Project Name: Extending Equity into the Digital Workforce

Absolute Priority 1: Moderate Evidence (A.3)
Absolute Priority 3: Field-initiated Innovations – STEM Education (B.1)
Competitive Preference Priority – Computer Science (B.1)
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A. SIGNIFICANCE

A.1 NATIONAL SIGNIFICANCE

The Early College High School (ECHS) model is an exemplary solution in which students simultaneously earn their high-school diploma and cost-free college credits (WWC, 2017). Upon graduation, ECHS students move seamlessly from high school to college to *continue, rather than begin,* earning a degree or industry-recognized credential (Hughes, Rodriguez, Edwards, & Belfield, 2012). Issues arise upon high-school graduation, as evidenced in the number of students selecting STEM majors and the rate of matriculation. Students fall further behind in their next steps, as evidenced in the continued underrepresentation of minorities and women in digitally rich jobs and IT careers.

The proposed program, ***Extending Equity into the Digital Workplace,*** builds on the moderate evidence of success of the ECHS model, where recruitment, admission, and enrollment in ECHS for its targeted students— *low-income, first-generation college-goers, racially and ethnically diverse*—have been successful. *Extending Equity,* the first major re-envisioning of ECHSs since their introduction almost 20 years ago, extends the model's commitment to equity by: (1) targeting an ECHS pathway to build students' digital skills, a required entry for *every job* in today's workforce; (2) developing the pathway as an *online* course, available to an *unlimited number* of students, particularly in rural areas where districts do not have the resources or enrollment to support an onsite IT program; and (3) through this virtual format, expanding the role of *business partnerships* in ECHSs by bringing *online* business partners from every industry across the state to support and mentor students. The result is students will not only build digital and IT skills but also develop personal, mentor/mentee relationships with prospective employers to open doors to a fully representational workforce.

A.1.1 Solution to Unmet Needs

A major concern around issues of a digital divide in our nation is the racial disparities in computer science careers, one of the fastest-growing and highest-paying fields today. If underrepresentation of women and minorities continue to shut these groups out of the field, it

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means public education is failing in its role as the great equalizer (Pearson, 2020). By providing access to IT skills training for any ECHS student—regardless of ethnicity, geographic distance, or other challenges—*Extending Equity into the Digital Workforce* provides a solution to this unmet need in the ECHS model and broader educational community.

A.1.2 Overcoming Potential Barriers in the ECHS Model and Education Community

College enrollment: While New Mexico's Higher Ed ECHS Partners meet the requirements for a postsecondary partner in the ECHS Rubric, students in the Online ECHS will not fully gain from the onsite college culture encouraged in ECHSs. To address this, New Mexico's Higher Ed ECHS Partners will provide virtual access to campus activities and special events, campus visits and tours, and campus counselors to answer questions students may have.

Small and rural schools: Setting the IT ECHS as an online opportunity addresses the challenges school districts face with staff shortages for small clusters of students in small rural schools. With schools and students geographically dispersed, districts were previously forced to consolidate and limit offerings in ECHS. The advantage of having university faculty deliver instruction online addresses teacher shortages and ensures IT instructors possess qualifications for a rigorous, high-quality IT online program (Zinth, 2018).

Financial: Establishing the IT pathway as an ECHS program eliminates some of the financial strains many students face in postsecondary education by providing access to college credits free of charge while still in high school (Estrada, Burnett & Campbell, 2017).

Business Partnerships: Online course access also means online business/employer access, and in larger numbers. This eliminates the current "single business partner" at many of the ECHSs and, instead, opens door for many employers to *remotely* work directly with students from across the state.

A.2   POTENTIAL CONTRIBUTION TO INCREASED KNOWLEDGE

Taking the basic tenets of ECHSs as a demonstrated effective model, **Four Corners Regional Education Cooperative #1,** located in the northwest corner of New Mexico, will lead this initiative to develop an **Online IT ECHS Career Pathway.** The design brings greater

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assurance that ECHSs accomplish what they set out to do—that is, provide equity of preparation and opportunity to bring high-need, disadvantaged students into rich, high-demand STEM careers (See Section B.1).

With access to an ECHS IT program provided *online,* and with a more active and larger business partnership, equitable opportunity for rigorous training and preparation for high-demand jobs will become part of the ECHS model and regional economies. With businesses providing students with STEM mentors and role models, who students can look up to, coupled with continuous employer online interactions, students will learn more about and be comfortable with STEM skills and jobs.

A.2.1 Contributions to Knowledge

Extending Equity into the Digital Workplace will facilitate replication and scale-up through design modifications in place and structure (Online), and confirmed relevance to local and regional economies (STEM/IT career demand):

Online ECHS: An **Online IT ECHS Career Pathway** will be first open in Year 1 to the estimated 500 9th grade students (725 enter NM ECHSs each year at 9th grade) Beginning in Year 2, the online IT pathway will be open to any of the 2,900 9th through 12th grade students enrolled each year. For many of these students, this Pathway will be a solution for the limited resources in their districts to support IT pathways. For the proposed program, "place and structure" has the advantage of synchronous and asynchronous learning and potentially unlimited employer partners, as well as high-level college instructors. By being an online curriculum, enrollment and business engagement are potentially unlimited, thereby extending opportunities in place and structure.

No studies have been conducted to determine the efficacy of locating the ECHS model online and its impact on development, operational, and sustainability costs, and open access to students. In this ECHS scale-up in New Mexico, we will examine to what extent this newly proposed ECHS implementation structure can achieve similar or improved outcomes with differences in cost efficiencies and student accessibility.

Confirmed relevance to local needs: The proposed **Online IT ECHS Career Pathway** is linked to the rapidly growing demand for individuals entering the workforce to demonstrate a high level of digital skills. Business partners from across the state, identified through each economic region's Comprehensive Local Needs Assessment (CLNA - Perkins V), will provide an essential link *from* training and education *to* the workplace as well as build student interest and understanding of the importance of these digital skills. Project partners will help economic planners, employers, and educators understand how best to align students' career pathways with well-prepared entry into high-demand careers, and which employers to engage in the program. It is this level of planning and thoughtful partnerships that are invaluable to the success of the program.

A.2.2 Absolute Priority 1: Moderate Evidence of Effectiveness

Gradually over the past decade, education, the economy, and workforce readiness have converged to redefine what students require from schools. Zinth (2016) attributes these new high-school demands to multiple factors: (1) more jobs and careers require training and education beyond high school; (2) America's underserved populations have lower probabilities of getting the education and training they need; and (3) traditionally underserved populations constitute a growing proportion of students in US schools.   To address this trifecta of educational challenges, the Bill & Melinda Gates Foundation funded the initial ECHS model in 2002 to *improve college readiness and completion rates for students underrepresented in postsecondary education.* Since then, the model has proliferated nationwide, serving more than 80,000 students in its first decade (College in High School Alliance & Jobs for the Future, 2017).

A.2.2.1 Contributions to a Strong Evidence Base:

A 2016 study of NM ECHSs showed the effectiveness of the model for the targeted population it serves. Prior to high-school graduation: (1) 64% earned the equivalent of two years' college work; (2) 43% earned an industry certification; (3) 79% participated in workforce learning placements; (4) 23% enrolled directly in community college; and (5) 67% enrolled in a four-year college/university after graduation. In comparison, just 14% of non-ECHS students in

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NM engaged in any workforce learning; and just 14% earned an associate's or workforce credential prior to graduation (NMPED, 2018a).

In 2019, New Mexico's Legislative Financial Department (NMLFD, 2019) led a quasi-experimental analysis of student outcomes for two New Mexico ECHSs (901 students in ECHS treatment group; 425 students in the non-ECHS control group). Findings over eight years (2010-2018) showed attending an ECHS increased the earning a postsecondary degree by 10%.

