RETENTION RATES AT ESU: ASYMMETRY OF INFORMATION AND SCREENING DEVICES

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Dr. Greg Martinez, the Director of the Academic Success Center (ACSU) at the Eastern Sanders University (ESU), was reviewing the university's annual report as he waited for the rest of the team to join the monthly meeting. The report revealed a retention rate of 71.8%, the lowest rate since ESU's inception in 1944. This news was distressing for the faculty and staff – and especially for Dr. Martinez – who strongly believed in ESU's high-quality education.

Dr. Martinez had stepped down from his position as a full-time faculty member to join the administration three years prior. He loved his students and the positive learning environment fostered throughout his 20 years of teaching. However, he wanted to address the ominous trend of high dropouts at ESU, a liberal art college located in the heart of Tampa, Florida. After graduating with a Ph.D. in Economics, he worked as an assistant professor at a small college but soon accepted a position at ESU, where the diversity of the student body convinced him to settle his roots in Tampa.

Dr. Martinez and his team extensively researched the factors affecting retention at ESU. The outcomes of this research corroborated Dr. Martinez's conjecture that ESU had limited information on applicants' non-academic abilities required for adapting to college life, exposing ESU to financial and retention rate projections based on incomplete information concerning first-year cohorts of students.

The author developed the case for class discussion rather than to illustrate either effective or ineffective handling of the situation. The case and its accompanying instructor's manual were anonymously peer reviewed and accepted by the ***Journal of Case Research and Inquiry, Vol. 7, 2022***, a publication of the Western Casewriters Association. Contact Karla Borja, The University of Tampa, 401 W. Kennedy Blvd., Box O, Tampa, FL 33606, kborja@ut.edu.

Previous attempts to bolster retention rates had been partially successful, including the creation and funding of the ACSU, where first-year students had access to free tutoring, advising, academic exploration, and scholarship programs.

Nonetheless, Dr. Martinez was ready to try something new. With his knowledge and experience in economic theory, Dr. Martinez developed a *"screening device"* model to identify first-year students with limited non-academic skills so that resources could be focused on these students. While waiting for his team, Dr. Martinez pondered over the screening device. Would it be effective to differentiate at-risk students? Would the Provost be on board with the implementation of this device? Dr. Martinez understood that ESU's financial position could not be exposed to another year of low retention rates; hence, if approved, could the screening device be implemented during the next school year?

ESU's Efforts to Improve Retention Rates

Dr. Martinez understood that no higher education institution was indifferent to low retention rates. Still, low numbers were distressing for a private institution such as ESU. A low retention rate led to mismatches between revenues and expenses, compromising the long-term financial sustainability of the organization. ESU, a private liberal arts school comprising 7,200 undergraduate students, was accredited by the Southern Association of Colleges and the School Commission on Colleges (see Appendix A). The university was considered one of the best undergraduate institutions in the Southeastern United States, which made it an attractive higher education institution among domestic as well as international students (Appendix B).

ESU annually developed its budget based on a set of assumptions regarding retention rates and donor contributions, but student withdrawals before the end of their four-year plans caused an unfavorable revenue shortage.

Dr. Martinez noted that many renowned private universities throughout the United States were closing majors and reducing tenure-track faculty positions, with the regretful outcome of having their accreditations revoked (Boylan 2019; Horn 2018). He wanted to ensure that ESU improved its retention rates and avoided such a negative outcome.

Dr. Martinez completed an extensive study on the factors explaining retention rates while serving as the Director of the ACSU. He found that academic success measured via high school grade point average (HSGPA) was a core element that was already requested by ESU in the application form. He knew that average HSGPA value was in line with peer-institutions (refer to Exhibit 1). However, Dr. Martinez was unable to obtain non-academic information about ESU students. He had come across an article a few years prior regarding the positive effect of non-academic skills on studying habits and adjustment to college life. However, ESU did not obtain students' data on non-academic skills.

