Strategic Workforce Initiative Proposal

Introduction / Summary

Applicant Name: Utah Valley University

Target Industry: *Information Systems & Technology (IS&T)*

Funding Level Requested: $260,000

Partners: K-16 Alliance, Mountainland Technical College, Utah Valley University

Introduction

Utah Valley University (UVU), in collaboration with the UVU MTECH K-16 Alliance and Mountainland Technical College (MTECH), will design clear and efficient pathways for student completion within the Software development and Information Technology sector. The pathways are designed to produce work ready graduates prepared to reduce the number of unfilled tech-sector jobs and increase educational attainment opportunities in the region. Pathways are carefully created to provide on-ramps via pathway certifications beginning in high school, which can then articulate to higher education certificate and degree programs to serve the needs of students while providing an educated workforce with multiple on and off-ramp points along the pathway.

Project Description

a. Program is responsive to the workforce needs of the CTE region in the *Software Development and Information Technology* industry cluster:

Although Utah is growing economically, technical employers have difficulty finding qualified employees to fill open STEM positions. For instance, a 2011 survey of engineering companies in Utah conducted by the Utah Technology Council showed that 51% of STEM employers were having difficulty finding enough qualified candidates and that 65% were seeking employees from out of state or out of the country (Univeristy of Utah, 2011). The October 2017 employment statistics show Utah has a state-wide increase in non-farm employment of 2.7% while Utah County is growing at almost twice that rate at 4.4% (Department of Workforce Services, 2017). Much of the growth in Utah County is being spurred by Silicon Slopes where jobs in the Information Technology and Information Systems are in demand and experiencing a high volume of annual growth (Department of Workforce Services, 2017). Clint Betts, Executive Director and Editor in Chief at Silicon Slopes, indicated the main barriers to building the tech industry in Utah are diversity, recruiting and education (Mathis & Gorrell, 2017). As Utah grows and the interest in locating tech companies in the state continues, it is estimated the talent shortage may grow to over one million surplus tech jobs by 2020 (Robbins, 2017). The unfilled jobs will be high-wage and high-demand positions, requiring skill and educational preparation. Both educators and employers need to double down on their efforts to increase the number of students entering the pipeline from multiple entry

points in order to increase certificate and degree attainment rates which could dramatically reduce the gap in trained workers and allow Utah to respond positively to the impending growth in high tech.

The Bureau of Labor Statistics has recorded significant growth in the computer systems design and related services sector for Utah County (Table 1). Total employment in the sector has increased 40.9% since 2012 while average annual wage has increased a significant 10.9% with average salaries coming in at $75,919 making this a high wage/high demand sector.

Table 1

Industry Trends (Utah County, Utah):
5415 Computer systems design and related services (all ownership categories *)

Category	2012	2013	2014	2015	2016	Chg 2012-16
No. of Establishments	477	508	508	526	558	17.0%
Total Employment	5,168	5,997	6,704	7,146	7,280	40.9%
Total Annual Wages	$353,798,351	$415,524,762	$477,150,421	$504,487,590	$552,692,768	56.2%
Average Annual Wage	$68,459	$69,289	$71,174	$70,597	$75,919	10.9%

Source: U.S. Department of Labor, Bureau of Labor Statistics

Standard Occupational Classification (SOC) reported by the Bureau of Labor and Statistics for the state of Utah shows significant growth in average annual total job openings of 1,310 across the many categories available and appropriate for students within the Information Systems & Technology Pathways (Table 2).

Table 2 – Standard Occupational Classification Data for Utah

SOC Code	SOC Title	Median Wage Change 2012-16	Employment Growth 2014-24	Average Annual Total Job Openings	Unit of Analysis
15-1111	Computer and Information Research Scientists	13.5	52.6%	30	Computer Systems
11-3021	Computer and Information Systems Managers	3.5%	45.1%	170	Computer Systems
15-1143	Computer Network Architects	16.8%	39.7%	40	Computer Systems
15-1152	Computer Network Support Specialists	-8.6%	35.9%	80	Computer Systems
15-1199	Computer Occupations, All Other	-1.0%	32.8%	120	Computer Systems
15-	Computer Programmers	4.3%	21.2%	170	Computer

1131					Systems
15-1121	Computer Systems Analysts	4.8%	49.5%	240	Computer Systems
15-1151	Computer User Support Specialists	1.6%	44.2%	450	Computer Systems
	Total			**1,300**	

Source: US Department of Labor, Bureau of Labor Statistics

The programs of study designed to support students in accessing the high wage/high demand IS&T jobs are only producing just over 1,000 graduates annually across the entire state (Table 3).

