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Supporting students to pursue computing degrees: A tale of a university's computing excellence scholarship

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Abstract

In 2021, the University of North Alabama decided to invest $2.5 million per year in scholarships for the next 10 years supporting students pursuing computing degrees. This paper will tell the story of why the university officials decided to make this major investment, how the computing department developed a process to screen and award scholarships and examine the initial findings during the first three years of this initiative. Post-implementation data reveals a consistent increase in enrollments, alongside notable findings from qualitative survey responses. The research demonstrates that well-designed scholarship programs can significantly enhance enrollments, draw talented students, and offer transformative opportunities for financially disadvantaged individuals.

Keywords: Computing degrees, Computing excellence scholarship, Student success

Introduction

Globally, there is a workforce shortage for jobs requiring highly technically skilled employees (Sork, 2024). In areas where high tech jobs are a major economic driver, organizations compete with one another to attract and retain technology talent (Khmelevska, 2022). Companies often base decisions on expanding current operations or opening new locations on the availability of a skilled high-tech workforce. Some innovative companies are seeking to expand operations to areas not traditionally seen as technology hubs, especially areas with a low cost of living and a regional university with high-quality computing and technology programs.

The University of North Alabama (UNA) is located in an area known as the Shoals, which is approximately 70 miles to the west of Huntsville, Alabama. The Huntsville area is consistently ranked as one of the top locations for technology jobs in the U.S. (McLaughlin, 2023). To leverage the Shoals proximity to Huntsville and its lower cost of living to attract new technology companies, the Shoals Economic Development Authority engaged with the Computer Science and Information Systems (CSIS) department and UNA in a joint effort to recruit new technology companies to the area. In initial conversations with prospective companies, one area of concern was the availability of technological talent in the immediate area.

To help address this, the UNA administration decided to invest heavily in an effort to grow the number of computing and technology graduates by committing $2.5 million per year over 10 years for computing and technology scholarships (Swain, 2021). The goal was not only to attract more students, but also to effectively compete for the best computing students that may not have otherwise chosen UNA to pursue a computing degree.

Certainly, other Universities have seen a similar need and taken a similar tack for competing in the market for top students. What makes our case different, however, is that the design, administration, and execution of the awarding processes for our scholarship was left entirely up to the faculty at the department level. We began from scratch, built data-driven procedures, and challenged common assumptions. Thus, the Computing Excellence Scholarship was born. Its stated objective was to offer monetary awards (in the form of reduced or waived tuition, fees, room and board) to prospective students who have shown excellence in their academic pursuits and who convincingly show their passion for pursuing computing degrees.

Being both exploratory and descriptive in nature, this paper details how the design and implementation of the scholarship award process was undertaken, what lessons were learned from that process, and the effectiveness of the design. Assessment of effectiveness is based on two fundamental research questions. The first one: "Is it possible to use a relatively simple points system to identify from the total pool of scholarship applicants those candidates that are likely to be academically successful?" We detail both the points system we created and why it was chosen. Then we analyze the academic performance of freshman awards recipients alone. The second question: "Can we show a relationship between providing financial resources to students and a positive impact on their academic outcomes?" Such continuing positive impacts should eventually lead to a higher graduation rate, which will meet the goals for the scholarship program.

Related work

Most existing research studies show that scholarships, regardless of their types, result in positive student outcomes. For instance, Barrow et al. (2014) found evidence that a performance-based scholarship increases student retention and academic performance. In another example, Bartik et al. (2021) found that a generous, place-based college scholarship increased college enrollment and credential attainment. Using cross-cohort and difference-in-difference estimation strategies, Bifulco et al. (2019) found that place-based scholarships improved college matriculation and retention. Similarly, financial aid (loans and scholarships) to students increased student enrollment and improved student performance (Canton & Blom, 2010). Using a comparative case study approach to triangulate cohort and survey data in the 2013 academic year for scholarship holders at three Australian universities, Zacharias and Ryan (2021) found that "scholarships consistently increased retention, reduced stress and bought recipients more time to dedicate to their studies" (p. 159).

Furthermore, research indicates that the availability of scholarships may attract students to choose a specific college over its competitors. For example, through analyzing data from 456 questionnaires and 23 interviews with the University of Tasmania (UTAS) Chinese international students, Wu and Myhill (2017) found that a larger number of scholarships was one of the primary motivators for the Chinese international students to choose UTAS, a regional Australian university, over universities in Australian metropolises.

A few research studies, however, indicate that scholarships have no or negligible effect on student outcomes. For instance, using microdata from the 2000 United States Census and 2001-2010 American Community Survey, Sjoquist and Winters (2015) found "strong consistent evidence that exposure to state merit aid programs had no meaningfully positive effect on individual college attendance or degree

completion" (p. 386). Also, using the difference-in-differences and generalized synthetic control estimators, Nguyen (2019) found that New York's Excelsior program (i.e., free tuition to eligible residents attending its state-funded two-year and four-year colleges and universities) did not increase their enrollment.

It is worth mentioning that one study indicates that the features of a scholarship program matter. Using data from the 2009-2014 American Community Survey, Jia (2019) found that leniency and generosity are important determinants of program effectiveness on educational outcomes. Specifically, it is found that "leniency of academic requirements for initial eligibility largely contributes to program effects on associate's degree completion, whereas generosity of scholarship amount significantly increases college attendance and bachelor's degree completion" (Jia, 2019, p. 2963).

