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USU STARS! GEAR UP: Fall 2018 to Spring 2019

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USU STARS! GEAR UP

ANALYSIS

FALL 2018 - SPRING 2019

USUSTARS!
GEAR UP
UtahStateUniversity

USU STARS! GEAR UP Analysis

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USU STARS! GEAR UP programming offers a variety of services to promote post–secondary education among middle and high school students. This report identified 4 unique profiles of service use. Profiles were differentially associated with post–secondary outcomes.

ABSTRACT:

Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) is a federally funded program designed to prepared secondary students for college. USU has received several of these competitive grants to work with middle and high school students throughout Utah. This analysis explores how GEAR Up students utilized services. Use patterns were regressed on college enrollment.

 METHODS: Latent profile analysis (LPA) is a powerful tool for uncovering common response patterns across multiple continuous variables. Following the LPA, the common response patterns were regressed on post-secondary enrollment.

FINDINGS: The latent profile analysis exposed 4 well-defined use patterns across the GEAR UP services. Profiles were differentially associated with college enrollment post-graduation from high school. The profile named **Preppers**, defined by high use of College & Career and Advising services and Family Involvement, was associated with increased college enrollment. Future directions are discussed.

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What is GEAR UP?

THE GEAR UP GRANT

Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) is a federally funded program through the U.S. Department of Education designed to help students prepare for and succeed in college. GEAR UP is a highly competitive grant program that helps empower local partnerships comprised of schools, institutions of higher education, state agencies, and community organizations.

USU STARS! GEAR UP

Utah State University Science Technology Arithmetic Reading Students (USU STARS!) GEAR UP program is part of the School of Teacher Education and Leadership in the Emma Eccles Jones College of Education and Human Services at USU. This seven-year grant began in 2012. The program partners with schools in which at least 50 percent of the students were eligible for free or reduced-priced lunch. The program was cohort-based which means that it works with entire grade levels, and whole schools, starting in 7th grade through the first year of post-secondary education. Over the course of the grant, the project served nearly 5,000 students attending 17 schools in eight public school districts along with three charter schools.

USU STARS! GEAR UP provides services to support students, families, and schools, through:

• Academic tutoring

• Career exploration/advising

• College campus visits

• Summer programs

• Comprehensive mentoring

• Financial aid counseling advising

• Academic advising/planning

• Educational field trips

• College application/scholarship workshops

Students in participating schools received these services to help them:

1. Graduate from high school

2. Plan for advanced education

3. Meet their post-secondary academic goals

Schools and teachers received professional development and resources to help them support students in these goals.

USU STARS! GEAR UP was designed to benefit communities throughout Utah. By engaging students earlier on in their academic career this program builds a well-educated populations equipped with skills of the future.
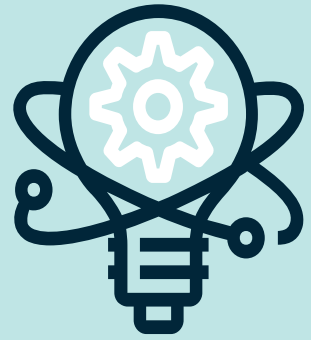
DATA COLLECTION

The data that was collected over the life cycle of the grant includes demographic information, classroom success, and activities supported by USU STARS! GEAR UP (ex. campus visits, workshops). The activities data consists of type of activity, date, and amount of participation time spent. For instance, if a student spends a half hour a week participating in an after-school robotics club for a month, they will have accumulated two hours of workshop time. The following sections describes the breadth and nature of these activities.

KEY FINDING #1: GEAR UP IS COMPLICATED, BUT WE CAN STEP BACK AND SEE THE BIG PICTURE

During this past school year fall 2018 - spring 2019, the students in USU STARS! GEAR UP cohort 1 entered the seventh year of the grant. During the grant's final year, students complete their high school education and were now eligible to enroll in post-secondary education, fulfilling the goals and objectives of the grant. But there arise questions as we look back on the past seven years of hard work, effort, time spent, and preparation. **How did we do? What did we do well? Can what we learned impact future cohorts?**

To address these questions, GEAR UP conducted an evaluation to look holistically at the student experience and how student experience associated with enrollment in post-secondary education. A Latent Profile Analysis (LPA) was employed to uncover common patterns of experience. Common profiles of experience were then regressed on students' post-secondary enrollment status. This analysis allows us to "step back and see the big picture" so to say, thereby helping administrators answer important questions and understand the details of our program.

