

Forecasting Enrollment to Achieve Institutional Goals

by Janet Ward

As strategic and budget planning commences at community colleges, baccalaureate institutions, and comprehensive universities, administrators turn to enrollment professionals to forecast next year's enrollment. At my institution, some models project enrollment for five years, whereas others project enrollment for ten years. What administrators seek are reliable projection models that will forecast enrollment in one or more of the following areas:

- **Size:** What is the headcount projected to be? Will the goal be achieved? How will this influence student credit hour generation and tuition revenue?
- **Enrollment Profile:** What percentage of the total headcount will be undergraduate versus graduate students? For two-year institutions, what percentage will be pursuing a two-year transfer degree, a vocational degree, or high school completion?
- **New Student Profile:** Will the academic ability of our incoming class meet institutional goals (*e.g.*, entrance exam scores, grade point averages)?
- **Enrollment Mix:** Will the institutional goals for attaining specific student body characteristics be achieved? This may include, for example, the percentage of students of a certain gender, ethnicity, international status, registration status (full-time versus part-time), or lodging status (residential versus commuter)?
- **Enrollment Outcomes:** Will the persistence rate for first-time full-time freshmen be enhanced? Will retention from spring term to fall term be sustained or improved across all student levels? Will graduation rate goals be achieved?
- **Financial Aid and Net Revenue:** Will the financial aid strategy support the size, enrollment mix, and enrollment outcome goals while achieving the net revenue goal?

The starting point for enrollment forecasting is understanding what your institution wants to achieve in the areas noted above, as well as your present state. With a roadmap that outlines where you want to go (known as an institution's enrollment management plan), forecasters are able to construct forecasting models that address the areas of greatest interest to the administration.

Enrollment projections are tied to analyzing current trends, understanding the primary drivers that impact enrollment and revenue outcomes, and using this information to influence future strategy and resource decisions. This article discusses three models tied to new student projections that illustrate the primary elements for building an effective projection for

- **Size:** This model focuses on the flow from application to enrolled student. This model can be designed to project the number of applications required to achieve matriculated student goals as well as to improve admit rates, which is a measure used by more selective institutions.
- **Profile:** When the fall headcount (size) is determined, this model provides a method for distributing new students across the various levels of academic ability (*e.g.*, based on grade point average or SAT scores). This distribution is useful for financial aid administrators because it impacts the projected institutional financial aid expenditure and therefore the projected net revenue.
- **Mix:** When size is determined, this projection modeling is useful for forecasting the number of students required to achieve mix goals, for example, in terms of gender and ethnicity.

New Student Projection Model: Size

- **Goal:** To accurately project the size of the entering new student class.

Table 1: New Student Projection Model—Size

| Undergraduates | Actual | | | | | | Projected |
|---|--------|-------|-------|-------|-------|----------|-----------|
| | 2001 | 2002 | 2003 | 2004 | 2005 | 3-Yr Avg | 2006 |
| Enrolled New High School Students | 647 | 603 | 683 | 635 | 710 | 676 | 650 |
| Admit Rate/Application Data for Traditional Undergraduates | | | | | | | |
| Admit Rate: High School (%) ¹ | 94.3 | 95.8 | 91.9 | 92.8 | 84.8 | 89.8 | 80.0 |
| Applications | | | | | | | |
| Total Received (n) ² | 1,769 | 1,699 | 1,900 | 1,809 | 1,921 | | 2,100 |
| Completed (n) ² | 1,558 | 1,564 | 1,778 | 1,716 | 1,858 | | 1,995 |
| Completed (%) | 88.1 | 92.1 | 93.6 | 94.9 | 96.7 | 95.1 | 95 |
| Annual Application Growth (%) | 17.2 | -4.0 | 11.8 | -4.8 | 6.2 | 4.5 | 9.32 |
| Admits (n) | 1,469 | 1,499 | 1,634 | 1,592 | 1,576 | | 1,596 |
| Denied (n) | 89 | 65 | 144 | 124 | 282 | | 399 |
| Yield (% Admits Enrolled) | 44.0 | 40.2 | 41.8 | 39.9 | 45.1 | 42.2 | 40.7 |
| Alternate Projection Method³ | | | | | | | |
| Enrolled New High School Students ⁴ | | | | | | | 674 |
| Difference from Original Projection | | | | | | | +24 |

¹ Adjust variables to influence the enrolled student goal. The final headcount goal for incoming freshmen may be influenced by adjusting either the *Admit Rate* or *Yield Rate*. If the admit rate is increased, then more students will be admitted which in turn will increase the enrolled number. If the yield rate is increased even though the admit rate is held constant, this too will increase the enrolled number. This model allows testing both Admit Rate and Yield Rate assumptions when projecting the final enrolled student goal.