Nationwide, seminal studies show ECHS students are more likely than non-ECHS students to graduate from high school, enroll in college, and earn a two- or four-year college degree prior to high-school graduation (AIR & SRI International, 2009; Berger, Turk-Bicakci, Garet, Song & Knudson, 2013; Berger, Turk-Bicakci, Garet, Knudson & Hoshen, 2014; College in High School Alliance, 2017; Edmunds, Bernstein, Unlu, & Glennie, 2012; Edmunds, Unlu, Glennie & Bernstein, 2017; Edmunds, Willse, Arshavsky & Dallas, 2013; Mickens, 2014). The evidence for historically underserved students was compelling: Minority students and those from low-income families who attend ECHSs were ten times more likely to obtain a college degree than students who attend traditional high schools (Berger et al, 2014).

With 94% of ECHS graduates earning college credit (free of tuition) while in high school, an estimated 30% of tuition costs toward a bachelor's degree is saved, or 60% of tuition costs toward an associate degree (Jobs for the Future, 2012).

A.2.2.2 *What Works Clearinghouse (U.S. Department of Education, 2015, 2017):*

From among the eligible studies of ECHSs WWC reviewed, two met group design standards without reservation. Berger (2014a) and Edmunds (2015) conducted randomized controlled trials (RCT) to examine ECHS model effects across programs. Statistically significant positive effects were found in high-school graduation and college degree attainment.

Two studies of dual enrollment programs, including ECHSs, met WWC group design standards with reservations. Giani, Alexander, & Reyes (2014), and Struhl & Vargas (2012) showed statistically significant positive effects in multiple domains.

For these four studies, statistically significant positive effects were shown on college

enrollment and degree attainment (Berger, 2014a, Edmunds, 2015; Giani, 2014; Struhl & Vargas, 2012); credit accumulation (Giani, 2014; Struhl & Vargus, 2012); high-school completion (Berger, 2014a; Edmunds, 2015); high-school academic achievement (Berger, 2014a; Edmunds, 2015); and staying in school and college readiness (Edmunds, 2015).

B. STRATEGY TO SCALE

In 2016, a state study was commissioned by NMPED to document the primary reasons districts established ECHSs. Findings showed: (1) the need to improve graduation rates; (2) the need to find high-school alternatives that work for disengaged students; (3) local communities' inabilities to attract new industry requiring skilled workers; and (4) a reduction in college enrollments due to financial and emotional challenges for students and their families. *These issues have all been positively impacted with the NM ECHSs, setting the impetus for scale-up.*

B.1 BARRIERS TO SCALE: PREPARING STUDENTS FOR HIGH-DEMAND CAREERS.

This section addresses **Absolute Priority 3: Promoting STEM Education, and Competitive Preference Priority – Computers**

In New Mexico, as in the entire nation, the workplace is changing. **Digital skills are not just required for the technology industry, but across the span of practically every industry.** Manufacturing and mining are being largely replaced by technology and service industries that together require varying levels of technical, administrative, and workplace skills. Many of these new jobs require some postsecondary credentials. Clearly, all students are affected by the demands for education beyond high school. High-risk students, however, are far more impacted due to their lack of exposure and preparation for high-demand, high-paying jobs.

B.1.1 High-demand Jobs

At the forefront of everything in our lives are digital skills, which are crucial as workers prepare for the future. Digital literacy and knowledge—part of an overall digital infrastructure—

are required for any job, from entry-level to higher-level in today's workforce (Lund, 2021).

The digital future will result in a growth in jobs related to STEM careers. The greatest demand will be in computer/digital occupations, projected to increase 11.5% by 2029 (US Bureau of Labor and Statistics, 2021). These occupations will include information security analysts and cybersecurity, information technology specialists, and software developers.

As more small devices become connected to the internet and send data (Internet of Things), computer research scientists will also be needed. For entry-level jobs, skilled workers are already asked to be familiar with machine learning, coding, and automation. At higher levels of workforce entry, skilled workers are required to be familiar with online marketing and platform development, i.e., Zoom and Asana (Torvekar, 2020). Other STEM careers that will realize a more modest growth are engineers, life scientists, STEM post-secondary teachers, physical scientists, and math science occupations (Zilberman & Ice, 2021).

In other arenas, new technologically-rich systems are being developed for warehouses, grocery stores, call centers, and manufacturing sites. And, health sciences (Dennon, 2020) and clean energy industries (Kane & Shivaram, 2020) will also require these kinds of skills.

B.1.2 Making Time for STEM

When prospective employers take an interest in individual students and allow them to envision their STEM careers, the students can become further engaged to continue their career pathway. *"STEM needs to be the sport your child is playing, the show they are watching, and the hero they are emulating. It's not that kids don't have the time or capacity to 'fit in' STEM, but rather that time needs to be reshaped to include STEM"* (iD Tech, 2021).

B.1.3 Barriers Leading to Under-representation in STEM Majors and the Workforce

The proposed program addresses the scarcity of dedicated IT career pathways available in both ECHSs and CTE programs in New Mexico. This scarcity contributes to the findings of a year-long study in New Mexico which showed significant under-representation in STEM college majors and jobs of: (1) female students (29% vs. 49% of total population); and (2) Native American students (3.8 vs. 10%) (Hoachlander, 2021).

Students with STEM majors can earn 26 to 40% more over the course of their careers than non-STEM counterparts. While Hispanic and African Americans account for approximately 30% of the workforce, they account for 11% of the Science and Engineering workforce (Funk & Parker, 2018). This minority disparity in STEM originates in the STEM educational pipeline. In 2013, White students obtained 67% of STEM-related bachelor's degrees, while African Americans obtained 6% of these degrees (Musu-Gillette, Robinson, McFarland, KewalRamani, Zhang, & Wilkinson-Flicker, 2016).

Online courses will ensure students who are under-represented in today's IT-focused jobs have access to IT career pathways in preparing for college and careers. The opportunity is an online approach which, according to the National Alliance for Partnerships in Equity's mission statement, is "*an effective solution for increasing student access, educational equity, and workforce diversity*" (NAPE, 1993).

The following table summarizes barriers to scale and strategies to overcome the barriers. All have an impact on equitable opportunity in education, the economy, and the workforce.

Barrier/Problem	Strategy to Overcome Barrier
Limited number of highly qualified IT instructors, particularly in rural areas.	With the ECHS IT pathway being offered online, university instructors can teach/reach an unlimited number of ECHS students, while also reducing the number of instructors required.
Lack of availability of STEM program resources in more rural areas unequally affect students living in poverty.	While the proposed program does not directly address issues of poverty, it will impact the neediest communities since students in rural areas can enroll in the online STEM IT program to develop digital skills for college and the workplace.
The number of business partners to work directly with students is limited, particularly for students in more rural areas.	Employers and businesses across the state will be available online, both asynchronously and synchronously, to provide clarity on IT skills needed for different jobs, advise on work-based learning, provide virtual workplace experiences, and serve as mentors. This opens more doors for partnerships between students and businesses.
Software and hardware issues, particularly in rural areas, including broadband connectivity, equipment, and programs.	Online access from the school provides students with required hardware and software, and access to the Internet. Additionally, NMPED recently launched the New Mexico Student Connect program to help bridge the digital divide, particularly in rural areas.

The proposed program will replicate the evidence-based ECHS model within the new

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Online IT ECHS Career Pathway across New Mexico, building on rigorous proven studies of the program nationwide, the commitment of the Governor of New Mexico and the Public Education Department, the experience of current ECHS models, the input from business partners, and the availability of online course programming.

B.2. INVITATIONAL PRIORITY 2 – PROMOTING EQUITY IN STUDENT ACCESS TO OPPORTUNITIES

Equity is the systemic approach schools need to take to successfully educate diverse student populations. When successful, *equity* exemplifies the promise that no student—regardless of race, gender, ethnicity, or economic background—is disenfranchised from pathways to college and careers. The level of support and its direction the pathway requires shifts the role of education to include a long-term vision, linking students with next steps following graduation.