The review of related work reveals three major issues in the existing literature: 1) there is a lack of studies using quantitative methodology; 2) the effect of scholarships on student outcomes is not conclusive; and 3) their research scope tends to be myopic. To address these issues, in this research, we attempt to depict a holistic view of our university's computing excellence scholarship, using both qualitative and quantitative data.

Predicting success

As mentioned previously, the details for how to design and administer the awards process for the new scholarship program were left entirely for the department to decide. In this section, we detail how decisions about the eventual design were made.

The first step was determining how to predict if a given student coming to college directly out of high school would graduate with a CSIS degree. We looked at historical data from the past 10 years. Initially, there were 1,000 records of high school students that were initially declared as a CSIS major. Seven features were examined and classified as either "graduated" or "not graduated" with a UNA CSIS degree. These seven features were readily available and seemed to be indicators that could prove to be helpful:

- Gender
- High School GPA
- ACT English subscore
- ACT Math subscore
- ACT Reading subscore
- ACT Science subscore
- ACT Composite score

After removing instances with missing information, 602 students were identified (Table 1):

Table 1: Students Identified

Status	Initial Data	Filtered
Graduated	364	204
Not Graduated	636	398
Total	1000	602

Among these, high school GPA was the most predictive indicator for students who graduate with a CSIS degree. Alternatively, the student's gender was the least predictive indicator of student success (Figure 1).

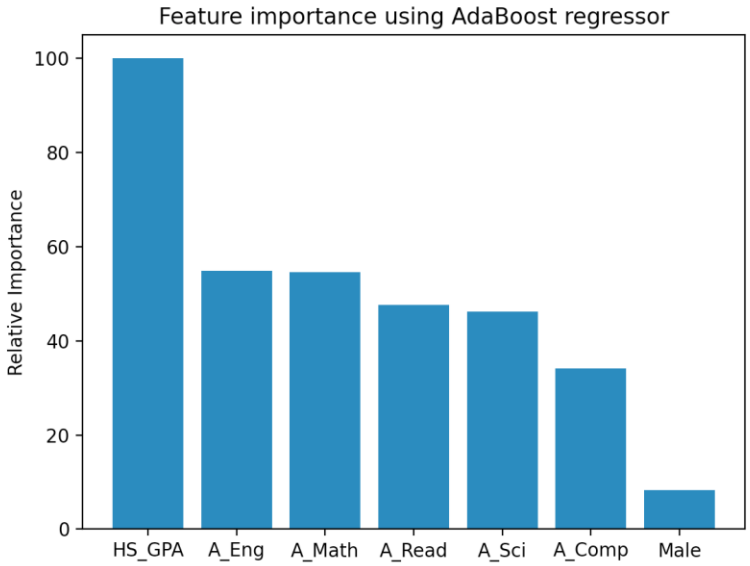

Figure 1: Relative Importance of the Seven Features

Using a Naïve Bayes Classifier, several different combinations of features were tested, and accuracy was examined. The best classifier was combining the high school GPA and the ACT Math subscore. This gave a 71.90% accuracy. Other combinations were investigated, and many of these showed similar but not better accuracies. A sample of a few combinations of features are shown below:

- HS GPA and ACT Math 71.90%
- HS GPA and ACT English 71.07%
- HS GPA and ACT Composite 70.25%
- ACT Math and ACT Science 70.25%
- HS GPA and ACT Science 69.42%
- Using all 7 features 68.60%
- HS GPA and Gender 67.77%
- ACT Math and Gender 67.77%

Our analysis showed that the HS GPA and ACT Math pair was the best indicator (71.90%) for our specific data set. We cannot argue, however, that this is true in general. Since the ACT Composite score was easier for us to collect and because the HS GPA and ACT Composite pair had similar accuracy (70.25%), we performed a linear regression using those two features as input to predict UNA GPA. It turned out those two features were equally important, so we used this information when determining our award formula. It is also worth noting that using all seven features' scores worse than using the top five indicators we selected.

Unfortunately, any formula that assesses applicants based only on numeric input will be dependent entirely upon the validity of the numbers given. We had to ask questions like "Is a HS GPA in one case always directly comparable to HS GPAs in other cases?". It was not clear to us that the direct comparison of these values will always be appropriate. So, in addition to the HS GPA and ACT Composite, we wanted to add more personal input to the process to learn more about the applicants. To facilitate this, we require a recommendation letter as well as a short video in which the applicant speaks about their computing background and future goals.

The application process

First, we established CSIS Computing Excellence Scholarship Application guidelines for what is expected from the reference letter and video application.

Regarding the written recommendation, a one-page letter is expected. It can come from an academic advisor, college instructor, high school counselor, or a high school teacher. It should detail the academic background of the student. In addition, the letter must address whether the student can complete a computing degree.

As to the video requirement, the following is expected:

- The length of the video should be 3-4 minutes.
- The video will be judged only on the content quality; thus, video professionalism is not expected.
- The content of the video should address the following:
    - Describe your knowledge of computers.
    - State your personal accomplishments that you are most proud of.
    - What are your favorite school subjects? Give your reasons.
    - What major/career would you like to pursue? Give your reasons.