² The drivers in this model are the total applications received and completed percentage. Both numbers are determined by enrollment leaders and then hard coded into the projection model. This information drives other calculations within the model (e.g., *Total Received* multiplied by *Completed [%]* determines the number of completed applications).

³ Used when Yield at 3-Yr Avg (42.2%) is different from goal (40.7%).

⁴ Alternate headcount calculated by multiplying Projected 2006 Admits (1,596) by the 3-Yr Avg Yield (42.2%).

■ **Principle:** Past performance is one of the best predictors for the future.

To achieve the institutional mission and to sustain economic vitality, colleges and universities need to annually achieve enrollment goals. Each institution may have a different set of enrollment drivers based on the mission: Four-year institutions may focus on increasing access or selectivity, whereas community colleges may focus on achieving enrollment goals for specific vocational and transfer programs. Regardless of the type of institution, the following projection model may be adapted to project new student goals for any given term.

This model's principle is to first understand past performance tied to the

- number of applications received
- percentage of applications completed
- percentage of students admitted
- yield rate percentage (number enrolled divided by number admitted)

When constructing the model, it's important to gather three to five years of historical data throughout the student timeline, from new student applicant to registered student (e.g., January through August/September), and to determine how frequently data will be captured and analyzed (e.g., daily, weekly, biweekly, monthly). Along with the data, it will be important to understand any unique occurrences in a given year or point in time that may have influenced the numbers being reported. For example, if you look at the three-year trend for completed applications and there is a significant

increase in the percentage during April, the key is to understand whether an institutional activity occurred that would explain the increase (e.g., a special mailing to students) and whether this tactic will occur in the future. If the tactic is planned to occur again, then the forecasting model may assume that a similar percentage of applications will be completed next April.

CONSTRUCTING THE FORECASTING MODEL

The components of the forecasting model are illustrated in Table 1 and include

- *Capturing historical trends:* This is demonstrated in the Table 1 columns with the 2001–2005 data.
- *Creating an average of the most recent historical trends* (two-year, three-year, or four-year): This is shown in the Table 1 column headed “3-Yr Avg,” which is the previous three-year average for key indicators.
- *Providing a headcount goal for the given term:* This is demonstrated in Table 1 in the 2006 projected number of enrolled new high school students (650).

Drivers in this projection model include

- *Total applications received* (See Table 1 for the 2006 projected total number of applications to be received [2,100].)
- *Completed applications (%)* (See Table 1 for the 2006 projected percentage of applications to be completed [95%].)

The variables in this projection model include

Table 2: New Student Profile and Projection Model by Academic Ability—Applications

| Application Year | Academic Ability (Grade Point Average) at Entrance of All Freshmen Applicants ¹ | | | | | | | | | Completed Applications | |
|--------------------------|--|-----------|-----------|-----------|-----------|-----------|------------|---------|-------|------------------------|-------------------|
| | 4.00–3.61 | 3.60–3.51 | 3.50–3.26 | 3.25–3.10 | 3.09–3.00 | 2.99–2.80 | Below 2.80 | Unknown | Total | (n) | (%) |
| Historical Data | | | | | | | | | | | |
| 2002 | 154 | 129 | 409 | 233 | 133 | 199 | 322 | 120 | 1,699 | 1,564 | 92.1 |
| 2003 | 207 | 150 | 496 | 274 | 144 | 234 | 278 | 117 | 1,900 | 1,778 | 93.6 |
| 2004 | 158 | 179 | 446 | 270 | 122 | 231 | 334 | 69 | 1,809 | 1,716 | 94.9 |
| 2005 (final) | 186 | 181 | 457 | 284 | 158 | 240 | 353 | 62 | 1,921 | 1,858 | 96.7 |
| Projected Data | | | | | | | | | | | |
| 2006 | 203 | 198 | 500 | 311 | 173 | 262 | 386 | 68 | 2,100 | 1,995 | 95.0 ¹ |
| Percentage of Row Total | | | | | | | | | | | |
| 2005 | 9.7 | 9.4 | 23.8 | 14.8 | 8.2 | 12.5 | 18.4 | 3.2 | | | |
| Avg. of previous 2 years | 9.2 | 9.7 | 24.2 | 14.9 | 7.5 | 12.6 | 18.4 | 3.5 | | | |
| Avg. of previous 3 years | 9.8 | 9.1 | 24.8 | 14.7 | 7.5 | 12.5 | 17.1 | 4.4 | | | |

¹ 2006 percentage completed applications; Decision point—follow most recent data or two-year or three-year trend?

