

De Anza College Office of Institutional Research and Planning

To: Senior Staff

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Subject: Cluster Analysis for Enrollment Planning

In an attempt to better understand the varying student populations we serve, the Institutional Research Office partnered with two consultants to conduct a statistical analysis of the students attending De Anza College in fall 2016.

Methodology

A cluster analysis was chosen to evaluate and assess the clustering of student demographics and academic performance. This procedure allowed for the creation of clusters based on individual characteristics of the students which included: age, credits attempted (in fall 2016), cumulative GPA, cumulative credits attempted, EOPS status, DSPS status, Calworks status, attended orientation, selected a major, completed an educational plan, selected an education goal, highest education level attained, full/part time status, low income status, financial aid awarded, visa status, and applied for financial aid. Five clusters resulted which accounted for 97.2% ($n = 20,179$) of individuals in the data set, with 2.8% ($n = 575$) remaining as outliers who did not fit into any cluster and were excluded from the analysis.

Descriptive Statistics

Descriptive statistics were run on the dataset with the outliers excluded and showed a snapshot of students within the clusters who attended De Anza College in fall quarter of 2016. The average age was 25.88 (SD = 10.23), and students attempted an average of 10.55 units in fall quarter (SD = 5.02). The students' average cumulative GPA was 2.72 (SD = 1.08) and students had on average accumulated 67.15 units, though showed a large variance in the number of units they had acquired (SD = 67.37). About half of the students were full time students ($n = 48.9\%$). Less than half of the students attended orientation ($n = 8,869, 44.0\%$), but the majority of students had selected a major ($n = 18,777, 93.1\%$) and had developed an education plan ($n = 12,866, 63.8\%$). The majority of students wanted to transfer ($n = 15,025, 74.5\%$), while less students wanted to earn a degree ($n = 1,736, 8.6\%$), certificate ($n = 581, 2.9\%$), or had another type of education goal ($n = 2,837, 14.1\%$).

A quarter of students identified as low income students ($n = 5,215, 25.8\%$). About half of students applied for financial aid ($n = 10,824, 53.6\%$), and one in six students were awarded Pell Grants ($n = 3,065, 15.2\%$) and one in five were awarded another type of aid ($n = 4,354, 21.6\%$). The majority of students had a high school or equivalent degree ($n = 15,795, 78.3\%$), but some had bachelor's degrees or higher ($n = 2,197, 10.9\%$), associates degrees ($n = 586, 2.9\%$), or other degrees ($n = 1,601, 7.9\%$). Lastly, 8% of all students were international students ($n = 1,608, 8.0\%$).

Table 1. Clusters

	Label	Label Desc.	Description	N/%
	Full-Time, Transfer Bound, Lower Income	Full-time students with a goal of transfer who are receiving financial aid	The largest group of students enrolled full-time with a transfer goal who are Asian and Latino/a. The majority receive financial aid. It is the second youngest group with the second highest term units enrolled and have the second highest GPA behind the full-time transfer bound students with a higher income. The majority of all EOPS students are in this group, all selected a major, almost all completed an educational plan, over half attended orientation, all applied for financial and 2/3 received financial aid; the largest recipients of PELL grants are in this group. The majority are continuing students followed by first-time students. 18% of course enrollment is online for this group.	n = 5,642; 28.0%
	Part-Time, Possible Transfer, Lower Income	Part-time students who may want to transfer who are receiving financial aid	The second largest cluster and second youngest group enrolled part-time and comprised of Asian and Latino/a students. Enrolled in 1-2 courses per term, almost all applied for financial aid, over half are receiving some type of aid with about 2/5 identifying as low income. Average cumulative GPA is 2.4 and 3/4 declared a transfer goal. Half attended orientation, almost all selected a major, and more than half completed an educational plan. About half of all students enrolled in special programs are in this group. The majority are continuing students followed by returning students. 18% of course enrollment is online for this group.	n = 5,576; 27.6%
	Part-Time, Returning Students	Part-time students who have a bachelor's degree	This group comprises 1/5 of our student population. These students are enrolled part-time and 3/4 have a bachelor's degree or higher. Of all students with a goal of certificate, over 3/5 are in this cluster and they enroll in one course per term. This group is predominantly Asian and White. This group is older, does not receive financial aid, have not completed orientation nor are they enrolled in a special program. The majority of students are continuing followed by first-time transfer then returning students. 16% of course enrollment is online for this group.	n = 4,301; 21.3%
	Full-Time, Transfer Bound, Higher Income	Full-time students with a goal of transfer who are not receiving financial aid	This group comprises another 1/5 of our student population. These students are enrolled full-time, are enrolled in the most term units of any group and have the highest cumulative GPA. 9 in 10 plan to transfer, almost all selected a major and completed an educational plan, the majority attended orientation, and almost none applied for financial aid or belong to a special program. This group is predominantly Asian. This is the youngest group and the majority of international students are in this group. The majority of students are continuing students. 18% of course enrollment is online for this group.	n = 4,146; 20.5%

