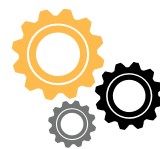




ENHANCING DIVERSITY IN CAREER & TECHNICAL STEM

2023 ANNUAL REPORT

Prepared by
Emily Creamer, Ph.D.
Susannah Townsend, M.P.H.
Matthew J. Mayhew, Ph.D.
Laura S. Dahl, Ph.D.



EDICTS

ENHANCING DIVERSITY IN
CAREER & TECHNICAL STEM



INTRODUCTION

The EDiCTS Project

The Enhancing Diversity in Career & Technical STEM (EDiCTS) project explores the educational experiences of students, faculty, and staff in the Automotive Student Service Education Training (ASSET) program and the associated outcomes for students within the program. The program plays a crucial role in nurturing a diverse pool of skilled technicians by creating stable employment opportunities for marginalized and under-served student groups as they pursue an associate degree. The ASSET program is a collaboration between the Ford Motor Company, community colleges with automotive tech programs, and nearby Ford dealerships (Ford Motor Company, 2021). While the program is funded through college tuition and operating funds, the Ford Motor Company assists with program oversight and curriculum development.

The EDiCTS project aims to improve the ASSET program's retention, graduation, and workforce entry outcomes by developing extra-curricular opportunities and evaluating program initiatives and results. The impact of this effort includes long-term retention of women and People of Color in the industry, regional economic development, and enhanced socioeconomic mobility for the project participants. The three guiding questions of this work are:

1. To what extent does the ASSET program improve student retention, persistence to degree, degree completion, and automotive workforce entrance?
2. What specific institutional conditions and educational experiences support the retention, persistence to degree, degree completion, and automotive workforce entrance of ASSET program students who identify as women, Latinx, Native American, and/or Black?
3. What are the effects of institutional financial, material, and extra-curricular support upon student retention, persistence to degree, degree completion, and automotive workforce entrance of ASSET program students?

This institutional report provides an overview of our findings and recommendations based on the first year of the EDiCTS project. A final institutional report will be provided to the key stakeholders at the end of 2024.

Data Collection and Project Timeline

The EDiCTS project is a 2.5-year mixed methods project that started in the fall of 2022. We collected survey data from 105 first- and second-year ASSET students and 208 students from non-ASSET automotive technology associate degree programs at four community colleges in Texas and Oklahoma. Surveys responses were collected from October 2022 through January 2023. ASSET students were also asked to complete two activities: a goal-setting activity and a self-assessment activity. Qualitative data collection occurred in early spring 2023 and included interviews with 17 stakeholders, including ASSET students, faculty and staff; site visits at the four participating community colleges, and five focus groups with the ASSET cohorts. We ended data collection with a second survey administered in late spring 2023, which yielded responses from 31 ASSET students and 20 non-ASSET students in automotive technology associate degree programs.





Data collection will continue as we move into the second year of the EDiCTs project (fall 2023-spring 2024). We plan to send a two-month post-graduation survey to collect data from recent ASSET graduates. The EDiCTS research team will also visit the four community colleges to administer the fall 2023 survey as well as implement the goal-setting and self-assessment activities to ASSET students. The research team also plans to collect qualitative data at the site visits through interviews and focus groups with ASSET students, faculty, and staff. We will make another visit to the four community colleges to administer the spring 2024 survey and finish any additional interviews at the end of the spring 2024. Data collection will conclude with a two-month post-graduation survey for the students who graduated in 2024 and a one-year post graduation survey for the students who graduated in 2023 in the summer of 2024.

The findings and recommendations presented in this report are part of the larger project, and the final report will be produced in fall 2024 after all the data has been collected and analyzed. These recommendations should be considered pieces of a more nuanced picture, explaining the experience of students within the ASSET program.








SURVEY MEASURES AND FACTORS

The EDiCTS project is informed by Astin’s (1984) Inputs-Environments-Outcome model (I-E-O), a conceptual framework for understanding student development. The model investigates the relationships between inputs (personal characteristics students bring to college), environments (how students perceive and experience their campus environments as well as their level of engagement with these environments), and outcomes (the end results, behaviors, or acquired skills that individuals achieve during their time in college).

