TechForward Robotics Workforce Development Project

Case Study Information

Project Overview

The TechForward Robotics Workforce Development project at Riverbend Community College in southeastern U.S. addresses the shortage of skilled technicians in intelligent robotics and advanced manufacturing. In response to the growing global demand for next-generation robotics, the college partnered with regional manufacturers and a four-year university to establish one of the first workforce training programs in intelligent robotics and AI. **The program equips students with skills to program, maintain, and repair intelligent robots, strengthening U.S. competitiveness in advanced manufacturing.**

Located in Riverbend County, which has faced economic challenges from the decline of traditional industries like textiles and agriculture, the program offers new opportunities for high-tech job growth. Riverbend Community College, alongside local manufacturers, is bridging the skills gap by offering industry-recognized certifications and **aims to train 75 participants over three years by increasing the representation of Black/African American and LatinX community members in advanced manufacturing.**

With funding from the NSF ATE program, the TechForward project uses several strategies to address local industry needs and support underserved populations. These include hands-on educational modules in robotics, AI, and machine learning, along with industry-recognized certifications to boost employability. The project builds strong partnerships with local manufacturers for internships and on-the-job training. It also offers flexible scheduling, including evening and weekend options, to accommodate working adults. Additionally, support services like childcare, transportation, and mentorship help improve retention among underrepresented groups.

Evaluation Questions

1. **Implementation:** How well have strategies such as flexible scheduling, targeted recruitment, and partnerships with local manufacturers been implemented to meet the needs of minoritized groups and the regional robotics industry?
2. **Effectiveness:** How effectively has the program reduced the robotics and advanced manufacturing skills gap, particularly for Black/African American and LatinX community members?
3. **Outcomes:** What progress have participants made in obtaining robotics certifications and securing employment in advanced manufacturing roles, especially among minoritized groups?
4. **Sustainability:** What factors influence the potential for sustaining partnerships with local manufacturers beyond the current funding cycle, and how can these partnerships support ongoing recruitment and employment for minoritized groups?

Rationale for RQA Evaluation Activity

In its second year, the TechForward project team needed updated data for the NSF annual report on local industry alignment and partner satisfaction with student skills. To gather timely feedback, evaluators used Rapid Qualitative Analysis (RQA) to quickly analyze qualitative data from key participants, including industry partners. The insights gained will help the evaluation team provide actionable recommendations for improving program implementation and supporting underrepresented groups as the project nears its final year. These findings will guide adjustments to recruitment, curriculum design, and industry partnerships to enhance the program's sustainability.

Inductive Coding Activity
Interview Notes

Follow these steps to conduct open coding and identify key themes from the **interview notes** of industry partners in the TechForward Robotics Workforce Development project:

1. **Read the Interview Notes**
   - Carefully read through the provided interview notes summarizing a conversation between an evaluator and a TechForward industry partner.
   - As you read, focus on the context, tone, language, and underlying assumptions behind the participant's responses.

2. **Highlight or Underline**
   - Identify significant words, phrases, or important or meaningful concepts.
   - Consider areas where the participant expresses challenges, successes, or insights about the TechForward project.

3. **Label with Codes**
   - After highlighting, create short labels or "codes" (one or two words) that capture the essence or meaning of each segment.
   - For example, if the participant mentions not having enough funding, you might code it as "resource limitation."
   - Your codes should reflect the content without interpretation—just focus on what is being said.

Deductive Coding Activity
Interview Notes

Follow the directions below to deductively code **interview notes** of industry partners involved in the TechForward Robotics Workforce Development project.

1. **Review the Predetermined Codebook**
   - Begin by familiarizing yourself with the provided codebook. The codebook contains predefined categories or codes that align with the key themes of the TechForward Robotics Workforce Development project (e.g., "Skills Gap," "Partnership Challenges," "Workforce Diversity").

2. **Read the Interview Notes**
   - Carefully review the provided interview notes, summarizing a conversation between an evaluator and a TechForward project participant.
   - As you read, pay close attention to how the content aligns with the pre-determined codes provided.