To be considered, a student must be declared as a major in Computer Science, Computer Information Systems, or Information Technology.

The application requirements depend on student type:

- First-time freshman: 3.0 high school GPA OR 24 ACT composite
- Transfer student: 3.25 GPA in all post-secondary coursework
- Current UNA student: 3.25 overall GPA and 3.25 in-major GPA

The process for applying for a scholarship is as follows:

1) Apply for admissions to UNA
2) Have transcripts sent to UNA
3) First-time freshman must complete FAFSA and have ACT scores sent to UNA
4) Apply for the CSIS Computing Excellence Scholarship and submit video and recommendation letter

The award process

Points are computed for each student to calculate a Potential Success Factor (PSF). We created a different (but very similar) formula for each of the three categories of applicants that we expected: first-time freshmen, transfer students, and current UNA students. Although this paper focuses mainly on the first-time freshman category, all three of the formulas are listed below.

The PSF is computed based on student type:

- First-time freshman: $PSF = W_{F1}*HS\_GPA + W_{F2}*ACT + Video\_Letter$
- Transfer student*: $PSF = W_{S1}*Credits + W_{S2}*GPA + Video\_Letter + W_{S3}$
    - *Maximum of 60 credits
- Current UNA student#: $PSF = W_{C1}*Credits + W_{C2}*GPA + Video\_Letter + W_{C3}$
    - #Maximum of 96 credits

Pursuant to our experimentation, all three of the formulas are based on GPA, ACT Composite score, and a component for the score awarded by the assessment committee for the reference letter and video. These are weighted based on the results of our linear regressions discussed earlier.

As mentioned before, points for Video_Letter are awarded by the members of a four-person faculty committee based on the recommendation letter and the student video. Committee members provide a score based on the likelihood the candidate will graduate from UNA with a CSIS degree. This committee agreed at the inception of the scholarship program to several ground rules about how assessment was to be done. Specifically, each committee member gives a single overall score to each application based on the letter and video components of the application only. In making an assessment, committee members ask for each applicant, "Will the student graduate with a CSIS degree?"

Scores range between 0 and 20. A score of 20 would indicate "nearly certain" to graduate. A score between 16 and 19 would fall in the "great likelihood" range, 12 to 15 would be the "good likelihood" and less than 12 would mean "probably not." Only the letter and video are assessed. No other input is considered, including any previous knowledge of the applicant.

Scorers work in isolation from each other and are not allowed to influence one another. Scores are only revealed between committee members after all the members have finished scoring. The specifics of how each committee member arrives at their score are unique to that specific member. The committee members draw from years of experience teaching and working in academia to assess the likelihood of success. Generally, scores are not wildly divergent. Based on the single aggregate PSF score, students are offered scholarship at one of three levels (Table 2):

Table 2: Three Levels of Scholarship Offered

PSF	Level	Amount
111+	Purple	100% of all tuition, fees, room and board – up to $20,718 / year
101-110	Gold	80% of all tuition, fees, room and board – up to $16,574 / year
90-100	Silver	60% of all tuition, fees, room and board – up to $12,430 / year

Student application data

In the first year, 79 students submitted complete applications. Of those, 72 students were offered a scholarship and 66 students accepted and attended full-time in the Fall 2021 semester.

In the second year, 80 students completed scholarship applications and 71 were offered scholarships. In year three, 86 students applied and 77 qualified for a scholarship offer. Some application demographics are shown in the graphs below (Figure 2). As you can see, about 2/3 of the applicants are freshmen applying out of high school, and about 2/3 of the applicants are computer science majors. Our scholarship formula strives to award the purple, gold, and silver levels somewhat evenly.