Exhibit 1. Retention Rates in Peer Institutions

Source: College Data

Institution	First Year Retention Rate	Acceptance Rate	Undergraduate Enrollment	Average High School GPA
ESU	71.8%	58%	7,200	3.52
University of Tampa	79.3%	48%	8,400	3.40
Loyola Marymount U	89.9%	47%	6,700	3.81
Hofstra University	82.1%	63%	6,800	3.61
Elon University	89.2%	67%	6,100	3.98

Note: Information from peer institutions was retrieved from their websites and CollegeData at http://www.collegedata.com. The first-year retention rate is the percentage of the school's first-year undergraduate students who continued to the next year at that school. The acceptance rate is the ratio of the number of students accepted to the number of applications.

Dr. Martinez and his ACSU team reviewed the admission guidelines of other higher education institutions, including community service and other non-academic activities during high school. He wondered if non-academic factors could explain the high dropouts at ESU.

Extracurricular Activities as a Screening Device

As an economist, Dr. Martinez knew that accepting students to college was inherently a problem of asymmetric information. The Admissions Office had limited knowledge of the non-academic abilities and adaptability attributes of a potential student, and those with poor skills would not provide this information on a college admission form. Unknowingly, the Admissions Office enrolled a group of students who were otherwise ill-equipped to succeed in college.

A simple —but ineffective— solution was to directly ask the applicants about their non-academic skills. However, who would highlight poor skills and abilities in a college application? Dr. Martinez needed a screening device that would *"reveal"* the level of non-academic attributes among applicants. He knew that ESU and most universities utilized screening devices to gauge students' academic success, such as a minimum high school GPA (HSGPA). The Admissions Office checked the HSGPA rather than directly asking applicants about their academic abilities. Nevertheless, non-academic skills were difficult to measure and had seldom been addressed in the literature that Dr. Martinez had reviewed up to that point (DeBerard *et al.* 2004; Sommerfeld 2011).

Dr. Martinez contemplated the relevance of non-academic skills such as interpersonal attitudes, time management, and organizational skills to explain a better transition from high school to college life. What type of information could reveal such skills? Based on his research, Dr. Martinez had become aware that academic and socioeconomic factors were systematically employed as screening devices by ESU and its peers, but he found no device measuring non-academics (refer to Exhibit 2).

Exhibit 2. Factors Increasing the Probability of Success in College

Source: Melendez 2016; Misra and McKean 2000; Lotkowski et al. 2004.

(1) Academics	(2) Socioeconomics	(3) Non-Academics
- High school GPA (HSGPA) - Standardized pre-college tests - High school advanced courses (Honors programs)	- Family income - Racial and gender compositions - Social and financial support - Age - Labor market conditions upon graduation	- Self-confidence - Study and reading habits - Adaptability to connect with peers, faculty, and community - Time management skills - Organizational skills - Perseverance and commitment - Detailed goals and long-term aspirations

Dr. Martinez read that high school students participating in extracurricular activities (ECAs) showed more positive development and less risky behavior than those who did not. After-school programs cultivated the sense of being an active member in a community and being socially recognized and valued in a group, facilitating social networking among peers and adults. Participation in ECAs was also associated with better interpersonal aptitude, self-conceptualization, school engagement, and educational aspirations. (Refer to Eccles *et al*. 2003; Marsh & Kleitman 2002; Durlak *et al.* 2010; Youniss *et al.* 1999; Lotkowski *et al.* 2004.) Dr. Martinez believed that he found the screening device needed to access non-academic information of ESU applicants. ECAs promoted the development of such skills and could be measured by the number of ECA hours invested during high school.

Dr. Martinez understood that no screening device would be able to remove the asymmetry-of-information problem; still, these devices were known for improving applicants' evaluations. He anticipated that ECAs would assist him in recognizing students with similar academic backgrounds but different non-academic skills. He also knew that an effective screening device could sort out students, but wondered if ECAs could sort two types of applicants with similar HSGPA: those better equipped to adapt and adjust to new challenges, ideas, and diverse people, defined as A-type, and those who would face hardships when coping with new environments, defined as B-type.