Table 3 Programs of Study & Training Across Utah

		Completers		Most Frequent Award		
CIP Code	**CIP Title**	**Number 2015**	**Change 2011-15**	**Title 2015**	**Number 2015**	**Unit of Analysis**
11.0101	Computer and Information Sciences, General	610	159.6%	Award < 1 yr	288	Computer Systems
11.0899	Computer Software and Media Applications, Other	5	N/A	Award < 1 yr	5	Digital Graphics
11.1006	Computer Support Specialist	13	N/A	Award < 1 yr	13	Computer Systems
11.0299	Computer Programming, Other	2	N/A	Award < 1 yr	2	Computer Systems
11.1003	Computer and Information Systems Security/Information Assurance	611	349.3%	Bachelor's	320	Computer Systems
11.0803	Computer Graphics	10	150.0%	Bachelor's	10	Digital Graphics
11.0202	Computer Programming, Specific Applications	188	548.3%	Bachelor's	187	Computer Systems
11.0201	Computer Programming/Programmer, General	125	267.6%	Bachelor's	67	Computer Systems
11.0501	Computer Systems Analysis/Analyst	0	-100.0%	Bachelor's	0	Computer Systems
11.0901	Computer Systems Networking and Telecommunications	233	161.8%	Bachelor's	147	Computer Systems
Total					**1039**	

Source: US Department of Labor, Bureau of Labor Statistics

Many of these trained employees are finding lucrative employment in their home cities outside of Utah County or are being attracted to out of-state employment, leaving the current educated gap of just over 300 based on the number of openings and the number of total graduates in tables 1 and 2. This gap is much larger when accounting for attrition outside of Utah County. Additionally, tech employers located in Utah County noted they regularly place a job add for a single higher but will often hire 10+ employees from every advertisement as they have more jobs to fill than applicants. Even a modest 5x multiplier of our 300 openings in Utah County brings the number much closer to 1500 job openings going unfilled from the statewide production of 1000 qualified graduates. Clearly there is a need to increase the pipeline of students into the IT&S pathway to increase graduates and produce an industry ready workforce to meet the demands of regional employers. UVU is planning a stackable pathway in IS&T to increase the eligible pipeline to these high wage/high demand career fields. The project proposed is timely and represents an opportunity to both effectively and efficiently allocate resources as UVU and MTEC are geographically, educationally, and economically positioned as key partners with industry leaders on Silicon Slopes to fashion a deeper entrenchment of the pipeline to meet the region's need for skilled workers at every level of the IS & T industry and facilitate a hub of economic growth in high tech fields.

b. Program leads to the attainment of a stackable sequence of credentials

At Utah Valley University (UVU), the Information Systems & Technology department focuses on preparing students for employment in a variety of roles within the areas of Information Systems and Technology. The IS & T states Mission Statement reads:

> The Information Systems & Technology Department offers stackable degree programs to provide students with engaged learning opportunities to help students develop technical, communication, managerial, and lifelong -learning skills. The department's programs prepare students for opportunities in information systems, information technology and security, information management, and education (Utah Valley University, 2017).

At MTECH the mission train an employable workforce using curriculum developed in coordination with industry. Rigorous accreditation standards require each certificate program offered have at least a 70% placement rate of graduates in a related industry. In the Information Technology and Web Development areas, MTECH curriculum is developed by industry and is taught by industry experts are currently employed and active in local industry. Curriculum is updated regularly in response to industry needs. Students in the Information Technology Program earn industry certifications through Test Out and Comp Tia. To accommodate articulation with area high schools, MTECH accepts work completed in high school as transfer credit towards competencies within the certification programs.