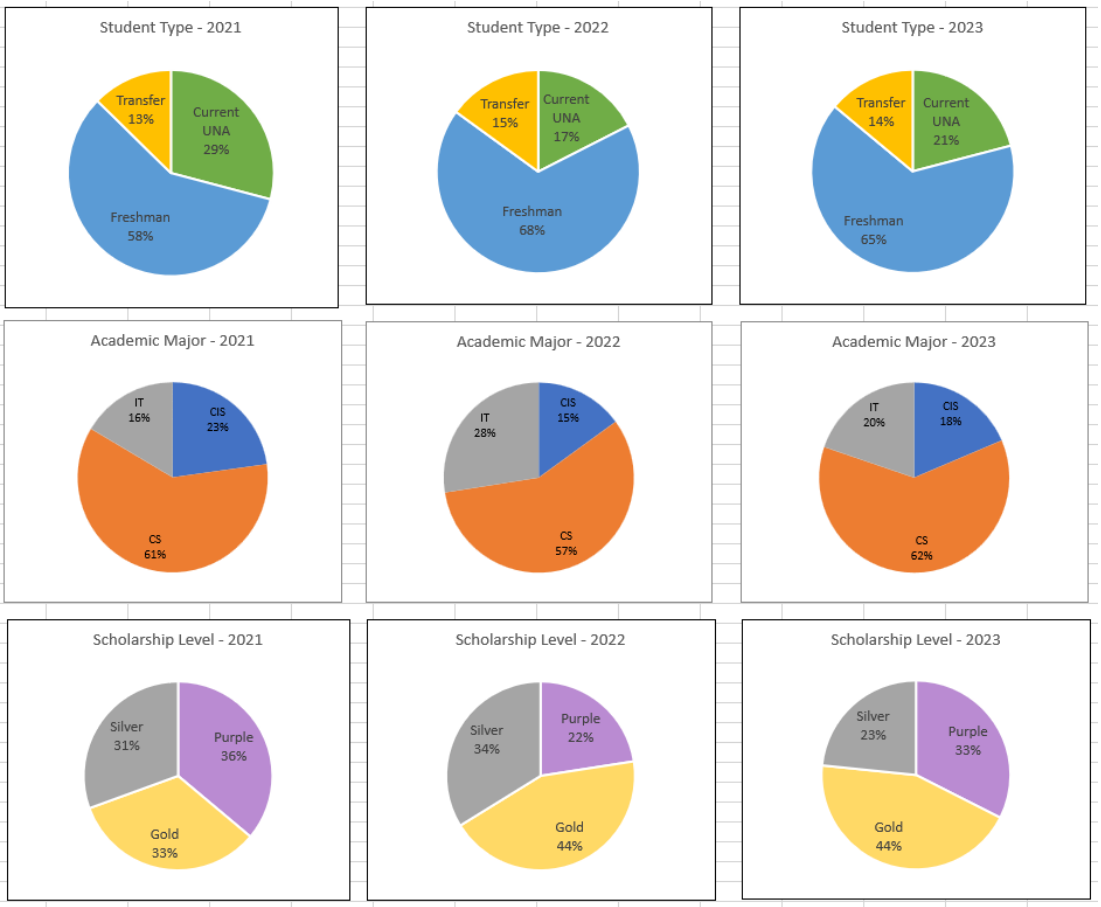

Figure 2: Student Type, Academic Major, and Scholarship Level in 2021-2023

CSIS enrollment patterns

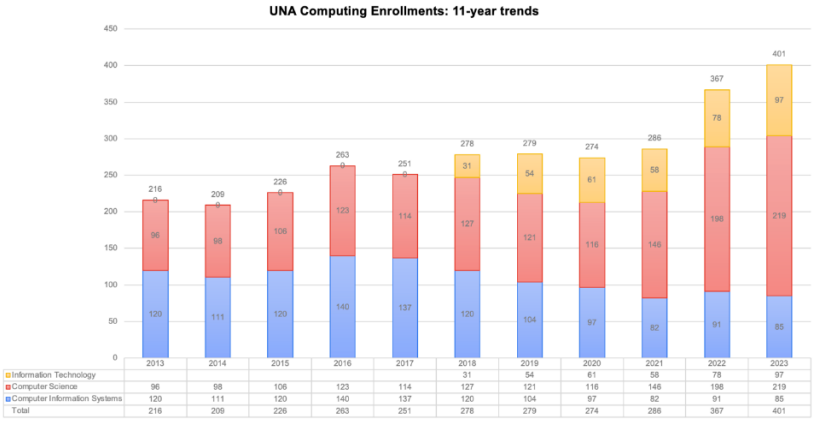

Figure 3: UNA Computing Enrollments in 2013-2023

Figure 3 provides the university's data for students enrolled in undergraduate computing degrees over the last eleven years. A small spike occurred in 2018 when we added an Information Technology degree. A noticeable positive trend has emerged over the last 3 years accompanying the establishment of our scholarship program.

Student success data

The ultimate objective for executing a scholarship program such as ours is to benefit students and the culture of the department simultaneously. A key component of this goal is to increase the percentage of students who are ultimately successful in earning their degree in a computing field from our institution. Student retention is a matter of great concern to our institution. The foundational hypotheses that underpin our efforts are first, that we can identify candidates that are likely to be academically successful, and second, that providing extra resources to these candidates will positively impact their academic efforts and increase the likelihood of their ultimate success. Certainly, these two hypotheses are not independent. They are related in convoluted and complicated ways. Still, in this paper we attempt to tease them apart and deal with each separately as much as we can.

For the second hypothesis, it is difficult to know from looking at raw academic data from our scholarship recipients alone if the scholarship awards have had a positive effect, or how large that effect has been, for our recipients. We have offered scholarships to all the best candidates that we could identify. Our datasets contain only data from scholarship recipients. It is impossible to roll back the clock and see how these candidates would have performed had they not received scholarships and equally impossible to go back and offer scholarships to different students. However, to help investigate this hypothesis we have polled our scholarship recipients concerning the impact the scholarship has had on them. We will discuss the results later in this paper. Regarding the first hypothesis—that we can identify candidates most likely to succeed—we now possess relevant academic data that will assist us in testing this hypothesis.

This analysis will be divided into two parts: first, academic data for the first two semesters across all scholarship recipients, and second, data concerning scholarship retention year over year. In the first part we will look at GPA, department GPA, highest math course achieved, and highest computing course achieved. For the second, we will examine what percentage of our students were able to retain their scholarship into the second year. To avoid unequal comparison, the academic data we are examining is for freshmen and first-time transfer students only. At a later date, it would be useful to examine academic data from current students to see if outcomes improved after receiving the scholarship, but that data is outside the scope of this discussion.