■ **Admit Rate:** This is the percentage of completed applications to be admitted (*See* Table 1 for 2006 Admit Rate projection [80%]). This factor is important for more selective institutions and/or those needing to control the size of the new student class. In the model, adjusting the admit rate will adjust the yield rate.

■ **Yield Rate:** This is the percentage of admitted students projected to enroll (*See* Table 1 for 2006 Yield Rate projection [40.7%]). Yield rate is defined as the number of enrolled new high school students divided by the number of admits.

Enrollment forecasting is both an art and a science. Although the projection model shows historical trends and recent three-year averages, significant discussion occurs with enrollment leaders to determine what should be the final projections. In the example illustrated in Table 1, a decision was made to reduce the projected admit rate by setting a goal of 80 percent, even though the percentages for 2005 and the three-year average were higher. In addition, the projected number of total applications was increased in response to new tactics employed by the admissions office to stimulate application growth.

Table 1 provides a snapshot in time based on fall census information, but it is useful to track this level of information on a biweekly or weekly basis to understand historical patterns tied to growth in applications and admits.

The 2006 projection is based on a 40.7 percent yield rate, which more closely aligns with 2002–2004 data; the 2005 yield rate of 45 percent was viewed as an anomaly.

An alternative enrollment projection (bottom right of Table 1) indicates that if the admit goal (1,596) is achieved and the three-year yield rate of 42.2 percent is used, then 674 students are projected to enroll, or 24 students above the goal. Providing an alternative model allows a forecaster to project a headcount range (*e.g.*, 650–674), which may be useful for

some areas of the university, such as financial aid, housing, class scheduling, and other areas.

Although Table 1 demonstrates historical trends for new students entering from high school, this model may be adapted for new undergraduate transfer students or students entering specific programs (*e.g.*, vocational programs, master’s or doctoral programs).

New Freshman Profile: Projections by Academic Ability

■ **Goal:** To project the enrolled student headcount goal by level of academic ability. These data inform the financial aid strategy as it relates to the projected number of students who may receive institutional merit aid by category; these headcount data impact financial aid expenditure projections.

■ **Principle:** Past trends are the foundation for the projection model, provided an annual analysis occurs to understand changes between the various years.

When the overall new student goals for applications, completed applications, admission offers, and enrolled students have been determined, the next step in the process is to project the student distribution across various academic ability categories. Key elements in the forecasting model follow, which are illustrated in Table 2:

- Various academic ability groups
- Total applications for various years
- Total completed applications for various years
- Percentage of total applications that were completed
- Historical data from various years (2002–2005)
- 2006 projections by academic ability category

The 2006 projection is based on determining what percentage of the total applications (2,100) will fall into each category. Options include using the percentages from the

- most recent year (2005)

Table 3: New Student Profile and Projection Model by Academic Ability: Admits

| Admission Year | Academic Ability (Grade Point Average) at Entrance of All Freshmen Admitted | | | | | | | | | Admit Rates (%) |
|--------------------------------|---|-----------|-----------|-----------|-----------|-----------|------------|---------|-----------|-----------------|
| | 4.00-3.61 | 3.60-3.51 | 3.50-3.26 | 3.25-3.10 | 3.09-3.00 | 2.99-2.80 | Below 2.80 | Unknown | Row Total | |
| Historical Data | | | | | | | | | | |
| 2002 | 153 | 128 | 408 | 228 | 133 | 195 | 252 | 2 | 1,499 | 95.8 |
| 2003 | 205 | 150 | 492 | 263 | 138 | 212 | 172 | 2 | 1,634 | 91.9 |
| 2004 | 158 | 175 | 440 | 264 | 119 | 222 | 210 | 4 | 1,592 | 92.9 |
| 2005 (final) | 183 | 181 | 445 | 268 | 148 | 204 | 144 | 3 | 1,576 | 84.8 |
| Projected Data | | | | | | | | | | |
| 2006 | 185 | 183 | 451 | 271 | 150 | 207 | 146 | 3 | 1,596 | 80.0 |
| Percentage of Row Total | | | | | | | | | | |
| 2005 (final) (%) | 11.6 | 11.5 | 28.2 | 17.0 | 9.4 | 12.9 | 9.1 | 0.2 | | |

- previous two-year or three-year average

FORECASTING APPLICATIONS

The projected 2006 distribution by category of academic ability shown in Table 2 (on page 43) was generated by using data from 2005. As an example, in the 4.00–3.61 grade point average category, it is expected that 9.7 percent of the 2,100 applications will fall here, totaling 203 applications.