2. **Highlight Relevant Segments**
   - Highlight or underline words, phrases, or sections that match the coding categories you've been given.
   - These codes reflect themes you are specifically looking for, such as "collaboration," "challenges," or "outcomes."

3. **Assign Codes**
   - Label each highlighted segment with one or more of the pre-determined codes that best fit the content.
   - Ensure that your coding is consistent with the definitions or criteria associated with each code.

4. **Add Comments (Optional)**
   - You can also add brief notes or comments if a segment seems to fit multiple codes or if clarification is needed.

Interview Summary Notes
Interview 1

The following summary notes were developed during the interview. They are intended to capture high-level insights and key takeaways from the discussion.

1. **How has your experience been as a partner in the TechForward Robotics Workforce Development project?**
   - Very positive
   - Consistent communication
   - Partnership allows them to tap into the talent pipeline
   - Appreciate how students are curious about solving real-world problems

2. **How satisfied are you with the program participants, specifically in robotics, AI, and precision machining? Are there any standout skills or areas for improvement?**
   - Students are strong in robotics- specifically automation systems and programming
   - A recent hire jumped into a project on collaborative robots. Within weeks was diagnosing problems
   - Precision machining is an area that needs more experience – Some hesitations on tight tolerances or custom machines. Need hands-on experience

3. **How well do you think the program aligns with the current and future needs of the robotics industry? Any emerging technologies or skills that should be added to the curriculum?**
   - Meet immediate needs
   - Industry is evolving
   - Systems integration – Students need more experience here connecting robotics with other systems like IoT devices
   - Experience on Cyber security and automation – safeguarding automation systems would be "invaluable."

4. **Have you hired any graduates from the Riverbend program? If so, how has their performance been?**
   - 2 graduates
   - One made an impact by streamlining processes for robotic welders
   - Adapt to tools and workflow quickly
   - Not a lot of foundational training is needed, just finetuning for their organization's processes
   - More training on precision making

5. **What do you think are the key factors for maintaining strong partnerships between RoboTech Solutions and the TechForward program beyond the current funding?**
   - Open communication
   - Regular check-ins
   - Recruiting from underrepresented groups – need more resources here
   - A diverse workforce brings in a fresh perspective

6. **What support have you implemented to ensure inclusivity for employees from diverse backgrounds?**
   - Pairing new employees with seasoned employees. Help with skills and acclimating to the culture
   - Diversity training
   - Would love more resources and support from the program here

Interview Summary Notes
Interview 2

The following summary notes were developed during the interview. They are intended to capture high-level insights and key takeaways from the discussion.

1. **How has your experience been as a partner in the TechForward Robotics Workforce Development project?**
   - Positive experience
   - Raising solid talent
   - Challenges around communication
   - Not sure if the program was meeting the specific needs – skills development
   - A lot of potential to benefit students and industry partners

2. **How satisfied are you with the program participants, specifically in robotics, AI, and precision machining? Are there any standout skills or areas for improvement?**
   - Well-versed in robotics basics
   - Hired a couple of graduates
   - Gaps in troubleshooting abilities – specifically when systems malfunction
     - *More exposure to real-life scenarios would help with this. Maybe case study or scenario based learning would help this. Setting up a robot with deliberate issues.*
   - Diagnosing issues on the fly is a challenge for the new hires from the program

3. **How well do you think the program aligns with the current and future needs of the robotics industry? Any emerging technologies or skills that should be added to the curriculum?**
   - Aligns decently,
   - More demand for robotics with AI integration – haven't seen much emphasis on that
   - If Techforward could get ahead of the curve and learn about robotics with AI integration, it would be really helpful

4. **Have you hired any graduates from the Riverbend program? If so, how has their performance been?**
   - two graduates.
   - One has been there for six months. A quick learner. However, issues with time management and juggling multiple tasks
   - Other is still adjusting. They have the technical skills but still adjusting to the pace.
     - Thinks hands-on experiences, like internship/coop, may have provided exposure that the students need to adapt to the work environment.