It is worth noting here that an analysis of academic performance alone cannot really test our hypothesis that we can identify the most promising candidates. What academic data can show us is how well our recipients are performing. However, if the recipients perform poorly, does that necessarily mean that they were not promising and/or that they might have made slightly different choices or faced slightly different circumstances and as a result performed very highly? It certainly seems not. So, an individual's poor performance does not mean that they were misidentified as promising. However, if the data shows us en masse that our candidates are not performing at a noticeably higher rate then that will be an indication that our hypothesis may be flawed, and that our processes should be amended. Ultimately, we hope to use the below data to argue in support of our first hypothesis and to simultaneously have a baseline to see if future modifications to our processes lead to greater success.

First, let us look at academic data for our recipients.

- GPA averages (vs. non-recipients)
- Department GPA averages (vs. non-recipients)
- Highest math course taken (vs. non-recipients)
- Highest computing course taken (vs. non-recipients)

Next, let's take a look at data related to scholarship retention from the first to second year. In order to maintain the scholarship, a student must meet the following basic requirements: (1) Maintain a 3.0 overall GPA, (2) maintain a 3.0 department GPA, and (3) complete at least 24 credits towards a computing degree each year. We evaluate student academic performance each year. A student goes on a one-semester probationary period if they fall below the criteria.

In the first year of the scholarship program, 52 scholarships were offered, and 46 recipients accepted and enrolled. After the first year (which includes the fall, spring, and summer semesters), 10 recipients failed to meet academic progress requirements and had their awards withdrawn, an additional 6 were placed on probation for the next semester and are in danger of losing their scholarships. Taken together, these 16 represent just under 35% of the recipients in the first year. On the surface, this is an alarmingly large number. But is a 65% retention rate over the first year an acceptable result or is it evidence that our processes are underperforming? Given such a small sample set, a closer look at statistics surrounding these 16 recipients is warranted.

Of these 16, the 10 who lost their scholarships had an average high school GPA of 3.37, with a standard deviation of 0.42 and an average reported ACT of 22.7 with a standard deviation of 3.43. Among the 6 probationary cases there was an average high school GPA of 3.665 with a standard deviation of only 0.21 and a reported ACT of 23 with a standard deviation of 2.45. Compare this to all recipients who have sufficient academic progress who have an average high school GPA of 3.83 with a standard deviation of 0.23 and an average ACT 25.9 with an average ACT of 3.76 and you see that these two predictive indicators seem to still be effective. The averages of these predictive indicators are significantly lower for those students who have not performed well.

As we have stated, our process for identifying candidates has both an objective solely data-driven component and a subjective scoring component based on the assessment of application components by a committee of faculty. The question arises, is there a problem perhaps, with human-driven assessments? The answer seems to be no. Tellingly, of the 10 recipients who have failed to maintain adequate academic progress, 6 were awarded silver level scholarships, 3 were awarded gold level scholarships, and only 1 was awarded a purple (top-level) scholarship. Likewise, of the 6 students on probation, the awards were 1 silver, 4 gold, and only 1 purple. Together that makes 7 silver, 7 gold and 2 purple. Additionally, out of the 30 scholarship recipients who have successfully met required academic progress over the first year, only 6 are silver, 11 are gold, and 13 are purple level awardees.

These numbers seem to indicate a few things. First, our processes are seeing some false positives when identifying successful candidates, but they are relegated to edge cases among our assessments. Our highest awardees, those candidates we have the greatest faith in, are performing best, and our lower-assessing awardees are performing less well. Also, these results may indicate that there is some correlation between the size of the award and the positive impact on the recipient.

Freshmen student award recipients for 2020-2022

Figures 4, 5, and 6 illustrate the performance of the freshmen scholarship recipients for 2020-2022. Figure 4 contains the scatter charts of HS-GPA and UNA-GPA scores of freshmen scholarship recipients for 2020-2022; Figure 5 contains the histograms of HS-GPA and UNA-GPA scores of freshmen scholarship recipients for 2020-2022; and Figure 6 contains the pie charts of UNA-GPA scores of freshmen scholarship recipients for 2020-2022.

The first diagram in Figure 4 shows that for 2020, the HS-GPA scores are scattered around the mean value of 3.72, the standard deviation being 0.317. Although there were a few setbacks, the charts indicate a considerable number of recipients have performed well enough to maintain their scholarship eligibility. An upward trend for GPA is observed in the years 2021 and 2022. The histograms of the results (Figure 5) show a shift towards lower GPA scores. However, in the subsequent years the scholars have gathered momentum to obtain higher GPA scores.