UVU currently provides multiple pathways to completion in the Information Systems & Technology programs stacking from certificates of proficiency or certificates providing job ready skills in less than one year of coursework in the following areas:

- Certificate of Proficiency Information Technology (18 cr or one year)
- Certificate of Proficiency Health Information Technology (one year)
- Certificate of Proficiency Data Analytics (one year)
- Certificate of Proficiency Database Administration and Data Warehousing (18 cr or one year)
- Certificate of Proficiency Application Development (one year)
- Certificate of Completion Network Administration (31 cr or one year)

Each Certificate maps to AAS degree pathways and onto BS degrees in:

- AAS in Information Systems & Technology
- AS Pre-major in Information Systems & Technology
- BS in Information Systems
- BS in Information Technology

Pathways between the Certificates, AAS/AS degrees and BS degrees are clearly defined at UVU, but are not clearly aligned between UVU, MTECH and the K-16 Alliance member high schools. The gap in articulations creates confusion for students as they are preparing for pathways in high school, and it adds time to degree completion for students transferring from MTECH to UVU. These disconnected pathways make it more difficult for students to navigate from high school through bachelor's degree attainment, and it results in fewer prepared workers entering the workforce. Additionally, the faculty in IS&T recognize the need to increase awareness of career clusters and the employment possibilities to students much earlier than the junior year of high school. Students must be prepared, in particular, in math as early as middle school in order to engage in the coursework in high school which prepares them for successful matriculation in any of the undergraduate pathways at MTECH or UVU.

This shortage of technologically ready graduates in Utah is critical to the state's economy because all of the economic clusters identified by the Governor's Office of Economic Development as priority opportunities for sustainable economic development rely on engineering and computer science type clusters for their success (Sutherland, 2012). State educational reports identify one of the biggest factors preventing students from obtaining degrees in STEM fields at Utah Valley University (UVU) is a lack of preparation in mathematics (Utah State Office of Education, 2009). Key to the success of this proposal will be early preparation in math and increasing interest in IS&T pathways for students facilitated through UVU PREP, and clear pathway creation with clear alignment from the K-16 alliance schools and MTECH to certificates, AAS/AS and BS degrees at UVU.

c. Program includes a non-duplicative progression of courses that include both academic and CTE content

UVU PREP:

UVU IS&T faculty will engage in curricular alignment activities aimed at providing Information Technology specific content and mentoring to the UVU PREP program to build the pipeline of students accessing appropriate coursework in high school. Hosted on the UVU campus, UVU PREP provides a seven-week program for three consecutive summers to eligible middle-school students as a collaboration between UVU and Alpine, Nebo and Provo school districts. In addition to delivering a broad STEM education, the course content is designed to provide experiences that promote a clear understanding of how mathematical concepts and procedures are applied in the fields of information technology, engineering and science. The program aims to motivate and prepare participants to successfully pursue STEM studies and careers by giving middle school students a deep-dive into mathematical concepts that are a core component to IS & T and really all STEM fields allowing them to enter high school ready for higher-level concurrent enrollment STEM courses. A comprehensive STEM education enables all students, but particularly women and underrepresented individuals, to overcome negative stereotypes and gain the technical skills and competencies needed to compete in today's local and global marketplace.

K-16 Alliance Partnership:

