



Impact Allies

STEM Evaluations

PathTech LISTEN:

Mixed Methods Longitudinal
Investigations of Students in
Technician Education

End of Grant Year

Evaluation Report

September 2019

PathTech



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SOUTH FLORIDA



PathTech



End of Grant Year Evaluation Report September 2019

Prepared for

Dr. William Tyson, Principal Investigator
PathTech LISTEN: Mixed Methods Longitudinal
Investigations of Students in
Technician Education
Headquartered at University of South Florida
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Prepared by

Benjamin Reid, External Evaluator
Impact Allies Inc
pathtech@impactallies.com



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Executive Summary

This PathTech LISTEN End of Year (October 1, 2018 - September 30, 2019) Evaluation Report is intended for use by the Principal and Co-Principal Investigators, National Science Foundation (NSF) Advanced Technological Education (ATE) Program Officers, the PathTech LISTEN Advisory Board, and all stakeholders and researchers who may find the targeted research activities of PathTech LISTEN useful. This is an Implementation Evaluation, also known as a Process Evaluation, describing and documenting the activities undertaken during PathTech LISTEN's first year of operation.

The reviewers of the PathTech LISTEN proposal specifically requested extra "efforts to examine implementation." The Evaluation Plan was thus reexamined and redesigned to ensure an explicit focus on the implementation of the project and under the theme: How can the project improve? Two Evaluation Questions were asked here:

1. Is the project being conducted according to the proposed plan?
2. Is some modification needed and why?

Early in the researchers data collection process, a significant challenge emerged: How to increase the response rate in both recruiting prior PathTech LIFE survey participants to agree to participate in this PathTech LISTEN study and converting those "yesses" into Round 1 interviews. The Evaluation Questions, Methodology, and Findings section covers the Challenge, the Background, the Indicators of Need to Modify, the Modifications, and the Results.

The process improvements made by the PathTech LISTEN Principal Investigators / researchers are examined and documented. The main take-away is their attention to detail and persistence in thoroughly examining the process, finding the root causes to the challenges faced, and quickly identifying solutions to address those challenges. And the results speak for themselves. All told, the percent interviewed total increased from 8.5% (4 of 47) to 19.3% (88 of 457). **Between the pilot round and the subsequent rounds of recruiting and interviewing, the PathTech LISTEN team increased the total percent interviewed by 227.06%.**

Introduction

PathTech LISTEN Award Abstract

Producing more middle skills professionals in advanced technology fields is important for the nations' prosperity. To promote greater success in advanced technology education, this project aims to study the relationships between community college attendance and later educational and occupational outcomes. The research team from the University of South Florida and the Florida Advanced Technological Education Center at Hillsborough Community College propose extending their current research on school-work-life balance. To accomplish this goal, they will conduct a longitudinal research study that examines the transition from taking community college courses, to attaining associates and baccalaureate degrees, to reaching career goals, such as better pay and job promotion.

The project will increase understanding of issues and challenges involved in the school-work-life balance for students pursuing credentials and careers in advanced technology. A qualitative and quantitative mixed method longitudinal study will examine student life experiences and pathways, from entry to completion of academic programs to entrance into the workforce. The study will address the shortage of information about pre-college and college technician and occupational pathways, and attainment of credentials and post-program outcomes (e.g., careers and employment). The proposed work builds on the first two phases of the PathTech LIFE study and focuses on Engineering Technology, Advanced Manufacturing, and Biotechnology. The project team will conduct a longitudinal interview study with national scope coupled with the development and administration of a national survey to answer four sets of research questions that examine the connections among school, work, and other life responsibilities: 1. How do students from diverse backgrounds at different life stages experience their advanced technological program? 2. What are students' short-term education goals (i.e., complete specific coursework, earn certificate or degree) and do they accomplish them? 3. What aspects of an advanced technology education programs prepare student to meet their broader educational and employment goals? 4. What program and institutional efforts do colleges employ to increase recruitment, retention, and connections with students from diverse backgrounds? Results of this research can inform improvements to advanced technological education that support greater retention, graduation, and successful entry into the technical workforce.

External Evaluator Bio

Benjamin Reid has a Masters of International Business from the University of Florida and worked as a marketing manager launching products for major companies before his career in education. From 2007-2012 he was a business faculty member and center director, serving as the director of the Center for Promotional Development at California State Polytechnic University and the Banner Center for Energy at Indian River State College. In 2013 he started Impact Allies Inc which provides STEM evaluations and project management. Between these two roles, Reid is involved in National Science Foundation (NSF) Advanced Technological Education (ATE) awards in every category (Center, Project, Targeted Research, and New-to-ATE) at Institutions of Higher Education. Additionally, Reid has received training from and regularly presents at conferences with EvaluATE (the evaluation support center for the NSF-ATE program).