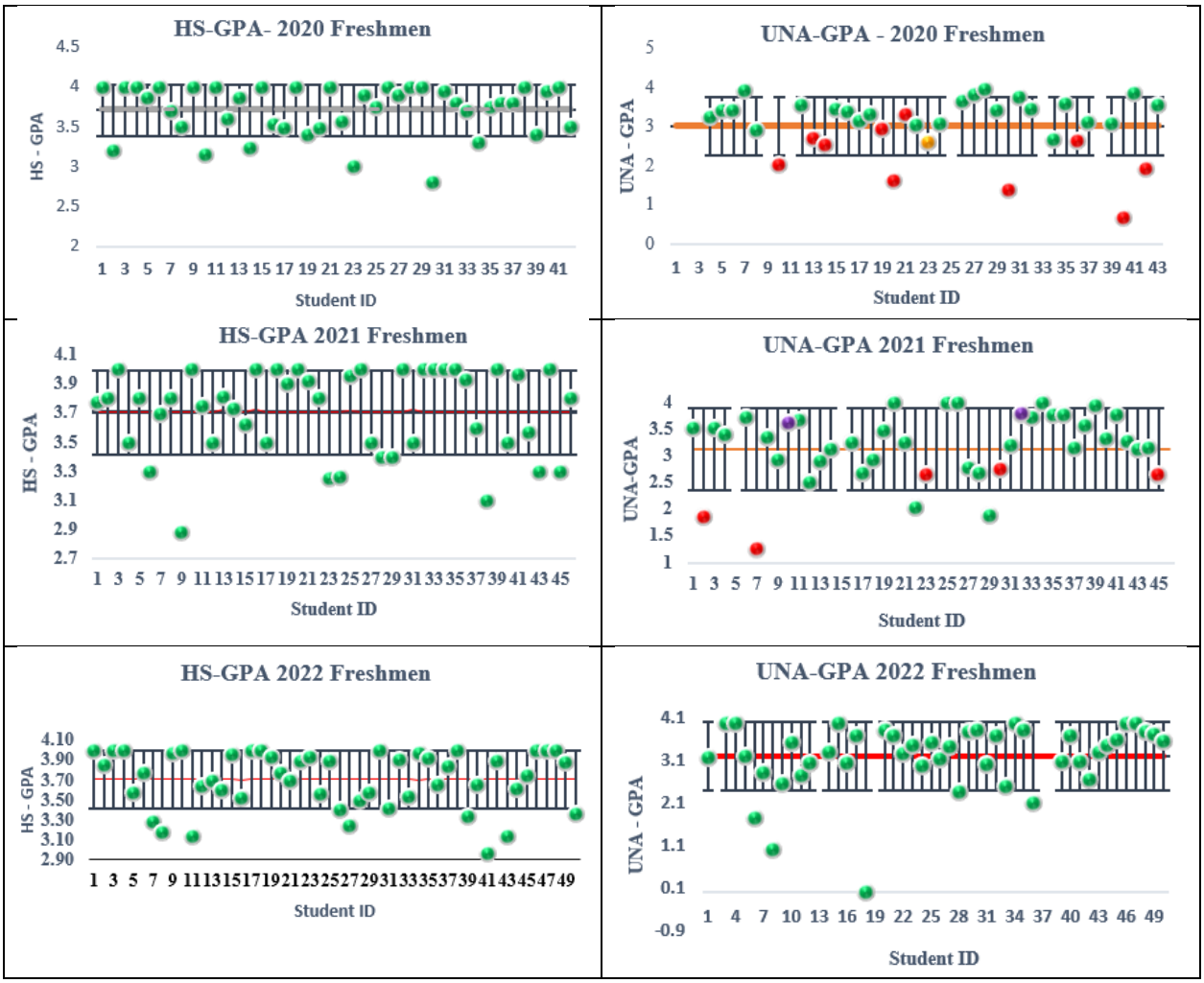

Figure 4: Scatter Charts of HS-GPA and UNA-GPA Scores of Freshmen Scholarship Recipients for 2020-2022