From entry-level to advanced job entry across industries, increasing levels of digital proficiency and IT knowledge are required. And yet: (1) minorities are significantly underrepresented in STEM careers; and (2) just 16% of minorities who enter a STEM major in college remain in this pathway (College Board, 2016; Funk & Parker, 2018). The result is that employers struggle to maintain a workforce that mirrors the diversity of their communities. By better preparing students for success in college and careers and providing college and business support, employment equity can become a reality.

While achievement of better representation of target students in STEM careers is a long-term outcome, the evaluation will establish shorter-term markers for achievement. Measures such as enrollment in the Online IT pathway, engagement with online employers, and virtual or onsite workforce learning opportunities will serve as markers for achievement.

B.3 INCREASED EFFICIENCY IN DISSEMINATION AND REPLICATION

B.3.1 Efficiency of Dissemination Across Programs

The proposed program builds upon New Mexico's strong foundation for online learning:

- In 2020, NMPED was awarded a statewide demonstration grant from the US Department of

Education. Gathering with business leaders, policymakers, educators, and community stakeholders—including NMPED, Regional Education Cooperatives, rural and non-rural district and school leadership, the CLNA Consortia, the CTE Industry Council, and the Higher Ed Council—New Mexico has begun implementation of a program of well-rounded educational opportunities through online course access in math and CTE.

- In 2020, High Plains REC in New Mexico was awarded a statewide FIPSE grant from the US Department of Education to develop career exploration curricula for NM middle and high schools as a required core curriculum to help guide all students toward college and careers.

The proposed program coordinates its use of resources with these programs.

Additionally, NMPED maintains high-quality standards and professionalism in its ECHSs through its Designation Rubric and its fidelity Matrix. These will measure to what extent schools meet high standards required of ECHSs. Because New Mexico's ECHS requirements are clearly specified and leadership for establishing ECHSs is *filtered through the State,* the proposed program can provide an *ease of replication and scale-up* statewide.

B.3.2 Efficiency of Costs

Cost efficiencies for the proposed **Online IT ECHS Career Pathway** will accrue to students and their families, *as they do in the traditional ECHS model.* Students beginning college early are realizing significant cost savings in their college education—up to 60% as reported nationally and confirmed in New Mexico (JFF, 2012). By locating the proposed IT ECHS program online, *scale-up costs will be minimal if at all.*

Clearly, as online program enrollment increases, per-student costs decrease. With the proposed **Online IT ECHS Career Pathway,** the decrease in costs is enormous since the course is accessible online, with unlimited enrollment. This is particularly impactful for rural school districts which often lack the critical mass of students required for cost effectiveness of ECHSs.

B.3.3 Dissemination and Replication

Following dissemination of successful evaluation outcomes, the **Online IT ECHS Career Pathway** will be made available to all students across the state, who may or may not be

enrolled in ECHS programs. This replication will eliminate any concerns regarding exclusion of other high-need students not enrolled in ECHSs.

Also, we anticipate the independent evaluation will show the online format for high-demand IT job skills to be highly effective in bringing underrepresented populations to the workforce in IT jobs. To this end, reflecting the high-demand Healthcare industry, the program leaders and NMPED will investigate replicating the program design in an online healthcare ECHS program.

All outcomes and best practices will be published online through the New Mexico ECHS Website (www.echs-nm.com) and shared through professional organization presentations and data sharing.

C. QUALITY OF PROJECT DESIGN (20 POINTS) (approx. 6 pages)

The conceptual framework for this project is presented in C.2.

C.1   SPECIFIED AND MEASURABLE GOALS, OBJECTIVES, AND OUTCOMES

The project design includes four major areas of activity: (1) outreach to the NM ECHSs; (2) development and delivery of the IT course, and provision of career-infused math curricula; (3) review of sector analyses and development of business partnerships; and (4) engagement of students.

Objective 1.   ECHS Outreach

*Outcomes: All 20 ECHSs will offer its students the **Online IT ECHS Career Pathway** to build greater equity into the ECHS model.*

██ an exemplary ECHS, will be the **ECHS Coordinator** for the program. Working closely with the NMPED and New Mexico's Higher Ed ECHS Partners, the SJCHS ECHS Coordinator will ensure each participating ECHS's **Online IT ECHS Career Pathway** adheres to state requirements for ECHSs.

As a first step, ████████ will develop a series of white papers to summarize supporting research and conditions for this mid-level EIR grant. The goal of these papers is to help ECHS district superintendents and principals to understand the program goals—i.e., to increase equitable access to STEM college pathways and workplaces for underrepresented students.

Following distribution of these papers, SJCHS will convene an initial meeting of district superintendents and school principals to introduce the new pathway, review timelines for recruitment of students, schedule professional development workshops on the impact of high-demand STEM jobs in IT, and review individual modifications a school may require to implement the program. ████████ will also address the expanded role of business partners for this ECHS pathway, and how this may impact current ECHS pathways at a school.

Throughout the project, ████████ will work closely with each school's ECHS teachers to continually support integration of this new pathway, address space requirements, and ensure site-based counseling support and college advisement is available.

School principals and teachers will meet monthly with ████████ during the first two years of the grant to ensure fidelity of implementation. A summary of the ECHS Programs and their associated HED partners is listed, the intent is to work with each interested HED partner on the IT Pathway, with the goal to establish a unified strategy that combines the expertise and the knowledge of each group into a coherent IT/STEM pathway for ECHSs.

	ECHS Programs Designated by NMPED		
INSTITUTION NAME	**TITLE**	**NAME**	**HIGHER ED PARTNER(S) (ECHS-HED)**
Early College Health and Academic Academy - Alamogordo, NM	Principal	Dr. ███ ███	New Mexico State University - Alamogordo
Alta Vista Early College HS - Gadsden, NM	Principal	███████	Doña Ana Community College
Arrowhead Park Early College HS - Las Cruces, NM	Principal	██████	Doña Ana Community College
Arrowhead Park Medical Academy - Las Cruces, NM	Principal	██████	Doña Ana Community College
Bond Wilson Technical Center/College Academies – Kirtland, NM	Principal	████ ██████	Navajo Technical University; ███████
Carlsbad Early College HS – Carlsbad, NM	Principal	████████	NMSU - Carlsbad
Clovis Early College HS – Clovis, NM	Program Director	██████	Clovis Community College
College and Career HS – Albuquerque, NM	Principal	███████	Central New Mexico Community College
Deming Public Schools – Deming, NM	Program Director	███████	Western New Mexico University
Early College Academy - Albuquerque, NM	Principal	███████	University of New Mexico; Institute of American Indian Arts
Early College HS – Roswell, NM	Principal	███████	Eastern New Mexico University - Roswell
Early College Opportunities - Santa Fe, NM	Principal	███████	Santa Fe Community College
GCCS Early College HS – Grants, NM	Principal	Dr. ██████	New Mexico State University - Grants
Los Alamos Early College HS – Los Alamos, NM	Principal	██████	University of New Mexico - Los Alamos
The Masters Program - Santa Fe, NM	Head of School	██████	Santa Fe Community College
Middle College HS – Gallup, NM	Principal	███████	University of NM, Gallup; Navajo Technical University
R.I.S.E. (Peñasco HS) – Peñasco, NM	Principal	██████	Northern New Mexico College
Ruidoso Early College Academy – Ruidoso, NM	Principal	███████	Eastern New Mexico University - Ruidoso
███████ Farmington, NM	Principal	███████	███████
School of Dreams Academy (SODA) – Los Lunas, NM	Principal	███████	University of New Mexico - Valencia
Taos Academy – Taos, NM	Principal	███████	University of New Mexico - Taos

Objective 2.   Academic Resources

Objective 2.a: IT Course

Program Outcome: An **Online IT ECHS Career Pathway** *developed by New Mexico's Higher Ed ECHS Partners will increase student preparedness for STEM college pathways and digitally rich workplaces.*

IT - Information Technology, A.A.S. Outcome: Students will be able to: (1) identify, diagnose, troubleshoot and solve various IT issues found in regular businesses by using diagnostic software and technical knowledge base; (2) demonstrate and apply effective written, oral, and nonverbal communication techniques in a variety of organizational situations; (3) explain terminology, rules, and practices regarding common IT issues and their proper solutions; and (4) identify and apply procedures from security threats related to information technology software and hardware.