Evaluation Questions, Methodology and Findings

The External Evaluation of PathTech LISTEN is divided into two parts: formative and summative. “The purpose of a summative evaluation is to assess the quality and impact of a fully implemented project.” Thus the summative evaluation component will occur in the third and final year of the project. “The purpose of a formative evaluation is to provide information for project improvement”. Thus the formative evaluation (though it “begins during project development and continues in some form throughout the life of the project”) will primarily occur in the first and second year of the project. This first year formative evaluation was primarily concerned with the “implementation evaluation” component, also known as “process evaluation”. “The underlying principle (of an implementation evaluation) is that before you can evaluate the outcomes or impact of a project, you must examine how it is operating, whether it is operating according to the proposed plan or description, and whether some modification is needed. In addition to assessing fidelity, implementation evaluation serves the purpose of describing and documenting the activities a project undertakes.”¹

Besides adherence to the above quoted evaluation theory as stated in The 2010 User-Friendly Handbook for Project Evaluation, as recommended in the NSF ATE Program Solicitation and by EvaluATE (the evaluation support center for the NSF ATE program), an implementation evaluation was the overall focus of this first year evaluation because the reviewers of the PathTech LISTEN proposal specifically requested extra “efforts to examine implementation.”

The Evaluation Plan was thus reexamined and redesigned to ensure an explicit focus on the implementation of the project and under the theme: How can the project improve? Two Evaluation Questions were asked here:

3. Is the project being conducted according to the proposed plan?
4. Is some modification needed and why?

The simple answer to both questions were “yes”. The project was being implemented as planned, challenges arose in the longitudinal study research process, modifications occurred to address those process challenges, and the project concluded its first year effectually as planned. The methodology was of a mixed methods approach, receiving both quantitative and qualitative data by means of project documents and interviews, correspondences, and feedback sessions with the Principal Investigator, Dr. William Tyson and Co-PI, Dr. Lakshmi Jarayam. The details of the activities in question are described and documented below.

¹ http://www.evalu-ate.org/wp-content/uploads/formidable/Doc_2010_NSFHandbook.pdf

With an extension granted to the NSF-ATE award, PathTech LIFE, that this PathTech LISTEN targeted research project builds upon, the proposed timeline of activities was pushed back so that PathTech LIFE could be effectively completed and used for this longitudinal study. This was communicated to NSF, and thus the timeline as originally contained in the proposal was modified with start dates and time to complete specific tasks. The first set of tasks - “develop protocols, secure IRB approval, pilot instruments” - was completed in a timely manner. The main qualitative questionnaire was completed, tested, and received USF’s IRB approval, an industry survey was completed, two graduate student researchers were onboarded and trained, protocols and procedures were developed, and USF’s Institutional Review Board approved the email and information to recruit prospective participants. It was the second and third set of tasks - “recruit participants for Round 1 interviews” and “Administer Round 1 interviews” - that posed challenges and required quick problem solving by the team in order to make modifications to the research process and get back on track.

Challenge:

Increase the response rate in both recruiting prior PathTech LIFE survey participants to agree to participate in this PathTech LISTEN study and converting those “yeses” into Round 1 interviews.

Background:

With a recruitment pool of 2,363 pre-identified people (73.5% of the 3,216 PathTech LIFE respondents who provided their permanent email addresses and said they would be interested in participating in future PathTech research projects for additional compensation) the likelihood of gaining the purposeful sample of 150 participants to interview and survey for this PathTech LISTEN longitudinal study was high, requiring the recruitment and closing (interview) of 6.4% of people who have already expressed interest in being a part of a further study.

The PathTech LISTEN Principal Investigators and research team, though, saw this recruitment effort as an opportunity to refine and record this part of the research process. It would be helpful to them individually as researchers and it would be useful knowledge and know-how to share with other researchers in the NSF-ATE community and at large, especially is it pertains to recruiting people who participated in a previous study one, two or three years prior. Thus effort in design, implementation and evaluation was given to this part of the process.

