

## **Work in Progress: Adult Learner Pathways to Prosperity through STEM**

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## WORK IN PROGRESS

### ADULT LEARNER PATHWAYS TO PROSPERITY THROUGH STEM

#### Introduction

This work in progress is developing and implementing the *Adult Learner Pathways to Prosperity through STEM* (ALPPS) research project. ALPPS is informed by evidenced-based practices to assist adult learners with navigating the process to return to college and earn a certificate or degree in STEM disciplines. The program targets adult learners in the Dallas County, Texas metropolitan area who are active participants in the Dallas County Promise – Parent Program (DCP-PP). DCP-PP is working to provide support for high need, low socioeconomic families to fund college degree completion. This program is part of a larger strategy focused on supporting workforce development and family prosperity as a way of improving overall quality of life. ALPPS includes researchable interventions that will supplement programs and services available to adult learners through a DCP-PP that are designed to promote successful college matriculation and retention.

#### Research Methods

The Adult Learner Pathways to Prosperity through STEM (ALPPS) research project includes a mixed-methods study that begins with qualitative data collection to inform the design of project interventions and the creation or adoption of quantitative instruments. This exploratory study employs case study methodology. Case study methodology is appropriate for this research study where a contemporary problem is investigated through several sources of data [1]. The specific case study approach for this research project includes multiple or collective case studies given that the researchers have selected several cases of adult learners as a way to examine issues of motivation, determination, self-control, and grit among adult learners who are pursuing a postsecondary STEM certificate or degree. Case studies “may be particularistic (focused on a particular phenomenon, situation or event), descriptive (providing as an end result a thick rich description), or heuristic (focused on providing new insights)” (p. 454) [2].

#### Research Question and Project Goals

The primary research question guiding the ALPPS project is:

What are the sources and influencers of motivation, determination, self-control, and grit that support adult learners’ pursuit of a postsecondary STEM certificate/degree program in a high demand occupation?

Duckworth and Gross [3] underscored the importance of examining self-control and grit and raised the question: “What are the main and interactive effects of self-control and grit with respect to specific success outcomes?” (p. 323). Both self-control and grit are necessary to continually pursue goals through times of adversity. Self-control enables people to “adjudicate between lower-level goals” and grit helps “maintain allegiance to the highest level goal” (p. 322). Arguably, both are necessary to drive motivation and determination for adult learners. Therefore, the project has two primary goals that will be informed by the research conducted:

- Goal 1: Develop an evidenced-based program that supports adult learner transition and success as they pursue certificates/degrees in STEM fields.

- Goal 2: Deliver direct student services as researchable interventions to support adult learner success in postsecondary STEM fields.

### Study Population and Sample Description

Recent data from the National Center for Educational Statistics (NCES) indicates that 74% of students in American higher education have at least one adult learner characteristic or trait. Common traits used to define adult learners or nontraditional students in American higher education include being 25 years of age or older, delayed enrollment after high school, less than fulltime attendance, and maintaining fulltime employment [4]. The adult learners identified for this research project possess these and other attributes that mirror the adult learner population in American higher education today. Furthermore, the demographic makeup of adult learners participating in the Dallas County Promise - Parent Program (DCP-PP) aligns with that of the community college district these students are attending. Current demographics for the area include 37.1% Hispanic students, and 24.8% African American students. Given the demographic makeup of the community college and DCP-PP participants, this project includes individuals from a racially and ethnically diverse student population.

### Focus on Adult Learner Needs

Although the number of adult learners in American higher education has increased, institutions still struggle to understand adult learner motivators and factors related to successful postsecondary placement, matriculation, retention, and graduation [5]. Theoretically, there are three barriers to participation in education by adult learners including institutional, situational, and dispositional factors as defined by Cross [6]. Institutional barriers are often considered those that exclude or discourage attendance, situational barriers are related to the adult learners' life circumstances, and dispositional barriers are related to attitudes about self and self-perceptions. Engagement in education by adult learners is often impacted by issues such as time, resources, transportation availability, and even health. Another dominant concern that has been repeatedly identified is personal pride and ego [7].

The marked increase of adult learners in American higher education is a confounding issue when previous research has indicated that reasons and motivations for attendance vary especially among community college students where many adult learners often enroll [8]. Donaldson and Graham's [9] "Model of College Outcomes for Adults" underscores the importance of motivation and self-confidence among adult learners juxtaposed with the impact of prior experience, cognitive attributes, and balance of life-world environments including work and family. Donaldson and Graham's "Model of College Outcomes for Adults" serves as the theoretical framework for the study and is used to guide inquiry for this project throughout data collection and provide a framework for data analysis.

### Emphasis on College Completion and STEM Focused Degrees

Industries are demanding a more highly educated workforce and community colleges are positioned to fulfill a critical role in developing future employees for various industries. New models are needed across the nation to inform institutional practices and incentives to student behavior [10]. The Adult Learner Pathways to Prosperity through STEM (ALLPS) research project presents an opportunity to gain an understanding of how adult learners entering community college can achieve success and identify interventions that are scalable to

metropolitan areas where high-tech industry is demanding employees who are ready for STEM careers such as artificial intelligence, computer programming, and engineering.