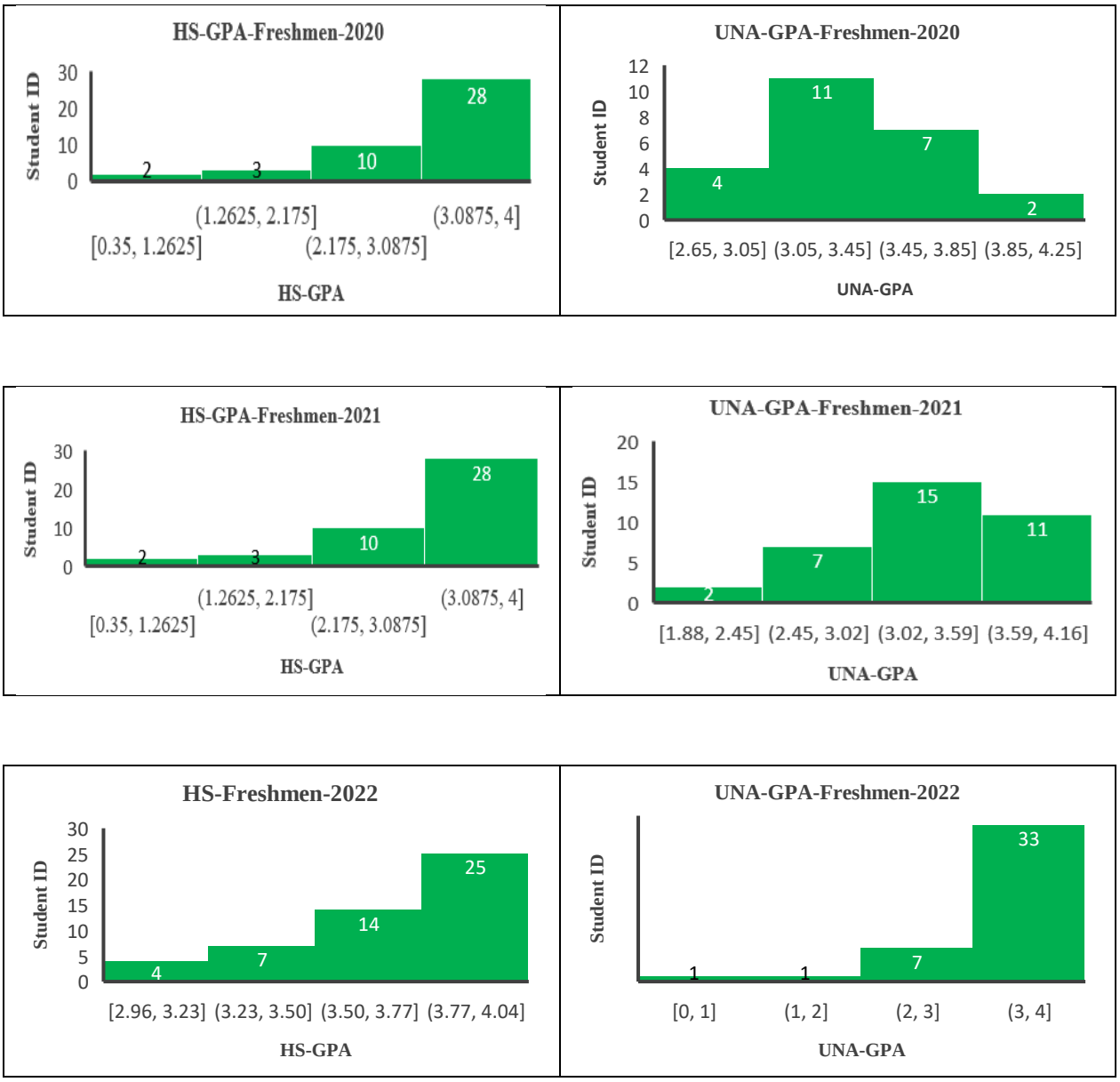

Figure 5: Histograms of HS-GPA and UNA-GPA Scores of Freshmen Scholarship Recipients for 2020-2022

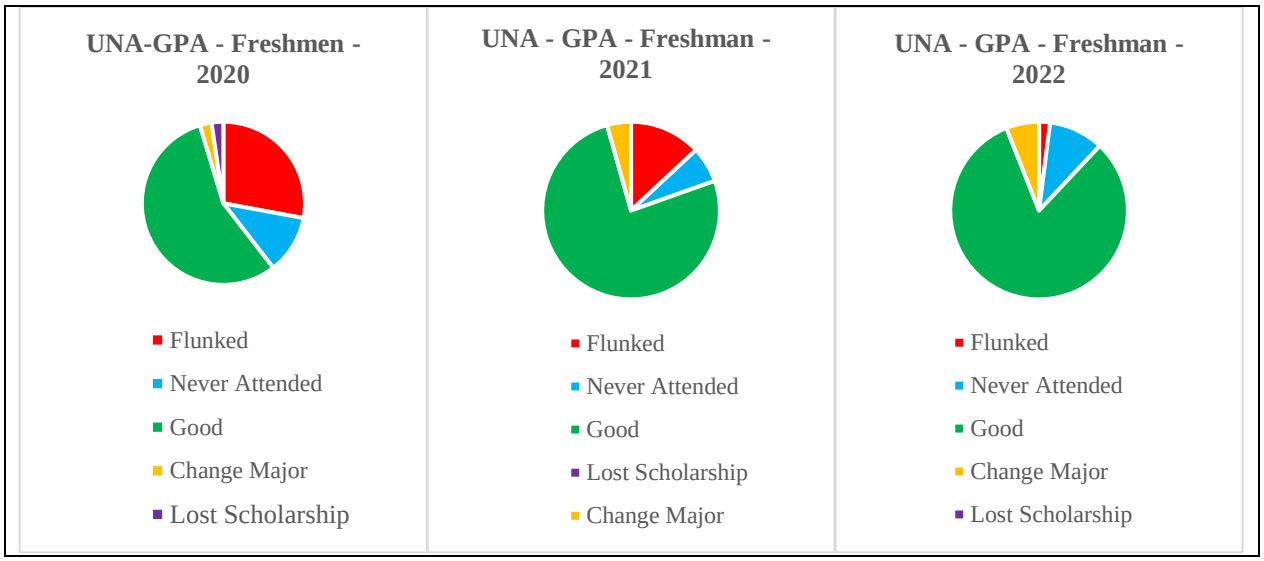

Figure 6: Pie Charts for UNA-GPA Scores of Freshmen Scholarship Recipients for 2020-2022

The end of year survey

We invited 142 first-time first-year students who received scholarships in the first three years to take part in a survey with the intention of measuring the subjective impact of scholarship awards for recipients. A questionnaire consisting of five basic questions was given to them through an online survey tool. They were encouraged to support their answers with explanations. The identity of each participant was protected and blinded when collecting, analyzing, and reporting data. To acquire longitudinal data, we polled the students from the scholarship's first year at the end of that year (2022), and the students from the scholarship's second and third year at the end of the third year. Fifty-five students responded to the survey. The authors coded and categorized the open responses.