Indicators of Need to Modify:

In the first week of the PathTech LISTEN data collection, the two aforementioned challenges became apparent. The researchers identified an initial sample of 340 PathTech LIFE respondents who indicated they were graduating after the semester in which they completed the survey and provided a permanent email address that was not their school address. On Tuesday, May 21, 2019, the researchers sent emails to 50 of them (47 actually received the messages as 3 emails bounced back). 8 of them replied and agreed to participate in the study, but by Sunday only 2 had scheduled interviews (with both interviewed on Friday, 5/24). That was a 17% response rate with a 4% interview rate; rates that would not meet the total number of 150 interviews. Granted the team saw that those numbers may increase in the coming weeks, but also understood that the first week

responses would be the greatest and that, most importantly, there was an issue in the process bringing people from agreeing to participate to actually following through (only 25% converted from having responded “yes” to participation to actually being interviewed).

Modifications:

The conversion process (all steps from initial “yes” reply through to completion of interview) was identified as the number one process that needed to change, followed by the recruitment process (initial “yes”).

In the May 21 recruitment, if they said “yes” then they were given a long set of instructions to follow including filling out a Doodle form (this was used originally used to simplify and avoid the back and forth emails for scheduling interviews) and filling out the consent form (at this point the researchers were under the impression from USF’s IRB that the consent had to be a signed consent form, with electronic signatures not allowed, which meant the interviewees had to print, sign, and scan and send the consent form). See Appendix A: PathTech LISTEN Informed Consent Form.

The researchers were able to work with USF’s IRB to allow for verbal consent which overcame a large obstacle or nuisance to many people. The Doodle scheduling was also replaced with an email from the interviewing team researcher which helped to build rapport with the interviewees. Collectively, these two efforts resulted in a drastic reduction in the length of the team’s response email (See Appendix B: PathTech LISTEN Original Follow-Up Email) and the corresponding amount of effort it took for the interviewee to just take the next step. All said, the full page follow-up email of instructions with tasks for the interviewee to complete was replaced with the following reply which focused more on the interviewee and the benefits to them of participating. That email read:

“Thanks for agreeing to participate in PathTech LISTEN! I’ve forwarded your email to (name of one of the three interviewers), a member of our research team. She (or he) will set up an interview time with you. This phone interview should take around 30-45 minutes. Please let her know when you are available over the next week. After you complete the interview, you will receive a \$50 Amazon gift card within 5 business days.

Thanks,

Will
PathTech LISTEN Research Team”

In addition to the reply email and the streamlined process, the Subject Line of the first email prospective participants received was modified to include the name of their college which helped to personalize the message and grab their attention. Also, the researchers established a systematic process of persistent emails which emphasized the value proposition to the prospective participants in both the groups that hadn’t replied and the group that replied “yes” but hadn’t followed through to the interview.

Results:

The results of modifying the process to a verbal consent, personal scheduling, shortened follow-up emails and persistent outreach resulting in the following as of September 26, 2019:

Contact Date	Total Contacted	Total YES	YES Percentage	Total Interviewed	Percent Interviewed among YES	Percent Interviewed Total
5/21/19	47	14	29.8%	4	28.6%	8.5%
6/5/19	289	114	39.4%	59	51.8%	20.4%
6/24/19	168	62	36.9%	29	46.8%	17.3%
6/5 + 6/24	457	176	38.5%	88	50.0%	19.3%

By June 24, the total from the 47 people in the first batch that said “yes” to participate increased from 8 to 14 (75% increase), with the number of those actually being interviewed increasing from 2 to 3 (50% increase) and by September 26 that number increased to 4 (100% increase). This indicates that the persistent messaging with the simplified consent and scheduling process worked, however, the numbers from this group were significantly lower overall indicating that it is important to have the right messaging and streamlined process sent from the beginning.

The two groups (June 5th and June 24th) that received all the noted modifications from the very first time they were contacted resulted in a significant increase in the total number of “yes” responses (from 29.8% to 38.5%; a 29.2% increase in positive responses). Moreover, the modifications to these latter groups resulted in a drastic increase in conversion. The percent interviewed from the “yes” responses increased from 28.6% in the first round to 50.0% -- a 74.8% increase in conversion from “yes” to interviewed!

All told, the percent interviewed total increased from 8.5% (4 of 47) to 19.3% (88 of 457). **Between the pilot round and the subsequent rounds of recruiting and interviewing, the PathTech LISTEN team increased the total percent interviewed by 227.06%.**

For thoroughly examining the process, finding the root causes to the challenges faced, and quickly identifying solutions to address those challenges, the PathTech LISTEN team should be commended.