ESU had already committed considerable financial resources to its First-Year Experience program, the ACSU, the Career Exploration Program, and the *"Tutor-In,"* which was a free academic tutoring program. Still, many of these programs provided limited results in terms of retention rates due to the tardiness of identifying B-type students. They were also expensive endeavors since they had to be completed by all first-year students (A-type and B-type). The ineffective use of ESU resources prompted Dr. Martinez to try ECAs as a screening device.

While going over the report, many questions occupied Dr. Martinez's mind. First, he was unsure about the effectiveness of the screening device for identifying B-type students. He knew that other screening devices, such as HSGPA, already assisted ESU in spotting students with academic deficiencies, but he did not have evidence that ECAs would function as an operational device to isolate non-academic skill deficiencies. He also wondered how this procedure could be ethically implemented. The categorization of students according to HSGPA was a standard procedure, but segregating them based on non-academic skill levels could bring forth feelings of injustice and unfairness. For instance, while discussing the ECA model with a colleague a few days ago, Dr. Martinez was appalled by her comment: *"Many high school applicants with limited financial resources would not be able to access ECA opportunities at their schools and be labeled as B-types."* Furthermore, explaining the program to the Provost, the Faculty Senate, and the administration posed another challenge.

In the report, Dr. Martinez recommended that questions regarding the number and type of ECAs should be added to the admission forms. ECAs were classified into four categories: (1) volunteer activities, such as church services or community services; (2) performance activities, such as school band, drama, or dance; (3) sports and cheerleading; (4) academic clubs, such as debate, foreign language, math, chess, or science clubs. Dr. Martinez explained that the purpose of the ECA was not to decrease the number of admitted students but to identify at-risk students early in the first semester so that ESU could tailor remedial courses, programs, and services specific to this group of students.

Identification of Students: The Screening Device Model

Dr. Martinez labeled the two types of applicants as A-type, or those with well-developed non-academic skills, and B-type, or those with limited non-academic skills.

When admitting two students with similar HSGPA, A-types had a higher probability of adapting well to college life, while B-types were likely to struggle to adapt to the new experiences. He recognized that most applicants would signal themselves to be A-types if they were simply asked about their non-academic skills. The ECA information was a screening method that would signal the type because ECAs were correlated with the development of non-academic skills.