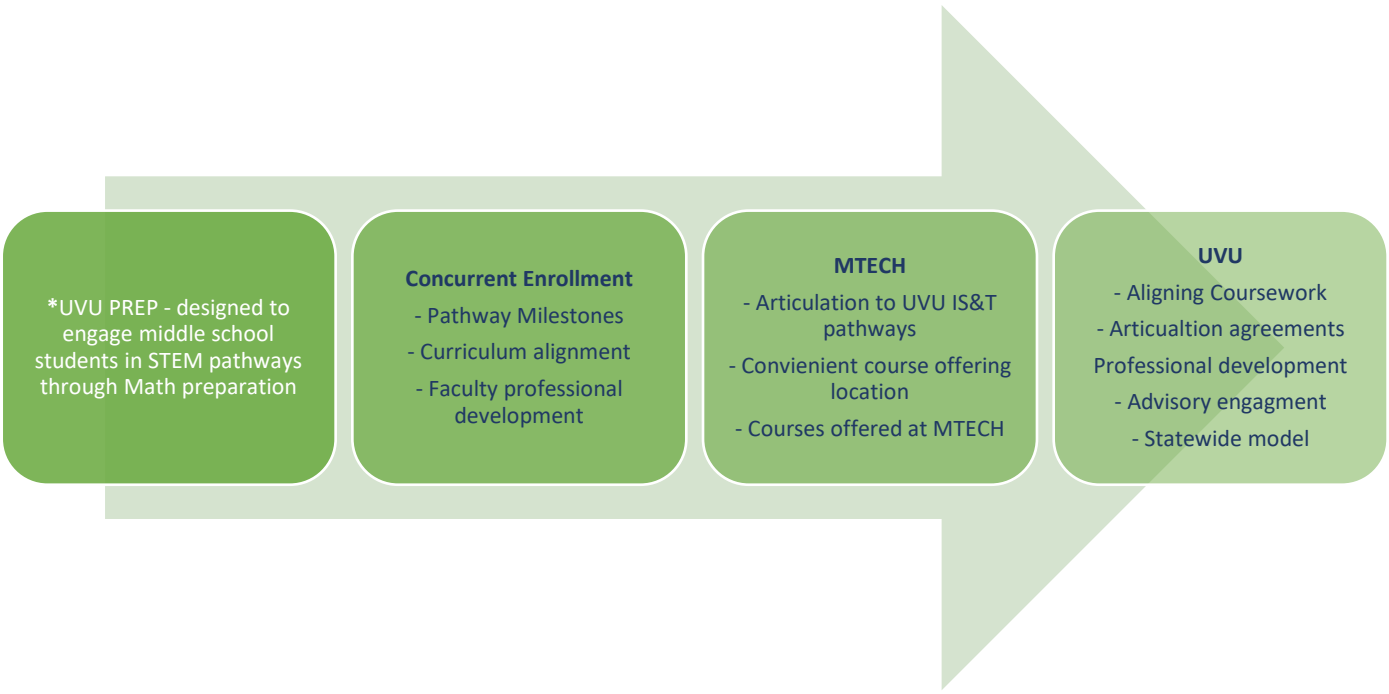
UVU faculty will continue to partner with K-16 Alliance members in creating Pathway Milestones to be offered to students through concurrent enrollment. This coursework, chosen during high school, will apply towards their degree pathway and reduce extraneous college credits. Carefully chosen concurrent enrollment courses assist students in saving money on college tuition and decreases time to degree completion. The Pathway Milestones will provide for a combination of academic preparatory coursework and CTE-focused coursework to inspire students to continue to pursue a IS&T pathway. UVU faculty will continue to partner with concurrent enrollment faculty to ensure a tight alignment between concurrent enrollment and university coursework. UVU faculty are committed to designing, providing and supporting high school faculty professional development to improve the quality and quantity of IS&T focused coursework offered to high school students through concurrent enrollment.

MTECH Partnership:

UVU faculty will work closely with MTECH faculty and with the University curriculum committee to create a clear and efficient articulation agreement for students attending MTECH and wishing to advance their degrees through AAS/AS and BS programs at UVU. UVU faculty will partner with MTECH faculty to create an articulation agreement allowing MTECH students to seamlessly transfer to UVU degree pathways without losing time towards their ultimate degree goals Articulation will be provided in block format to students to facilitate smooth transfer and completion. Additionally, UVU will partner with MTECH on course location to ensure students transferring from MTECH to UVU have access to classes at the Thanksgiving Point location. When possible, UVU may offer AAS degree courses on the MTECH campus for ease of access and transferability for MTECH students.

UVU Pathways:

UVU will review all IS&T coursework with a focus on alignment and articulation partners while continuing to support the stackable nature of the current degree offerings. Faculty will be provided with appropriate professional development training to ensure the broadest possible offerings and the latest technologies and responsiveness to industry need. The IS&T advisory committee will continue to partner with industry leaders to align curriculum to best practices in industry and provide for a well prepared workforce. UVU faculty will provide developed articulations and course maps to other USHE institutions as an opportunity for state-wide collaboration and best practices sharing.