INPUTS

-  Student demographics (e.g., age, gender, income, parental education, race)
-  Academic background (e.g., GPA, tests scores)
-  Pre-college automotive experiences
-  Motivations, aspirations, and personality

ENVIRONMENTS

-  Cohort experience
-  Sense of belonging
-  ASSET coursework
-  Ford STARS/Certification
-  Relationship with ASSET faculty
-  Mentors and supervisors
-  Internships

OUTCOMES





-  Retention in ASSET program
-  Graduation from ASSET program
-  Job/Career as a Ford technician
-  Career decision making self-efficacy

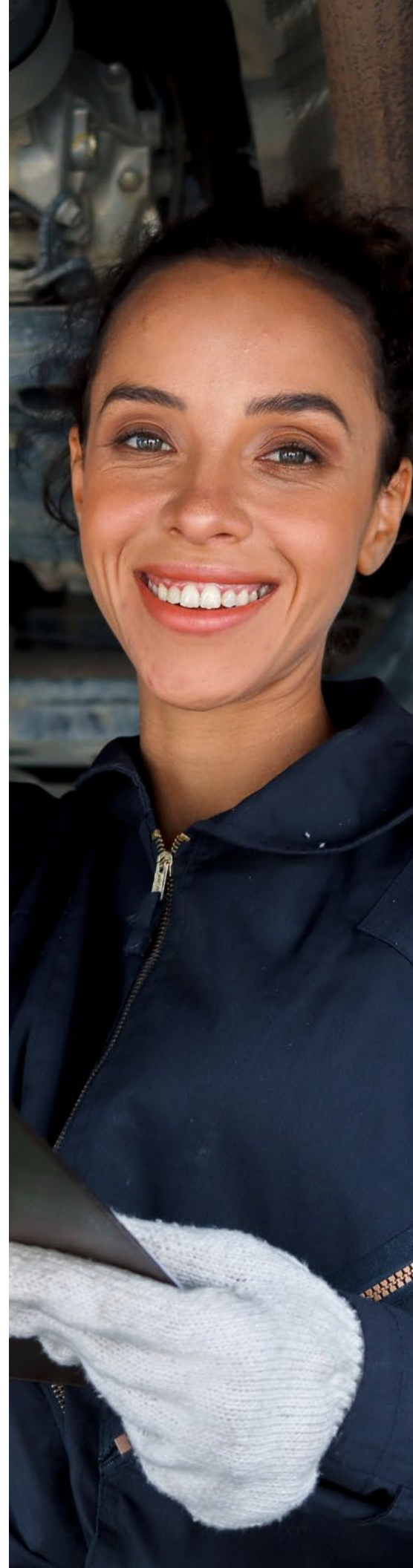


Figure 1: Astin’s I-E-O model (1984)

Inputs: Sample Demographics

The table below presents the demographic information for the 105 ASSET students surveyed in Fall 2022.

	N	%
Sex		
Male	97	93%
Female	6	6%
Prefer not to say	1	1%
Gender identity		
Man	95	92%
Woman	6	6%
Prefer not to say	2	2%
Race/ethnicity		
American Indian/Alaskan Native	2	2%
Asian/Asian American	1	1%
Black/African American	2	2%
Latinx/Hispanic	51	49%
White	29	28%
Other	2	2%
Two or more races	15	14%
Unknown	3	3%
Political leaning		
Very conservative	10	10%
Conservative	24	23%
Neither conservative nor liberal	52	50%
Liberal	3	3%
Very liberal	0	0%
Prefer not to answer	15	14%
Highest level of parents' education		
Elementary school or less	5	5%
Some high school	17	16%
High school diploma/GED	23	22%
Some college	17	16%
College degree	32	31%
Some graduate school	0	0%
Graduate degree	10	10%