5. **What support have you implemented to ensure inclusivity for employees from diverse backgrounds?**
   - Mentoring (internal) – Aimed to support employees from underrepresented groups. Pair with senior employees
   - Diversity and inclusion training
   - Ongoing process.
   - Make people feel included, not just hired

6. **What do you think are the key factors for maintaining strong partnerships between RoboTech Solutions and the TechForward program beyond the current funding?**
   - Clear and ongoing communication
   - Need to know how the program adapts to address the needs of the industry
   - Understand the industry's evolving needs
   - More collaboration on curriculum development – maybe a liaison
   - Internships – to create a pipeline of students

Inductive Coding Activity
Interview Audio

Follow these steps to conduct open coding and identify key themes and concepts from the **audio files** of industry partners in the TechForward Robotics Workforce Development project:

1. **Listen to the Audio Segments**
   - You will be provided with audio clips from interviews with industry partners involved in the TechForward Robotics Workforce Development project.
   - Listen carefully to each segment, focusing on understanding the content and the participant's intent.

2. **Use a Coding Matrix for Organization**
   - Set up a coding matrix with the following columns:
     - **Time Segment**
     - **Key Concepts/Words** (the most important ideas from the segment)
     - **Code** (short, one- or two-word labels capturing the essence of the segment)
     - **Notes/Observations** (any additional context or reflections)

3. **Note Key Concepts**
   - After listening to each audio segment, identify significant words, phrases, or meaningful ideas that stand out.
   - Pay close attention to any references to challenges, successes, or suggestions about the TechForward project.
   - Summarize the key concepts in your matrix's "Key Concepts/Words" column.

4. **Assign Codes to Each Segment**
   - After identifying the key concepts, create short labels or "codes" that reflect each segment's core meaning.
   - For example:
     - If a participant discusses the difficulty of hiring graduates with the right skills, you might label the segment "Hiring challenges."
     - If they mention positive feedback on collaboration with the college, use a code like "Partnership success."
   - Make sure your codes focus only on what is said in the audio, without interpretation.

Inductive Coding Activity
Interview Audio

Time Segment	Key Concepts/Words	Code	Notes/Observations
EXAMPLE: 0:00-0:00	*"difficulty hiring graduates"*	*Hiring challenges*	*Mentioned lack of hands-on experience.*
Clip 1			
Clip 2			
Clip 3			
Clip 4			

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Deductive Coding Activity
Interview Audio

Follow these steps to deductively code from the audio files of industry partners in the TechForward Robotics Workforce Development project:

1. **Review the Predetermined Codebook**
   - Begin by familiarizing yourself with the provided codebook. The codebook contains predefined categories or codes that align with the key themes of the TechForward Robotics Workforce Development project (e.g., "Skills Gap," "Partnership Challenges," "Workforce Diversity").
   - Ensure you understand each code and its definition to apply them consistently across all segments.

2. **Listen to the 45-second Audio Segments**
   - You will receive 45-second audio clips from interviews with industry partners involved in the TechForward Robotics Workforce Development project.
   - Listen carefully to each segment, focusing on understanding the content and the participant's intent.

3. **Use a Coding Matrix for Organization**
   - Set up a coding matrix with the following columns:
     - **Audio Segment**
     - **Key Concepts/Words** (the most important ideas from the segment)
     - **Code** (short, one- or two-word labels capturing the essence of the segment, pulled from Deductive Codebook)
     - **Notes/Observations** (any additional context or reflections)

4. **Apply Codes to Each Segment**
   - After listening to each 45-second segment, identify the most relevant code(s) from the codebook.
   - Apply the code that best captures the segment's content. Multiple codes may apply to one segment but focus on the most fitting one(s).
   - Record the code in your matrix's "Relevant Code" column and the specific quote or key concept from the audio supporting that code.

5. **Provide Supporting Quotes or Key Concepts**
   - In the "Supporting Quote/Key Concepts" column, capture the most relevant phrase, idea, or sentence that aligns with the selected code.
   - This will provide evidence for why you assigned the code and will help during analysis and reporting.

6. **Review and Refine Codes**
   - After coding all segments, review your matrix for consistency and accuracy in applying the codebook.
   - Ensure that each code aligns with the codebook definitions and that the supporting quotes or key concepts accurately represent the participant's response.