Recommendations

With just over 90 people interviewed thus far of the 150 target, and with a second round interview yet to come for all the interviewees, it would be advantageous to address the concerns expressed by PI Tyson, namely to further streamline the entire process. The bullets below are quotes or paraphrases by Evaluator Reid of comments made by PI Tyson:

- Issue: The conversion process is tedious because plenty of people don't respond to the scheduling email or no show the scheduled time. It's taking up time that could be spent on interviewing, reviewing the transcripts, and coding. The two problems with the "Yes" group is we get them scheduled, but they don't call in or don't answer when we call them.
- Issue: Another area for improvement is communication and database within the team. I would like to create a searchable database so we can see a profile of each person in the pool and can track their interactions with them. Right now I have a Word doc created from a mail merge with profiles on each person.

The recommendation is to address these back end issues not as a single mind working in isolation but by the collective brainpower of the entire PathTech LIFE team (including the External Evaluator here, too). An ideal in-person time would be in October in Washington D.C. at the ATE PI Conference. Prior to that meeting the concerns could be communicated amongst the team and to the advisory board with suggestions gathered for how to proceed. The database and communication systems previously suggested by Evaluator Reid could be shortlisted by the team, and the Evaluator could perform a mini-focus group with "yes" respondents that didn't interview and interview participants to ascertain from a user perspective how to alleviate the aforementioned issues in converting "yes" responses to completed interviews.

Appendix A: PathTech LISTEN Informed Consent Form



Informed Consent to Participate in Research Involving Minimal Risk

Information to Consider Before Taking Part in this Research Study

Title: PathTech LISTEN: Mixed Methods Longitudinal Investigations of Students in Technician Education

Pro # 00037290

Overview: You are being asked to take part in a research study. The information in this document should help you to decide if you would like to participate. The sections in this Overview provide the basic information about the study. More detailed information is provided in the remainder of the document.

Study Staff: This study is being led by Dr. Will Tyson who is an Associate Professor at the University of South Florida. This person is called the Principal Investigator. Other approved research staff may act on behalf of the Principal Investigator.

Study Details: This study is being conducted by telephone and online, and is supported by the National Science Foundation. The purpose of the study is to collect information about educational and career pathways experienced by technicians and technician students. We plan to ask you questions about your interest in technician careers, short-term and long-term educational and career goals, as well as about your experience in your educational program(s). We would like to interview you by telephone twice (once in 2019 and again in 2020) and will ask you to complete an online survey as well (in 2021). We anticipate each interview may last 45-60 minutes and it may take about 15-20 minutes to complete the survey.

Participants: You are being asked to take part because you participated in a survey some time ago called PathTech LIFE and indicated that you were interested in participating in future research about technicians and technician students. We think you will help us better understand the educational and career pathways experienced by students and workers like you.

Voluntary Participation: Your participation is voluntary. You do not have to participate and may stop your participation at any time. There will be no penalties or loss of benefits or opportunities if you do not participate or decide to stop once you start. Your decision to participate or not to participate will not affect your job status, employment record, employee evaluations, or advancement opportunities. Your decision to participate or not to participate will not affect your student status, course grade, recommendations, or access to future courses or training opportunities.

Benefits, Compensation, and Risk: We do not know if you will receive any benefit from your participation. There is no cost to participate. You will be compensated with a \$50 Amazon gift card per interview for your participation and with a \$25 Amazon gift card for completing the survey, for a total of \$125 for completing all phases of the study. This research is considered minimal risk. Minimal risk means that study risks are the same as the risks you face in daily life.

Confidentiality: Even if we publish the findings from this study, we will keep your study

information private and confidential. Anyone with the authority to look at your records must keep them confidential.

Why are you being asked to take part?

We would like to talk to you about your educational and career experiences, as well as your short- and long-term goals. In particular, we would like to learn more about your technician education program and any work experience in the technician field. We hope to gain an in-depth understanding about the work and lives of technicians and technician students.

Study Procedures:

If you take part in this study, you will be asked to participate in two individual interviews that will ask you questions about your experience in an advanced technology program. Each interview will likely last about 45-60 minutes and will be conducted by telephone. The first interview will be in 2019 and the second interview will be 2020. With your permission, the interviews will be audio-recorded to ensure accuracy. In addition, we will ask you to participate in an online survey in 2021. The survey may take you about 15-20 minutes to complete.

Total Number of Participants

About 200 individuals will take part in this study at USF.

Voluntary Participation / Withdrawal

You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study. Your decision to participate or not to participate will not affect your student status (course grade) or job status.

Benefits

We are unsure if you will receive any benefits by taking part in this research study.

Risks or Discomfort

This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. There are no known additional risks to those who take part in this study.

Compensation

You will be compensated with a \$50 Amazon gift card per telephone interview and with a \$25 Amazon gift card for completing the online survey, for a total of \$125.

Costs

It will not cost you anything to take part in the study.

