The structure of student satisfaction with college services: a latent class model

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ABSTRACT

Latent Class Analysis (LCA) was used to identify distinct groups of Community college students based on their self-ratings of satisfaction with student service programs. The programs were counseling, financial aid, health center, student programs and sudent government. The best fitting model to describe the data was a two Discrete- Factor model among 2 through 5 class solutions that were examined. The model provided insight into the structure of students' feelings about their college services.

The following four classes of D-Factor #1 were observed: Class 1, students who were very satisfied with all the programs (19%). Class 2, a relatively satisfied group of students (16%). Class 3, a large majority (57%) of students who felt ambiguous about the programs and class 4, a small group of very dissatisfied students (8%). The first class of D-Factor #2 students was satisfied with counseling and financial aid services but was ambiguous about health services. The second-class students (D-Factor #2) on the other hand, were dissatisfied with financial aid services. Their feelings about student government, student programs and health services were ambiguous. The two DFactor model provided a clear differentiation of the students in terms of their satisfaction, or dissatisfaction with the student services provided by the college.

Keywords: Latent class analysis, student satisfaction, Discrete-Factor model.

INTRODUCTION

A conjugation of rising expectations for educational attainment and the current economic crises has created problems for community colleges. The Colleges are expected to respond to the educational and vocational needs of individual adult learners. In particular, a major goal of Community colleges is to provide access and lifelong learning for all students and to promote the state's interests in a skilled workforce and an educated citizenry. The open-access policy of the institutions has led naturally to a great diversity (i.e., ethnicity, age, gender, socio-economic status, academic preparation, and carrier interests) of student population of the colleges (Sengupta, & Jepsen, 2006). The daunting task of the colleges is to integrate socially and academically students with different needs, aspirations and commitments into the institution to enable them to succeed. The student services unit has a special responsibility to ensure that

All students who might otherwise lack the financial or academic preparation to pursue higher education receive support they need to achieve their educational goals. Among the broad range of services typically provided by community colleges is Health, financial aid, counseling services and student government.

The current emphasis on accountability and Data Driven decisions has spurred colleges to collect pertinent institutional data for program evaluation, planning and accountability. The heterogeneity of community college populations may create technical problems for program evaluation or assessment. To answer specific evaluation or research questions of interest may require advanced statistical techniques e.g., for a) predicting ordered polytomous dependent variable from a set of independent variables, or b) classifying students into descrete groups or latent classes based on manifest variables and relating the classes to selected covariates of interest.

The present investigation was undertaken to apply latent class analysis to identify and characterize student satisfaction with their programs. Specifically, this study was aimed to determine whether distinct groups or classes of college students could be identified based on their self-report ratings of satisfaction with selected college services. The services were counseling, financial aid, health center, student programs and student government. As a part of institutional self-study, a sample of 920 students in a Northern California Community College completed Likert-type survey questionnaire covering many instructional areas including students' current educational goals, financial and academic problems and family related concerns. Selected items dealing with students' satisfaction ratings of the five services were subjected to latent class analysis (LCA).

LCA is a method for analyzing the relationship among manifest variables where a number of latent or unobserved categorical variables are used to explain the relationships among the manifest data (McCutcheon, 2002). LCA with categorical variables has two types of parameters, conditional response and class membership probabilities. The later specifies the size or proportion of the population in each class. The conditional response probabilities on the other hand are the probabilities for each latent class that an individual in that class will endorse or choose a given value on an item.

Haughton, Lybrand and Wolfed (2009) state that the basic latent class cluster model is given by

$$P(yn|\theta) = \Sigma \pi j \, Pj \, (yn|\theta j)$$

Where yn = the nth observation of the manifest variables

S = number of clusters
Πj = size of cluster j. or prior probability of membership in cluster j.
Pj = cluster specific probability of yn given the cluster specific parameters θj.

The data analysis was performed with Latent Gold Version 4.5. (Vermunt & Magidson, 2005). The analysis began with an exploratory LC analysis of the data. Different models were estimated by stepwise addition of classes to identify a model that fit the data well.