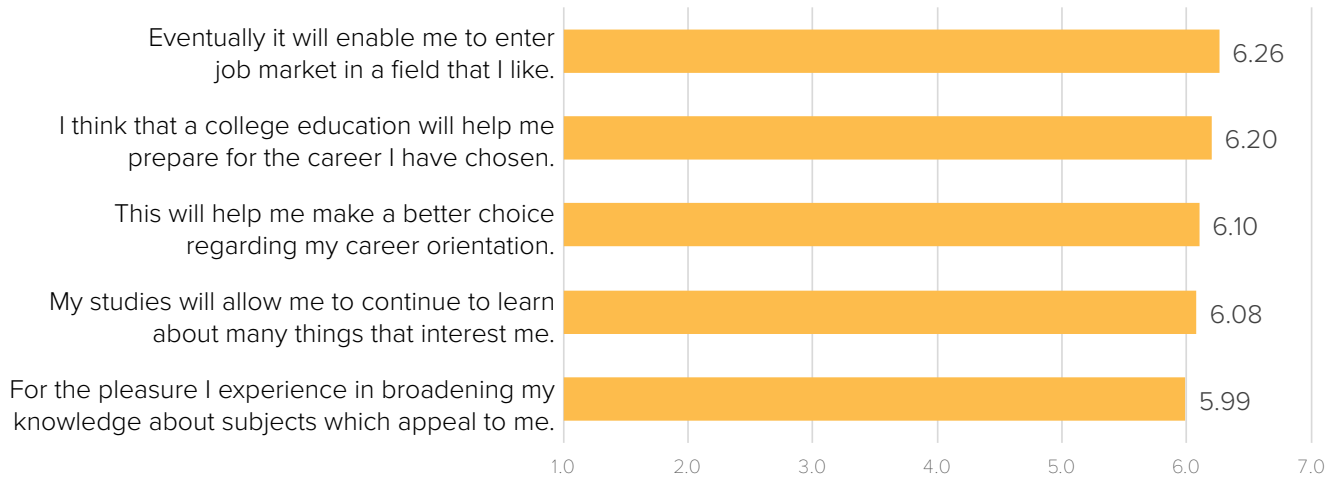




	N	%
Family income		
Less than \$25,000	13	13%
\$25,000-49,000	22	21%
\$50,000-74,999	34	33%
\$75,999-99,999	12	12%
\$100,000-124,999	14	14%
\$125,000-149,999	2	2%
\$150,000-174,999	1	1%
\$175,000-199,999	2	2%
\$200,000 or more	4	4%
Sexual orientation		
Heterosexual/straight	97	93%
Bisexual	3	3%
Gay	0	0%
Lesbian	1	1%
Queer	1	1%
Pansexual	1	1%
Marital status		
Married	10	10%
Living with a partner	10	10%
Widowed	1	1%
Divorced/separated	1	1%
Never been married	82	79%
Children in household		
None	71	69%
One	16	16%
More than one	16	16%

Inputs: Motivation for Attending College

We asked students to rate their motivations for attending college on a scale from 1 = Very untrue of me to 7 = Very true of me. The chart below presents the mean scores for the top five motivations provided by ASSET students.