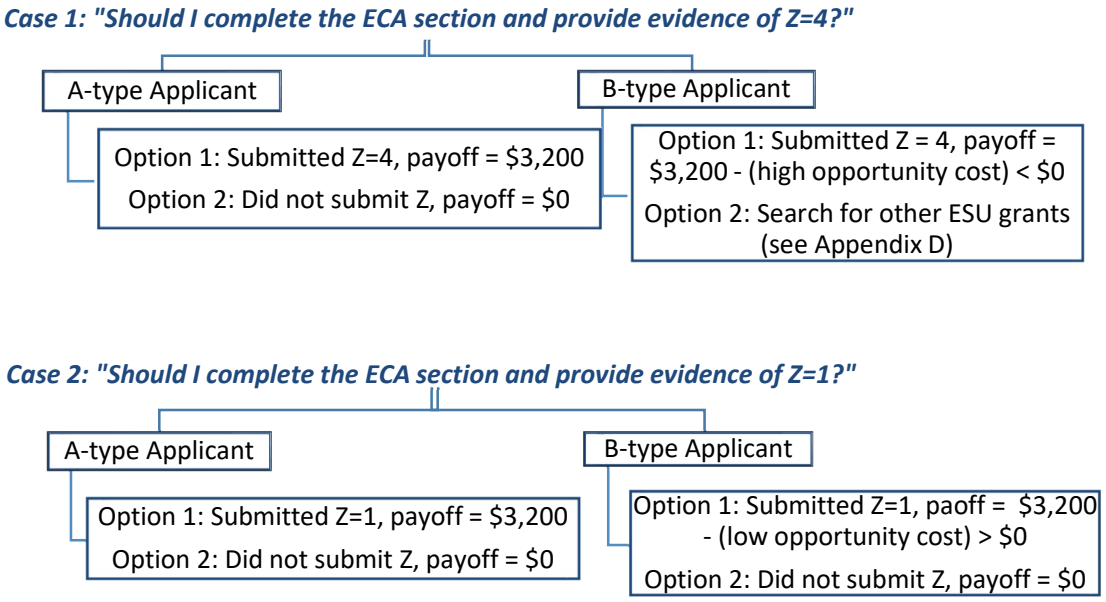
Dr. Martinez admitted that few ECA hours might not be enough to determine the types of the applicants because most high school students could fulfill the listed requirements (*e.g.,* one hour of ECA per month). Therefore, Dr. Martinez developed a model using game theory tools wherein the number of ECA hours per week in high school, defined as *"Z,"* was the variable to be solved. Finding *"Z"* required some assumptions concerning the cost of ECAs for a typical high school student. For instance, a student needed to sacrifice part-time jobs, playtime, and family time (*i.e.,* opportunity costs) to participate in ECAs. An A-type student, who enjoyed and felt comfortable being involved in ECAs, would experience a significantly less opportunity cost than a B-type student.

In the report to the Provost, Dr. Martinez proposed a scholarship of $3,200 among accepted students who submitted evidence of *"Z."* This amount would serve as an incentive to complete the ECA form by A-types, which required letters of recommendations and essays describing their role in ECAs during high school. Dr. Martinez's model produced a *"Z"* between 3.3 and 6.7 ECA hours per week. (The mathematical model was described in Appendix C). He considered possible scenarios while thinking like a student (refer to Exhibit 3). At Z = 4, A-types applied for the ECA grant of $3,200 by submitting evidence of four hours of ECAs. B types, however, did

not apply for the ECA grant; the Z value was too high, and any attempt to imitate an A-type by submitting evidence of four ECA hours implied an opportunity cost that would produce negative payoffs. Alternatively, B-types could easily submit evidence at Z = 1. In this case, both types of students would apply for the ECA grants, and ESU would not separate the students.

Exhibit 3. Applicants Responses to the Screening Device

Source: Author's Notes



Note: The specific values of the opportunity costs for B-types were shown in Appendix C. However, without specific monetary values, a B-type applicant could get evidence of one ECA hour per week much easier than four ECA hours per week during a year in high school.

Conclusion

As he reviewed the report, Dr. Martinez was confident that the ECA information would assist ESU in recognizing academically worthy students but with limited non-academic skills. ESU could reinforce these skills early in the first semester by focusing on a specific group of students. As he welcomed his team members to the meeting, Dr. Martinez also questioned the assumptions of the model and wondered about the reliability of Z = 4. Additionally, he was concerned about possible misconceptions between non-academic skills and the socioeconomic conditions of the applicants, producing a false sense of unfairness that he did not know how to explain.

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Appendix A. Academic Accreditation and College Ranking

Academic Accreditation

The goal of accreditation is to ensure that institutions of higher education meet adequate levels of quality. Accrediting agencies are responsible for conducting periodic examinations to confirm that institutions meet specific criteria. The academic accreditation process represents a long and costly endeavor for any higher-education institution. However, the accreditation offers a valuable opportunity to be recognized as a high-quality education institution. Here are some of the factors that accredited organizations consider during the process:

First, the institution must collect and organize a long list of qualitative and quantitative data, representing an opportunity for the identification of low performance areas and continued improvement and innovation in curricular plans, assessment tools, and overall quality of education.