Privacy and Confidentiality

We will do our best to keep your records private and confidential. We cannot guarantee absolute confidentiality. Your personal information may be disclosed if required by law. Certain people may need to see your study records. These individuals include:

- The research team, including the Principal Investigator, study coordinator, and all other research staff.
- Certain government and university people who need to know more about the study. For example, individuals who provide oversight on this study may need to look at your records. This is done to make sure that we are doing the study in the right way. They also need to make sure that we are protecting your rights and your safety.
- Any agency of the federal, state, or local government that regulates this research.
- The USF Institutional Review Board (IRB) and its related staff who have oversight responsibilities for this study, and staff in USF Research Integrity and Compliance.

We may publish what we learn from this study. If we do, we will not include your name. We will not publish anything that would let people know who you are.

If completing an online survey, it is possible, although unlikely, that unauthorized individuals could gain access to your responses. Confidentiality will be maintained to the degree permitted by the technology used. No guarantees can be made regarding the interception of data sent via the Internet. However, your participation in this online survey involves risks similar to a person's everyday use of the Internet. If you complete and submit an anonymous survey and later request your data be withdrawn, this may or may not be possible as the researcher may be unable to extract anonymous data from the database.

A federal law called Title IX protects your right to be free from sexual discrimination, including sexual harassment and sexual violence. USF's Title IX policy requires certain USF employees to report sexual harassment or sexual violence against any USF employee, student or group, but does not require researchers to report sexual harassment or sexual violence when they learn about it as part of conducting an IRB-approved study. If, as part of this study, you tell us about any sexual harassment or sexual violence that has happened to you, including rape or sexual assault, we are not required to report it to the University. If you have questions about Title IX or USF's Title IX policy, please call USF's Office of Diversity, Inclusion & Equal Opportunity at (813) 974-4373.

What if new information becomes available about the study?

During the course of this study, we may find more information that could be important to you. This includes information that, once learned, might cause you to change your mind about being in this study. We will notify you as soon as possible if such information becomes available.

You can get the answers to your questions, concerns, or complaints.

If you have any questions, concerns or complaints about this study, call Dr. Will Tyson at (813) 974-2893. If you have questions about your rights, complaints, or issues as a person taking part in this study, call the USF IRB at (813) 974-5638 or contact by email at RSCH-IRB@usf.edu.

Consent to Take Part in Research

I freely give my consent to take part in this study. I understand that by signing this form I am agreeing to take part in research. I have received a copy of this form to take with me.

Signature of Person Taking Part in Study

Date

Printed Name of Person Taking Part in Study

Statement of Person Obtaining Informed Consent and Research Authorization

I have carefully explained to the person taking part in the study what he or she can expect from their participation. I confirm that this research participant speaks the language that was used to explain this research and is receiving an informed consent form in their primary language. This research participant has provided legally effective informed consent.

Signature of Person Obtaining Informed Consent

Date

Printed Name of Person Obtaining Informed Consent

Appendix B: PathTech LISTEN Original Follow-Up Email

ATTACH CONSENT FORM

Dear [Insert Name]:

We are thrilled you are interested in participating in PathTech LISTEN! Please follow the process below to schedule your interview and ensure that the interview is conducted in an efficient and ethical manner.

1. Please click on this link to schedule your interview: <https://doodle.com/meetme/qc/suY74GzRti>
 - a) Select the time that works best for you and click “Book It”
 - b) In the pop-up box, insert your name and email address, and select “Book It” again
 - c) You will be taken to a confirmation page that lists your scheduled interview date, time, and call-in information
 - d) If you need to reschedule your interview, please email pathtech@usf.edu
 - e) You will also receive a calendar invitation which gives you the option to add the interview to your personal calendar
2. Attached to this email is a Consent Form that must be completed **prior** to the interview:
 - a) Please open the file and download
 - b) Sign on the last page of the consent form, under “Consent to Take Part in Research”
 - c) You will be asked for your signature, printed name, and date
 - d) Take picture or Scan and email the signed form to pathtech@usf.edu
 - e) Please email any questions you have to pathtech@usf.edu
3. You will receive an email from the PathTech LISTEN team the day before the interview checking in with you and confirming the interview date and time.

On the day of your interview:

1. Identify a place that is comfortable to you to complete the phone interview
2. Please call the PathTech line at (813) 438-6467 at your scheduled time
3. Your interviewer will verify that they have received your Consent Form and answer any questions that you have about the interview

We are looking forward to talking with you! Thank you for participating in PathTech LISTEN!

Sincerely,

The PathTech Team