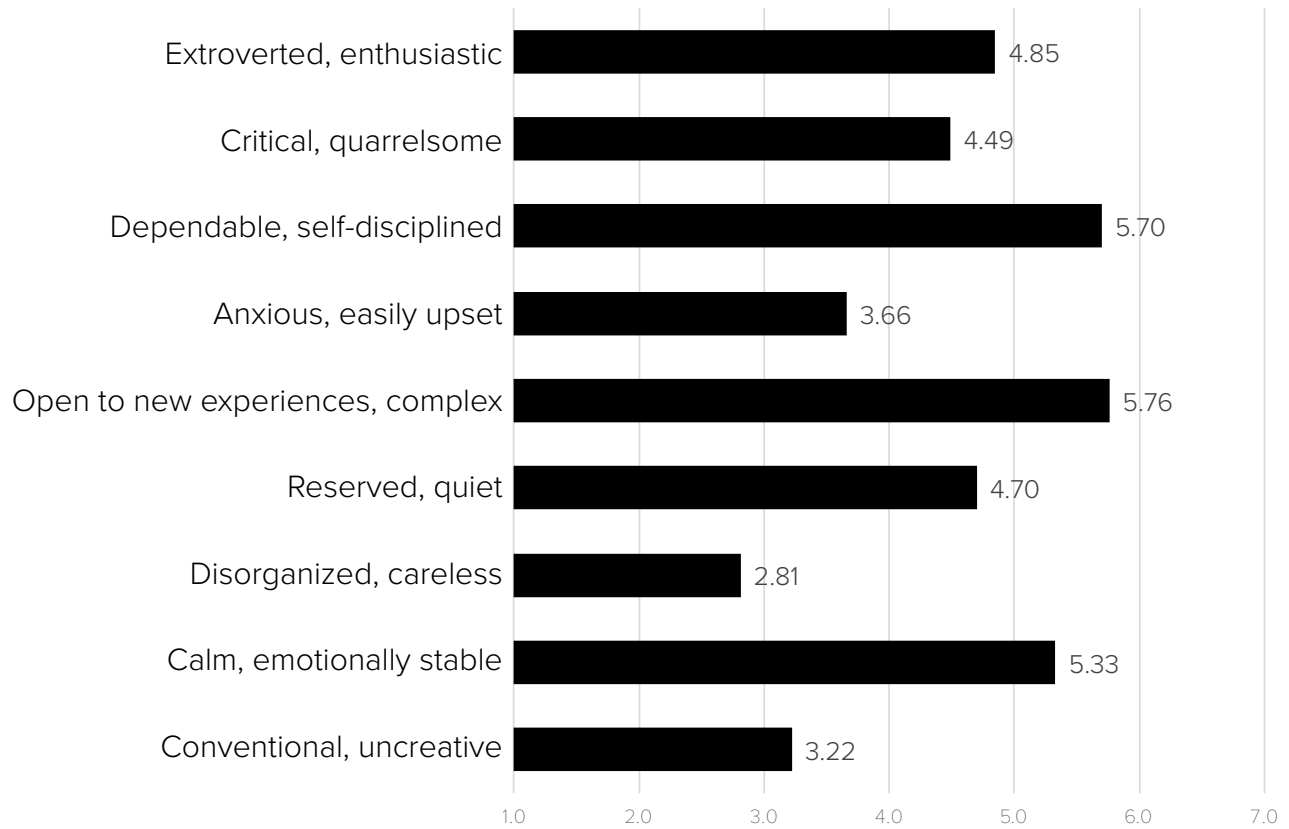
Inputs: Career Aspirations

We also asked students to rate their career aspirations on a scale from 1 = Not at all true of me to 5 = Very true of me. The chart below presents the mean scores for the top five reasons provided by ASSET students.



Inputs: Personality Inventory

Finally, we asked students to rate their level of agreement on a scale from 1 = Strongly disagree to 7 = Strongly agree to several personality traits. The chart below presents the mean scores provided by ASSET students.



RECOMMENDATIONS

Several best practices emerged from the perspectives ASSET students, faculty, staff, and other key stakeholders shared with us during the first year of the EDiCTS project. The following recommendations are based on the surveys, the focus groups, and interviews we conducted and are divided into seven areas: 1.) curriculum, 2.) faculty and teaching, 3.) community college policy and procedures, 4.) ASSET students, 5.) internships and mentoring, 6.) dealership owners and managers, and 7.) the Ford Motor Company.

Recommendations Regarding Curriculum

Every ASSET student shared that they enjoyed their ASSET coursework. Students specifically cited the hands-on experience working on Ford vehicles as their favorite part of the program. However, most students expressed frustration with the general education courses, particularly the writing, math, and humanities/social science general education (GE) coursework required for their associate degree. While some students described their frustrations with the GE due to scheduling issues (e.g., no time to complete an in-person class), others desired a more practical connection to their coursework. The following statements are recommendations, regarding curricular elements:

Purposefully select and frame courses to fulfill general education (GE) requirements. We recommend institutions emphasize general education requirements as an opportunity to gain practical skills that directly relate to technical education and a career in automotive technician service industry. For example, a student could be advised to take a technical report writing class instead of an English composition class. Students could even be prompted to write up service reports after completing a job for a shop. In turn, students may be more engaged in the academic work because skills in these courses directly translate to the work they are training for. Similarly, advisors and faculty can help students to see the value in classes such as psychology if the content is reframed to better understand its application in the dealership context. For instance, students at one community college we visited could enroll in a social science psychology class that connected psychological theory to practical applications using consumer behavior as an example. Students can then see firsthand how the academic skills from these classes are needed to work effectively in teams and communicate productively with colleagues and customers.