The final column of numbers in Table 2 provides the trends in the percentage of completed applications. In the new student projection model demonstrated earlier (Table 1, on page 42), the decision was to use a 95 percent completion rate for 2006 (1,995 completed applications). By reviewing the past historical trends for number of admits, number denied, and yield, a decision was made to use 2005 data, considering there was no significant difference between 2005 data, the two-year average, or the three-year average.

This model is adaptable for any institution trying to understand the academic ability of its incoming class, with the option to make further adaptations to construct forecasting models to provide historical trends for significant populations, such as

- early action freshmen (those who apply by a specific date)
- non-early action freshmen (those who apply after the deadline)
- transfer students
- female students/male students
- other groups important to your institution

FORECASTING ADMITS

When satisfied with the application projection by category, the next step is to determine the appropriate admission break out. Table 3 provides similar information to that in Table 2, but for students admitted into each category. Note the 2006 projections by academic ability category, which are based on determining what percentage of the 1,596 total admits will fall into each category. This model assumes the total admits will follow the 2005 final distribution (bottom row of Table 3). Remember that the 1,596 admit projection is based on the

assumption that 80 percent of the completed applications (1,995) will be admitted.

For example, in the 4.00–3.61 grade point average category, the projected number of admits is based on the assumption that 11.6 percent, or 185 admits, will fall into this category.

Although not demonstrated in Table 3, this projection model includes the previous two-year and three-year averages, similar to what was demonstrated in the applications model earlier in this article (see Table 2, on page 43).

FORECASTING ENROLLED STUDENTS (YIELD RATES)

After decisions on admits have been finalized, the final set of decisions will be tied to yield rates. Although looking at trend data is useful in forecasting yield, it is vital to understand how the financial aid strategy (need-based and non-need-based aid) influenced historical yield rates. The following are questions to explore for students by academic ability group:

- Was there a difference in the yield rate for students based on their level of need (high, medium, low, or no need)? Is the yield rate by need level institutionally defined?
- When reviewing yield rates by academic ability group between years, are there any significant differences? If so, can the differences be explained?
- What current strategy is being employed to improve yield rates for the incoming class and how may this influence the yield rate projection for any of the academic ability groups?

Unlike the application and admit sections, the driver for determining the enrolled student headcount goal is the projected yield rate by category. Although the overall goal in the projection model is a yield rate of 40.7 percent for the incoming class, the challenge is to establish a reasonable projected yield rate by academic ability category.

The final headcount projection (650 students) in Table 4 is obtained from multiplying the total admits (1,596) by the projected yield rate (40.7%). Also shown in this table is the yield by academic ability category, which gives the final rates for the 2006 model.

Table 4: New Student Profile and Projection Model by Academic Ability: Enrolled Students

| Enrollment Year | Academic Ability (Grade Point Average) at Entrance of All Enrolled Freshmen | | | | | | | | Row Total |
|-------------------------------------|---|-----------|-----------|-----------|-----------|-----------|------------|---------|-----------|
| | 4.00–3.61 | 3.60–3.51 | 3.50–3.26 | 3.25–3.10 | 3.09–3.00 | 2.99–2.80 | Below 2.80 | Unknown | |
| Historical Data | | | | | | | | | |
| 2002 | 45 | 58 | 176 | 79 | 47 | 94 | 104 | 0 | 603 |
| 2003 | 85 | 69 | 203 | 118 | 50 | 89 | 68 | 1 | 683 |
| 2004 | 64 | 71 | 159 | 115 | 45 | 82 | 99 | 0 | 635 |
| 2005 | 98 | 77 | 211 | 117 | 57 | 86 | 62 | 2 | 710 |
| Projected Data | | | | | | | | | |
| 2006 | 75 | 74 | 187 | 112 | 56 | 83 | 63 | 0 | 650 |
| Yield (%) | 40.5 | 40.6 | 41.6 | 41.5 | 37.5 | 40.3 | 43.5 | | 40.7 |
| Yield | | | | | | | | | |
| 2005 (final) (%) | 53.6 | 42.5 | 47.4 | 43.7 | 38.5 | 42.2 | 43.1 | 66.7 | 45.1 |
| Average of previous two years (%) | 47.5 | 41.6 | 41.8 | 43.6 | 38.2 | 39.4 | 45.5 | | 42.5 |
| Average of previous three years (%) | 45.2 | 42.9 | 41.6 | 44.0 | 37.5 | 40.3 | 43.5 | | 42.2 |