Deductive Coding Activity
Interview Audio

Time Segment	Relevant Code	Supporting Quote/Key Concepts	Notes/Observations
EXAMPLE: 0:00-0:00	*Hiring challenges*	*"difficulty hiring graduates"*	*Mentioned lack of hands-on experience.*
Clip 1			
Clip 2			
Clip 3			
Clip 4			

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Deductive Code Book

This codebook provides a structured framework for analyzing feedback from industry partners regarding the TechForward Robotics Workforce Development Initiative at Riverbend Community College. It is designed to guide the evaluation of key areas, including program implementation, participant outcomes, workforce alignment, and sustainability.

The codes and subcodes outlined here will help categorize and interpret qualitative data from partner interviews, ensuring a comprehensive understanding of how the program meets industry needs and fosters inclusive workforce development.

1. **Overall Experience as a Partner**: Respondents describe their general experience working with the initiative, focusing on collaboration, quality of the partnership, and relevance to robotics and industrial technologies.
    *   **Subcodes**:
        *   **Perceived Value**: How the partnership benefits both the program and the industry partner.
        *   **Engagement Level**: How often and how deeply partners are involved in the initiative.
        *   **Satisfaction**: Overall happiness with their involvement in the initiative.

2. **Satisfaction with Participant Skills**: Assessment of participants' technical skills, highlighting strengths and areas for improvement in robotics, AI, and precision machining.
    *   **Subcodes**:
        *   **Technical Proficiency**: Skills in robotics, AI, and precision machining.
        *   **Soft Skills**: Skills like communication, problem-solving, and teamwork.
        *   **Preparedness**: Readiness of participants for industry jobs.
        *   **Skills Gaps**: Areas where participants lack technical or soft skills.
        *   **Curriculum Suggestions**: Ideas for updating or expanding the curriculum.

3. **Alignment with Industry Needs**: How well the program meets current and future workforce demands, including relevant skills and new technologies.
    *   **Subcodes**:
        *   **Current Alignment**: How well the curriculum matches today's industry needs.
        *   **Future Needs**: Anticipation of future skills and industry trends.

4. **Hiring and Retention of Program Graduates**: Experience with hiring or keeping graduates and how well they perform in advanced manufacturing roles.
    *   **Subcodes**:
        *   **Hiring Success**: Number of graduates hired.
        *   **Performance Satisfaction**: Satisfaction with graduates' job performance.
        *   **Retention**: Success in keeping program graduates over time.
        *   **Underrepresented Groups**: Impact on Black/African American and LatinX participants.

5. **Sustainability of Partnerships**: Factors that help maintain partnerships with local manufacturers and support recruitment and employment for underrepresented groups beyond the current funding period.
    *   **Subcodes**:
        *   **Long-Term Partnership Potential**: Likelihood of keeping partnerships after current funding ends.
        *   **Key Sustainability Factors**: Elements that help or hinder the sustainability of partnerships.
        *   **Employer Engagement**: Level of ongoing support from local manufacturers.

Consolidated Framework for Implementation Research (CFIR)

Rapid Qualitative Analysis Framework Fact Sheet

CFIR is a comprehensive framework used to assess and understand the factors influencing the successful implementation of programs or innovations. It organizes data into five domains (innovation, inner setting, outer setting, individuals, and implementation process), helping evaluators explore complex, multi-level implementation environments. CFIR helps identify facilitators and barriers to the implementation process by identifying various influencing factors within organizational, individual, and external settings.

Steps

1. **Operationalize CFIR Domains:**
    a) **Define the Subject of Each Domain:** Tailor the five key CFIR domains (innovation, inner setting, outer setting, individuals, implementation process) to fit the project context.
    b) **Replace Broad Language:** Adapt the framework's constructs to project-specific terminology.
    c) **Add Constructs as Needed:** Include any relevant themes that might be missing from the core CFIR model.
    d) **Data Collection and Analysis:** Use CFIR to guide data collection, helping to focus on predefined areas of interest.