Finally, we recommend advisors offer classes that reflect the students' preferred hands-on, active learning styles when helping them choose general education courses to complement the ASSET coursework.

Encourage ASSET students to enroll in the same sections of general education coursework to keep with the cohort relationships and accountability that is embedded into their ASSET coursework. If possible, the general education courses should be offered in the same building as the ASSET coursework. This may accomplish two outcomes:

1. Alleviate some of the scheduling and logistic issues that the students encountered due to the length of their ASSET courses and labs.
2. Improve attendance for these classes since students do not have to leave the building.

Use caution when recommending online-asynchronous completion of the general education classes. ASSET faculty, staff, and students each shared that online learning environments led to more challenges engaging in the coursework and completing assignments. Failing grades in the general education courses creates graduation barriers since students must retake them to complete their degree. An advisor at one community college we visited noted a tendency for students to enroll multiple times in general education courses when they attempt the online option. For the benefit of the students' progression toward completion, the advisor has now shifted to automatically registering students for the synchronous option if the student fails an initial attempt at the online-asynchronous course.

Recommendations Regarding Faculty and Teaching

The ASSET students praised the ASSET faculty and instructors as critical to their success. Most students felt their faculty and instructors cared about their experiences and named them as sources of support in their academics and work/internships. Although the students viewed their ASSET faculty and instructors as valuable, the faculty and instructors fulfilled several roles beyond teaching. In fact, the faculty and instructors managed the recruitment (e.g., visits to high school automotive technology programs and career fairs), provided academic and career advising (e.g., course registration, help with job/internship search), and acted as program coordinator (e.g., working with college administrators). The following statements are recommendations regarding faculty and teaching elements:

Utilize staff for administrative duties such as academic advising, career exploration, internship placements, and program recruitment. Almost all faculty and instructors described the additional roles and tasks well beyond their teaching load. Research (Hatch & Garcia, 2017) suggests that students may benefit from more intensive academic advising, which faculty may not have the time for given their busy schedules.

Examine tenure and promotion policies for ASSET faculty and instructors to incorporate the depth of service they provide to their (a) students, (b) the ASSET program, and (c) the automotive industry. One instructor described the difficulties he encountered while trying to meet the college's requirements for promotion, which included in-person professional development that occurred while he was teaching (Note: ASSET classes are typically Monday through Thursday or Friday for five to seven hours).

Structure compensation (i.e., salary, stipends, travel/gas reimbursement, payment for certifications, etc.) equitably to reflect the numerous roles that ASSET faculty and instructors assume. Aside from teaching, faculty are also program coordinators, internship coordinators, program recruiters, academic advisors, success coaches, career advisors, and mentors. These various roles make the faculty key elements to the success of the ASSET program and its enrollees, but they are also time-consuming and require significant skill. Pay must be commensurate to attract and retain excellent faculty who can juggle these roles.



Recommendations Regarding Community College Policies and Procedures

The ASSET programs are one of many degree programs at community colleges, where a multitude of resources exist for students, faculty, and staff. The need for collaboration and support across programs and departments is reflected in the heavy workload of the ASSET instructors and the concerns that students, faculty, and staff shared regarding the curriculum. The following statements are recommendations regarding community college policy and procedure elements:

Ensure that the selection of courses that fulfill general education requirements include coursework that is directly applicable to technical careers (e.g., technical report writing, business math).

Strengthen connections between staff advisors and the ASSET curriculum so that students can rely on more program-specific advice. Advisors who understand the ASSET program can help students select general education requirements that more closely align with a technical career. Staff advisors may be able to alleviate the heavy teaching-advising-recruitment burden on ASSET faculty. Advisors may want to reach out to students at regularly scheduled intervals to encourage them to check-in.

Dedicate a portion of marketing/recruitment budget to the ASSET program (or to all manufacturer-specific automotive programs, if multiple exist). This investment may draw in additional students who may not otherwise perceive an associate degree as worth the cost without the program-specific benefits, such as a paid internship and manufacturer-specific certifications.

Increase the type of transfer coursework that can be applied to their associate degree program. Incoming ASSET students with earned bachelor's degrees from regionally accredited postsecondary institutions should have their general education courses waived. Math classes that are at a higher level than what is required for the associate degree should automatically fulfill the math requirement.