IT Cybersecurity Support Certificate Outcomes: Students will be able to: (1) analyze, design and document computer network specifications; (2) install, implement, manage, and maintain services and infrastructure in Microsoft Windows and MacOS environments; and (3) integrate various core database concepts into the analysis of database functionality requirements.

New Mexico's Higher Ed ECHS Partners offer innovative, challenging, and affordable academic programs that equip students with the knowledge, skills, and confidence to succeed in the global economy. They also provide quality education to approximately 80,000 students annually. The majority of New Mexico's Higher Ed ECHS Partners also provide workforce training and non-credit community learning classes.

With *Online IT ECHS Career Pathway* for the proposed grant, students earn credits toward an A.A.S. degree in Information Technology. The course is designed to provide students the essential educational and hands-on elements needed for a career in IT as well as the training to sit for several industry exams. This program provides students with the skills needed to plan, implement, administer, support, troubleshoot and secure networked computer systems found in educational, governmental, and corporate settings.

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Students can also earn the IT-Cybersecurity Support Certificate while in ECHS. This certificate prepares students for a career in computer security—gaining experience in business continuity, computer system design, contingency planning, data integrity, risk assessment and mitigation techniques, security investigation, troubleshooting, and disaster recovery.

The full course sequence will be developed and finalized prior to the fall of 2022. A listing of proposed course components is included in the proposal attachments. All *Online IT ECHS Career Pathway* courses will begin in 11th grade.

As part of the *Online IT ECHS Career Pathway* program, a minimum of two course instructors will be available to students for guidance. The courses will be delivered both live and through video replays.

The *Online IT ECHS Career Pathway* Course will be accessible through a single online platform to assure seamless delivery throughout the State—even in the most rural areas. Thus, the potential for replication in other states is high.

ECHS programs are required to provide opportunities for students to earn a minimum of 26 college credits prior to graduation; and an associate degree and/or workforce credential/ technical certifications. New Mexico's Higher Ed ECHS Partners will provide transferable course credits for the program. They will also assist students in the transition from the ECHS to a college campus, where they can complete their A.A.S degree.

Objective 2.b Career-infused Foundational Math Courses

Outcome: Career-focused math program will build foundation skills for the IT pathway.

The proposed IT ECHS Pathway is a STEM program that relies on students' understanding of math concepts to build digital skills. To ensure students take prerequisite classes needed to succeed in the IT program, participating ECHSs will enroll students in Algebra I (9th grade), Geometry (10th grade), and Algebra II (optional, 11th grade). These career-infused math curricula will provide foundational skills for the IT Course.

The math curricula for the proposed program will be the Pathways programs. These are being used in the NM Demonstration grant and will therefore ensure consistency across the state.
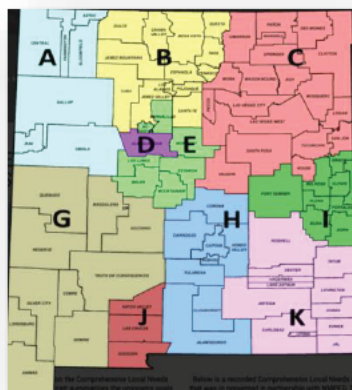
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With career-infused math programs, students learn how math is used in real workplace settings. Learning math in this way builds familiarity for students so they are more comfortable with IT skills and better prepared to be part of a more representative and inclusive workplace.

To assure math lessons reflect students' career interests in STEM jobs, each course begins with students exploring their career interests. Then, each lesson begins with a career spotlight that provides students with the occupation description and the differing levels of education required for their selected careers. In this way, students come to understand the importance of math no matter the career they choose.

Objective 3.   Sector Analyses and Business Partnerships

Outcome: The program will have a minimum of 30 business partners to engage with students online as role models, mentors, and career guides.

Objective 3.a. Sector Analysis

As part of its Perkins V CLNA in 2020, NMPED convened "CLNA Councils" in each of its ten economic districts. Representatives from business, education, economic development, and local government collaborated to establish standards, skills profiles, and vision statements for CTE in each district. This innovative approach provided an unprecedented level of insight into the priorities and needs of local employers. *This approach in course design will serve students well when they face these same employers upon graduation from high school or postsecondary programs.*

Four Corners REC will be responsible for reviewing and updating CLNA Council findings on: (1) IT skill needs and availability; (2) degree requirements; (3) employers' hiring challenges; (4) perceived skill gaps; and (5) employers' use of skill indicators in hiring practices. This activity will ensure course alignment to current and projected job demand in the region as well as *identify employers interested in being participants in this program.*

3.b Business Partnerships

Perhaps the most impactful expansion of the ECHS model as proposed is the larger role of business partnerships. It is this enhancement that will directly engage students in IT careers and reverse underrepresentation of women and minorities in STEM fields. *New Mexico's Higher Ed ECHS Partners will oversee all program liaisons and activities with the business partners in order to best integrate course content with business partner participation.*

The process will begin with identification of 30 employers interested in participating in the program—three from each of the ten economic regions. Identification will be through the CLNA Councils, local business groups, and workforce development boards. A series of presentations and workshops for potential partners will review the ECHS model, the proposed course, employer responsibilities, and the goal of a diverse workforce.

Business engagement in the IT course will be virtual, in keeping with the online structure of this grant. Front Porch Studios, which has to date developed more than 80 business videos for the NMPED Demonstration grant, will develop a series of five to 15-minute audiovisual interviews, videos, and podcasts with each of the business partners participating in this grant. These interviews will focus on how digital and IT skills are used in careers at all entry levels. Presentations will highlight what employers are looking for in an employee, and other tips for what students can do as they prepare for their future career. The interviews, accessible online, will be part of the IT Course, and thus coordinated throughout the process.

Monthly, each employer will present a real-time question and answer session with students to increase their comfort with STEM careers and encourage them to pursue these opportunities. Additionally, each business partner will develop a capstone project based on their workplace. These will be submitted to New Mexico's Higher Ed ECHS Partners for integration into their course assessments.

The ECHS model requires students to engage in authentic workplace experiences each year. To meet this requirement, New Mexico's Higher Ed ECHS Partners will work with business partners to schedule each student's placement *virtually* or *onsite,* depending on geographic location and availability of transportation. Of note, because the business involvement

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is primarily *virtual*, students can choose to engage in virtual workplace experiences with employers across the state, if these employers reflect their career interests more closely than local employers.

Objective 4.   Student Engagement

*Outcome: 2900 ECHS students will have an opportunity to enroll in the **Online IT ECHS Career Pathway**.*

Enrollment in the ECHS IT program will follow the same Rubric used by the NM Public Education Department in their designation of ECHSs.

Currently, there are 21 ECHSs designated in New Mexico. Adding this Career Pathway opportunity to their programs, we anticipate enrolling up to 2900 students during the grant period *(approximately 25-30 students per participating ECHS per year)* to evaluate the effectiveness of this program expansion.

The program will aim to enroll 525 9th grade students in the program each year. These students will have an expressed interest in building their digital/IT skills for college and careers. Reflecting the equity requirements of the ECHS model, these students will primarily be minorities, students from low-income families, and students who are first in their families to attend college. By the end of the grant, more than 2900 students are expected to participate. Due to the lack of limits put on online enrollment, this number could be far greater. Management and advisement to ensure student success and continued enrollment will be through the students' home schools. Where helpful, New Mexico's Higher Ed ECHS Partners will also provide advisement to the students to smooth the bridge from high school to college.

C.2   CONCEPTUAL FRAMEWORK – LOGIC MODEL

Goal: *Extending Equity into the Digital Workforce* will scale-up New Mexico's successful ECHS model by introducing an Online Career Pathway that is accessible to all students and addresses high-demand workforce skills, providing greater equity for ECHS students in college and careers.

