

The Role of Diversity Focused Conference in Aiding Returning Women's Transition to Computing and Technology Discipline

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Abstract— It is widely known that the field of computing and Emerging Technology (EmTech) lacks diversity. There have been many national initiatives over the past decade that tried to enhance diversity in these fields. However, one group of population, returning women, have received little to no attention. Covid-19 pandemic has made this situation even worse by sharpening the inequality in America's economy, where nearly eight times the number of women left the workforce compared to men last year. Yet, returning women, remain to be one of the largest untapped talent pools in the nation. The field of computing and EmTech can use the untapped potential of returning women to fill the gap in workforce, which is growing at a rapid rate. Hence, to broaden participation and to understand the barriers and challenges faced by returning women to (re-)enter EmTech, a national virtual conference, NSF RESET, was organized in 2021 amid the COVID-19 pandemic. In this poster, we present results from a mixed method study to investigate if the attendance at the RESET conference is a predictor of returning women's elevated knowledge in (re-)entering EmTech education or workforce.

Keywords—*returning women; gender; computing; diversity; emerging technology; conference*

I. INTRODUCTION

The academic and professional pipeline of computing discipline lacks diversity which have been a pressing problem for the last two decades. Although the proportion of women computing degree holders remains relatively low, the field of computing continues to grow each year [1]. Further, a recent survey of Americans [2] found that 48% of respondents expect the number of computing jobs to continually grow in the U.S. over the next decade. Some industry within computing domain known as Emerging Technology (EmTech), like machine learning, artificial intelligence, cloud computing, and data science, are growing at an exponential rate and there is prediction that these areas will face skill shortage in the coming years [3]. Additionally, due to COVID-19 pandemic, nearly eight times the number of women left the workforce compared to men this year [4] and this inequality has also impacted the computing industry's diversity representation very negatively. Literature has demonstrated that women who leave school or career often do so because of finances, lack of support network or personal obligations [5] and the pandemic has made these challenges more prominent for women.

In recent years, studies have shown experiential educational activities, like conferences, encourage learners' persistence in

STEM [6]; this is especially important for students underrepresented in the field. With this theory in place, to identify challenges and barriers faced by returning women in their journey to (re-)enter EmTech, we have implemented a three-day national virtual conference, RESET, in 2021.

II. GOALS, METHODOLOGY AND RESULTS

In Figure 1, we highlight the conference's three primary goals:

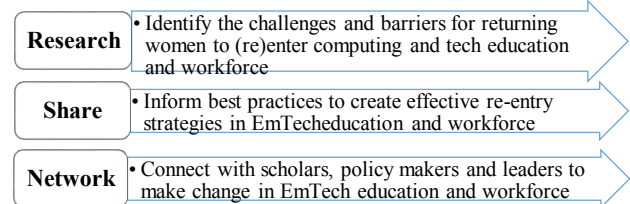


Figure 1. Conference Goals

Through the three primary goals highlighted above, RESET also enabled the sharing of experiential knowledge and evidence-based findings, and provided recommendations on how the enrollment, retention, recruitment, and employment opportunities of returning women may be improved through different efforts like research, practice, policy, and evaluation. The conference sessions emphasized on the following theme topics, but not limited to 1) Current state of EmTech curriculum initiatives, 2) Equitable EmTech education initiatives, 3) Upskilling and reskilling in EmTech, 4) Non-traditional paths in EmTech, 5) New initiatives for tech diversity, 6) Diverse routes to EmTech, and 7) Tech re-entry lessons learned.

Additionally, to facilitate technical training, numbers of hands-on virtual workshops and technical interview sessions were provided which focused on 1) Google Cloud Build platform, 2) building a Chatbot with AWS Lex, 3) data science and visualization in healthcare, 4) cyber-attacks with cryptography, forensics, and web exploitation, 5) assessing trustworthy AI with Z-Inspection®, and 6) securing and privacy-preserving of data-driven systems.

