipments and concentration on English should be given higher priority if private schools are targeting new students or keeping actual ones.
 - Private schools should also pay more attention to religious education since it was found an important attribute in parental choice of schools.

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