A component of the GEAR UP program is to provide participants with a broad base of experiences to help them prepare for college. The variety of experiences can make evaluating the program statistically complicated, fortunately, many of the experiences rationally fall within reasonable umbrella classifications.

For example, the SCRIBE database has 28 different designations that describe the activities that are deployed to help students prepare for and

succeed in college. In conjunction with cohort 1 administrators, the 28 activities were classified into 8 umbrella categories. The 8 categories are as follows:

- Advising
- Family involvement
- College and career experience
- Direct student services
- Tutoring
- Rigorous curriculum
- Interpersonal skills
- Student workshops

With a logically reduced and manageable variable set an LPA was employed to investigate underlying patterns of use among the cohort. LPA is a person centered approach that helps us understand if students are using GEAR UP experiences similarly, or if students have different patterns of experience.

What profiles (or patterns) of experiences exist?
The LPA exposes common patterns of experience across multiple continuous scale factors. "The Goal of LPA is to identify different subgroups… whose members are similar to each other and different from members of other subgroups" (Specht, Luhmann & Geiser 2014). In order to identify a model that had both best fit and robustness, a combination of the Bayesian Information Criteria (BIC; Nylund, Asparouhov, & Muthen, 2007), entropy (Jung & Wickrama, 2008;Muthen and Asparouhov, 2012), parsimony (Marsh, Ludtke, Trautwein, & Morin, 2009) and the Vulong-Lo-Mendell-Rubin test(Lo,me dell, & Rubin, 2001) were used to identify the best model. Solutions with one to five profiles were tested, the four profile solution best reflected the data (entropy = 0.99).

FIGURE 1. Umbrella categories for the 28 different experiences available to GEAR UP students.

KEY FINDING #2: NOT EVERYONE EXPERIENCES GEAR UP THE SAME

GEAR cohort 1 served 1,180 students, the LPA revealed that instead of a singular GEAR UP experience, students fell into 1 of four patterns of use. The profiles of use allow us understand that rather than each student experiencing a similar combination of GEAR UP activities, there were four ways that GEAR UP students experienced the program.

Figure 1 displays students' mean hours of participation (the y-axis) by umbrella experience (x-axis) for each profile. Notice the gaps in between lines on the vertical axis, this separation reflects a difference in hours of exposure to a GEAR UP experience. The separation of space is what helps differentiate one profile from the others. The more space between these mean hours experienced translates to a more unique experience than the student's peers in other profiles.

The Present Majority. The **yellow** profile is interesting because it contains the majority of students. It can be inferred that this combination of experiences is the most common experience of our GEAR UP students. It is characterized by low consistent levels of each of the services categories except for moderate levels of advising and rigorous curriculum. We can describe these students as "Present" students as they showed up and participated at low consistent levels.

Special Interest Students. The **gray** line is characterized by it's high level of Direct Student Services, and a moderate level of just about everything else. Direct student services include English language arts, science, and social studies activities such as field trips that focus around that curriculum. We can describe these students as "Special Interest" students for their interest in specialized camps and activities surrounding a certain subject.

Tutored Students. The **teal** line has a large level of participation in Interpersonal Skills and Tutoring comparative to other groups. The Interpersonal Skills category includes volunteering, leadership and mentoring activities. The space between this profile's tutoring and the others is especially striking. Other profiles have mean tutoring hours clustered at a low total hours, but **Special Interest Students'** tutoring level is far higher . We can describe these students as "Tutored" students for their high participation in tutoring activities.