DSPS and Adaptive PE Students	Students enrolled in ADPE courses and the DSPS program	The smallest cluster and oldest group of students who are largely White. Almost all are part-time and have the lowest cumulative GPA of all groups and enrolled in the lowest number of term units, but have the highest number of cumulative units. The majority are enrolled in DSPS and half received financial aid. The majority are continuing students. 1% of course enrollment is online for this group.	n = 514; 2.5%
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Note: some percentages might not add up to 100% due to rounding. Special programs include Veterans, CalWorks, EOPS, DSPS, and Foster Youth.

Table 2. Success and Retention

Label	Success Rate – Fall 2016	Withdraw Rates – Fall 2016	Persistence Rate to Winter 2017	Cumulative GPA
Full-Time, Transfer Bound, Lower Income	75%	11%	89%	2.75
Part Time, Possible Transfer, Lower Income	65%	16%	65%	2.46
Part-Time, Returning Students	76%	12%	55%	2.79
Full-Time, Transfer Bound, Higher Income	81%	7%	90%	3.01
DSPS and Adaptive PE Students	96%	2%	87%	2.38

Observations and Recommendations:

Full-Time, Transfer Bound, Lower Income: This group is our largest population of students who are enrolled full-time and plan to transfer but they have a lower GPA and lower success rate (75%) than the higher income transfer-bound group (81%). These students are already connected to EOPS and financial aid and have matriculated. These students have a similar persistence rate as the higher income group but a higher withdraw rate. We would want to make sure these students are aware of resources to help them remain enrolled full-time and be successful. It may be worth exploring why all students in this group applied for financial aid but only 75% are receiving aid.

Part Time, Possible Transfer, Lower Income: These students have the intent to transfer but can only attend part-time. Since only about half enrolled in a special program, it would be good to reach out to the other half and see if they are eligible for assistance. This group would also benefit from completing an educational plan to help them stay on track. We will also want to make sure they are connected to financial aid options that are available to part-time students since only 52% of this population is receiving aid. This group may be able to attend full-time if additional aid were available. This is our second largest group of students so we will want to focus on their success and persistence to keep them enrolled. This group could benefit from being more connected to special programs and learning communities to help improve their success and persistence rates. This group has a high withdraw rate (16%) which should be of concern.

Part-Time, Returning Students: These students tend to be coming to De Anza to take one course per term but are enrolled for around 6 terms. This group has a success rate of 76% but persist from term

to term at a lower rate than other groups at 55%. These students are largely enrolled in Math, CIS, KNES, C D, ACCT, ESL, BUS, EWRT, PSYC courses. Only about 30% have completed an educational plan. This group may benefit from meeting with a counselor to help them stay on track to meet their educational goal while taking only one course per term.

Full-Time, Transfer Bound, Higher Income: These students are the highest achieving group of students with a success rate of 81% and persistence rate of 90% and cumulative GPA of 3.01, This group does not need much support but could be tapped to serve as mentors or tutors for other students.