2. **Create Interview Protocol:** The CFIR framework will structure your interview questions and guide data collection, ensuring you cover all relevant domains.

3. **Take Detailed Notes:** During interviews, the primary analyst should take detailed notes and capture key quotes related to CFIR constructs, emphasizing important themes like alignment with industry needs, workforce preparedness, and implementation barriers.

4. **Immediately Post-Interview Coding:** After each interview, the primary analyst codes the interview notes into a CFIR construct-by-facility matrix in MS Excel or a similar tool. Be sure to timestamp when necessary and note where additional detail may be needed.

5. **Valence and Strength:** After coding, analysts should rate each CFIR construct based on its:
    a) **Valence:** Whether the factor positively or negatively influenced program implementation.
    b) **Strength:** Whether the factor had a weak or strong influence on the program's overall success.

6. **Domain Summaries:** Draft a high-level summary for each domain, which the secondary analyst then reviews and refines.

Things to Consider

- **Understanding Complexity:** Applying the CFIR framework effectively requires a thorough understanding of how each domain influences project implementation.
- **Customization:** The CFIR framework is flexible but needs to be carefully adapted to reflect the study's specific context.
- **Relevance to Projects:** This framework is particularly beneficial for evaluations related to introducing new processes, programs, or technologies.

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Hamilton Rapid Qualitative Analysis

Rapid Qualitative Analysis Framework Fact Sheet

The Hamilton RQA method provides a structured, deductive approach to summarizing qualitative data from interviews, making it easier to analyze and report key findings quickly.

Hamilton RQA accelerates the qualitative analysis process by using predefined domains for data collection, which guides a focused and efficient review of interview data.

Steps

1. **Create Neutral Domains:** Align each interview question with a corresponding domain utilizing interview and evaluation questions. Domains refer to categories or thematic areas that group related interview questions.
2. **Design a Summary Template:** Develop a standardized template for capturing interview summaries highlighting these domains.
3. **Test the Template:** Ensure the template is user-friendly and relevant to the study.
4. **Summarize Transcripts:** Summarize each transcript based on the template.
5. **Matrix Organization:** Transfer summarized data into a matrix (respondent x domain)

Things to Consider

- **Predefined Structure:** The deductive approach including predetermined domain may limit the discovery of emergent themes but ensures consistency.
- **Iterative Analysis:** Be prepared to revisit and refine your summaries and analyses as new insights emerge. Qualitative analysis is often an iterative process, and allowing for flexibility can lead to a deeper understanding of the data.
- **Comprehensive Documentation:** Keep detailed notes of your decisions, coding choices, and rationale throughout the analysis. This documentation promotes transparency and can be valuable for revisiting your work or justifying your conclusions later on

Hamilton RQA Matrix

Prepared By: **Respondent Role:**

Domain	Summary
Domain 1	
Domain 2:	
Domain 3:	
Domain 4	

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Hamilton RQA Matrix

	Domain 1	Domain 2	Domain 3	Domain 4
Respondent 1				
Respondent 2				

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Rigorous and Accelerated Data Reduction (RADaR)

Rapid Qualitative Analysis Framework Fact Sheet

The RADaR technique systematically reduces large qualitative data sets through multiple stages, organizing raw data into concise tables for easier analysis. This phased reduction helps quickly identify key themes while maintaining the integrity of the original data.

Steps

1. **Ensure Consistent Formatting:** Make sure all data transcripts are in a uniform format.

2. **Create a Phase 1 Data Reduction Table:** Organize raw data into a comprehensive table with columns for transcript numbers, questions, participant responses, codes, and notes. (See Handout 10.)

3. **Review the Phase 1 Data Reduction Table:** Examine the all-inclusive data table to identify specific areas or concepts you want to focus on.

4. **Create the Phase 2 Data Reduction Table:** Remove irrelevant information from the Phase 1 table, retaining only the content that is most pertinent to your research questions for targeted analysis.

5. **Further Reduction:** Continue condensing the data through additional rounds (Phase 3, 4, etc.) as necessary.