*****UVU PREP is not included in the funding for the SWI proposal but is an important partnership in building capacity in the pipeline of available and prepared students. UVU faculty are interested in supporting this program.

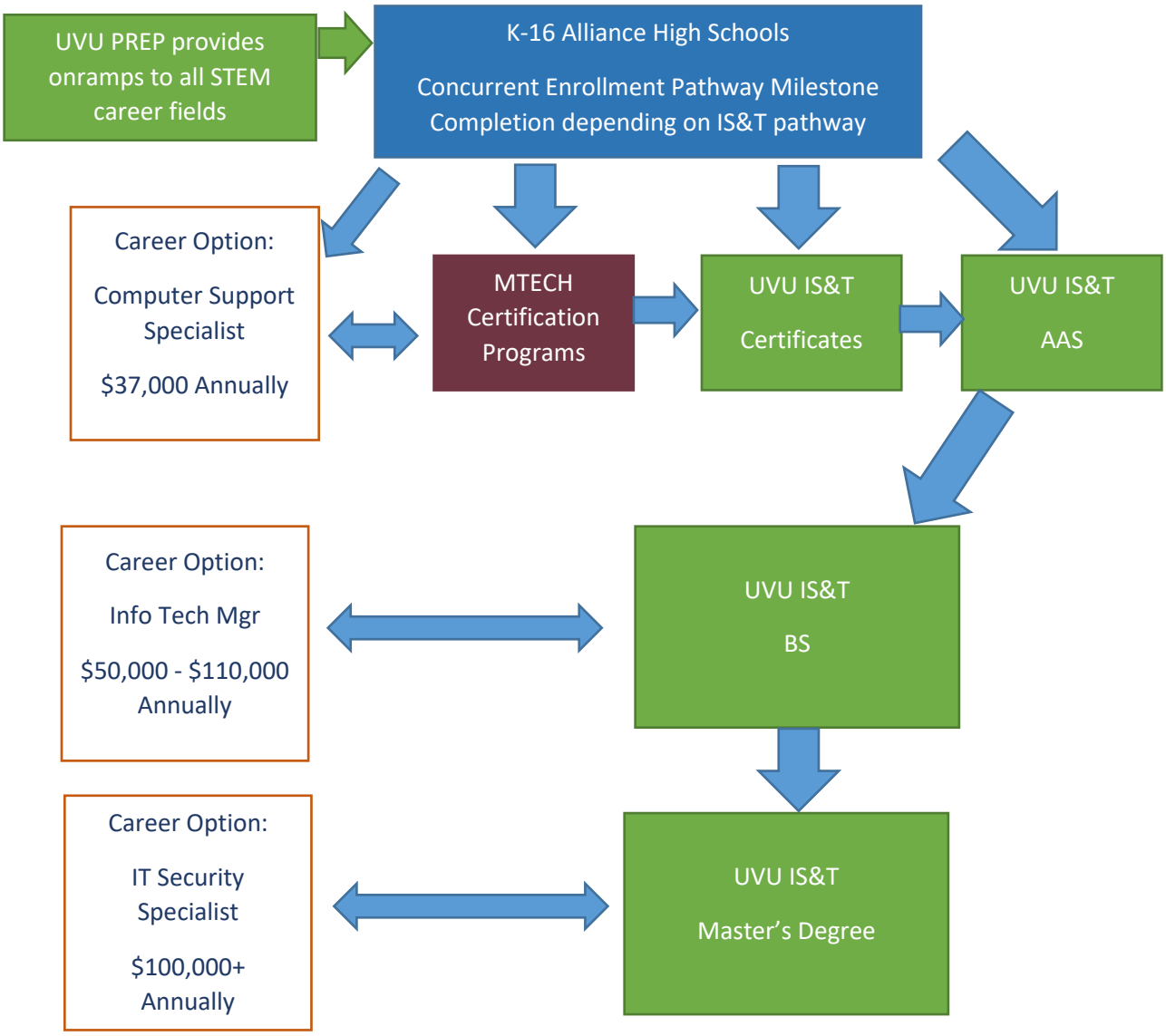
d. Expected student enrollment, attainment rates, and job placement rates

Enrollments are expected to increase significantly in the Concurrent Enrollment area which will lead to increased articulation to MTECH programming as well as freshman entering directly into UVU programming. Enrollments in each entry-point will continue to grow as the project progresses due to increased ease of transfer between institutions and increased awareness of availability of multiple options to completion (see Table 4).