DSPS/ADPE Students: This is our smallest population of students but they have completed the most units of all groups, 203 total units, all in SPED and PEA. These are students that return quarter after quarter to take the same classes. We should ensure that this population has a way to continue to enroll in courses after the repeatability requirements came into effect.

Table 3. Cluster Results for Categorical Variables

	Full-Time, Transfer Bound, Lower Income	Part Time, Possible Transfer, Lower Income	Part-Time, Returning Students	Full-Time, Transfer Bound, Higher Income	DSPS and Adaptive PE Students
Full Time	5642 (100.0%)	3 (0.05%)	69 (1.60%)	4142 (99.9%)	2 (0.39%)
DSPS	35 (0.62%)	43 (0.77%)	15 (0.35%)	40 (0.96%)	485 (94.4%)
EOPS	387 (6.86%)	110 (1.97%)	0 (0%)	1 (<0.01%)	0 (0%)
Foster Youth	45 (0.80%)	44 (0.79%)	10 (0.23%)	0 (0%)	0 (0%)
CalWorks	14 (0.25%)	19 (0.34%)	0 (0%)	0 (0%)	0 (0%)
Orientation	3118 (55.3%)	2772 (49.7%)	436 (10.1%)	2537 (61.2%)	6 (1.17%)
Select Major	5585 (99.0%)	5446 (97.7%)	3508 (81.6%)	4047 (97.6%)	191 (37.2%)
Has Ed Plan	4611 (81.7%)	3701 (66.4%)	1311 (30.5%)	3174 (76.6%)	69 (13.4%)

Transfer Goal	5160 (91.5%)	4326 (77.6%)	1795 (41.7%)	3722 (89.8%)	22 (4.28%)
Degree Goal	296 (5.25%)	629 (11.3%)	506 (11.8%)	291 (7.02%)	14 (2.72%)
Cert Goal	42 (0.74%)	167 (2.99%)	343 (7.97%)	23 (0.55%)	6 (1.17%)
Financial Aid Applied	5639 (99.9%)	4885 (87.6%)	82 (1.91%)	4 (0.10%)	214 (41.6%)
Pell Grant	2245 (39.8%)	818 (14.7%)	0 (0%)	0 (0%)	2 (0.39%)
Other Aid	1963 (34.8%)	2108 (37.8%)	4 (0.09%)	21 (0.51%)	258 (50.2%)
Received Aid	4208 (74.6%)	2926 (52.5%)	4 (0.09%)	21 (0.51%)	260 (50.6%)
No Aid	1434 (25.4%)	2650 (47.5%)	4297 (99.9%)	4125 (99.5%)	254 (49.4%)
Bachelor or Higher	74 (1.31%)	288 (5.16%)	1598 (37.2%)	141 (3.40%)	96 (18.7%)
HS/Equivalent	5332 (94.5%)	4813 (86.3%)	2026 (47.1%)	3491 (84.2%)	133 (25.9%)
Low Income	2166 (38.4%)	2221 (39.8%)	563 (13.1%)	245 (5.91%)	20 (3.89%)
Visa	1 (<0.01%)	3 (0.05%)	187 (4.35%)	1417 (34.2%)	0 (0%)
Asian/P.I.	2,112 (34.2%)	1,510 (12.6%)	1,828 (12.9%)	2,314 (39.6%)	93 (0.5%)
White	672 (25.3%)	948 (18.5%)	1,278 (21.8%)	786 (30.2%)	268 (4.0%)
Latino/a	1,970 (47.6%)	2,299 (29.3%)	774 (8.53%)	569 (13.8%)	60 (0.5%)
African American	319 (55.0%)	263 (22.8%)	129 (9.1%)	70 (11.6%)	18 (1.3%)
Filipino	520	501	199	240	19