Preppers. The **blue** line is strikingly different from other profiles in College and Career Experience, Advising, and Family Involvement. College and Career Experiences include activities such as college visits and job shadowing. Advising includes activities such as counseling, advising, academic planning, and financial aid counselling. These students can be categorized as "Prepper" students for their high participation in college preparation activities.
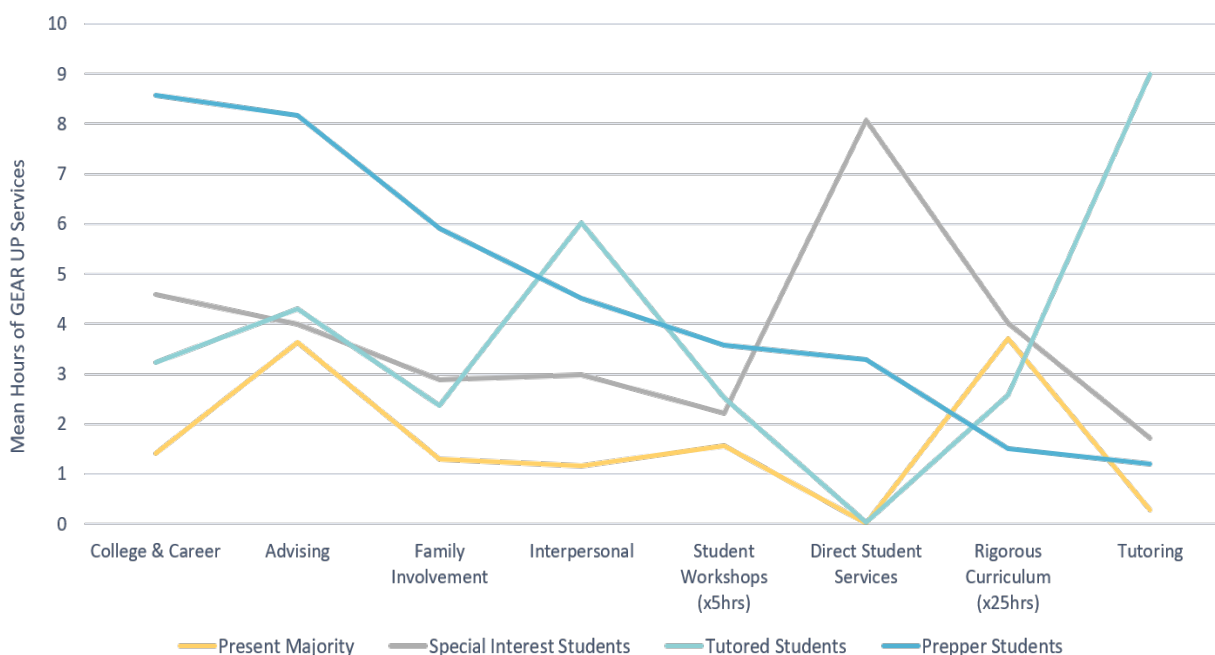

FIGURE 2. Means hours spent on each category for each profile

KEY FINDING #3: EACH PROFILE HAS STUDENTS ENROLLING IN POST-SECONDARY EDUCATION AT DIFFERENT RATES

What outcomes are associated with LPA membership? The LPA uncovered 4 unique patters of GEAR UP users. This descriptive analysis helps us understand how GEAR UP experiences are being used by students. The analysis was extended to understand if different profiles had different likelihoods of enrolling in post-secondary education. This gets us one step closer to answering the question, is GEAR UP service profile associated of enrollment in post-secondary education? This was done using structural regression modelling (Muthen and Muthen, 2012).

Enrollment in post-secondary education was obtained from the national student clearinghouse records in combination with Utah State University's college enrollment records. The logistic structural regression found that the proportion of students enrolling in post-secondary education differed across the profiles.

Compared to students in the **Present Majority, Preppers** were more likely to attend college (ODD = 2.42). 63% of Preppers were enrolled in post-secondary education compared to 41% of the Present Majority. In fact, Preppers had greater odds of attending college compared to all profiles.