In this current research, we are interested in finding if the RESET diversity focused conference was able to elevate the knowledge of returning women to (re-)enter EmTech fields. This will be evident if the attendance and dissemination of conference artifacts lead to attendees reporting - 1) *high level of satisfaction*; 2) *knowledge benefit from various technical sessions*; 3) *compliance with effectiveness of the resources offered*; and 4) *preparedness in pursuing an EmTech education*

and workforce. These four reported parameters are considered as covariates in our study. These covariates are known correlates of outcome variables and are included in statistical models so that any observed effects of predictors (conference attendance) and moderators (returning women) on outcome variables are true over and above the effects of our covariates on outcome measures. Hence, an underlying research question we are investigating is if the attendance at the RESET conference is a predictor of returning women's elevated knowledge in (re-)entering EmTech. Figure 2 illustrates our analytical model showing the moderating role of returning women in determining the impact of the conference.

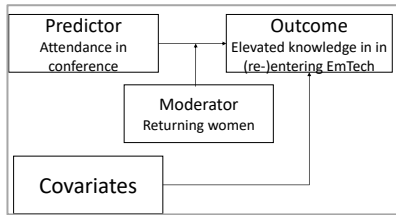


Figure 12. Analytical model of research

There were three main survey instruments in this study: (1) *post-sessions surveys for all conference sessions*; (2) *a post-conference session*; and (3) *focus groups with volunteers to discuss their experience attending the RESET conference and their perspectives on career breaks for women in computing*.

The primary two data collection instruments, post-session survey and post-conference survey, were developed to answer the research questions and measure conference satisfaction and outcome. The main postsurvey consisted of three demographic questions, five Likert questions, 34 other questions that asked participants to report their current academic concentration, if they had any career break, if they have (re-)entered computing and/or tech education or professional pipeline, what challenges and barriers they faced and what strategies have been useful for them to reskill or upskill so they could (re-)enter. In the post-survey, of the 161 attendees who responded to the survey, two-thirds (67.74%) were undergraduate students, 12.50% were graduate students, and 8.55% were faculty members. All respondents were women (100.00%) with just over half (55.26%) under the age of 30, and one-quarter (26.97%) reported that they had experienced a career break. The number of participants included in each of the data collection points are provided in Table 1.

Table 1. Data collection from conference survey

Data Collection	Number of Participants
Post-Session Surveys	1360 responses
Post-Conference Survey	161 attendees responded

Attendees of the conference reported the degree to which they found conference informative and provided open-ended comments related to the effectiveness of different sessions. We first disaggregated the four reported parameters (i.e., covariates), which were answered on a 5-point Likert-type scale, against different characteristics of the attendees (i.e., moderator). And then we conducted a series of moderated multiple regression analyses to address our single research question. A “moderation” effect occurs when the relationship

between a predictor variable (e.g., attendance at the conference) and an outcome variable (e.g., elevated preparedness to (re-)enter EmTech) depends on a moderator variable (e.g., demographic group: returning women characteristics). In the following subsections, we first present the disaggregation of the moderator characteristics and covariates, and later we report only on the impact of our primary variables of interest to answer the research question. All of the following findings were significant at the $p < .05$ level.

In the poster, we will present our analysis to report the following measured outcome: Level of Satisfaction, Knowledge Benefit from Various Technical Sessions, Compliance with Effectiveness of the Resources Offered, and Preparedness in Pursuing EmTech Education and Workforce.

III. POST-CONFERENCE IMPACT

Nearly 95% of respondents (94.77%) reported that they would recommend the resources provided through the conference to their peers. One hundred sixteen conference attendees also reported on the most important benefits that they gained from attending the conference. Their responses fell into three common themes: 1) *a network of women to support them*; b) *inspiration as they continue their career paths*; and 3) *knowledge and practical information*. Table 2 summarizes the evidence of achievement of the conference with respect to the conference goals.

Table 2. Conference Goals Achievement

Conference Goal	Evidence of Achievement
Goal 1: Identify the barriers for returning women to enter EmTech education and workforce	Survey respondents reported similarly on key barriers, both from their own lived experiences through post-conf survey and from what they learned in conference sessions
Goal 2: Inform best practices to create effective re-entry strategies in EmTech for returning women	Meaningful recommendations were provided by the conference attendees in surveys to inform the field of ways to better support re-entry for EmTech women into both academia and industry settings
Goal 3: Connect with scholars, policy makers and leaders to make change in EmTech	Throughout the pre-conference and post-session survey data, participants noted the value of the connections they made with other attendees and presenters, the importance of networking, and the ways in which an intentional network of support is meaningful as they further their pursuits in the field

IV. REFERENCES

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