Recommendations for ASSET Students

The ASSET students need to know that the ASSET program requires commitment and will comprise much of their time. This degree takes approximately two years to complete, and their schedule can range from 7:00 a.m. until 10:00 p.m., between commuting, classes, internship, and additional homework. Developing success strategies and sources of support aided the ASSET students in their degree progression, including sticking to a schedule, setting goals, and turning to their classmates/cohort, family, and instructors for help. Recommendations for ASSET students include:

Proactively reach out to an advisor (or faculty, if faculty-advisor fills this role for ASSET students) for regular check-ins. We recommend that students discuss and document their semester, year, and program goals. Students may also want to outline possible challenges and brainstorm ways to address them. Advisors can help students find the most relevant courses to fill general education requirements and faculty can help students identify elements of the courses that apply to career-building skills.

Understand the commitment necessary to succeed in the ASSET program. The ASSET students should understand the intense nature of the program. We recommend students connect with faculty, second-year students, and alumni to comprehend the intensity of this program and develop strategies for success.

Recommendations Regarding Internships and Mentoring

The internship element of the ASSET program comprises approximately one of the two years of the degree program, making it a key feature. It was the students' favorite part of their experience in the ASSET program and why many students selected ASSET over another program. The satisfaction with their internship is linked to the relationship the ASSET student has with their internship supervisor/mentor as well as the specific duties they perform at the internship. The ASSET students discuss which internship sites have supervisors/mentors that want to teach and work to improve their skills and which sites have supervisors/mentors who view ASSET students as a burden. In addition, the type of work at the internship site is also important to the ASSET students. They want to have their duties at the internship sites to link to what they are doing in their ASSET classroom by bridging the gap from lab/classroom work to the actual Ford dealership. The ASSET students also discuss which internship sites keep their interns in stagnate positions such as quick lane, oil change, tire rotations, etc. and which sites allow the interns to hone their skills that they learned in the ASSET classroom and the Ford STARS certifications. The following statements are recommendations regarding internship and mentoring elements:

Aid students who struggle to secure internships. We recommend the faculty/program coordinators provide timely assistance to students who have trouble securing an internship, especially for women or Students of Color who may face discrimination and biased hiring practices. Coordinators may want to direct students to the college's career center for mock interviews and resume building workshops. In some cases, program coordinators may need to directly intervene and connect students to available dealerships when necessary to prevent students from losing work time.

Increase financial investment in students by dealerships based on academic performance. There is compelling evidence in the literature that students who must pay higher tuition costs and work more hours per week tend to have higher attrition rates, and that this is particularly true at community colleges (St. John & Starkey, 1994). Additionally, receiving grants or scholarships appears to increase student retention (Nguyen et al., 2019).





Document, track, and listen to student feedback about their internship experiences.

We recommend coordinators allow students to evaluate the dealership and their supervisor(s) following their internship rotations and keep students from toxic work environments. Mentors who provide students with highly effective experiences should be recognized and rewarded. From the student perspective, the following behaviors can make an internship successful:

- A dealership's willingness to move a student out of the oil change routine in a reasonable amount of time to gain more relevant experience.
- A mentor's pay-it-forward mentality. One student noted, "My mentor is really helpful... we never work separate. And it's really great because he doesn't mind making a little less [money] just for me to learn something because he says in the long run, it's going to help me and benefit me more. And he hopes that when I become my own tech and I get a helper, that I'll treat that helper how he treated me."
- A mentor's willingness to balance independent tasks with collaborative work. A student may be allowed to work independently on tasks they have already mastered, but this should not dominate the internship experience. A good mentor allows a student to explore a complex problem with supervision and then watch or assist while the technician solves it.

Establish and communicate guidelines for selecting mentors at dealerships.

Mentors should receive financial incentives for taking on a student intern and be recognized by the Ford Motor Company for their involvement. Mentors who are willing to voluntarily take on students make better mentors, and financial incentives can offset potential time lost on a job that a student is helping with. Mentors should demonstrate the following characteristics:

- Understand the long-term benefits to the whole shop of properly training and retaining a new service technician.
- Be established technicians who do not view a new student as competition.
- Be able to talk and walk through diagnostics and repairs alongside a student instead of solely tasking the student with individual jobs.