The questions were as follows:

1) Did receiving this scholarship impact your decision of attending UNA instead of other schools? Describe.
2) How has receiving this scholarship impacted your life?
3) In what ways has the scholarship impacted your ability to attend college?
4) What is your current academic major? Do you feel that major is a good fit for you? Explain.
5) Do you have any other comments or feedback you would like to share about the scholarship?

The responses to the first question were overwhelmingly positive, stating that being awarded the scholarship was either the deciding factor or a major factor influencing their decision to join UNA. Thirty-two students reported the scholarship was the deciding factor in their decision, 20 listed it as a major contributing factor, and only 3 reported that the scholarship was not a major factor.

As expected, answers given to question 2 emphasized recipients' relief from the financial burden they were to shoulder to realize their future dreams as a major positive impact. Several recipients went to the extent of stating that if not for the scholarship the only choice left was to join a community college or to give up higher education. Recipients reported several ways scholarships had positively impacted their lives. Forty-one students indicated a positive impact in reduced financial stress for themselves and/or their families. Four reported the scholarship positively impacted their ability to focus on their academic success.

Moreover, six mentioned both reduced financial stress and better academic outcomes. Only 1 reported no appreciable impact.

Tellingly only a small number (3) of students mentioned specifically that the scholarship helped in guiding their academic path. This makes sense given that the scholarship is targeted toward students already demonstrating excellence in the field. Student responses clearly indicated the positive impact of the scholarship on their lives. This is further elaborated by the answers given for the third question. Nineteen students report that the scholarship made attending four-year college achievable. Another ten said the scholarship let them focus on academic pursuits and non-work-related activities. Twenty-two others reported a positive impact either generally or in terms of reduced financial stress from long-term debt. Only a single respondent reported no impact from the scholarship.

In question 4 students were asked to give their academic major AND to report if they felt their academic major was an appropriate fit for them. The question responses give us not only demographic information, but asking the respondents to self-assess their choice to enter a computer-related field helps us understand how successful we have been in identifying these students.

- 33 were majoring in Computer Science (CS)
- 7 were majoring in Computer Information Systems (CIS)
- 15 were majoring in Information Technology (IT)

Every student but one who responded agreed that their major was a good fit for them. One student who listed CIS as their major announced their intention to change majors. Still another student who was double majoring in Math was considering being a CS major and leaving Math as a minor.

Students provided a variety of answers to question 5. While some responses offered ideas for improving the administration of the scholarship (and one wondered if the academic requirements for keeping the scholarship could be lowered) the responses were overwhelmingly positive. A few samples of student responses follow:

- "I am very grateful for this scholarship, and I appreciate the people who have made it possible, especially for me being a minority, giving me a chance to take advantage of this opportunity. I would recommend anyone that has an interest in the IT field to consider applying for the scholarship. I honestly didn't know for sure what I wanted to do as my career, but I applied for the scholarship and decided to take a chance to take advantage of the opportunity it could bring for me and my future career."

- "This scholarship has granted me the ability to experience the college social life, make connections, learn about myself, and increase my academic knowledge. Without this scholarship, I do not think that all of that would be possible. I am so thankful for this scholarship and the opportunities it has given me in life so far. I am getting to experience things I was scared that I would never get to because of my financial situation."

- "The computing scholarship of distinction has allowed me to attend a four-year university without me having to be in debt. A four-year university was important to me because I wanted to be able to grow at a school and make connections through the four years. I am paying for college on my own, and receiving this scholarship has allowed me to not worry about financial burdens so much and let me focus on my schoolwork and my future career."

- "As a first-generation college student, receiving a higher education was always a dream of mine. I worked tirelessly in high school so that I could receive scholarships and go to a good college. Attending college was challenging for me because I was paying for it on my own, but I wanted to attend a four-year university. I wanted the experience and connections that a school like UNA could give me, but I could not afford the tuition without starting my adult life in major debt. Receiving this scholarship has allowed me to have these experiences and connections without having to worry about the financial burden, and I believe this will greatly help me in my professional future."

Discussion, conclusion, and future work

In this paper, we investigated the design and implementation of a new scholarship program developed by the Computer Science and Information Systems department at the University of North Alabama. The scholarship program was created to increase enrollment in computing programs and provide more high-quality graduates for industries in the region. Historical student data was used to develop a Potential Success Factor score that was used to determine the likelihood that a student will successfully complete a computing degree. Our analysis supports the effectiveness of the Potential Success Factor score in determining the likelihood of student success in computing programs.

The data also shows increased enrollments each year after implementation of the scholarship program. While this is expected with any new scholarship program, our research also uncovered some other interesting findings. Through our qualitative analysis of survey responses, we learned that many of our scholarships went to first-generation college students that would not have been able to afford college otherwise. In addition, many very high performing students chose UNA over what might be considered more prestigious schools due to the scholarship program. Anecdotally, the department faculty reported that the overall quality of the student population noticeably improved. This research provides support that well-designed scholarship programs can improve enrollments in computing programs, attract high-performing computing students, and provide potentially life-changing opportunities for high performing but financially disadvantaged students. Future research can include additional longitudinal data analysis to track scholarship students through graduation and into careers.

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