Inputs	Objectives	Activities	Short/Intermediate- term Outcomes	Long-term Outcomes/ Impact
4 Corners REC #1 New Mexico's Higher Ed ECHS Partners ███████ ███ New Mexico Public Education Department 21 NM ECHSs CLNA Councils 30+ business partners Students District superintendents School principals and ECHS teachers Independent evaluator (NS4ed)	**ECHS Outreach** 1.1 Increase school infrastructure to support Online IT Career Pathway	• Outreach to ECHSs. • Provide professional development on new program. • Review hardware/software system requirements. • Establish PLCs.	• 21 ECHSs will develop infrastructure to add an Online IT ECHS Career Pathway to their programs. • 100% of new Pathway integration will adhere to ECHS guidelines.	• The availability of Online IT ECHS Career Pathway will increase opportunities for ECHS under-represented target student populations to succeed in STEM majors and careers
	IT Course 2.1 Increase availability of Online IT ECHS Career Pathway 2.2 Increase skills in foundational math.	• Develop course content and platform. • Identify course instructors. • Implement career-infused math programs.	• An Online IT ECHS Career Pathway will be available for 525 incoming 9th grade students, as well as all 2,900 9th through 12th grade students. • Student math scores will increase 20% with career-focused learning.	• Access to Online IT courses will be extended to all NM students. • Online ECHS courses will be developed to reflect high-demand jobs across regional economies.
	Business Partnership 3.1 Significantly increase participation of business partners in the Online IT ECHS Career Pathway.	• Identify business partners. • Videotape business presentations. • Work with businesses to develop capstone projects. • Develop work-based learning opportunities.	• A minimum of: (1) 30 businesses will participate; (2) 120 videos will be filmed; (3) 30 capstone projects will be developed per semester. • 100% of students engage in online/onsite work-based learning. • 100% of students engage in STEM learning	• Business participants will have greater awareness of readiness of the diverse ECHS students for high-demand jobs in IT and requiring digital skills. • Regional economies will have a ready workforce to attract new businesses.
	Student Engagement 4.1 Increase the number of students engaged in IT pathways at ECHSs.	• Develop recruitment materials for parents and students. • Hold informational presentations. • Enroll students in program.	• 500 9th grade students across the 21 ECHSs (69%) will enroll. • 67% of all program participants are minorities, women, first-in-family to attend college, and economically disadvantaged students. • College enrollment increases by 20% in IT/STEM majors.	• Students completing the IT Pathway will have college-ready and job-ready digital skills. • Students completing the program will change the face of the workforce. • Students will be motivated to complete STEM programs and enter STEM careers, through mentorships and partnerships with prospective IT employers.
	Equity Model Evaluation Demonstrate the efficacy of a high school to college to workplace ECHS equity model.	• The independent evaluator will develop interim benchmarks to estimate long-term impact on equity in the workforce.	• 50% of participating students enroll in STEM majors in college. • 30% of students gain employment in IT jobs following high-school.	• The expanded ECHS model will increase equity and diversity of the IT workforce. • A shared equity portal will increase best practices in equity across the educational sector.

C.3   DESIGN ADDRESSES NEEDS OF TARGET POPULATION

Research and evidence of success for ECHSs have shown that this is a model upon which we can build equity into our workforces across the country. ECHSs give us a good start by providing opportunities for its targeted student population to earn college credits and/or industry credentials while in high school. This ECHS design has made the transition from high school to postsecondary education and career training easier for those students who complete the ECHS program and wish to continue their education. What the ECHS model provides for this project is the design framework for going one step further, by motivating students and making them comfortable with, and better prepared for, STEM careers in order to achieve greater equity to the currently underrepresented workforce. The conceptual framework for this project is shown in Section C.3.

With the proposed program, in the long-term, equity will become a more fluid part of the ECHS experience, bridging through postsecondary education and into the workforce.

The proposed program will demonstrate an enhanced ECHS equity model for education. While this is a long-term outcome, benchmarks and interim measures will determine progress toward this goal. The internal evaluators and independent evaluators will closely monitor program outcomes across all objectives. Important markers will be an increase in the number of students attending college, enrolling in STEM majors, and moving on to the workplace. Because of the target population served in ECHSs, these markers will decrease underrepresentation of women and minorities in IT programs.

The equity model will also create an equity community to ensure these goals are priorities on the national education agenda. To this end, the project will maintain an online program portal through New Mexico's ECHS website. This portal will create authentic opportunities for all stakeholders to collaborate on shared projects. The portal creates ongoing collegiality, sharing of best practices, outcomes, and building student engagement. Lessons learned will support other high school programs across the state and nationwide as educators and workforce developers join together to bring equity to colleges and the workplace.

D. ADEQUACY OF RESOURCES AND QUALITY OF MANAGEMENT PLAN

D.1   ADEQUACY OF MANAGEMENT PLAN

The project includes several major components—outreach and coordination of the ECHSs participating in the project; development and delivery of the online IT course; provision of the Algebra 1 and Geometry curricula to demonstrate career-infused math learning; development and nurturing of business partnerships; and enrollment of students.

- Coordinating these components throughout the project will be the Project Director, ███████████ Executive Director of the Four Corners REC #1 in New Mexico.

- Outreach to the ECHSs will be the responsibility of ███████████, Principal of ███████████ ███████████ an ECHS in Farmington, NM and one of the six districts of the served by Four Corners REC #1.

- Development of the Online IT courses *and* coordination of business partnerships to integrate with course delivery will be a representative of New Mexico's Higher Ed ECHS Partners.

These three key personnel constitute the project's **Executive Leadership Council** (ELC). Together, they will implement the project and oversee program benchmarks and success measures. As the grant applicant, Four Corners REC #1 will serve as the fiscal agent, committing the personnel, resources and active participation required for success.

- ███████████ Executive Director of NS4ed, will serve as the independent evaluator of the project.

- ███████████ Superintendent of the Farmington Municipal Schools, with extensive experience and appreciation for data-informed decision making, will be the internal liaison for the evaluation team.

The logic model, presented on page 17 will be used to guide planning, implementation, communication, and evaluation to ensure results-based performance. These inputs will offer timely and authentic feedback and information, charting actual progress versus targets, so the evaluator and stakeholders can make informed decisions related to continuous improvement.

Utilizing existing organizational and operational structures, the *Executive Leadership Council* will ensure the goals and objectives they established can be achieved within the grant timeline with efficacy,

efficiency, and sustainability.

D.1.1   Planning Period

The project will begin with a six-month planning period during which the Executive Leadership Council, along with New Mexico's Higher Ed ECHS Partners, will develop the online IT Pathway with accompanying course materials and the online platform, identify business partners, and coordinate the delivery of course content with ongoing business mentorships and presence in the program. A minimum of three businesses will be chosen to participate from each economic region, for a total of 30 business partners initially.

Working with Front Porch Studios, the business videos and podcasts will be filmed during the planning period and continuing each year as more businesses join the program. Front Porch Studios is currently working with NMPED through its Demonstration grant to videotape businesses across NM (85 to date) as they reach out to minority populations on workplace inclusion. Where there is a crossover in participating businesses, current videos will be utilized.

During the planning period ███████████████████ will begin its outreach to the NM ECHSs to begin addressing operational details for the ECHS IT pathway. By the end of the planning period, each ECHS will begin recruitment, admission, and enrollment of students in its district for the new ECHS Pathway.

Implementation will begin in the second half of Year 1, following the planning period.

D.2 CAPACITY TO BRING TO SCALE

The **Executive Leadership Council** will convene a **Project Advisory Team (PAT)** to oversee all ECHS protocols and college course implementation. The PAT will include representatives from NMPED; the ECHS Principals Council; and local community organizations. The PAT will meet monthly in Year 1 (and bi-monthly in subsequent years) to develop and implement effective strategies related to program implementation, evaluation, networking and publicity, replication, and sustainability. The PAT will further refine partners' roles and responsibilities, monitor implementation, respond to challenges, support data collection and analysis, and promote the sustainability of ECHS Online IT pathways. The PAT activities will be facilitated by the Executive Leadership Council.