Table 4

Program Pathway	**FY 2018/2019**	**FY 2019/2020**	**FY 2020/2021**
K-16 Pathway Milestone	50	70	90
Articulation from MTECH to UVU Pathways	25	40	60
UVU Enrollment – entering Freshman	100	125	150
Job Placement	18	45	65

Stackable Credentials Model - Strategic Workforce Pathways (IS&T)



Project Partners

Educational partners: UVU, MTECH & K-16 Alliance Schools. Identified partners are committed to establishing and supporting pathways for students beginning during their K-16 journey through completion of higher education credentials or degrees. See Letters of Support in document Appendx.

Project Budget

Description	Year 1	Year 2	Year 3	Item Totals
Salaries	50,000	100,000	100,000	250,000
Benefits	20,000	35,000	35,000	90,000
Professional Development UVU Faculty & MTECH Coordinators	25,000	25,000	25,000	75,000
Curriculum Development MTECH Faculty	20,000	20,000	20,000	60,000
Professional Development for K-16 Faculty	20,000	20,000	20,000	60,000
Curriculum Alignment	20,000	10,000	10,000	40,000
Equipment	100,000	50,000	50,000	200,000
Yearly Totals	***255,000***	***260,000***	***260,000***	
		3-Year Project Total	***775,000***	

Budget Narrative:

Salaries/Benefits – First year salaries will be used to cover the two adjuncts to teach additional courses required to facilitate articulation agreements between MTECH & UVU. Second year, and beyond, salaries will be used to hire a full-time lecturer position at UVU to teach coursework in the articulated IS&T programs. This faculty member will have a 4/4 teaching load allowing for a course release each semester to partner with industry and facilitate increasing work based learning, job shadow and internship placements for students enrolled in IS&T pathways. These increased engaged learning opportunities will facilitate development of necessary soft-skills required by workforce partners.

Professional Development UVU Faculty – UVU faculty will partner with MTECH coordinators to design aligned professional development plans for IT&S faculty which can assist in facilitating better collaboration and articulation between the two schools. Plans will allow for engagement in key professional development opportunities including; university courses appropriate to acquiring additional degrees within the IS&T areas, workshops to develop key programming and software skills required by industry, conferences to network with other faculty and industry partners to facilitate course development and student placement, as well as other relevant training required by the industry to remain current.

Curriculum Development MTECH Faculty - MTECH faculty will partner with UVU faculty and industry to crosswalk MTECH programs by individual standards and objectives required within the UVU IS&T courses to facilitate ease of articulation. In the event curriculum must be enhanced or altered to better align between the schools, faculty will be compensated for rewriting course outcomes with industry input and feedback. Additional competencies required to facilitate articulation between the institutions will be written in collaboration between MTECH, UVU and industry partners. Examples of new competencies to be written include:

- Give prospective students (Adult or HS) foundational knowledge to be successful in either the MTECH program or the applicable UVU IS&T Certificate of Proficiency program;

- Create a Bridge course to fill in competencies where UVU feels students may be lacking, so students can be granted a Certificate of Proficiency in the respective IS&T program and be poised to move directly into an AAS, AS or BS Degree in IS & T.
- Provide faculty to offer bride course at MTECH Lehi campus

Professional Development for K-16 Faculty – UVU and MTECH will partner to design professional development programming for high school faculty enabling more teachers the ability to teach the concurrent enrollment curriculum available to be offered at area high schools. These professional development opportunities will be taught by UVU faculty, MTECH faculty or industry partners as appropriate. Stipends will be provided to K-16 faculty to facilitate attendance.

Curriculum Alignment – UVU faculty will work with MTECH faculty and K-16 partner faculty to update UVU curriculum to facilitate articulation between all three entities. UVU faculty will sponsor the curriculum adoption within the UVU curriculum structure to ensure inclusion in annual course catalogs and articulation documentation with the registrar's office.