The **Present Majority** and **Special Interest** students had similar odds of enrolling in post-secondary education. Students in the **Tutored** profile had the lowest odds of attending college. They were 25% less likely to be enrolled than the **Present Majority** and 50% less likely than **Preppers**. Only 33% of students in the **Tutored** profile were enrolled in post-secondary education following graduation.

What demographics were associated with post-secondary enrollment? GEAR UP is concerned with education equity, GEAR UP schools are specifically selected to bolster populations of students at a lower likelihood for attending college. Gender, Free and Reduce Meals (FARM), and English as a Second Language (ESL) were included in the model as predictors of post-secondary college enrollment. Each was significantly associated with enrollment.

Females were significantly more likely to enroll in post-secondary education than males. Students qualified for FARM were half as likely to enroll in college compared to those who were not qualified. ESL students were 66% less likely to be enrolled compared to students who had English as their first language.

Odds Ratios of Student Subgroups on Post-Secondary Enrollment

TABLE 1:

Association of demographic characteristics with enrollment

N	Student Group	Odds ratio	S.E.	p-value
Female Students	934 (50%)	2.78	0.27	< 0.001
ESL	95 (5%)	0.44	0.11	< 0.001
FARM	505 (27%)	0.54	.06	< 0.001
1,468	Graduate Students	92.07%	90.07%	2.21%

KEY FINDING #4: LIKELIHOOD OF GOING TO COLLEGE & STATE TRENDS

The logistic regression gave evidence that GEAR UP experience patterns are significantly associated with post-secondary education enrollment, with **Preppers** attending at the highest rate than other profiles of use and **Tutored** students attending at the lowest rate.

How do profile rate look compared to state level trends? 52% of recent graduates in Utah enroll in post-secondary education. Only **Preppers** from the GEAR UP cohort 1 surpass the state's 52% rate, with an enrollment rate of 63%.

The State of Utah, like most other states, does not enroll low-income students at the same rate as moderate or high income students. A smaller proportion of low income-students in Utah enroll in post-secondary education following high school, 38%. Considering that GEAR UP is targeted towards low income students, this number offers a second comparison. Compared to other low in-come students in Utah, **Preppers**, **Special Interest**, and **Present Majority** students enroll more students in higher education. The **Tutored** students were the only group enrolling a smaller proportion of students in post-secondary education than the state trend.

Proportion of GEAR UP students enrolled in post-secondary education & trends in Utah

TABLE 2:

Comparing GEAR UP outcomes with state trends

N	Number (%) of Sample	Proportion Enrolled
Present Majority	1,491 (79%)	41%
Special Interest Students	118 (6%)	48%
Tutored Students	187 (10%)	33%
Prepper Students	83 (4%)	63%
All Utah recent high school graduates		**52%**
All Utah low-income recent high school graduates		**38%**

The Lifecycle of sustainable analytics

FORMAL ANALYTICS → **FULFILLMENT OF HUMAN NEEDS**

DATA COLLECTION & ACCESS → DATA SCIENCE & MODELING → VISUALIZATION & WORKFLOWS → SOCIALIZATION OF TOOLS → EMPOWERMENT OF HUMAN ACTION → ADVOCACY & INNOVATION
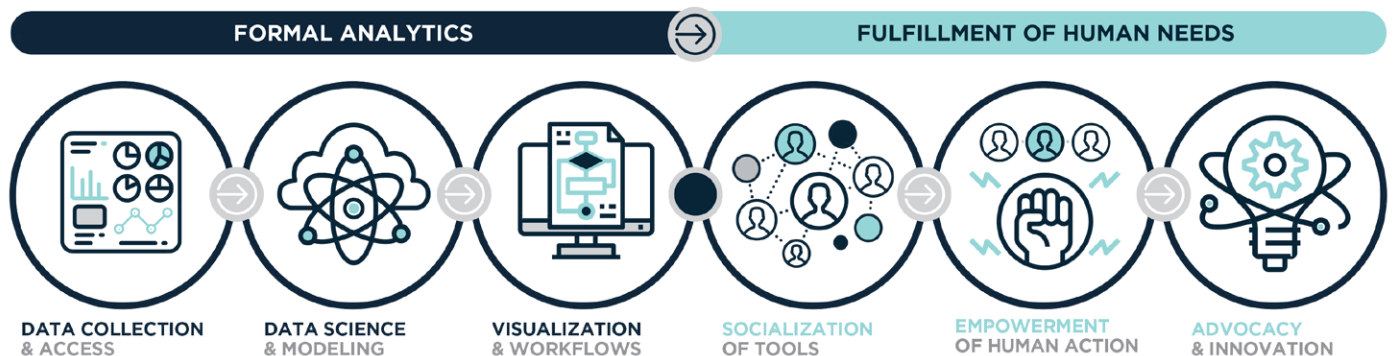
FIGURE 3
The Lifecycle of Sustainable Analytics.