RESULTS:

The results of the analysis suggested that the best fitting model to describe the student satisfaction data was a two Discrete-Factor model [2 D-factor (4, 2)]. As shown in Table 1, the 2 DFactor model has the lowest Bayesian information criterion, (BIC=5386.2) compared to the other models. E.g., two class model, BIC = 5623.7, three class model., BIC=545825, four class model, BIC= 5431.3 and five class model, BIC= 5439.1

The first discrete factor (D-Factor #1), consisted of four ordered classes and the second (D-Factor #2) contained two classes.

The 2 D-factor model indicated that students' satisfaction with college services is described by two dichotomous groups of students (D-Factors #1 & #2) with four and two ordered levels or classes respectively.

The conditional probabilities of D-Factor #1 classes are presented in Table 2. They are probabilities for each latent class that an individaul from that class will display a specific response to an observed variable. The first class of this 4-class model may be labeled as "satisfied students" This class included 19% of the college students who expressed strong satisfaction with all the student service programs. A small group (8%) of students in the fourth class expressed dissatisfaction with all the services. A relatively large proportion of the students (58%) were in the third class. These individuals expressed dissatisfaction and ambiguous feelings about all the college services. (See Table 2). In contrast to D-Factor #1, the two classes of students in D-Factor #2, shown in Table 3 were differentiated by their feelings about counseling, financial aid and health services. The first class of D-Factor #2 students was satisfied with counseling and financial aid services but was ambiguous about health services. The second-class students (D-Factor #2) on the other hand, were dissatisfied with financial aid services. Their feelings about student government, student programs and health services were ambiguous.

SUMMARY:

The present study utilized Latent Class model to identify and characterize Community college students' satisfaction with their student service programs. A 2 D-Factor model fitted to the data provided insight into the structure of students' feelings about their college services. It provided a clear differentiation of students in terms of their satisfaction, or dissatisfaction with the student services provided by the college. In addition, the model provided estimates of types of students who belonged to each of the classes identified in the study.

Table 1 - BIC Values for Estimated Models of student satisfation

Model	BIC (LL)
1-Cluster	6395.6
2-Cluster	5623.7
3-Cluster	5458.5
4-Cluster	5431.3
2-Dfactor (2,2)	5434.4
2-Dfactor (4,2)	5386.2

Table 2 - Parameter estimates of student satisfaction with college services

DFactor 1

	Level 1	Level 2	Level 3	Level 4
Size	0.19	0.16	0.57	.08
Indicators:				
Counseling Services				
Dissatisfied	.002	.024	.199	.630
Uncertain	.040	.148	.333	.276
Sastified	.958	.829	.469	.094
Financ. Aid				
Dissatisfied	.168	.204	.329	.674
Uncertain	.078	.201	.422	.293
Satisfied	.754	.595	.249	.033
Health Services				
Dissatisfied	.000	.008	.076	.355
Uncertain	.150	.514	.812	.633
Satisfied	.850	.478	.113	.013
Student Programs				
Dissatisfied	.000	.000	.049	.951
Uncertain	.000	.014	.778	.049
Satisfied	1.00	.986	.173	.000
Student Government				
Dissatisfied	.000	.000	.068	.752
Uncertain	.011	.304	.881	.248
Satisfied	.989	.696	.051	.000

Table 3 - Parameter estimates of student satisfaction with college services

	DFctor 2	
	Level 1	Level 2
Size	.80	.20
Indicators:		
Counseling Services		
Dissatisfied	.128	.326
Uncertain	.236	.274
Satisfied	.637	.400
Financial Aid		
Dissatisfied	.143	.960
Uncertain	.379	.039
Satisfied	.478	.001
Health Services		
Dissatisfied	.047	.176
Uncertain	.616	.659
Sastisfied	.337	.165
Student Programs		
Dissatisfied	.098	.119
Uncertain	.448	.470
Satisfied	.454	.411
Student Government		
Dissatisfied	.093	.116
Uncertain	.574	.577
Satisfied	.333	.307

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