6. **Draft Deliverables:** Create project reports or outputs using the final condensed table.

Things to Consider:

- **Collaborative Analysis:** Although this method is effective for team settings, solo analysts can still benefit from the structured approach to ensure consistent and accurate data reduction.

- **Balancing Efficiency and Depth:** While RADaR allows for rapid analysis, it may sacrifice some granularity as data is condensed, so be mindful of the level of detail needed for your evaluation.

- **Adaptability:** The RADaR technique is flexible and can be tailored to various stages of analysis, making it compatible with other qualitative approaches you may be using.

RADaR RQA Data Reduction Table

1 **Evaluation Question:** How well have strategies such as flexible scheduling, targeted recruitment, and partnerships with local manufacturers been implemented to meet the needs of Black/African American and LatinX groups and the regional robotics industry?

Transcript #	Question	Response	Code	Notes
001	How has your experience been as a partner in the TechForward Robotics Workforce Development project?	It's been a very positive experience. We've had consistent communication with the college, and the partnerships allowed us to tap into a solid talent pipeline. I'm particularly impressed by the way the students come out with a genuine curiosity about solving real world problems. That's what we need in robotics.		
002	How has your experience been as a partner in the TechForward Robotics Workforce Development project?	It's been a positive experience overall. The program is producing some solid talent, but there have been a few challenges, especially around communication. There have been a few times where we weren't sure how closely the program was aligned with our specific needs, particularly in terms of skills development, but I do think the program has a lot of potential to benefit both students and industry partners like us.		

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RADaR RQA Data Reduction Table

2 **Evaluation Question:** How effectively has the program contributed to reducing the skills gap in robotics and advanced manufacturing, particularly for Black/African American and LatinX community members?

Transcript #	Question	Response	Code	Notes
001	How satisfied are you with the program participants, specifically in robotics, AI, and precision machining? Are there any standout skills or areas for improvement?	The students we've worked with are strong in robotics, especially with automation systems and programming. For instance, we had a recent hire who jumped into a project involving collaborative robots, And within a few weeks, he was diagnosing issues in our automated assembly line. That kind of problem solving initiative is fantastic. But precision machining is an area that could use more focus. We've noticed some hesitation when they have to work with tight tolerances or custom machining setups. Hands on experience there would make a big difference.		
001	How well do you think the program aligns with the current and future needs of the robotics industry? Any emerging technologies or skills that should be added to the curriculum?	The program meets our immediate needs well, but the industry is evolving quickly. One area that stands out is systems integration. Students need more experience connecting robotics with other industrial systems, like IoT devices. We're also seeing a surge in the importance of cybersecurity and automation. Just last year, we had to shut down an entire production line for 48 hours due to a ransomware attack on our connected systems. Training students in safeguarding automated systems would be invaluable.		
001	What support have you implemented to ensure inclusivity for employees from diverse backgrounds?	We've started pairing new employees, especially those from underrepresented backgrounds, with seasoned mentors who guide them through both technical skills and navigating company culture. 1 of our Latinx employees recently mentored a new hire who was hesitant to take initiative in team meetings. After a few weeks of mentoring, that new hire now regularly regularly leads project updates. We've also implemented diversity training, but we know that there's more we can do. We'd love any insights or supports from the program in this area.		

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RADaR RQA Data Reduction Table

2 **Evaluation Question:** How effectively has the program contributed to reducing the skills gap in robotics and advanced manufacturing, particularly for Black/African American and LatinX community members?