	(46.1%)	(23.7%)	(8.4%)	(21.0%)	(0.05%)
Continuing Students	3606 (64%)	3300 (59%)	1486 (35%)	2468 (60%)	465 (90%)
First-Time Students	1121 (20%)	538 (10%)	413 (10%)	923 (22%)	17 (3%)
First-Time Transfer	533 (9%)	491 (9%)	1165 (27%)	537 (13%)	9 (2%)
Returning Student	381 (7%)	1244 (22%)	1028 (24%)	207 (5%)	23 (4%)
Continuous Variables					
Age	22.25 (5.02)	25.38 (7.09)	31.43 (12.35)	21.85 (4.32)	57.11 (18.34)
F16 Units	14.69 (2.26)	7.09 (2.62)	5.87 (2.84)	15.23 (2.70)	3.91 (31.8)
Cum GPA	2.75 (0.91)	2.46 (1.04)	2.79 (1.29)	3.01 (0.88)	2.38 (1.77)
Cum Units	69.97 (50.60)	77.24 (62.76)	40.33 (52.67)	60.75 (47.29)	202.74 (200.65)

Note: For categorical variables the frequency is displayed above percentage of cluster which is in parentheses. For continuous variables the mean is displayed above standard deviation, which is in parentheses.

De Anza College - Cluster Analysis Groups
Fall 2016

Cluster	Size	Enrollment	Ed. Goal	Financial Aid	EOPS, Etc.	Matriculation	Outcomes
Full-Time, Transfer Bound, Lower Income (Asian & Latino/a)	5,642 28.0%	Full-Time 14.69 Term Units 69.97 Cum Units 18% Enroll Online	Transfer: 92% Degree: 5% Cert.: 1%	Applied: 100% Received: 75% PELL: 40% Low Income: 38%	CalWorks: 1% DSPS: 1% EOPS: 7% Foster Youth: 1%	Orientation: 55% Major: 99% Ed Plan: 82%	GPA: 2.75 Success: 75% Persistence: 89%
Part Time, Possible Transfer, Lower Income (Asian & Latino/a)	5,576 27.6%	Part-Time 7.09 Term Units 77.24 Cum Units 18% Enroll Online	Transfer: 78% Degree: 11% Cert.: 3%	Applied: 88% Received: 53% PELL: 15% Low Income: 40%	CalWorks: 1% DSPS: 1% EOPS: 2% Foster Youth: 1%	Orientation: 50% Major: 98% Ed Plan: 66%	GPA: 2.46 Success: 65% Persistence: 65%
Part-Time, Returning Students (Asian & White)	4,301 21.3%	Part-Time 5.87 Term Units 40.33 Cum Units 16% Enroll Online	Transfer: 42% Degree: 12% Cert.: 8%	Applied: 2% Received: 0% PELL: 0% Low Income: 13%	CalWorks: 0% DSPS: 1% EOPS: 0% Foster Youth: 1%	Orientation: 10% Major: 82% Ed Plan: 31%	GPA: 2.79 Success: 76% Persistence: 55%
Full-Time, Transfer Bound, Higher Income (Asian)	4,146 20.5%	Full-Time 15.23 Term Units 60.76 Cum Units 18% Enroll Online	Transfer: 90% Degree: 7% Cert.: 1%	Applied: 1% Received: 1% PELL: 0% Low Income: 6%	CalWorks: 0% DSPS: 1% EOPS: 0% Foster Youth: 0%	Orientation: 61% Major: 98% Ed Plan: 77%	GPA: 3.01 Success: 81% Persistence: 90%
DSPS and Adaptive PE Students (White)	514 2.5%	Part-Time 3.91 Term Units 202.7 Cum Units 1% Enroll Online	Transfer: 4% Degree: 3% Cert.: 1%	Applied: 42% Received: 51% PELL: 0% Low Income: 4%	CalWorks: 0% DSPS: 94% EOPS: 0% Foster Youth: 0%	Orientation: 1% Major: 37% Ed Plan: 13%	GPA: 2.38 Success: 96% Persistence: 87%

Notes: Term units and cum units are averages; all other indicators are yes/no responses.