Table 5: New Student Mix: Projection by Gender

| Gender (First-time Freshmen) | Applied | | | | Admitted | | | | Registered | | | |
|---|---------|------|------|------|----------|------|------|------|------------|------|------|------|
| | 2005 | 2004 | 2003 | 2002 | 2005 | 2004 | 2003 | 2002 | 2005 | 2004 | 2003 | 2002 |
| Early Action (Fall Census) | | | | | | | | | | | | |
| Women | 635 | 614 | 674 | 460 | 575 | 578 | 639 | 430 | 298 | 253 | 323 | 214 |
| Men | 250 | 239 | 216 | 178 | 224 | 232 | 199 | 169 | 117 | 124 | 119 | 86 |
| Men (%) | 28 | 28 | 24 | 28 | 28 | 29 | 24 | 28 | 28 | 33 | 27 | 29 |
| Yield | | | | | | | | | | | | |
| Women (%) | | | | | | | | | 52 | 44 | 51 | 50 |
| Men (%) | | | | | | | | | 52 | 53 | 60 | 51 |
| Males—Change from Previous Conversion Stage (%) | | | | | -0.2 | 0.6 | -0.5 | 0.3 | 0.2 | 4.2 | 3.2 | 0.5 |
| Regular Admission (Fall Census) | | | | | | | | | | | | |
| Women | 664 | 642 | 711 | 710 | 519 | 530 | 570 | 624 | 192 | 162 | 162 | 200 |
| Men | 372 | 314 | 299 | 351 | 258 | 252 | 227 | 276 | 103 | 96 | 79 | 103 |
| Men (%) | 36 | 33 | 30 | 33 | 33 | 32 | 29 | 31 | 35 | 37 | 33 | 34 |
| Yield | | | | | | | | | | | | |
| Women (%) | | | | | | | | | 37 | 31 | 28 | 32 |
| Men (%) | | | | | | | | | 40 | 38 | 35 | 37 |
| Males—Change from Previous Conversion Stage (%) | | | | | -2.7 | -0.6 | -1.1 | -2.4 | 1.7 | 5.0 | 4.3 | 3.3 |

New Freshman Mix: Projections by Gender

- **Goal:** To project the enrolled student headcount goal to achieve mix goals based on gender.
- **Principle:** The foundation for the projection model is past trends, provided an annual analysis occurs to understand changes between years.

Most institutions seek to enroll more than just a target number, but want to meet student body characteristics that are tied to institutional mission (e.g., based on gender, ethnicity, access). It may be worthwhile to develop a model focused on whatever student body characteristics are highly valued by your organization.

In this section, two models are presented that look at gender for the incoming freshman class in terms of applicants, admits, and enrolled students (see Table 5):

- **Early Action Model:** New students who met the early action application deadline
- **Regular Admission Model:** All other new students

The models were designed to understand how men flowed through the admission funnel so as to support the goal of reaching 35–40 percent men in the new student class.

After comparing the two models:

- What is suggested about male applicants? More men apply as regular admission students than as early action applicants, as can be seen in Table 5 by comparing the 2002–2005 numbers for both applicant types.
- What is suggested about male admits? The percentage of early action applicants and admits remains similar, whereas those who fall into the regular admission process have lower conversation rates from applicant to

admit. (See the “Change from previous conversion stage” rows for early action versus regular admission males in Table 5.) This suggests that early action male applicants may be more committed to coming to the institution than are regular admission males.

- What is suggested about registered male students?
 - ▶ Early action men have a higher yield rate than regular admission men.
 - ▶ Most years men have a higher yield rate than women when comparing early action students and regular admission students.
 - ▶ If the goal is to increase the percentage of enrolled men to reach 40 percent of all freshmen, then the focus would need to fall on increasing the number of qualified men in the applicant pool in order to increase the number of men in the admit pool.

Conclusion

Enrollment forecasting is a complex process that requires an understanding of institutional enrollment goals as well as past and current strategies employed to realize the goals, all while developing models that reliably project future enroll-

ment. Models should be constructed based on historical data with this information placed into context. The most effective models emerge when changes in trends can be explained by changes in the surrounding competitive higher education environment (*e.g.*, understanding why students chose to attend a competitor) or changes within the institution (*e.g.*, understanding how a new financial aid strategy impacted yield rates). Overall, it is important to appreciate that enrollment forecasting is an iterative and collaborative process, with models being annually reviewed and refined based on feedback from various constituents within the community.

ABOUT THE AUTHOR

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