Insights & Next Steps

A major goal of analytics is to identify areas for improvement and innovation. To be successful, all initiatives must consider the role of formal analytics and role of the humans needs. The Lifecycle for Sustainable Analytics presents the major domains within any successful analytics initiatives. It requires sound data science practices on the left-hand and proactive human relations on the right. Together the six domains support the development and utilization of analytics insights for improvement and innovation.

MOVING ANALYTICS-TO-ACTION

The following ideas can be leveraged by GEAR UP administrators to innovate practice. By understanding the differences between the profiles, we can appreciate that each unique summation of experiences within the program associates differently with the path to college. From a big picture view, this can help us formulate strategy for what types and frequency of services are offered and promoted to students. It further suggested that services could be blended together for increased impact.

1. LEVERAGE POTENTIAL COMBINATIONS

High school students are presented with many powerful decisions as they move towards graduation. The GEAR UP experiences offers guidance as they consider options for their future. By leveraging the most potent combination of experiences, USU STARTS! GEAR could possibly increase student enrollment in post-secondary education. A possible future avenue could encourage **Prepper** use of GEAR UP resources.

2. GEAR UP MAKES AN IMPACT

The GEAR UP use patterns exceeded enrollment expectations for state for low-income populations. **Preppers** exceed the Utah average enrollment for the general population.

3. LOOKING FORWARD

This analysis depicts an association between GEAR UP service use patterns and college enrollment. This correlational analysis can be informative to further evaluation planning to explore the link between service use and post-secondary outcomes.

CORRELATIONAL ANALYSES

Correlational analyses are a powerful first-step in exploring associations between behaviors and outcomes. Correlational analyses, however, cannot determine causation. The results here should be viewed as a first attempt to understand the impact of GEAR UP programming on post-secondary outcomes. Further evaluation could strengthen these insights by adding additional covariates or plan interventions to better understand the causal association or incorporate additional cohorts.

Appendix A

UTAH STATE UNIVERSITY'S ACADEMIC & INSTRUCTIONAL SERVICES (AIS) EVALUATION CYCLE

AIS Evaluation Schedule

The process of program evaluation is never complete. Using the reported methodology, we will assist you to continually re-evaluate your program impacts on student retention each semester. Using this report determine a mid-initiative fidelity check to quickly assess how the activity is doing. Identify an end of initiative evaluation date, and a cadence to re-evaluate future results.

MAKE DECISIONS

PLAN

IMPLEMENT

EVALUATE & RE-EVALUATE

REFLECT & DISCUSS

EVALUATE & RE-EVALUATE

Get the data to AIS and we can run an evaluation on persistence. For goals that don't include persistence AIS can assist you in finding resources to measure your improvement.

REFLECT & DISCUSS

Consider the report and the evaluators insights to produce discussion within your department.

MAKE DECISIONS

Formulate possible actions to improve your program. Select actions that align with your program goals.

PLAN

Make concrete plans to apply your decisions. Determine the who, where, and when of your actions.

IMPLEMENT

Put your plans into actions. Remember to periodically check the progress of your plans as they are being implemented.