Transcript #	Question	Response	Code	Notes
002	How satisfied are you with the program participants, specifically in robotics, AI, and precision machining? Are there any standout skills or areas for improvement?	The participants are well versed in robotic basics. There's no question there. We've hired a couple of graduates, and they know their way around programming industrial robots and setting up automated systems, But we've seen some gaps in their troubleshooting abilities, specifically, when systems malfunction. So for instance, we had a recent hire who struggled when one of our robots went off script during a production run. They knew how to operate the system under normal conditions, but diagnosing and fixing the issues on the fly was a challenge. It's that kind of real world problem solving that they need more experience with.		
002	How well do you think the program aligns with the current and future needs of the robotics industry? Any emerging technologies or skills that should be added to the curriculum	It aligns decently with our current needs, but I think there's more that could be done. For example, we're seeing more demand in skills related to robotic integration with AI driven analytics, and that's not something we've seen a lot of emphasis on. If the program could get ahead of that curve, it could be really beneficial.		
002	When it comes to troubleshooting, do you think it's a matter of needing more hands-on experience, or is there a specific type of training you think would help prepare them better?	I think more exposure to real world scenarios would help. In school, everything works as expected, but out here, things break, and you need to think on your feet. It would be useful if the program simulated unexpected issues more often, maybe through case studies or scenario based training. For example, setting up a robot with deliberate glitches to test their troubleshooting skills under pressure.		
002	What support have you implemented to ensure inclusivity for employees from diverse backgrounds?	In the last couple years, we've launched an internal mentorship program aimed at supporting employees from underrepresented groups. For example, we have had a few women and people of color who've joined our engineering teams, and we pair them with senior employees who can help guide their career development. We're also trying to create a more inclusive culture by having regular diversity and inclusion training. But, honestly, it's an ongoing process. We're still figuring it out and how to make everyone feel truly included, not just hired. We'd appreciate any guidance the program can offer in this area too.		

RADaR RQA Data Reduction Table

3 **Evaluation Question:** What progress have participants made in obtaining robotics certifications and securing employment in advanced manufacturing roles, especially among underrepresented groups?

Transcript #	Question	Response	Code	Notes
001	Have you hired any graduates from the Riverbend program? If so, how has their performance been?	Yes. We brought on 2 graduates. One of them in particular made an immediate impact by streamlining the programming for our robotics welders. What stood out is their ability to adapt to our tools and workflow quickly. We didn't have to do much foundational training on robotics, just fine tuning specific skills for our processes. But like I said earlier, more work in precision making would round out their skill sets.		
002	Have you hired any graduates from the Riverbend program? If so, how has their performance been?	Yeah. We've hired 2 graduates from the program. 1 has been with us for about 6 months and is doing pretty well in their role. They're a quick learner and have adapted to our works our team's workflow, but we've noticed that they need more support with time management and juggling multiple tasks. In robotics, things move fast, and you have to deal with several issues at once. Another graduate is still adjusting. They have the technical skills, but they found it hard to keep up with the fast paced production.		
002	Do you feel like more internship or co-op experience during their education would have helped them better handle that pace?	Yes. Absolutely. They had more real world experience before joining us. I think they would have been better prepared for the demands of the job. Internships are great because they give students a taste of what the real world pace is like, working under deadlines, managing unexpected challenges, and balancing multiple tasks.		

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RADaR RQA Data Reduction Table

4 **Evaluation Question:** What factors influence the potential for sustaining partnerships with local manufacturers beyond the current funding cycle, and how can these partnerships support ongoing recruitment and employment for underrepresented groups?

Transcript #	Question	Response	Code	Notes
001	What do you think are the key factors for maintaining strong partnerships between RoboTech Solutions and the TechForward program beyond the current funding?	I think maintaining open communication and ensuring that the curriculum evolves with industry changes is key. Regular check ins with us like this one are critical. Also, continuing to focus on recruiting from underrepresented groups is important. We're proud to support that, but we'd also like to see more resources from the program to help us improve in this area. A diverse workforce brings in fresh perspective, and that's invaluable in a field like robotics.		
002	What do you think are the key factors for maintaining strong partnerships between RoboTech Solutions and the TechForward program beyond the current funding?	Clear and ongoing communication is really key. We need to know how the program is adapting to industry changes, and they need to understand our evolving needs. Also, we'd love to see more opportunities for collaboration on curriculum development, maybe having a dedicated liaison who meets up with us quarterly to discuss trends and feedback. And I can't stress enough the value of internships. If we can establish a consistent pipeline of interns, that's a win win for both the students and for us.		