Equipment – New equipment will be purchased to support additional courses offered at UVU's Thanksgiving Point location. Equipment necessary will include; software programs, additional servers to handle the processing necessary to support coursework, individual workstations for students. Workstations will be purchased in both years one and two in order to support expected program growth.

Letters / Evidence of Support

- Letter of support from Employer – Appendix A
- Letter of support from Mountain Land Technical College – Appendix B
- Letter of support from Rick Nielsen – K-16 Alliance Chair – Appendix C
- Letter of support from Board of Regents – Will be provided by Blair Carruth

References:

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Appendix A

INSTRUCTURE

canvas · bridge

December 12, 2017

Jessica Gilmore
AVP Community Outreach & Economic Development
Utah Valley University

Dear Mrs. Gilmore,

As an employer in Utah County it is imperative my organization has a qualified workforce to fill key technology positions. Without a qualified workforce, my organization is forced to import talent from other states and or move our business outside of the Utah area where we prefer to locate. Our partnership with the educational institutions in our region is central to our ability to have a qualified workforce trained in the types of skills which are necessary to support our business. To that end we are thrilled to support the Pathways project in Information Systems & Technology presented by UVU with partnerships with MTECH and area high schools. This pathway project will go a long way in supporting our future success in the Utah County region.

If you have any further questions, please do not hesitate to contact me.

Sincerely,

Jeff Weber
SVP People
Instructure

Appendix B

Office of the President
Clay Christensen

2301 West Ashton Blvd. Lehi, UT 84043
CChristensen@mlatc.edu
801.753.4123

December 21, 2017

To whom it may concern,

Please consider this letter as official notification that the Mountainland Technical College is desirous of support for a Strategic Workforce Initiative Grant. MTECH is committed to provide the necessary support to ensure that the training needs of business and industry are met. Consistent with similar program development, we will provide the necessary leadership to ensure that the program completers are trained to meet the needs of the workforce. MTECH will work with Utah Valley University and other K16 partners to expand and coordinate a stackable credential in the Software development and Information Technology sector.

MTECH has years of experience in establishing career and technical education programs and is desirous to meet employer needs through establishment of additional CTE programs. Employer advisory committees have directed program development and startup of the MTECH information technology programs and expansion and inclusion can be completed with a very short turnaround time.

We value our partnership with business and industry in the Mountainland Region and state of Utah and are anxious to assist in meeting workforce needs. This letter reflects the support of the college to partner with Utah Valley University and service providers in the Mountainland Region to provide a seamless, articulated pathway from the secondary schools through the technical college and university. Should the grant be funded we will ensure that the necessary facilities, equipment and ancillary support are provided for delivery of the program for the MTECH portion of the educational delivery.

Please don't hesitate to contact me should you have any questions.

Sincerely,

Clay Christensen
College President
Mountainland Technical College

Appendix C

NEBO SCHOOL DISTRICT
...your partner in education

350 SOUTH MAIN STREET SPANISH FORK, UTAH 84660
PHONE (801) 354-7400 FAX (801) 798-4010

December 28, 2017

Jessica Gilmore
AVP Community Outreach and Economic Development
Utah Valley University

Dear Ms. Gilmore,

Please accept my full support for your Strategic Workforce Initiative Proposal regarding the development of "clear and efficient pathways for student completion with the Software development and Information Technology sector." The proposal will have significant impact on individual students, the communities they live in and represent, and is in direct alignment with the collective and collaborative goals shared by all members of the K-16 Alliance.

Additionally, the goals of the proposal support legislative and gubernatorial areas of emphasis for effectively preparing public education students for successful transitions into post-secondary experiences, including increased educational opportunities and gainful employment.

Thank you for your vision in developing and implementing plans that will be of such benefit to our local community and to the state as a whole. You have the support of each of the seven Superintendent's in the Utah Valley University service area and we look forward to working with you to implement this vision.

Sincerely,

Richard C. Nielsen
Superintendent, Nebo School District
Co-Chair, UVU MTECH K-16 Alliance
Trustee, Utah Valley University