A separate Business Partnership Group will be developed to include all participating employers. The group will meet monthly (virtually), facilitated by the Executive Leadership Council, to review issues of mentorship, work-related learning experiences, and impacts on equity in the workplace.

D.2.1 ECHS Goals Survey

In 2020, NS4ed conducted an ECHS Reflections and Goals Survey to determine ongoing needs for the ECHS model (██████2020). It will be part of the ELC and PAT responsibilities to address these goals throughout their work to ensure the expanded model reflects issues raised during these sessions. These are specifically:

- Challenges to equity including equitable access to teachers in virtual environments.
- Challenges to pathways including lack of teachers or postsecondary partner course offerings and new pathway development.
- Challenges to completion rates, which currently range from 77% to 98% for ECHSs.
- Need for more career-related activities including mentorships.

Additionally, survey goals going forward included effective recruiting to increase enrollment, improving the success rate, and tracking success in college and/or the workplace. *All these challenges and goals are addressed as part of the proposed program design* and, thus, will be addressed by the ELC and PAT as part of its continuous improvement process (D.3 below).

D.2.2 Scale-up

Beginning in Year 4, the PAT will look at: (1) potential scale-up strategies to introduce the program to other students in NM, who may not be enrolled in ECHSs; and (2) extension of the online model to other high-demand careers such as Health Sciences. Because of the large distances in NM, monthly meetings in Year 1 will be virtual.

D.2.3 Timeline

Year/Quarter	Activity	Benchmark/Milestone	Responsibility
Administrative Start-Up			
Y1, Q 1	Establish financial controls	Financial structure in place	PD
Y 1, Q 1-2	Convene Executive Leadership Council (ELC)	Initial meetings, agenda	Project Director (PD)
Y 1, Q 1	Invitations to Project Advisory Team (PAT) members; Convene	Outreach to potential members; initial meeting	ELC, PAT
Y1, Q 1-2	Begin Planning Period	Begin outreach to ECHSs,	ELC

		analyze sectors; identify businesses; develop course	
District Outreach to ECHSs			
Y1 Q1	Develop written materials for principals and district	Completed white papers, written program summaries	
Y 1 Q 1	Outreach to ECHSs	Convening of initial meetings. Presentation of new pathway. Review of timelines. ECHS sign-ups.	███
Y1 Q 1-2	Review software/hardware requirements	Schedule support as needed.	███ELC
Y1 Q 3 ongoing	Provide PD on IT and equity	Presentations/attendance logs on expanded business partnerships, IT, and equity.	PD, ███
Online IT ECHS Pathway Development			
Y1 Q1 ongoing	Development of course content, delivery platform, assessments	Completed course, online platform, assessments	ELC and participating NM Higher Ed ECHS Partners
Y1 Q2	Identify course instructors	Identification of instructors	ELC and participating NM Higher Ed ECHS Partners
Y1 Q3 ongoing	Delivery of course	Online course delivery	ELC and participating NM Higher Ed ECHS Partners
Y1 Q3 ongoing	Enrollment of students in Algebra 1 and Geometry courses	Enrollment in career-infused math	ECHSs
Development of Business Partnerships and Program Videos			
Y1 Q3	Review sector analyses	Update economic/workplace priorities as needed	PD
Y1 Q2-4 ongoing	Identify business partners	30 business partners	ELC and participating NM Higher Ed ECHS Partners
Y1 Q2-4 ongoing	Integrate business presentations into course content	Integrated program	ELC and participating NM Higher Ed ECHS Partners
Y1 Q2-4 ongoing	Videotape business partners	Videos of all partners	Front Porch, SJC
Y2-4	Develop capstone projects	2 projects/year; 1/business	Businesses; ELC and participating NM Higher Ed ECHS Partners
Y 2-4	Develop virtual and onsite work-based learning opportunities	Identified mentorships, internships. Student sign-up.	Businesses, ELC, participating NM Higher Ed ECHS Partners, SJCHS, ECHSs
Marketing, Recruitment, and Enrollment of Students			
Y 1 ongoing	Develop recruitment materials for parents and students	Completed materials, distribution	███
Y1 2-4 ongoing	Hold informational presentations for parents and students	Scheduled meetings; attendance sheets	███
Y 1Q 3-4 ongoing	Recruit, admit, and enroll students in program	Tracking sheets, enrollment of 125 students annually	███ECHSs
Emergence of New ECHS Equity Model			
Y 2-4	Develop interim benchmarks	Establishment of internal benchmarks, independent evaluation benchmarks	SJ Municipal Schools District Superintendent; independent evaluator

| Y 2 Q 3 | Development of stakeholder portal | Portal in place; stakeholders apprised of availability | PD, ELC |
| Y1-4 | Conduct independent evaluation | Studies of efficacy; reports | NS4ed |

D.2.4 Qualified Personnel

Resumes for each of the listed key personnel are included in the proposal attachments.

Key Personnel	Responsibilities
▮▮▮▮▮▮▮▮ Executive Director, Four Corners REC #1	Project Director, overseeing program operations, coordinating implementation.
▮▮▮▮▮▮▮▮ District Superintendent, Farmington Municipal Schools	Participating in internal tracking and data review; serving as the research liaison with the independent evaluator.
Key Personnel	Responsibilities
▮▮▮▮▮▮ Principal, New Mexico's Higher Ed ECHS Partners High School	Program Administrator, overseeing the ECHS experience for participants; coordinating ECHS participation.
TBD across New Mexico's Higher Ed ECHS Partners	Higher Education Director partner; development of the IT curriculum; oversight for online platform and delivery; Business Liaison.
▮▮▮▮▮▮ Director, New Mexico Public Education Department	State Education partner; state review and approval of curriculum and ECHS processes.
▮▮▮▮▮▮ Four Corners REC	Administrative Assistant, serving as Project Manager.
▮▮▮▮▮▮ Virtual Learning Independent Consultant	Equity and Online Advisor
▮▮▮▮▮▮ CEO, NS4ed	Independent Evaluator for the program.

D.2.5 Financial and Management Resources to Bring Project to Scale

Through the governor's initiative, support from ESSA, and the NMPED, financial and management resources will be made available to support ECHSs. New Mexico has a standing "community of practice" for ECHSs, districts, colleges, and business partners that will facilitate knowledge-sharing within and across districts and regions. This community will also build upon New Mexico's current Technical Resource Center platform to disseminate resources that spur and support further expansion nationally.

D.3   CONTINUED SUPPORT AND DEMONSTRATED COMMITMENT

A strong feedback and continuous improvement model works when it is supported by a "positive culture" for implementing robust data collection that embraces measurement and metrics. The District Superintendent of Farmington Municipal School will work closely with Four Corners REC to establish an internal data system for ongoing feedback and continuous improvement. All data will be stored in the Four Corners centralized intuitive hub to ensure strong communications across all partners.

The NS4ed evaluation team will meet quarterly with the PED to communicate insights gained from evaluation data collection activities. This information will be incorporated into decisions made by the ELC

to prepare for dissemination and scale-up across the state and nationally. To this end, documented data reports on continuous improvement efforts will be maintained and invaluable.

The NMPED will provide ongoing mentoring and coaching support for emerging ECHSs in the State that wish to participate in the program. The state of New Mexico supports equity, college persistence, and high rigorous standards to ensure its students have the education and skills required for the business and industry sector of local communities and the State.