Recommendations for Dealership Owners and Managers

Many of the dealership owners and managers our team met were alumni of the ASSET program and/or had a long history of working with the ASSET program. The following recommendations for owners and managers are based on our conversations and their descriptions of the ideal dealership:

Understand how the ASSET program and students benefit their business by creating a pipeline of highly skilled and educated workers.

Recognize that the interns are also students. ASSET students should not be penalized for missing shop work while they are supposed to be in the classroom.

Equitably pay ASSET student interns for their work and their time at the dealership. Internship activities generally mimic what students learned in recent coursework or were recently certified in.

Establish an agreement between the dealership and the ASSET students, either as an incentive for maintenance of a high GPA or in exchange for a student's commitment to working at the dealership for a specified period following graduation. The incentive could take one or both of the following forms:

- Paying students for class hours so that students feel less pressure to skip class for work or to fill non-class hours with work shifts, or
- Providing tuition reimbursement to the students each semester.

Reward the technicians who mentor, train, and supervise the ASSET students.

Allow the ASSET student to provide feedback on their supervisor(s) without fear of negative consequences.

Recommendations for Ford Motor Company

Ford Motor Company provides course curriculum for the automotive technology courses, the assessments for the Ford STARS certifications, the credentials for the Ford ASSET instructors, and some of the materials in the automotive technology classrooms. The following statements are recommendations for the Ford Motor Company:

Build dedicated infrastructure for ASSET program annual data collection, storage, and reporting (direct surveying of students and required reporting from program coordinators). By tracking the students, Ford will be able to see opportunities for improvement and growth. Also, with Ford Corporate's commitment to diversity and its belief that "diversity breeds innovation" (Ford Motor Company, 2020), understanding the demographic characteristics of students in the ASSET program is a critical step to insure equitable access into and through the ASSET program and into the technical field. The following data elements should be collected and reported each year:

- Enrollees (number and demographics)
- Year 1 to year 2 retention rates, overall and by race/ethnicity and by gender
- Stop-out, drop-out, transfer, or change of academic program (and follow-up with these students to see why they are not a part of ASSET)
- Graduation rate, overall and by race/ethnicity and by gender
- Student satisfaction measures for institution and internship
- Postgraduation employment outcomes (including employer, salary, position, and geographic location)

Enhance advertising of the program in all geographics areas around colleges with existing ASSET programs (to expand beyond institutional recruitment regions). Some areas close enough to the colleges to draw students are outside the allowable institutional recruitment region for a college; Ford has an opportunity to target marketing of the ASSET program in at least a 50-mile radius of a college.

Directly engage with local dealerships to encourage their participation in ASSET program internships and financial investment in students. We suggest Ford presents the benefits of participation to owners (e.g., long-term growth of loyal employees who have been trained in-house with manufacturer-specific certifications already complete). Success stories from other dealers, including locations where student tuition is reimbursed and/or class hours are paid when high academic performance is sustained should be shared. Ford can also encourage an incentive structure for mentors, with examples of how this might look for both small and large dealerships.

Offer paid mentorship training for employees at local dealerships to provide exceptional internship experience for students to boost retention and success of potential full-time employees.

Emphasize the importance of building an inclusive work environment for marginalized students and employees for overall workplace productivity, morale, and equity.

Encourage the purposeful movement of student interns from “quick lane” positions to the shop within 8 weeks so that students can gain more meaningful exposure and apply their classroom skills to the workplace by their second internship period.

Provide electric vehicles (EVs) to all ASSET programs and provide training and certification to ASSET faculty and instructors.

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EDiCTS Team Members

Matthew J. Mayhew, Ph.D.

William Ray and Marie Adamson Flesher Professor of Educational Administration

Emily Creamer, Ph.D.

Postdoctoral Scholar

Susannah Townsend

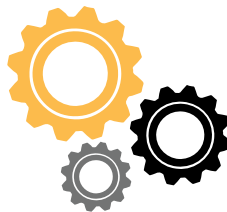
Doctoral Student

Jossie Muñoz

Program Coordinator

Laura S. Dahl, Ph.D.

Research Director



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