Second, accreditation promotes the integration of learning, evaluation process, and the academic growth of the institution. The institutions must conduct work related to technical infrastructure, systems, and assurance processes, so faculty can successfully deliver high-quality education.

Third, it promotes a culture of assessment and self-regulation. Accreditation is a process of an ongoing improvement of programs through constantly developing and sharing performance indicators.

Fourth, the programs must deliver academic knowledge that integrates well with work skills. The accreditation process requires a constant revision of the degree programs and curricular plan that reflect skill levels needed in the job market.

Fifth, the accreditation process requires faculty to innovate their lesson plans and improve alignments between content and assessment tools. At the same time, the university must open feedback channels, maintain a record of the changes and innovation, and provide reports of improvements and growth in academic knowledge and skills (SACSCOC n.d.; U.S. Department of Education n.d.).

Colleges Ranking Criteria

Using multiple criteria to assess the various dimensions of academic quality, several organizations rank colleges every year *(Forbes, US News, Times Higher Education, etc.)* These measures include impact factors on the quality of students and faculty and available resources. A list of some measures of quality used by these organizations is presented below (Morse & Brooks 2021):

- Retention rates and graduation rates
- Undergraduate academic reputation
- Faculty resources
- Class sizes
- Faculty compensations
- Proportion of faculty with terminal degree in their field

- Proportion of full-time faculty
- Student-faculty ratio
- Acceptance rate relative to applications
- SAT and ACT scores
- High school class standing
- Students' financial resources
- Alumni's giving rate
- Campus infrastructure and facilities
- Post-graduate success
- Campus diversity
- Success in the job market

Appendix B. News and Alumni Testimony about ESU´s Quality of Education

Princeton Review Ranks ESU

ESU has been nationally ranked the 25th and 29th top school for its entrepreneurship studies. The rankings were announced by The Princeton Review and *Entrepreneur* magazine.

ESU is the fourth-ranked school in Florida in the undergraduate category and ranked third in the graduate categories. In the Southeast, ESU was ranked No. 10 in undergraduate entrepreneurial studies and No. 5 in graduate entrepreneurial studies.

ESU Entrepreneur Center has supported more than 500 startups launched by students and alumni in the past five years and more than $120 million of funding raised.

The director of the Entrepreneurship Center said *"Our goal is to provide transformative educational experiences for our students. We are thrilled to be recognized as one of the top programs in the region."*

The Princeton Review's ranking is based on analyses of more than 40 data points from a survey. It includes questions about the proportion of faculty, students successfully involved in entrepreneurial endeavors, the number of mentorship programs, scholarships and grants, and the support for business plan competitions.

Alumni Testimony

Featured in ***Miami Magazine***, Alec Morgan '19 stated: *"My time at [ESU] was amazing. It was one of my best experiences in terms of education and faculty mentorship. My professors taught using different methods to adjust to different learners. All of them had practical experience in their fields and spoke to practical matters and cases."*

"[ESU] is an inclusive environment. They embraced my diverse background and I felt welcomed and appreciated in all my participations and contributions inside and outside the classroom. No matter who you are, they are ready to embrace different ideas and views" said Alec, during his interview.

"I believed in the mission of the school, and I believed in the professors," said Morgan. *"I knew I was going to get a great education here and its reputation would help me to reach the next step in my career, which it did."*

Appendix C. The ECA Model

Proposal: ECA grant of $3,200 to those students submitting Z in their application form.

Z = ECA hours per week during one year of high school, including evidence (recommendation letters and an essay explaining their role in the ECAs).

Objective: Z is large enough that separated the applicants in two types of students. A-Type = those applicants well-equipped to adapt and adjust to new challenges, ideas, and diverse people. B-type = those who could face hardships when coping with new environments.