Rapid Identification of Themes from Audio (RITA)

Rapid Qualitative Analysis Framework Fact Sheet

RITA is a method where evaluators listen to audio recordings to identify themes directly from the source, without transcribing the data. It is faster than traditional methods and preserves nonverbal nuances like tone and emotion.

RITA is designed to expedite the identification of key themes in qualitative data by forgoing transcription, allowing for more immediate analysis of participant responses.

Steps

1. **Specify Key Evaluation Foci:** Clarify the themes or topics that will be the focus of the analysis.
2. **Develop a Codebook:** Identify the key themes and create a codebook with codes, descriptions, and any inclusion/exclusion criteria.
3. **Create a Coding Form:** Design a form to track themes in audio recordings in designated time segments, including sections for codes, descriptions, and criteria for their application.
4. **Test and Refine the Codebook:** Pilot the codebook on a subset of interviews, refining codes and definitions as necessary.
5. **Coding:** Code each audio segment using the finalized codebook and coding form. Additionally, code the sentiment (valence) of the theme as + (positive), − (negative), or 0 (neutral).
6. **Analysis of Codes:** Tally the occurrences of each code or valence within and across interviews. Calculate the percentages to identify trends and the context of themes.

Things to Consider

- **Capture Nonverbal Cues:** While listening to audio recordings, notice nonverbal elements like tone and mood that might be missed in transcription. These cues can provide valuable context for your analysis.
- **Time Efficiency:** RITA speeds up the analysis process by skipping the transcription phase. However, some details may be lost, so consider making notes on any important nuances you observe during the listening process.
- **Focus on Established Themes:** RITA works best for studies with specific, clearly defined themes. If your research questions are not well-defined, consider refining them before starting your analysis to ensure you stay focused on the most relevant insights.

RITA Coding Form

In each audio clip, identify whether a theme occurs and mark its presence with a checkmark. Additionally, code the sentiment (valence) of the theme as + (positive), − (negative), or 0 (neutral). Focus only on whether the theme appears in the segment, not its frequency.

	Clip 1	Clip 2	Clip 3	Clip 4	Clip 5	Clip 6	Clip 7
Theme 1: Overall Experience as a Partner							
Sub Code: Perceived Value		✔ +					
Sub Code: Engagement Level							
Sub Code: Satisfaction		✔ +					
Theme 2: Satisfaction with Participant Skills							
Sub Code: Technical Proficiency		✔ +	✔ −				
Sub Code: Soft Skills		✔ +					
Sub Code: Preparedness		✔ +					
Sub Code: Skills Gaps							
Sub Code: Curriculum Suggestions			✔ 0				
Theme 3: Alignment with Industry Needs							
Sub Code: Current Alignment			✔ 0				
Sub Code: Future Needs				✔ 0			
Theme 4: Hiring and Retention of Program Graduates							
Sub Code: Hiring Success				✔ 0			
Sub Code: Performance Satisfaction				✔ +	✔ +		
Sub Code: Retention							
Sub Code: Underrepresented Groups					✔ 0	✔ 0	
Theme 5: Sustainability of Partnerships							
Sub Code: Long-Term Partnership Potential						✔ 0	
Sub Code: Key Sustainability Factors					✔ 0		
Sub Code: Employer Engagement							

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RITA Coding Form

In each audio clip, identify whether a theme occurs and mark its presence with a checkmark. Additionally, code the sentiment (valence) of the theme as + (positive), − (negative), or 0 (neutral). Focus only on whether the theme appears in the segment, not its frequency.

	Clip 1	Clip 2	Clip 3	Clip 4	Clip 5	Clip 6	Clip 7	Clip 8	Clip 9	Clip 10
Theme 1: Overall Experience as a Partner										
Sub Code: Perceived Value										
Sub Code: Engagement Level										
Sub Code: Satisfaction										
Theme 2: Satisfaction with Participant Skills										
Sub Code: Technical Proficiency										
Sub Code: Soft Skills										
Sub Code: Preparedness										
Sub Code: Skills Gaps										
Sub Code: Curriculum Suggestions										
Theme 3: Alignment with Industry Needs										
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Theme 4: Hiring and Retention of Program Graduates										
Sub Code: Hiring Success										
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