D.4 COSTS ARE REASONABLE

One of the perceived benefits of the ECHS is the power of place—that is, the influence on students' sense of themselves as college-bound. The budget includes funds to bring students into contact with a college environment and build a college culture *online.*

With the budget request for this mid-phase EIR grant at $6,511,272[1], and an estimated 2900 students enrolled in the ECHS Online IT Course over the grant period, the average student cost for the program is $2,245.27. When an estimated $993,000 of in-kind contributions (12.5% cost sharing) are added to this average per student cost, it rises to $2,587.68 per student. This cost is reasonable for this mid-phase scale-up and replication. As much of the cost is associated with start-up, sustainability costs become even more reasonable, **particularly in an online environment**. These costs efficiencies do not include the cost savings of students and their families on college tuitions when students continue their education, nor Return on Investment from employment in high-demand jobs.

E. QUALITY OF THE EVALUATION

███████████ CEO of NS4ed, will serve as the independent evaluator for the program. NS4ed is an action-based research company that works closely with companies, schools, teachers, and educators alike to understand how to apply best practices and research into practice. He works with states and districts across the country helping them to identify the best solutions for student success. ██████ has led several research and development programs for state education departments in New Mexico and Massachusetts as well as independent programs for districts across the country.

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[1] The costs for evaluation have been removed from this total.

NS4ed evaluation designs are a developmental, iterative, and emergent process that: (1) articulates clear questions to guide inquiry; (2) collects credible data as evidence and context to answer those questions; (3) analyzes data for digestible reports and data visualizations to uncover deep learning; and (4) facilitates learning that leads to action and improvement.

The proposed independent evaluation includes: (1) an in-depth implementation study that documents the extent to which key program components have been **implemented with fidelity** and facilitators of and barriers to **high-fidelity implementation to inform replication;** and (2) a randomized controlled trial (RCT) that will use **valid and reliable outcome measures** and yield evidence that **meets WWC Evidence Standards without Reservations**. NS4ed will also examine the **mediators** through which the proposed virtual IT ECHS produce effects and provide NMPED with timely feedback to support continuous program improvement.

Extending Equity into the Digital Workforce proposes to replicate proven, evidence based ECHS programs as a mid-phase grant across New Mexico. While many proven ECHS programs have established on college campuses or as separate standing learning sites apart from students' home high schools, this replication places an ECHS IT Pathway *online* to increase equity in access to preparation for high-demand careers. Several intended outcomes drive this ECHS structure being implemented with this mid-phase grant and are characterized as *unmet demand*. The following research questions will guide the evaluation and provide guidance about effective strategies for implementing and scaling on-line programs focused on providing Early College (EC) experiences to traditionally underserved student populations. NS4ed plans to address 10 research questions (RQs) about program implementation and impact. As outlined, the 10 RQs directly align with the project goals described in Section B.1.

Project Goals	Research Questions (RQs)
Goal 1: Build programs that will increase college readiness and postsecondary enrollment in High Demand IT / STEM Careers.	RQ1: What is the impact of an IT ECHS online pathway on high school outcomes (e.g., attendance, course taking)?
	RQ2: What is the impact of IT ECHS online on changes in students' awareness and enrollment in high-demand careers (e.g., is there an increase in enrollment in CTE pathways related to IT/STEM, increase college enrollment in IT/STEM related fields)?
	RQ3: What is the impact of IT ECHS online on high school graduation and college enrollment?
	RQ4: Is the impact of IT ECHS online on student academic outcomes mediated by measures of students' social-emotional skills?
Goal 2: Narrow the Opportunity gaps in the state's education system for students of color and other high-need students	RQ5: Are impacts of IT ECHS online moderated by student or program characteristics?
Goal 3: Increase efficiencies and build capacity for Designated programs	RQ6: To what extent is IT ECHS online implemented with fidelity?
	RQ7: What are the barriers and facilitators of implementing IT ECHS online?
	RQ8: To what extent are high schools able to sustain IT ECHS online after the initial period of funding?
	RQ9: How do the high school experiences of IT ECHS online participants differ from the experiences of nonparticipants?
	RQ10: Are the program models cost effective?

E.1. WELL-DESIGNED IMPACT STUDY THAT WILL MEET WWC STANDARDS WITHOUT RESERVATIONS

The evaluation design is a student-level randomized controlled trial (RCT) conducted through admissions lotteries at the 21 ECHSs across New Mexico. Randomization may be stratified to ensure that the population of students served by *Extending Equity into the Digital Workforce* reflects the goals of the program (e.g., predominantly serving low-income youth, first-generation college-goers,

English Learners, ethnically diverse students, and other young people underrepresented in higher education as defined by the equity criteria of New Mexico). NS4ed proposes a student-level instead of a school-level random assignment design because students are ultimately the recipients of the intervention (NMPED program services), and state designation criteria already require that oversubscribed programs conduct admissions lotteries in cases of too few seats. In addition, the student-level design requires far fewer schools and resources to implement. This student-level RCT will meet WWC evidence standards without reservations by drawing on best practices for student randomization via lottery admissions, mitigating sample contamination and attrition, and drawing on extant statewide data collections to produce evidence about the impact of *Extending Equity into the Digital Workforce*.

Estimates of the impact of *Extending Equity into the Digital Workforce* will reflect the intent-to-treat (ITT) effect of randomly winning the admissions lottery regardless of whether students enroll in the program. Based on a statistical power analysis, the sample for the proposed RCT will include approximately 5,000+ students who participate in admissions lotteries (either Grade 11 or Grade 12, depending on the nature of the program) across participating high schools in the 2022–23, 2023–24, 24-25, and 25-26 academic years. With the goal of scaling up *Extending Equity into the Digital Workforce* to serve an increasing number of students within participating schools, we will assign 50% of lottery applicants to students within participating schools. As described in Section B, Year 1 project activities include support from the New Mexico Public Education Department for recruitment of traditionally underserved students into *Extending Equity into the Digital Workforce*. High levels of student interest in the ECHSs ensures that the programs are oversubscribed and therefore, as stated in the state's designation criteria, obligated to perform an admissions lottery.

One commonly voiced concern about within-school random assignment is the risk of contamination, which occurs when some control students are exposed to features of the treatment.

Although contamination will not affect the internal validity of impact estimates based on ITT analyses, it may lead to an underestimate of the treatment effect. For the proposed project, the amount of contamination is likely to be limited because the primary components of *Extending Equity into the Digital Workforce* (e.g., participants complete at least 12-28 college credits in high school in the pathway; program staff provide intensive, intentional guidance to students regarding course selection, college applications, financial literacy, and academic support) are only made available to ECHS participants within the IT Online Pathway. However, it is possible that control students will receive similar academic supports and guidance in the business-as-usual condition in other pathways not related to the IT Online Pathway. To address this concern, for RQ2 (4), the research team will collect and analyze data on students' high school experiences to measure service contrast.

Attrition, or the absence of outcome data for study participants, can jeopardize the internal validity of an RCT by altering baseline equivalence, particularly if rates of attrition differ by treatment status. To minimize the potential threat of attrition, the primary student academic outcomes for this study will be provided by the ECHS. Therefore, this study will measure outcomes for all students who do not move outside of NM during the study time frame. However, we acknowledge that some outcomes of interest (e.g., absenteeism, retention, course taking) are only applicable for students who are enrolled in high school; therefore, rates of dropout may lead to attrition (and potentially differential attrition) for these outcomes in later grades.

The greatest risk of attrition involves survey measures of students' social-emotional skills, which will serve both as student outcomes (RQ4) and mediators (RQ5), because these measures are not collected by state administrative data systems. Rather, these data will be collected via student surveys at baseline (i.e., the September immediately following the admissions lottery) and during each subsequent spring, allowing the research team to measure changes in students' social-emotional skills during high school. To maximize response rates, the evaluation team will provide students with a $20

gift card as an incentive to take each survey, and NS4ed will collect student and parent email addresses and parents' phone numbers on lottery applications to allow for follow-up surveys to be administered to students who transfer out of participating schools during the study time frame. In addition, although surveys will be primarily administered online, data collection procedures will allow for the completion of surveys over the phone to maximize response rates.