Assumptions: In setting a dollar value to the opportunity cost of ECAs, Dr. Martinez used the average wage earned by a high school kid in a part-time job, say $10 per hour. For example, a member of the high-school band who practiced four hours per week (two days a week) incurred an opportunity cost of $40 per week ($10 × 4 hours). B-type students for whom ECAs were difficult and unpleasant, required double the effort than an A-type, and for the same four hours per week of band practice, a B-type incurred in an opportunity cost of $80 ($40 × 2). Most students were not actually choosing between ECAs and the earnings of a part-time job, but this framing provided a dollar value for the model.

Mathematical Model.

Finding Z: Under an effective screening device, A-types submitted Z. Other applicants with fewer Z (or no Z) were regarded as B-type. The optimal Z comes from two conditions:

Compatibility Condition A-type:

A-type payoff for submitting Z > A-type payoff for not submitting Z

$$\$3{,}200 - (\$10 * Z * 48) > \$0$$

Where: $\$10 * Z * 48$ = the ECA opportunity cost per year (48 weeks per year) for an A-type

$$\$3{,}200 - (\$480 * Z) > \$0$$

$$\$3{,}200 > \$480 * Z$$

$$\$3{,}200/\$480 > Z$$

$$6.7 > Z$$

Compatibility Condition B-type: Z was large enough that B-types did not have enough completed ECAs to apply to the ECA grant, and imitating A-type to get the grant was too costly. Mathematically,

B-type payoff for revealing their type (Z = 0) > B-type payoff for imitating A-type

$$\$0 \text{ (or other ESU grants)} > \$3{,}200 - (\$10 * Z * 48 * 2)$$

Where: $\$10 * Z * 48 * 2$ = the opportunity cost per year for a B-type (double than A-type)

$$\$0 > \$3{,}200 - (\$960 * Z)$$

$$960*Z>3{,}200$$

$$Z>3{,}200/960$$

$$Z>3.3$$

Under the assumptions described above, a 6.7 > Z > 3.3 separated the types of students.

Example:

If Z = 4,
A-type payoff for applying to the ECA grant = $3,200 – ($10*48*4) = $1,280.
B-type payoff for attempting to submit Z = $3,200 – ($10*48*4*2) = -$640.
B-type had no incentive to provide Z.

If Z = 1,
A-type payoff for applying to the ECA grant = $3,200 – ($10*48*1) = $2,720.
B-type payoff for attempting to submit Z = $3,200 – ($10*48*1*2) = $2,240.
Both types showed positive payoffs and submitted Z, and ESU did not separate the students.

In practice, most B-types would not participate in at least 4 hours of ECAs during a year in high school. It would be too costly in terms of other alternatives (job, free time, etc.) Even if they knew that ECAs could be requested during college application, it would be difficult to maintain 4 hours of ECA per week and eventually would opt for other college grants.

In practice, it could be possible that some B-types use deception in their applications and submitted Z. It would be possible that some B-types completed the minimum Z during high school, but showed limited non-academic skills. Screening devices could improve the asymmetry of information problem, but would not fully eliminate it.

Appendix D. ESU Website Information about Grants and Scholarships

Type	Requirements
1. Scholarships on academics	HSGPA or ESU cumulative GPA higher than 3.2 are considered for academic scholarships, ranging between $500 to 5,000 per semester.
2. Other ESU grants	Armed Forces, low-income family scholarship, business scholarships, Art, Film, Animation, and New Media grants, Health Science scholarships, Honors program, minority grants, study abroad grants, etc.
3. Outside grants	Armed Forces, minority scholarships, Florida state grants, etc.
4. Aid for Florida Residents	All full-time undergraduate Florida residents receive the Effective Access to Student Education (EASE) grant. Proof of Florida residency is required.
5. Federal Grants	Annual awards for federal need-based programs, such as Pell, SEOG and TEACH grants, range from $1,000 to more than $5,000.
6. Loans	All students enrolled in at least six credits per term qualify for federal loans.
7. Veterans Benefits	100% of the tuition and fees for veterans. Other veteran benefits available.
8. Employment	More than 500 jobs are available on campus.

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