The National Center for Education Statistics (NCES) identified Texas and California as the two states which have the lowest percentage of citizens who possessed a high school diploma or higher (Texas - 82.9%, and California - 82.4%). In Dallas County, Texas, where this study is conducted, the percentage of citizens with a high school diploma drops to 75.3% [11]. With Dallas County being the second largest county in the state (approximately 2.6 million residents), this means that roughly 25%, or approximately 650,000 residents, do not possess the necessary skills needed to secure a job in one of the fastest growing economies in the United States due to a lack of educational attainment.

The situation is further complicated by the fact that the Bureau of Labor Statistics reported that Texas added approximately 102,000 new jobs in STEM related fields between 2009 and 2015. Texas was second only to California, which added over 160,000 new jobs in STEM fields during this same time period [12]. The paradox of having a high number of undereducated adults, coupled with strong growth in new STEM jobs, creates a problem for states where hubs of STEM innovation exist. The expectations being placed on the postsecondary education systems have never been greater, and the need for an initiative which promotes prosperity for adults interested in STEM careers is more urgent than ever in Dallas County, Texas and similar metropolitan areas across the United States.

According to the Dallas Regional Chamber of Commerce, it is projected that the Dallas/Fort Worth economy will continue to grow at a rate that exceeds most areas through at least the next five years, with the majority of these employment needs being in a STEM related field. Businesses focused on health care, logistics, engineering, and technology are contributing to the diverse local economy that leads the State of Texas in employer needs. Key emerging technologies among Dallas/Fort Worth employers include next generation wireless and broadband communications, artificial intelligence, and virtual reality, all of which are highly technical fields situated in engineering disciplines. Other areas gaining increased recognition locally, and at a national level are medical, biomedical, biological and life science careers [13]. Adult Learner Pathways to Prosperity through STEM (ALPPS) seeks to support the talent development demands of the Dallas area by supporting the academic and career transition needs of adult learners entering the Dallas County Community College system to pursue STEM related credentials.

#### Intervention: Dallas County Promise – Parent Program

The Dallas County Community College District (DCCCD) and the Dallas County Promise - Parent Program (DCP-PP), have implemented efforts to address the institutional barriers that tend to negate adult learner matriculation and success in postsecondary education. Financial assistance is being offered through the DCP-PP for a select population of adult learners seeking to complete a postsecondary certificate or associates degree in a STEM related field. Academic advising, career exploration, mentoring, and academic support are being offered through DCCCD's efforts to focus on adult learner pathways in STEM. The efforts of the partnership between DCCCD and DCP-PP are making great strides to address institutional barriers that adult learners face when attempting to re-enter or enter college for the first time. Examples of these efforts include the addition of student success coaches and career mentors for adult learners participating in this program.

Proper support of adult learners' academic and career transition needs, which can lead to increased prosperity, is contingent upon understanding the levels of individual motivation, determination, self-control, and grit. These attributes must be understood in order for postsecondary educational institutions to develop the talent pipeline that major STEM employers in large metropolitan areas not only need, but are now requiring. Given the expansive diversity and influx of industry to the Dallas/Fort Worth area, Dallas County is an ideal location to develop an array of models for adult learners that are connected to the varying sectors such as medical, transportation, computer science, engineering, etc. Working in collaboration with DCCCD and DCP-PP, the Southern Methodist University research team is working to identify and test interventions for adult learners to provide valuable information that will inform other large metropolitan areas across the United States on best practices and methods to solve the longstanding problems associated with advancing adult learner education and employment opportunities in STEM careers. The following is a description of the two goals that will be executed for the project based upon research conducted through the ALPPS project.

#### First Goal: Develop Evidence-Based Programs for Adult Learners

The first goal of the research project investigates and works to understand motivation, determination, self-control, and grit among adult learners who are pursuing a STEM certificate or degree that is aligned to a high demand occupation. ALPPS interventions are informed by prior research conducted by Carrell and Sacerdote [14], which suggested that late interventions with high school seniors who were deemed good candidates for college, but had not applied, could be positively impactful. Similar to the high school students in the evidenced-based work by Carrell and Sacerdote [14], adult learners in the ALPPS project most likely will have a desire for college and career success, but that desire often faces limited support, and many adult learners might be unsure about what the proper steps or processes are to enroll in college.

#### Second Goal: Delivery of Student Services for Adult Learners

The delivery of direct student services is at the core of the ALPPS research project, and will begin after the research team has fully investigated promising practices and conducted baseline research on adult learners in the Dallas County Promise - Parent Program. The project will emphasize evidence-based practices to support adult learner adjustment to college, retention and career readiness.

#### Conclusion

The merit of the Adult Learner Pathways to Prosperity through STEM research project is based upon its primary goal to investigate and understand the impact of situational and dispositional barriers among adult learners. The need for examination of these barriers was underscored by Sissel, Hansman, and Kasworm [15] who called on higher education institutions to develop "new understandings of adult life, adult work, and the adult place in civic responsibility" (p. 25). ALLPS systematically examines and supports mitigation of these barriers so that new understandings related to the needs of adult learners can be discovered and contribute to the body of knowledge, specifically to help adults who are enrolling in college to pursue STEM certificate and degree programs. This research project is developing an evidenced-based program that supports adult learners, while conducting rigorous research on adult learners' motivation, determination, self-control, and grit throughout their participation in the Dallas County Promise - Parent Program.

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