E.2 EVALUATION PROVIDES GUIDANCE ABOUT EFFECTIVE STRATEGIES SUITABLE FOR REPLICATION OR TESTING IN OTHER SETTINGS

The proposed evaluation is designed to align with the conceptual framework presented in Section B.1, which lists key program components, student outcomes theorized to be impacted by *Extending Equity into the Digital Workforce*, and mediators that explain the effectiveness of the program. As delineated in the logic model, *Extending Equity into the Digital Workforce* is designed to affect a range of relevant student outcomes. During high school, participation in the ECHS IT Online program is theorized to positively influence students' academic behavior, including lower rates of absenteeism and retention, improved coursetaking, and higher rates of high school graduation and college enrollment after high school. The logic model also specifies a positive influence of *Extending Equity into the Digital Workforce* on intermediate social-emotional outcomes, and that positive impacts of ECHS on academic outcomes may be mediated by improvements in the following social-emotional skills: *Academic engagement*: Students' behavioral, emotional, and cognitive engagement in school*; Task value motivation*: The extent to which students find what they learn in class to be important and useful; *College-going culture*: Students' perceptions that adults and students in their school expect students to go to college or earn an industry certificate in IT; *Support for postsecondary life* **with an emphasis on IT/STEM related fields**: Students' perceptions of how helpful their high school is preparing them to apply to and enroll in college; and *Sense of belonging*: The extent to which students feel like they are a part of their school and that their teachers and peers respect them. Analyses of impact on student outcomes (RQ1–RQ4) will be based on a two-level model with a

random intercept and fixed slopes. The statistical model takes into account the clustering of students within admissions lotteries (i.e., the EC program and academic year the lottery took place), including student-level demographic information.

The proposed evaluation will examine the ways in which impacts of *Extending Equity into the Digital Workforce* may differ for different types of students and EC program models. Differential impact analyses will be conducted for the following student- and program-level characteristics, which will allow the research team to identify settings and populations for which ECHS model effectiveness may differ. Student-level moderators include race/ethnicity, low-income status, prior achievement scores, English learner status, and parents or siblings with prior college experience. Program-level moderators include institution level(s) of partnering institution(s); whether students enter the program in Grade 11 or Grade 12. To examine differential impacts of *Extending Equity into the Digital Workforce* (RQ5), we will include interaction terms between treatment status and the moderator at the student and lottery levels (as appropriate) in the previously described two-level model.

To assess the extent to which the impact of *Extending Equity into the Digital Workforce* on student academic outcomes is mediated by changes in students' social-emotional skills (RQ4), we will subtract baseline valuesof social-emotional skills from values calculated using Grade 12 survey data to measure changesin social-emotional outcomes over time. We will include each mediator in a separate impact model to determine whether the impact of *Extending Equity into the Digital Workforce* on student academic outcomes changes after accounting for the mediator. We also will estimate a model including all of the mediators listed above to examine the percentage of the total impact that is explained by the mediators.

Study RQs focused on the implementation of key features of *Extending Equity into the Digital Workforce* (RQ6–RQ10) will rely on qualitative data collected from principals and teachers, survey and focus group data collected from students, and a review of relevant documents from districts, high schools, and partnering ECHS HED.

E.3   EVALUATION METHODOLOGY PROVIDES VALID AND RELIABLE PERFORMANCE DATA ON RELEVANT OUTCOMES

To meet WWC standards without reservations, the outcomes in research evaluations must show evidence of both reliability and validity. According to WWC, student outcomes from administrative data sources (e.g., standardized state assessments, absenteeism, course taking, high school graduation, college enrollment) are assumed to be both reliable and valid. In line with this requirement, students' academic outcomes for this evaluation will be obtained through state databases.

In contrast, measures of students' social-emotional skills will be captured through a student survey. Survey items associated with each measure as well as information about the reliability and validity of each social-emotional skill will be used by accredited sources and peer reviewed teams. Survey measures of social-emotional skills have shown evidence of validity and reliability in prior research, with Cronbach's alpha values ranging between 0.77 and 0.94. Although these survey measures meet WWC standards for the reliability of outcome measures because values of Cronbach's alpha exceed 0.5, the research team also will assess the construct validity and reliability of survey measures within the evaluation's analytic sample.

E.4   EVALUATION PLAN ARTICULATES KEY COMPONENTS, MEDIATORS, AND OUTCOMES OF THE GRANT-SUPPORTED INTERVENTION AS WELL AS A MEASURABLE THRESHOLD FOR ACCEPTABLE IMPLEMENTATION

E.5   TIMELINE

The following chart presents the evaluation timeline.

Measures of Mediators and Outcomes

Short-term Outcomes (Mediators)	Specific Measures	Data Sources	When Collected
Student enrollment in courses aligned with pathway	Proportion of courses taken that align with designated pathway	Administrative data, Next Step Plan	2021-22 through 2025-2026
Student participation in work-based learning	Self-reported participation in work-based learning	Student survey	Spring 2024
Student participation in college-related activities	Self-reported involvement in five key activities: visits to the college campus, college-related events held at the high school, use of college services, completion of college application/ preparation requirements, and interaction with college-going peers	Student survey	Spring 2024
Student completion of a career plan	Self-reported completion of a career plan by end of 9th grade	Student survey	2021-22 through 2025-2026
Student advisement	Self-reported number of interactions with advisors; self-reported proportion of interactions focused on college and career activities; satisfaction with advising experiences	Student survey	2021-22 through 2025-2026
Student participation in tutoring	*Self-reported number of tutoring visits Satisfaction with tutoring visits*	Student survey	Spring 2021-22 through 2025-2026
Medium-term Outcomes	**Measures**	**Data Sources**	**When Collected**
Improved student attitudes	Self-Reported	Student survey	Spring 2023-26
College aspirations	Self-Reported	Student survey	Spring 2023-26
Clarity of career plans	Collection of Next Step Plan	Student survey	Spring 2023-26
Attendance	Annual attendance rate	State K-12 data	2021-22 through 2025-2026
Achievement	Successful completion of end-of-course exams in subjects related to High School Graduation and College Bearing Credit Courses	State K-12 data	2021-22 through 2025-2026
Completion of college coursework	College credits attempted and accumulated by the end of 9th, 10th, and 11th grade	Postsecondary data	2021-22 through 2025-2026

Table Y. Key Components of ECHS IT Course Online and Fidelity Measures

Key Components	Sub-Components	Evidence Used to Assess Fidelity	Fidelity Measures/Thresholds
Purposeful design (Values=0-3, threshold=3)		Description of school management	Description of ECHS Academy organization describes an ECHS situated within an existing high school
		Results of business analysis, list of pathways	College completes business survey/sector analysis College describes how pathways aligned with business survey/sector analysis
Partnerships (Values=0-2, threshold=2)		MOU with college(s)	Written agreement with at least one college partner(s) for each pathway offered.
		MOU with business(es)	Written agreement with at least one workforce partner(s) for each pathway offered.
Professionalism and high-quality standards (Values=0-3, threshold=3)		Completed rubric	Record of participation in the designation process
		Principal training records	Principal participated in at least 80% of the required hours of training and ongoing coaching
		Staffing plan, list of staff and qualifications	Staffing model and plan for ensuring licensure and qualifications provided
Populations served (Values=0-8, threshold=6)		Admissions process documentation	Use of performance-blind, open-access lottery to enroll students, with low-income students encouraged to apply and obtain admissions.
		Recruitment policy documentation	Focused recruiting efforts encourage applicants from underrepresented populations to enroll in ECHS
		Administrative data	Number of high-risk groups (economically disadvantaged, African American, American Indian, Hispanic, English Learner, disabilities) for which percentage in ECHS is within 5 percentage points of the district percentage
Powerful teaching and learning	Accelerated math and computer learning	Master Schedule	Indicates that students are expected to complete all High School Required courses and at a minimum college courses to be successful in the IT Pathway
	Career-focused project-based learning	Master Schedule	End Of Course Exams on IT related Math

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